

**MERCHANT HOROVITZ & TILLEY**

Peter A. Horovitz 6920-0  
2073 Wells Street, Suite 101  
Wailuku, HI 96793  
Tel: 808.242.5700  
Fax: 808.442.1255  
Email: [pah@mhmaui.com](mailto:pah@mhmaui.com)

Attorneys for Intervenor  
Waikapu Development Venture LLC

**BEFORE THE LAND USE COMMISSION**

**OF THE STATE OF HAWAII**

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF  
MAUI

To Amend the Land Use District Boundary of  
Certain Lands Situated at Wailuku, Island of  
Maui, State of Hawaii, Consisting of 25.263  
Acres from the Agriculture District to the  
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

MOTION FOR MODIFICATION;  
MEMORANDUM IN SUPPORT OF  
MOTION; AFFIDAVIT OF WILLIAM  
FRAMPTON EXHIBITS A TO F;  
CERTIFICATE OF SERVICE

**HEARING**

DATE: November 29, 2018

TIME: TBD

LOCATION: Maui Arts & Cultural Center  
Meeting Room, Maui, Hawaii

**MOTION TO FOR MODIFICATION**

**I. RELIEF SOUGHT**

Intervenor WAIKAPU DEVELOPMENT VENTURE, LLC ("**Intervenor**"), by and through its legal counsel, MERCHANT HOROVITZ, LLC, hereby respectfully requests that the STATE OF HAWAII LAND USE COMMISSION issue an order modifying the Commission's *Findings of Fact, Conclusions of Law, and Decision and Order* filed March 7, 2008, to allow for

use of the portion of the Petition Area acquired for a workforce housing project recently approved by the County of Maui.

## **II. GROUND FOR MOTION**

This Motion is made pursuant to Chapter 205, Hawaii Revised Statutes and Title 15, Subtitle 3, Chapter 15 of the Hawaii Administrative Rules ("**HAR**"), §§ 15-15-70 and 15-15-94, the other authorities and arguments stated in the attached Memorandum in Support of Motion, and the pleadings and files herein.

Petitioner requests a hearing on this Motion under HAR § 15-15-70(c).

Dated Wailuku, Hawaii OCT 22 2018



---

**PETER A. HOROVITZ**  
Attorneys for Intervenor  
**WAIKAPU DEVELOPMENT VENTURE,**  
**LLC**



**BEFORE THE LAND USE COMMISSION**

**OF THE STATE OF HAWAII**

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF  
MAUI

To Amend the Land Use District Boundary of  
Certain Lands Situated at Wailuku, Island of  
Maui, State of Hawai'i, Consisting of 25.263  
Acres from the Agriculture District to the  
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

MEMORANDUM IN SUPPORT OF MOTION

**MEMORANDUM IN SUPPORT OF MOTION**

**I. BACKGROUND AND STANDARD**

**A. Background to 2008 Decision and Order and Intervention**

Between July and September, 2007 the Land Use Commission of the State of Hawaii ("**Commission**") held multiple hearings to consider evidence and witness testimony relating to petitioner EMMANUEL LUTHERAN CHURCH OF MAUI's ("**Petitioner**") request to reclassified approximately 25.263-acres of land in Wailuku, and bearing Tax Map Key No. (2) 3-5-002:011 ("**Petition Area**") into the State Land Use Urban District. Subsequent to the multiple noticed hearings, the Commission considered further proposals and stipulations by the Parties. As a result of the hearings, testimony, and briefings, the Commission issued on March 7, 2008 issued its Findings of Fact, Conclusions of Law, and Decision and Order in Docket No. A07-773 ("**D&O**"). Along with various conditions, the Commission reclassified the Petition Area as State Land Use Urban District. The D&O allowed Petitioner to develop a new church and school campus (the "Project") on Petition Area

The D&O state that the Commission “may fully or partially release the conditions . . . as to all or any portion of the Petition Area upon timely motion and upon the provision of adequate assurances of satisfaction of these conditions. . . See D&O at pg. 48, ¶ 21.

In order to modify usage of any portion of the Petition Area, or to release any portion thereof from Commission Jurisdiction, the D&O require assurances that the conditions of the D&O would be largely be met. See D&O at pg. 48, ¶ 21. While not an exhaustive list, as some conditions comply solely to Petitioner, relevant conditions of the D&O include the following (the **“D&O Conditions”**):

1. Provision of water resources to the satisfaction of the County of Maui and other agencies.
2. Satisfactory development of wastewater resources.
3. Preparation of a TIAR for appropriate development of roadways.
4. Provisions for storm water retention and drainage.
5. Development of any required civil defense infrastructure.
6. Development and implementation of an archeological and historic preservation mitigation plan.
7. Appropriate treatment of any burial or historic sites discovered during development.
8. Preparation of an appropriate soil analysis.
9. Monitoring of air quality as required.
10. Preservation of historic access rights for cultural or religious practices.
11. Notification to purchasers of nuisance from adjacent agricultural lands.
12. Disclosures of Hawaii Right to Farm Act, as required.
13. Development of a solid waste management plan in compliance with State law and County regulations.
14. Implementation of Best Management Practices during and after development.

15. Implementation of appropriate water conservation measures.
16. Implementation of appropriate energy conservation measures.
17. Filing of annual report to the Commission
18. Receiving permission to sell all or a portion of the petition area.

At hearing on May 9, 2018, the Commission heard Intervenor's Motion to be Copetitioner or in the Alternative to Become a Party, or in the Alternative to Intervene filed hererin on April 12, 2018 (the "**Intervention Motion**"). As set forth therein, the Intervention Motion was based upon Intervenor's existing contract to purchase a portion of the Petition Area petitioner for a Workforce Housing Project under HRS 201H (the "**201H Project**").

Also on May 9, 2018, the Commission heard Petitioner's Motion for Extension of Time to Complete Project filed herein on April 9, 2018 ("**Petitioner's Motion for Extension**"). As detailed therein and at hearing, Petitioner reasonably believed that its intended school/church project could be completed on the portion of the Petition Area to be retained by it. It also offered testimony to the effect that the infusion of capital from the sale of a portion of the Petition Area would provide necessary capital towards the fundraising necessary to implement its project.

The Commission granted the Intervention Motion, granting intervenor status. The Commission continued Petitioner's Motion for Extension for a period of six (6) months, with the Commission's chair having discretion to extend that period for an additional six (6) months. The commission indicated their preference that Intervenor process its 201H Application with the Maui County Council prior to requesting Commission approval for use of a portion of the Petition Area for the 201H project, and that the parties to provide further testimony relevant to the intended time-lines of their respective projects. Separately both Intervenor and ELC have provided the Commission with timelines for their respective developments.

**B. Background To 201H Application and Project Need**

On November 21, 2016, Intervenor's Manager, William Frampton, entered into a purchase contract, later is under contract to purchase a subdivided portion of the Petition Area upon (1) subdivision and (2) approval of the Commission. Mr. Frampton ultimately assigned the purchase contract to Intervenor. A true and correct copy of the purchase contract and assignment is attached hereto as Exhibit "A" (the "**Purchase Contract**"). Various addendums to the Purchase Contract extending the closing date thereunder to accommodate the subdivision and actions before this Commission are not attached.

Throughout 2017, Intervenor met with community groups and select governmental departments as part of its efforts to conform its vision for the 201H Project to community need. See Affidavit of William Frampton attached hereto; Exhibit "B" attached to Affidavit of William Frampton (the "**Project Timeline**").

The 201H Project's goal is to meet a strong public need for affordable housing on Maui in general, and central Maui in particular. An accepted market demand study prepared by R.W. Spangler relating to the project (the "**Market Study**") is attached as Exhibit J to the 201H Application (attached hereto as Exhibit "E"). As set forth therein, the 201H Project will provide urgently needed affordable housing in the central Maui area. Furthermore, as noted in the Market Study, while there are currently other communities in various stages of permitting and completion in the general area, the proposed 201H Project will serve a need that is not met or entirely fulfilled by those projects. As specifically noted in the Market Study, the 201H Project "will fill a small portion of the substantive shortfall in available for-sale affordable residential housing." Id. at p. 40. Indeed, as a result of community outreach, Intervenor has received inquiries from prospective purchasers, many of whom were pre-qualified for neighboring

affordable-housing projects but did not receive allocations, which exceed the number of available lots in the proposed 201H Project. See Affidavit of William Frampton attached hereto.

The 201H Project is consistent with surrounding land uses. The Petition Area is zoned Public/Quasi-Public and by virtue of the D&O is within the State Urban District. Subsequent to the D&O, the County of Maui on December 28, 2012 adopted its Maui Island Plan encompassing desired growth projections through 2030 (the “**Maui Island Plan**”). A true and correct copy of relevant portions of the Maui Island Plan is attached as Exhibit “C.” The Petition Area is within the designated urban growth boundaries set forth in the Maui Island Plan. The Maui Island Plan was the product of nearly a decade of work at the community and government level to identify both the future needs of Maui Nui on all levels, as well as where growth should be encouraged or discouraged to meet those needs.

In January, 2018, and in coordination with the Maui County Department of Housing and Human Concerns, the ultimate accepting agency for the 201H Application, Intervenor transmitted its Draft 201-H Affording Housing Application to the following Federal, State, and County Agencies and Departments.

**Federal Agencies:**

1. U.S. Department of Interior
2. U.S. Corp. of Engineers

**State Agencies:**

3. Department of Transportation (Maui and Honolulu Offices)
4. Department of Health
5. Department of Land and Natural Resources, Land Division
6. Land Use Commission
7. Department of Agriculture

8. Department of Health
9. Hawaii Department of Defense
10. Office of Hawaiian Affairs
11. Office of Planning
12. Department of Education
13. Department of Land and Natural Resources – CWRM
14. Department of Land and Natural Resources – SHPD
15. Department of Hawaiian Homelands

**County Departments and Divisions:**

16. Department of Housing and Human Concerns
17. Civil Defense
18. Environmental Management
19. Fire & Public Safety
20. Housing Division
21. Parks and Recreation
22. Planning
23. Police
24. Public Works
25. Transportation
26. Water Supply
27. Zoning and Enforcement Division

Attached as Exhibit “D” are true and correct copies of the transmittal letters to the above Agencies, Departments, and Divisions without the noted enclosure.

As a result of requests for comments, Intervenor received responses from the following Departments and agencies:

1. Department of Planning (County of Maui)
2. Department of Fire and Public Safety (County of Maui)
3. Department of Public Works (County of Maui)
4. Department of Defense (State of Hawaii)
5. Department of Transportation (State of Hawaii)
6. Department of Transportation (County of Maui)
7. Department of Environmental Management (County of Maui)
8. Department of Education (State of Hawaii)
9. Department of Parks & Recreation (County of Maui)
10. Department of Water Supply (County of Maui)
11. Police Department (County of Maui)

---

12. Department of Health, Maui District Office (State of Hawaii)
13. Department of Health (State of Hawaii)
14. Office of Hawaiian Affairs (State of Hawaii)

Intervenor responded to all comment letters and where appropriate included suggested revisions in its final Application for Affordable Workforce Housing Subdivision (the “**201H Application**”). A true and correct copy of the final 201-H Application is attached hereto as Exhibit “E.” Intervenor also worked directly with many of the named Departments, particularly on the County level, to incorporate various design elements to address departmental preferences for items such as street width for emergency vehicles and sidewalk locations for safety. See Affidavit of William Frampton filed herein.

Intervenor filed its 201H Application with the County of Maui’s Department of Housing and Human Concerns on July 25, 2018. See Exhibit “B” attached hereto. The 201H Application

came on for hearing before the Land Use Committee of the Maui County Council on August 1, 2018, August 22, 2018, and August 28, 2018.<sup>1</sup> *Id.* The 201H Application passed out of committee with unanimous support. *Id.* The full Maui County Council took up the 201H Application and the Land Use Committee's unanimous recommendation on September 7, 2018 and the matter passed unanimously. *Id.* The Maui County Council adopted Resolution No. 18-150 (the "**Resolution**") approving the 201H Application with modifications, one of which is that Intervenor obtain Commission approval for the use of a portion of the Petition Area for the 201H project within six (6) months of the Resolution, by March 7, 2019. A true and correct copy of the Resolution is attached hereto as Exhibit "F."

C. **Applicable Standard**

HAR § 15-15-94(b) provides that "[f]or good cause shown, the [C]ommission may act to modify or delete any of the conditions imposed or modify the [C]ommission's order." "The term 'good cause' has been defined to mean 'a substantial reason amounting in law to a legal excuse for failing to perform an act required by law.' " *Miller v. Tanaka*, 80 Hawai'i 358, 363, 910 P.2d 129, 134 (Ct. App. 1995) (citation omitted). "'Good cause' also 'depends upon [the] circumstances of [the] individual case, and [a] finding of its existence lies largely in [the] discretion of [the] officer or court to which [the] decision is committed.' " *Id.* at 363-64, 910 P.2d at 134-35 (citation omitted). "As a general rule, 'good cause' means a substantial reason; one that affords a legal excuse." *State v. Estencion*, 63 Haw. 264, 267, 625 P.2d 1040, 1042 (1981) (citations omitted). There is good cause to amend D&O Condition No. 1 to allow for the

---

<sup>1</sup> The August 22, 2018 Committee hearing was scheduled the day Hurricane Lane passed through the State. All State and County offices were closed, but the Committee held an abbreviated hearing for the 201H Application nonetheless although not all members were in attendance. The Committee decided to postpone its vote until the next week to allow the opportunity for all members to be present. On August 28, 2018 the 201H Application passed out of Committee unanimously.



development of the Updated ELC Project and the Waikapu Affordable Workforce Housing Development.

## **II. DISCUSSION**

This is not a petition for a district boundary amendment. That occurred in 2007-2008 and the Commission appropriately considered submissions and testimony relevant to such a determination. The question here is whether a 201H housing project is an appropriate modification of the D&O and use of a portion of the Petition Area in light of (1) the Commission's urbanization of the Petition Area, with conditions, (2) and the County of Maui's subsequent inclusion of the Petition Area within its urban growth boundaries and (3) the County's approval of the 201H Project.

Furthermore, as noted above, the applicable standard is whether there is "good cause" to modify the condition limiting development to a church and school. HAR § 15-15-94(b). There is. At hearing on Petitioner's Motion for Extension the Commission made reference to its 2017 decision in *The Matter of The Petition of the County of Kauai Housing Agency*, Docket No. A17-802 (the "**Kauai Petition**"). The Kauai Petition involved an original petition for district boundary amendment for a 75 acre parcel of land and approval for a 550 unit 201H project as part of a master-planned community. See Findings of Fact, Conclusions of Law and Decision And Order For a State Land Use Boundary Amendment dated July 24, 2017 filed in the Kauai Petition. Given the size, scope and existing zoning of the underlying land, Commission approval was required and the Kauai 201H project could not simply be overlaid on existing zoning.

Here, the same conditions are not present, although Intervenor does agree that portions of the Kauai Petition are applicable. It is without question that an original request for a boundary amendment deserves close scrutiny. That is what occurred in the Kauai Petition, and that is what

occurred at the stage of the D&O and does not need to be revisited in full here as the Commission already determined that urbanization, for a beneficial purpose, was justified, and the County of Maui has subsequently determined that the property is in a location appropriate for urban development and that has indeed already been or is in the process of being developed as such. See Affidavit of William Frampton, Exhibits C & E. The 201H Project is surrounded by both single and multi-family and residential and affordable housing projects that have been approved and built, approved and under construction, or are in various states of entitlement. See Affidavit of William Frampton; Exhibit J attached to Exhibit E filed herein. These surrounding projects have largely come to fruition after the Commission approved urbanization of the Petition Area in 2008 and further the objectives of the Maui Island Plan that extended the urban growth boundaries to the Petition Area and beyond. The Kauai Petition is instructive, however, on appropriate conditions that should attach to HRS Chapter 201H project, regardless of size.

As directed at the hearing on the Intervention Motion and Petitioner's Motion for Extension, Intervenor processed its 201H Application to completion with the County of Maui. That approval, granted September 7, 2018 by County Resolution 18-150, is subject to the Commission's approval of the 201H use on a portion of the Petition Area. Intervenor has a limited time to obtain Commission approval or Resolution 18-150 lapses. See Exhibit F. Intervenor must also commence construction by not later than September 7, 2020, and construction must be completed by September 7, 2022. Id. Assuming it obtains necessary permissions from the Commission to modify the D&O, Intervenor's own internal timeline is more aggressive than that imposed by Resolution 18-150, and such a timeline is appropriate given the economic realities and pressures of an HRS Chapter 201H project.

It is without question that affordable housing is critically needed on Maui. See Market

Study. It is also without question that the location of Intervenor's proposed 201H Project is appropriate. Given the need, and the fact that sale of the Property will aid Petitioner in its efforts to realize its goal to construct a church and school on the remaining Petition Area, "good cause" exists to modify the D&O to allow for the 201H Project.

The question, therefore, is the appropriate conditions that should apply to the 201H Project. In reviewing the conditions imposed by the Commission relating to the Kauai Petition and the D&O currently in place on the Petition Area, as well as the conditions imposed by the County of Maui on the 201H Application, it is clear that the appropriate conditions are already in place. The following table provides a comparison of conditions imposed on the Kauai Petition to those in place on the Petition Area that would carry over to Intervenor's 201H Project as well as those separately imposed by the County of Maui pursuant to Ordinance 18-150:

Kauai Petition Condition	Corresponding D&O or Resolution 18-150 Condition	Comment
1. Affordable Housing	Resolution 18-150 paragraph 1 and Exemption G	The County approved only single-family and two-family (Duplex) use only. Bed & Breakfast Homes and short term rentals of less than 180 days as well as other commercial uses are prohibited.
2. Highway and Roadway Facilities	D&O Condition 5	
3. Schools	None	Intervenor will pay required impact fees as required. No exemption sought.
4. Archeological and Historic Preservation	D&O Condition 8	
5. Previously Unidentified Burials and	D&O Condition 9.	

Archeological/Historic Sites		
6. Established Access Rights Protected	D&O Condition 12.	
7. Endangered Species	Resolution 18-150	Adopted 201H Application contains initial findings relating to flora & fauna as well as appropriate recommendations to be observed
8. Air Quality Monitoring	D&O Condition 11.	
9. Water	D&O Condition 3.	
10. Storm water Management and Drainage	D&O Condition 6.	
11. Water Conservation Measures	D&O Condition 11.	
12. Compliance with HRS Section 205-3.5, Relating to Agricultural Uses on Adjacent Agricultural Land	D&O Conditions 13 & 14.	
13. Emergency Management	None.	Not applicable
14. Airports	None.	Not applicable
15. BMPs	D&O Condition 16.	
16. Notification of Potential Nuisances	None.	Not applicable – Kauai specific.
17. Energy Conservation Measures	D&O Condition 18.	
18. Sustainability Plan	None.	Not applicable
19. Public Information	None	Not applicable
20. Compliance with Representations	D&O Condition 1 Resolution 18-150	Intervenor is obligated to construct an affordable housing project as represented and approved or all permissions automatically

		lapse.
21. Notice to Commission	D&O Condition 20	
22. Annual Reports	D&O Condition 22	
23. Release of Conditions	D&O Condition 21	Resolution 18-150 requires Commission approval of modification within six (6) months or Resolution 18-150 lapses.
24. Notice of Imposition of Conditions	D&O Condition 22.	
25. Recordation of Conditions	D&O Condition 25.	

In addition, the following conditions exist by virtue of the D&O or Resolution 18-150:

<b>Condition</b>	<b>Source</b>
Wastewater	D&O Condition 4. Pursuant to 201H Application approved by Resolution 18-150, 201H Project will be served by existing public system capacity.
Civil Defense	D&O Condition 7
Soil Analysis	D&O Condition 10
Integrated Solid Waste Management Plan	D&O Condition 15.
Compliance with representations of 201H Application	Resolution 18-150
Commencement of Construction by September 7, 2020	Resolution 18-150
Completion of Construction by September 7, 2022	Resolution 18-150
Limitation on use to single-family and two-family (duplex) uses. No commercial or short-term uses permitted	Resolution 18-150 – approved exemptions item G.

As is clear, all relevant conditions applicable to the Kauai Project are already applicable to Intervenor's 201H Project by virtue of the D&O, Resolution 18-150, or both. Aside from allowing use of a portion of the Petition Area for the 201H Project, and bifurcation of the docket as separately requested, Intervenor does not seek release from the development level conditions. Indeed most, if not all, of the relevant conditions are addressed within the 201H Application, and are committed to by Intervenor by virtue of Resolution 18-150 that commits Intervenor to developing the 201H Project in conformity to the representations set forth in the 201H Application.

### **III. SUMMARY AND CONCLUSION**

Based on the foregoing, HAR §§ 15-15-70, 15-15-94, and the records and files in this Docket, Intervenor respectfully requests that the Commission issue an order amending D&O Condition No. 10 to allow for the use of the portion of the Petition Area under contract to Intervenor for development of its 201H Project. Intervenor further requests that as may be applicable to Intervenor on a bifurcated docket, that Condition 2 of the D&O require development of the 201H Project within four (4) years, or such other time as may reasonably be allowed by the County of Maui.

Intervenor reserves rights under HAR § 15-15-70(a) to modify this request before, during, or after the close of the hearing on this Motion.

Dated Wailuku, Hawaii OCT 22 2018



---

PETER A. HOROVITZ  
Attorneys for Intervenor  
**WAIKAPU DEVELOPMENT VENTURE,  
LLC**

**BEFORE THE LAND USE COMMISSION  
OF THE STATE OF HAWAII**

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF  
MAUI

To Amend the Land Use District Boundary of  
Certain Lands Situated at Wailuku, Island of  
Maui, State of Hawai'i, Consisting of 25.263  
Acres from the Agriculture District to the  
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

AFFIDAVIT OF WILLIAM FRAMPTON;  
EXHIBITS A TO F

**AFFIDAVIT OF WILLIAM FRAMPTON**

WILLIAM FRAMPTON, being duly sworn on oath, deposes and says:

1. I am a manager of WAIKAPU DEVELOPMENT VENTURE, LLC, a Hawaii limited liability company ("**Intervenor**").
2. I am competent and authorized to testify to the matters set forth herein, and unless otherwise indicated, I make this affidavit (the "**Affidavit**") based upon personal knowledge
3. Intervenor is under contract to purchase a subdivided portion of the Petition Area upon (1) subdivision and (2) approval of the Commission. A true and correct copy of the relevant purchase contract is attached hereto as Exhibit A (the "**Purchase Contract**"). There have been various addendums to the Purchase Contract which extended the closing date to accommodate both the subdivision and the present action before the Commission. Those addendums are not attached.



4. Throughout 2017, Intervenor met with community groups and select governmental departments as part of its efforts to conform its vision for the 201H Project to community need.

5. Attached hereto as Exhibit B is a true and correct copy of the current anticipated timeline for the 201H Project.

6. As a result of community outreach, Intervenor has received inquiries from prospective purchasers, many of whom were pre-qualified for neighboring affordable-housing projects but did not receive allocations, which exceed the number of available lots in the proposed 201H Project.

7. Attached hereto as Exhibit "C" are excerpts from the Maui Island Plan adopted on December 28, 2012. The attached excerpts deal specifically with housing needs on Maui and the desired urban growth boundaries for the project area in question.

8. The Petition Area is within the designated urban growth boundaries set forth in the Maui Island Plan.

9. In January, 2018, and in coordination with the Maui County Department of Housing and Human Concerns, the ultimate accepting agency for the 201H Application, Intervenor transmitted its Draft 201-H Affording Housing Application to the following Federal, State, and County Agencies and Departments.

**Federal Agencies:**

1. U.S. Department of Interior
2. U.S. Corp. of Engineers

**State Agencies:**

3. Department of Transportation (Maui and Honolulu Offices)
4. Department of Health

5. Department of Land and Natural Resources, Land Division
6. Land Use Commission
7. Department of Agriculture
8. Department of Health
9. Hawaii Department of Defense
10. Office of Hawaiian Affairs
11. Office of Planning
12. Department of Education
13. Department of Land and Natural Resources – CWRM
14. Department of Land and Natural Resources – SHPD
15. Department of Hawaiian Homelands

**County Departments and Divisions:**

16. Department of Housing and Human Concerns
17. Civil Defense
18. Environmental Management
19. Fire & Public Safety
20. Housing Division
21. Parks and Recreation
22. Planning
23. Police
24. Public Works
25. Transportation
26. Water Supply
27. Zoning and Enforcement Division

Attached as Exhibit “D” are true and correct copies of the transmittal letters to the above

Agencies, Departments, and Divisions without the noted enclosure.

10. As a result of requests for comments, Intervenor received responses from the following Departments and agencies:

1. Department of Planning (County of Maui)
2. Department of Fire and Public Safety (County of Maui)
3. Department of Public Works (County of Maui)
4. Department of Defense (State of Hawaii)
5. Department of Transportation (State of Hawaii)
6. Department of Transportation (County of Maui)
7. Department of Environmental Management (County of Maui)
8. Department of Education (State of Hawaii)
9. Department of Parks & Recreation (County of Maui)
10. Department of Water Supply (County of Maui)
11. Police Department (County of Maui)
12. Department of Health, Maui District Office (State of Hawaii)
13. Department of Health (State of Hawaii)
14. Office of Hawaiian Affairs (State of Hawaii)

11. Intervenor responded to all comment letters and where appropriate included suggested revisions in its final Application for Affordable Workforce Housing Subdivision (the **“201H Application”**). A true and correct copy of the final 201-H Application is attached hereto as Exhibit “E.”

12. Intervenor also worked directly with many of the named Departments, particularly on the County level, to incorporate various design elements to address departmental

preferences for items such as street width for emergency vehicles and sidewalk locations for safety.

13. Intervenor filed its 201H Application with the County of Maui's Department of Housing and Human Concerns on July 25, 2018.

14. The 201H Application passed out of committee with unanimous support.

15. The full Maui County Council took up the 201H Application and the Land Use Committee's unanimous recommendation on September 7, 2018 and the matter passed unanimously. Id. The Maui County Council adopted Resolution No. 18-150 (the "**Resolution**") approving the 201H Application with modifications, one of which is that Intervenor obtain Commission approval for the use of a portion of the Petition Area for the 201H project within six (6) months of the Resolution, by March 7, 2019. A true and correct copy of the Resolution is attached hereto as Exhibit "F."

16. The County of Maui has determined that the Petition Area is in a location appropriate for urban development and that has indeed already been or is in the process of being developed as such.

17. The 201H Project is surrounded by both single and multi-family and residential and affordable housing projects that have been approved and built, approved and under construction, or are in various states of entitlement.

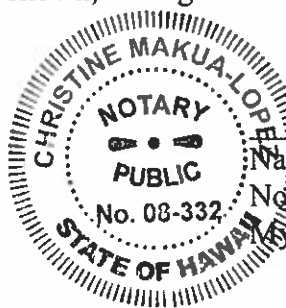
Further affiant sayeth naught.

EXECUTED: Waikuku, Hawai'i, October 22, 2018.

William Frampton  
WILLIAM FRAMPTON

STATE OF HAWAII )  
 ) ss.  
COUNTY OF MAUI )

On this 22nd day of October, 2018, before me personally appeared WILLIAM FRAMPTON, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.



Christine Makua-Lopez  
Name: Christine Makua-Lopez  
Notary Public, State of Hawaii  
commission expires: 8/10/20

NOTARY CERTIFICATION STATEMENT

Document Identification or Description: **AFFIDAVIT OF WILLIAM FRAMPTON**

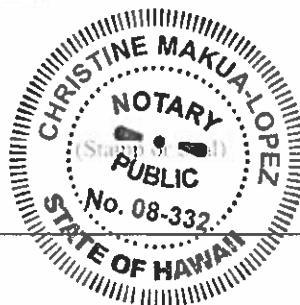
Document Date: October 22, 2018

No. of Pages: 6

Jurisdiction (in which notarial act is performed): 2nd Circuit

Christine Makua-Lopez 10/22/18  
Signature of Notary Date of Notarization and  
Certification Statement

Christine Makua-Lopez  
Printed Name of Notary



# **EXHIBIT A**



# COMMERCIAL REAL PROPERTY PURCHASE AND SALE AGREEMENT (PSA)

Hawaii Association of REALTORS® Standard Form  
Revised 2/14 (NC) For Release 11/16



**COPYRIGHT AND TRADEMARK NOTICE:** This copyrighted Hawaii Association of REALTORS® Standard Form is licensed for use by the entire real estate industry on condition that there shall be no alteration of the printed portions, pagination, or paragraph numbers or breaks. The use of this form is not intended to identify the real estate licensee as a REALTOR®. REALTOR® is a registered collective membership mark which may be used only by real estate licensees who are members of the National Association of REALTORS® and who subscribe to its Code of Ethics.

**NAR CODE OF ETHICS:** Buyer and Seller are aware that the National Association of REALTORS® holds its members accountable for their actions through a strict professional Code of Ethics, which includes a grievance system to address complaints. Non-members are not held to the same standards as members, nor are they required to participate in the grievance system.

Reviewed By: \_\_\_\_\_  
Principal Broker/Broker-in-Charge **Keoni Fursse, R(PB)**

Reference Date: **November 18, 2016** Purchase Price: **\$1,150,000.00** (See Paragraph D-2)

Closing Date: The Scheduled Closing Date shall be as set forth in Paragraph F-2.

Property Reference or Address: **0 Honoapiilani Hwy**  
**Wailuku, HI** (See Paragraph E-1)

Tax Map Key: Div. **2** /Zone **3** /Sec. **5** /Plat **002** /Parcel(s) **011** /CPR \_\_\_\_\_ (if applicable).

## IDENTIFICATION OF PARTIES:

## IDENTIFICATION OF BROKERAGE FIRMS:

<b>Buyer:</b> <u>William Frampton etal/assigns</u>	<b>Brokerage Firm:</b> <u>Kokua Realty, LLC</u>
	<b>Agent Name:</b> <u>Keoni Fursse</u>
<b>Street</b> _____	<b>Street</b> <u>296 Alamaha St Ste A</u>
<b>Address:</b> _____	<b>Address:</b> <u>Kahului, HI 96732-2412</u>
<b>Phone:</b> _____	<b>Phone:</b> <u>(808) 280-6556</u>
<b>Fax:</b> _____	<b>Fax:</b> <u>(808) 877-5078</u>
<b>E-mail:</b> _____	<b>E-mail:</b> <u>keoni@kokuarealty.com</u>

<b>Seller:</b> <u>Emmanuel Lutheran Church Maui</u>	<b>Brokerage Firm:</b> <u>Kokua Realty, LLC</u>
	<b>Agent Name:</b> <u>Uvette J. Sakamoto</u>
<b>Street</b> _____	<b>Street</b> <u>296 Alamaha St Ste A</u>
<b>Address:</b> _____	<b>Address:</b> <u>Kahului, HI 96732-2412</u>
<b>Phone:</b> _____	<b>Phone:</b> <u>(808) 269-5000</u>
<b>Fax:</b> _____	<b>Fax:</b> <u>(808) 877-5078</u>
<b>E-mail:</b> _____	<b>E-mail:</b> <u>uvette@kokuarealty.com</u>

**CONTRACT:** This is more than a receipt for money. It is a legally binding contract for the purchase of real estate. Read it carefully. Handwritten or typed provisions herein shall supersede any printed provisions if there is a conflict. FILL IN ALL BLANKS. WRITE "NA" IF NOT APPLICABLE. ITEMS WITH CHECK-OFF BOXES ARE OPTIONAL. ALL OTHERS ARE STANDARD PROVISIONS.

DS  
WF 11/21/2016  
BUYER'S INITIALS & DATE

DS  
MR 11/23/2016  
SELLER'S INITIALS & DATE

©Hawaii Association of REALTORS®  
Commercial Real Property Purchase and Sale  
Agreement  
Produced in conjunction with the Hawaii CCIM Chapter  
RR501 Rev. 2/14

Page 1 of 11

Kokua Realty LLC, 296-A Alamaha St. Kahului, HI 96732  
Phone: (808)270-9116 Fax: (808)877-5078 Kara Heen

Produced with zipForm® by zipLogix 18070 Fifteen Mile Pkwy, Suite 100, San Jose, CA 95131 www.zipLogix.com



0 Honoapiilani



**SECTION A: AGENCY DISCLOSURE**

A-1 **Agency.** Buyer and/or Seller in a real estate transaction in Hawaii may retain a real estate Brokerage Firm as their agent. In such case, Buyer and/or Seller is represented by the Brokerage Firm and all of its licensees. Hawaii law requires real estate licensees to disclose orally or in writing to Seller and/or Buyer whom the licensee represents. The form of representation may be one of the following:

- (a) **Seller's Agent.** Brokerage Firm represents Seller only unless a disclosed dual agency exists. Seller's Agent owes the highest duties to Seller, including confidentiality, loyalty, and due care and diligence.
- (b) **Buyer's Agent.** Brokerage Firm represents Buyer only unless a disclosed dual agency exists. Buyer's Agent owes the highest duties to Buyer, including confidentiality, loyalty, and due care and diligence.
- (c) **Dual Agent.** Brokerage Firm represents both Buyer and Seller. This commonly occurs when licensees in the Brokerage Firm representing Seller have Buyer clients looking for types of property similar to Seller's property. In such event, the Brokerage Firm and all of its licensees represent both Buyer and Seller and are dual agents. Dual agents must remain neutral in negotiations and must not advance the interest of one party over the other. **A separate Dual Agency Consent Addendum is required under Hawaii law.**
- (d) **No Agency Representation** (see A-2(d) below).


**A-2 Disclosure.**


- (a) **Seller Representation:** Seller is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (b) **Buyer Representation:** Buyer is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (c) **Dual Agency Representation:** Seller and Buyer are represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®. **A separate Dual Agency Consent Addendum is required.**
- (d) **No Agency Representation:**  
☐ Seller is a Customer and is not represented by a Brokerage Firm.  
☐ Buyer is a Customer and is not represented by a Brokerage Firm.

**It is recommended that Customers seek legal counsel prior to signing a PSA.**

If requested, a licensee may present a Customer's PSA to Seller and report Seller's response. A licensee cannot, however, negotiate for or otherwise advise a Customer in the transaction.

**Buyer and Seller acknowledge that oral or written disclosure relative to agency representation was provided to them before the signing of this PSA.**

<sup>DS</sup>  
 (Buyer's initials)

<sup>DS</sup>  
 (Seller's initials)


**SECTION B: EARNEST MONEY DEPOSIT**


B-1 **Earnest Money.** Buyer shall deposit with Escrow (identified in Paragraph F-4), the sums set forth below (the "Earnest Money") in good funds on or before the deadlines required by this Paragraph B-1 or as otherwise agreed in writing by the parties. Buyer shall pay (from sources other than the Earnest Money or any interest accruing thereon) any and all escrow or other fees charged by Escrow pursuant to Paragraph F-6. All interest accruing on such sum shall become a part of the Earnest Money and shall be distributed as Earnest Money in accordance with the terms of this PSA.

- ☒ (a) An initial Earnest Money deposit in the amount of \$ 50,000.00 shall be paid within 5 business days of the Acceptance Date (or as otherwise agreed in writing by the parties) (defined in Paragraph S-1).
- ☐ (b) An additional Earnest Money deposit in the amount of \$ \_\_\_\_\_ shall be paid within \_\_\_\_\_ business days after the end of the Inspection Period (see Paragraph J-2).

**B-2 Interest on Earnest Money. (Choose (a) OR (b))**

- ☐ (a) Buyer to Earn Interest. The parties instruct Escrow to place Buyer's deposit(s) in an interest-bearing account with all interest to be credited to Buyer at closing. Buyer shall pay any processing fee required by Escrow and all costs of setting up, maintaining and closing the account. Fees/costs may exceed the interest earned.
- ☒ (b) Buyer not to Earn Interest. Buyer hereby waives the right to place Buyer's deposits in an interest-bearing account. Buyer understands any interest earned on such deposits shall belong to Escrow.

<sup>DS</sup>  
 11/21/2016  
 BUYER'S INITIALS & DATE

<sup>DS</sup>  
 11/23/2016  
 SELLER'S INITIALS & DATE



**SECTION C: ADDENDA**

C-1 **Addenda.** The following addenda, if checked, are attached to and made a part of this PSA.

[ X ] Existing "As Is" Condition [ ] Other \_\_\_\_\_  
 [ X ] Other Dual Agency [ ] Other \_\_\_\_\_  
 [ ] Other \_\_\_\_\_ [ ] Other \_\_\_\_\_

**SECTION D: OFFER TO BUY AND PURCHASE PRICE**

D-1 **Offer to Buy.** Buyer offers to buy the Property described below on the terms and conditions contained herein, acknowledges receipt of a copy of the PSA, and agrees that this PSA shall be binding on Buyer if accepted by Seller on or before:  
 Date November 23, 2016 Time 4:00 AM [ ] PM [ X ].

D-2 **Purchase Price.** Purchase price for the Property in U.S. Dollars shall be paid as follows:

\$ 50,000.00 Initial cash deposit of Earnest Money ("B-1(a)").  
 \$ \_\_\_\_\_ Additional cash deposit of Earnest Money ("B-1(b)").  
 \$ 525,000.00 Balance of down payment (or balance of purchase price if all cash) paid into Escrow before closing.

\$ 575,000.00 TOTAL CASH FUNDS FROM BUYER (exclusive of closing costs).

\$ 575,000.00 By way of New first mortgage at terms and conditions acceptable to Buyer.

\$ \_\_\_\_\_

\$ 1,150,000.00 TOTAL PURCHASE PRICE

Failure to make any of the scheduled deposits herein shall constitute a default, and the termination provisions of Paragraph O-1 shall apply.

**SECTION E: PROPERTY**

E-1 **Description.** Tax Map Key: Div. 2 /Zone 3 /Sec. 5 /Plat 002 /Parcel(s) 011 /CPR \_\_\_\_\_ (if applicable).  
 All of that [ X ] fee simple [ ] leasehold Property zoned Public Quasi situated at the address set forth above described as follows: Approximately twelve (12.5) acres of vacant land in Wailuku, Maui, Hawaii.

The full legal description will be provided in the title report.

"Property" includes all improvements and fixtures except those owned by tenants and except as listed below:

**SECTION F: CLOSING**

F-1 **Closing.** For purposes of this PSA, "Closing" shall be the date when all appropriate conveyance documents are recorded. Buyer and Seller agree to promptly execute appropriate or customary documents when requested by Escrow.

F-2 **Scheduled Closing Date. (Choose Paragraph F-2(a) OR F-2(b))**

[ ] (a) \_\_\_\_\_, or  
 [ X ] (b) 30 days after the end of Inspection Period. If the Scheduled Closing Date falls on a day the Bureau of Conveyances of the State of Hawaii is closed, closing will be on the next day when documents can be recorded.

DS  
WF 11/21/2016  
 BUYER'S INITIALS & DATE

DS  
MR 11/23/2016  
 SELLER'S INITIALS & DATE

**F-3 Change to the Scheduled Closing Date. (Choose Paragraph F-3(a) OR F-3(b))**

- ☐ (a) **Extensions. There is no automatic right to extend.** If, for reasons beyond Buyer's or Seller's control, a party cannot perform its obligation to close by the Scheduled Closing Date, then such party may extend the Scheduled Closing Date up to \_\_\_\_\_ ( ) days by delivery of written notice to the other party prior to the Scheduled Closing Date. Thereafter, **time shall be of the essence**, and if a party fails to perform by the extended Scheduled Closing Date, such party shall be considered in default and the other party may elect to terminate this PSA pursuant to Paragraph O-1. The extended Scheduled Closing Date may not be further extended unless Buyer and Seller agree in writing. This provision relates only to the extension of the Scheduled Closing Date.
- ☒ (b) **Time is of the Essence.** Time is of the essence and the Scheduled Closing Date may not be extended unless Buyer and Seller agree in writing.

**F-4 Escrow.** This transaction shall be escrowed by: Fidelity National, Branch \_\_\_\_\_ ("Escrow").

Escrow officer: \_\_\_\_\_ Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Escrow officer email address: \_\_\_\_\_

Within the time period set forth in Paragraph B-1, Seller shall open an account with Escrow and provide Escrow with a copy of this PSA and escrow instructions.

**F-5 Prorations and Closing Adjustments.** At closing, Escrow shall prorate the following, if applicable, as of the date of closing: real property tax, lease rents, interest on assumed obligations, tenant rents, common area expenses and other items customarily prorated in commercial real estate transactions in Hawaii. When applicable, Escrow shall charge to Seller and credit to Buyer the amount of any tenant security deposits. Seller and Buyer agree to cooperate and use their best efforts to complete such prorations or adjustments that are not available at Closing no later than thirty (30) days after Closing. Such items of income and expense for the period prior to the date of Closing will be for the account of Seller and such items of income and expense for the period on and after Closing will be for the account of Buyer, all as determined by the accrual method of accounting, except that rent shall be prorated only to the extent actually collected. Bills received after Closing to the extent they relate to expenses incurred for services performed prior to Closing shall be paid by Seller, and those which relate to services performed after Closing (except as otherwise agreed to by the parties in writing) shall be paid by Buyer; provided, however, that Buyer's obligations under this PSA to assume and pay for services rendered after Closing pursuant to any service contracts shall not apply to any service contract that Buyer elected not to assume during the Inspection Period.

**F-6 Closing Costs.** The following allocates customary closing costs and **are not intended to be an all-inclusive list**. Escrow may charge the appropriate party other closing costs as agreed and directed in writing by the parties.

Charge to Buyer, if applicable:

50% of the premium for standard coverage title insurance and any additional costs relating to the issuance of extended coverage policy and endorsements (including a lender's policy)

Cost of drafting of agreement of sale or mortgage and note

Cost of obtaining Buyer's consents

Buyer's notary fees

50% of Escrow's fees

Any fees pertaining to any Buyer financing

Charge to Seller, if applicable:

50% of the premium for standard coverage title insurance

Cost of drafting of conveyance documents and bills of sale

Cost of obtaining Seller's consents

Seller's notary fees

Conveyance tax

50% of Escrow's fees

Recording fees

FIRPTA (Federal withholding)

HARPTA (State withholding)

**F-7 Assessments.** For purposes of Paragraphs F-7(a), F-7(b), and F-7(c), an assessment is defined as any obligation (not including prorations in Paragraph F-5) levied against the Property by a governmental body or any other entity with a legal right to assess. Assessments, if any, shall be charged as follows:

- (a) Any lump sum assessments levied against the Property prior to the Acceptance Date shall be paid by Seller ☒ or assumed by Buyer ☐.

Exceptions, if any: \_\_\_\_\_

- (b) Any assessments against the Property authorized as of the Acceptance Date which are being paid in installments shall be paid in full by Seller ☒ or pro-rated by Escrow as of the date of closing ☐.

Exceptions, if any: \_\_\_\_\_

- (c) If a new assessment is authorized against the Property between the Acceptance Date and the Scheduled Closing Date, such assessment shall be paid as Buyer and Seller shall agree, and if Buyer and Seller cannot reach an agreement within five (5) days of both parties being aware of the new assessment, either party may terminate this PSA and the termination provisions of Paragraph O-2 shall apply.

WF

11/21/2016

BUYER'S INITIALS &amp; DATE

©Hawaii Association of REALTORS®  
Produced in conjunction with the Hawaii CCIM Chapter

MR

11/23/2016

SELLER'S INITIALS &amp; DATE

RR501 Rev. 2/14 (NC) For Release 11/16

- [ NA ] F-8 **Lessor or Other Consents.** The obligations of Buyer or Seller hereunder are conditioned upon obtaining consents of the following lessor or other identified person or entity prior to Closing or such earlier time as may be required by this PSA: \_\_\_\_\_ . Neither Buyer nor Seller may waive this condition without the consent of the other. Buyer and Seller agree to cooperate and take all reasonable action to obtain such consents.

**F-9 Risk of Loss.**

- (a) **Minor Damage.** In the event of loss or damage to the Property or any portion thereof that is not "major" (as hereinafter defined), Seller shall notify Buyer within five (5) days of Seller being made aware of such loss or damage, and this PSA shall remain in full force and effect provided Seller performs any necessary repairs or, at Seller's option, assigns to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy and Seller shall be fully released from any additional claims. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer, subject to the terms and conditions of this PSA.
- (b) **Major Damage.** In the event of a "major" loss or damage, Seller shall notify Buyer in writing of such damage within five (5) days of Seller being made aware of such loss or damage. In such event, Buyer may terminate this PSA by written notice to Seller within thirty (30) days of the loss or damage, in which event the Earnest Money shall be returned to Buyer. If Buyer does not elect to terminate this PSA within ten (10) days after Seller sends Buyer written notice of the occurrence of major loss or damage, then Buyer shall be deemed to have elected to proceed with Closing, in which event Seller shall, at Seller's option, either (1) perform any necessary repairs, or (2) assign to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer.
- (c) **Definition of "Major" Loss or Damage.** For purposes of this PSA, "major" loss or damage refers to the following:  
 (1) loss or damage to the Property or any portion thereof such that the cost of repairing or restoring the Property to a condition substantially identical to that of the Property prior to the event of damage would be, in the opinion of a contractor reasonably selected by Buyer, equal to or greater than an amount equal to five percent (5%) of the Purchase Price; or  
 (2) any loss due to a condemnation which impairs the current use of the Property.

- F-10 **Possession.** Seller agrees to give Buyer possession at Closing or \_\_\_\_\_ **xxxx** \_\_\_\_\_, subject to tenant leases, if any.

**SECTION G: TITLE**

- G-1 **Preliminary Title Report.** Within Seven ( 7 ) days after the Acceptance Date, Seller shall cause Fidelity National (the "Title Company") to deliver a preliminary title report (the "Title Report") on the Property to Buyer.

- G-2 **Title.** Seller agrees to convey the Property with warranties vesting marketable title in Buyer, free and clear of all liens and encumbrances EXCEPT: (a) easements, covenants, conditions, reservations or restrictions now of record and  
 (b) \_\_\_\_\_ .

[ X ] G-3 **Title Objections; Permitted Exceptions; Cure of Title Objections.**

- (a) **Title Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Title Report.
- (b) **Permitted Exception.** Any item contained in the Title Report to which Buyer does not so object shall be deemed a "Permitted Exception".
- (c) **Cure of Title Objections.** In the event Buyer shall timely notify Seller of objections to any item contained in the Title Report, Seller shall have the right, but not the obligation, to cure the Title Objections. Seller shall inform Buyer in writing (the "Seller's Title Cure Notice") not later than five (5) business days after receipt of Title Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Title Cure Notice shall be deemed Seller's election not to cure the Title Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2 and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

- [ X ] G-4 **Vesting and Tenancy.** Title shall vest in Buyer(s) as follows (provide full legal names and marital status for individuals, trust information, name and form of business entity, etc.):

- { } (a) \_\_\_\_\_  
 [ X ] (b) to be determined by Buyer by written notice to Seller and Escrow Officer not later than five (5) business days prior to Closing.

WF 11/21/2016

BUYER'S INITIALS & DATE

MR 11/23/2016

SELLER'S INITIALS & DATE

**SECTION H: FINANCING CONTINGENCIES**

- [ X ] H-1 **Financing Contingency.** Buyer's obligation to buy the Property is subject to Buyer obtaining the loan (the "Loan") described in this PSA. Buyer is obligated to use Buyer's commercially reasonable efforts to obtain the Loan.

Buyer is obligated to deliver to Seller a conditional loan commitment letter not later than 150 days after the Acceptance Date, and a final loan approval letter not later than 30 days after the end of the Inspection Period.

If Buyer does not obtain the conditional loan commitment letter or the final loan commitment letter within the time periods specified above, Buyer may terminate this PSA by providing written notice of such failure and Buyer's termination of this PSA to Seller and Escrow on or before expiration of such specified time periods.

Buyer may increase the amount of Buyer's Cash Funds and thereby reduce the amount of the Loan or waive this Financing Contingency and purchase the Property on an all cash basis. If Buyer elects either of these two options, Buyer shall promptly give written notice of such election to Escrow and to Seller, together with evidence of Buyer's ability to do so.

- H-2 **Seller's Right to Terminate PSA for Financing Contingency.** If Paragraph H-1 is applicable, Seller's obligation to sell the Property is contingent upon Buyer using Buyer's commercially reasonable efforts to obtain the Loan within the time periods specified in Paragraph H-1 above. If any such obligation is not met by the end of the applicable time period, Seller may elect to terminate this PSA by delivering to Buyer written notice of termination within Seven ( 7 ) days (seven days if left blank) of the expiration of the time period or the date stated in Paragraph H-1, and Paragraph O-2 ("Termination Provision") shall apply. However, this right of Seller to terminate shall no longer apply if Buyer has elected to proceed pursuant to Paragraph H-1 and has provided Seller with reasonable assurance of Buyer's ability to do so. Seller shall have the right to inquire with Buyer's lender regarding the status of Buyer's financing.

**SECTION I: CONTINGENCY PROCEDURES**

- I-1 **Contingencies.** Buyer's obligation to buy and Seller's obligation to sell the Property may be subject in this PSA to satisfaction of one or more conditions (each called a "Contingency").

As used in this PSA, the term "Benefited Party" shall mean (a) Buyer, as to each Contingency which must be satisfied before Buyer is required to close on the purchase of the Property from Seller; and (b) Seller, as to each Contingency which must be satisfied before Seller is required to close on the sale of the Property to Buyer.

If a Contingency is not satisfied within the specified time period for meeting such Contingency ("Contingency Period"), the Benefited Party may elect to terminate this PSA and Paragraph O-2 ("Termination Provision") shall apply; or to waive the Contingency. **Unless otherwise expressly stated, the time period within which all Contingencies in this PSA must be satisfied shall be 5:00 PM, Hawaii Standard Time, on the last day of the Inspection Period identified in Paragraph J-2.**

If the Benefited Party wishes to terminate this PSA because a Contingency for that party's benefit has not been satisfied, the Benefited Party must deliver to Escrow a written notice terminating this PSA prior to the expiration of the Contingency Period or such other termination period which may be set forth in a specific contingency in this PSA. **If the Benefited Party fails to deliver the written notice to Escrow within such time period, the Contingency shall be deemed to be waived.**

Each party understands the requirement to act upon each Contingency according to the strict deadlines described therein.

**SECTION J: INSPECTION; MAINTENANCE AND WARRANTIES**

- J-1 **Inspection of Property.** At Buyer's sole cost and expense Buyer may (personally or by any expert, professional, or other representative of Buyer's choice): (a) inspect the Property or any portion thereof; (b) inspect all fixtures and improvements included in the sale; (c) inspect, investigate the Property, including, but not limited to all public records relating to the Property; (d) inspect all applicable laws and regulations which may affect the Property; and (e) inspect all financial and administrative records of Seller pertaining to the ownership and operation of the Property, except appraisals, material relating to negotiations with other buyers and material that is attorney-client privileged.

On or before 5 days after the Acceptance Date, Seller shall deliver to Buyer copies of the following documents (applicable only if checked), to the extent such documents are in the possession or control of Seller.

- [ X ] Plans and Specifications  
 [ ] Ground Lease  
 [ ] Rent Roll  
 [ X ] Tenant Leases  
 [ ] Financial Statements for \_\_\_\_\_ years & Year-to-date  
 [ ] Inventory of Tangible Personal Property  
 [ ] Management Contracts  
 [ ] Service Contracts  
 [ X ] Existing Surveys  
 [ X ] Soils Report

- [ X ] Environmental Report(s)  
 [ X ] Architectural Report  
 [ X ] Structural Engineering Report  
 [ ] Electrical Engineering Report  
 [ ] Mechanical Engineering Report  
 [ ] Building Maintenance Reports  
 [ ] ADA Report  
 [ ] Condominium Documents  
 [ ] Other:  
 [ X ] Other: All other reports & studies

WF 11/21/2016  
 BUYER'S INITIALS & DATE

MR 11/23/2016  
 SELLER'S INITIALS & DATE



**J-2 BUYER'S RIGHT TO INSPECT THE PROPERTY AND TO TERMINATE THIS PSA BECAUSE BUYER IS NOT SATISFIED WITH THE PROPERTY ENDS ON 270 DAYS AFTER ACCEPTANCE ("INSPECTION PERIOD").**

Seller shall provide Buyer and Buyer's representatives reasonable access to the Property during the Inspection Period, including Seller's records (except for excluded records described above) for this purpose, during reasonable hours with reasonable prior notice to Seller. The obligation of Buyer to purchase the Property is contingent upon Buyer's approval of the results of such inspection on or before the expiration of the Inspection Period. All inspections must be completed within the Inspection Period. In consideration of Seller making the Property and records available, Buyer agrees to perform a thorough investigation of the Property, including but not limited to any investigation deemed prudent by Buyer relating to the following: building improvements, environmental matters, mold, termite infestation, compliance with the Americans with Disabilities Act and any pending assessments against the Property. Buyer agrees that Buyer will rely on Buyer's own due diligence investigation and not upon information provided by Seller, Seller's Brokerage Firm, or Buyer's Brokerage Firm.

If Buyer disapproves of the results within such time period, Buyer may elect to terminate this PSA pursuant to Paragraph O-2. **If Buyer fails to elect to terminate prior to the end of the Inspection Period, Buyer shall have waived this contingency.**

Prior to the expiration of the Inspection Period, Seller may make changes to existing tenant leases and/or enter into new tenant lease agreements without the approval of the Buyer, however, Seller shall provide Buyer with at least five (5) days advance written notice that Seller intends to execute such documents along with copies of such documents. After the expiration of the Inspection Period, Seller shall not, without the written consent of Buyer, make any changes to existing tenant leases, enter into any new leases that extend beyond the Scheduled Closing Date, or enter into any other agreements that cannot be terminated upon forty-five (45) days' notice. The existing tenant leases will be assigned to Buyer at Closing and Buyer will assume the obligations of the Seller under the existing tenant leases, either as part of the instrument conveying the Property to Buyer or in a separate instrument, as elected by Seller. Seller will use commercially reasonable efforts to obtain estoppel certificates from all tenants on the Property, dated not earlier than thirty (30) days prior to Closing; provided, however, delivery of such estoppel certificates shall not be a condition of Closing unless otherwise specified in this PSA.

Buyer agrees to indemnify, defend and hold Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm harmless from any actions, suits, liens, claims, damages, expenses, losses and liability for damage to personal or real property or personal injury to the extent arising from or attributable to any acts performed by Buyer or Buyer authorized agents in exercising Buyer's inspection rights, if any, under this PSA (excluding any and all losses, claims, suits, damages and expenses, including reasonable attorneys' fees resulting from the mere discovery of, disclosure of, or injury or death resulting from, any pre-existing physical or environmental condition on, in, under or about the Property). This agreement to indemnify Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm shall survive any termination of this PSA.

☒ **J-3 Property Condition Maintenance.** Seller shall maintain the Property in the same condition and repair as when Buyer inspected the Property pursuant to Paragraph J-1.

☒ **J-4 Existing Warranties, Plans, etc.** Seller shall provide to Buyer at closing all existing warranty documents in Seller's possession covering the improvements and personal property being sold to Buyer; and, to the extent legally permissible, all originals and copies in Seller's possession of as-built blueprints, specifications, and copies of architectural or engineering drawings relating to the Property.

Buyer understands: (a) any warranties delivered by Seller to Buyer represent obligations of other persons, not Seller; (b) the warranties and other documents are provided for informational purposes only; (c) the warranties and other documents may not reflect improvements as built; and (d) Seller does not promise that any such warranties are transferable to Buyer, and that Buyer must contact the providers of such warranties to determine whether the warranties are transferable to Buyer.

**SECTION K: SURVEY**

☐ **NA K-1 Survey.** Within \_\_\_\_\_ ( ) days after the Acceptance Date, Seller shall, at Seller's sole cost and expense, provide Buyer with a current map (with surveyor's stamp and dated after the Acceptance Date) and accompanying report to show the perimeters of the Property and the location of any improvements in the vicinity of the perimeter Property lines. This survey and map may not address whether improvements on the Property are in compliance with State and/or County requirements, and/or subdivision covenants, conditions, and restrictions. If Buyer objects to any matters shown in such survey, Buyer shall notify Seller pursuant to Paragraph K-2 below.

☐ Buyer elects to have an ALTA survey prepared and agrees to pay the increase in cost to obtain an ALTA survey.

☐ **NA K-2 Survey Objections; Permitted Exceptions; Cure of Survey Objections.**

(a) **Survey Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Survey.

(b) **Permitted Exception.** Any matter shown on the Survey to which Buyer does not so object shall be deemed a "Permitted Exception".

(c) **Cure of Survey Objections.** In the event Buyer shall timely notify Seller of objections to any matter shown on the Survey, Seller shall have the right, but not the obligation, to cure the Survey Objections. Seller shall inform Buyer in writing (the "Seller's Survey Cure Notice") not later than five (5) business days after receipt of Survey Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Survey Cure Notice shall be deemed Seller's election not to cure the Survey Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2, and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

WF

11/21/2016

BUYER'S INITIALS &amp; DATE

©Hawaii Association of REALTORS®  
Produced in conjunction with the Hawaii CCIM Chapter

MR

11/23/2016

SELLER'S INITIALS &amp; DATE

RR501 Rev. 2/14 (NC) For Release 11/16

**SECTION L: ASBESTOS AND HAZARDOUS MATERIALS**

- L-1 **Asbestos Disclosure.** Buyer is aware that asbestos materials are hazardous to one's health, particularly if asbestos fibers are released into the air and inhaled. In the past (before 1979, but possibly since) asbestos was a commonly used insulation material in heating facilities and in certain types of floor and ceiling materials, shingles, plaster products, cement and other building materials. Buyer is aware that Buyer should make appropriate inquiry into the possible existence of asbestos on the Property. Structures having "popcorn" or "cottage cheese" type ceilings may contain asbestos fibers or asbestos-containing material. Such ceilings should not be disturbed since it could release asbestos fibers in the air. Any disturbance should be done only by licensed abatement contractors.
- L-2 **Hazardous Waste and Toxic Substances Disclosure.** Buyer is aware that federal and state laws place strict liability on property owners for dangers caused by hazardous waste management and may require that such owner pay for the cost of the cleanup of hazardous substances and other toxic substances. Buyer is aware that Buyer should make appropriate inquiries into the past use of the Property and should seek an environmental assessment to ascertain the possible existence of such hazardous substances or materials on or under the Property. Buyer is aware Buyer may have liability for hazardous substances located on or under the Property even if Buyer did not cause such substances to be on or under the Property.
- [ X ] L-3 Buyer [ X ] Seller [ ] will perform a Phase I Environmental Assessment at its sole cost and expense. Seller shall complete an Environmental Questionnaire required by the person/entity performing the Phase I Environmental Assessment.

**SECTION M: INTERNAL REVENUE CODE SECTION 1031 EXCHANGE**

- [ X ] M-1 **Right to Exchange/Cooperation.** Either Seller or Buyer may assign all of its right, title and interest in this PSA with respect to all or any portion of the Property to an affiliated entity and/or a qualified intermediary in order to facilitate a like-kind exchange transaction, which includes the Property, pursuant to Section 1031 of the Internal Revenue Code. Seller and Buyer will remain liable under this PSA, subject to the limits set forth herein, following any such assignment and shall indemnify, defend and hold the other party harmless from any additional cost, liability or expense suffered or incurred by reason of such assignment or cooperation with the exchange. Seller and Buyer further agree to cooperate with the other in effecting such transaction, including, without limitation, consenting in writing to the assignment of this PSA to any such qualified intermediary and/or any affiliated entity; provided that any such exchange transaction, and the related documentation, shall: (a) not require the other party to execute any contract (other than as set forth above), make any commitment, or incur any obligations, contingent or otherwise, to third parties which would expand the obligations beyond this PSA or incur any additional costs, (b) not delay the Closing or the transaction contemplated by this PSA, or (c) not include acquiring title to any other property. The obligations of Seller and Buyer under this Paragraph shall survive the Closing and shall not be merged therein.

**SECTION N: ELECTRONIC (Digital or Fax) SIGNATURES AND COUNTERPARTS**

- N-1 Electronically executed copies of this PSA and any related documents shall be fully binding and effective for all purposes whether or not originally executed documents are transmitted to Escrow. Electronic signatures on documents will be treated the same as original signatures; however, each party agrees to promptly forward original executed documents (if any) to Escrow. The parties understand that conveyance, mortgage and other recordable documents must be delivered in original form and will not be acceptable if signed only electronically.
- N-2 This PSA and any addenda and related documents may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so signed, shall be deemed to be an original, and all of which taken together shall constitute one and the same document, binding upon all of the parties, notwithstanding that all of the parties do not sign the original or the same counterpart.

**SECTION O: TERMINATION PROVISIONS**

- O-1 **Termination Due to Default.** In the event that Buyer is in default for failure to perform Buyer's obligations under this PSA (Seller not being in default), Seller may retain the initial deposit and all additional deposits provided for herein as liquidated damages. Buyer shall be responsible for any costs incurred in accordance with this PSA.

In the event that Seller is in default for failure to perform Seller's obligations under PSA (Buyer not being in default), Buyer may (a) seek specific performance of this PSA or (b) if the remedy of specific performance is not available, bring an action for damages for breach of contract. Seller shall be responsible for any costs incurred in accordance with this PSA.

In addition to the foregoing remedies, Buyer and Seller agree to the following additional remedies, if any:

---



---



---



---



---

DS  
WF 11/21/2016  
BUYER'S INITIALS & DATE

DS  
MR 11/23/2016  
SELLER'S INITIALS & DATE

- O-2 **Termination Due to Contingencies.** If the party for whose benefit a contingency exists, elects to terminate this PSA because the contingency has not been satisfied, that benefited party shall deliver to the other party a written notice of termination. If the benefited party so terminates this PSA, Buyer and Seller shall promptly execute all cancellation documents requested by Escrow. Buyer shall return to Seller all documents delivered by Seller to Buyer in connection with Buyer's inspection of the Property, and Escrow shall, unless otherwise agreed to in this PSA, return to Buyer all deposits previously made, less the amount of any escrow expenses or fees chargeable to Buyer. Thereafter, neither Buyer nor Seller shall have any further rights or obligations under this PSA.
- O-3 **Attorneys' Fees.** In the event of default by a party and/or a legal action or arbitration (including a claim by a Brokerage Firm for commission), the prevailing party shall be entitled to recover all costs incurred including reasonable attorney's fees.

#### SECTION P: TRANSACTIONS INVOLVING FOREIGN OR NON-RESIDENT BUYER AND SELLER

- P-1 **HARPTA Withholding Required If Seller is a Non-Resident of the State of Hawaii.** Under Hawaii law, if Seller is a non-resident person or entity (corporation, partnership, trust, or estate) of the State of Hawaii, Buyer must withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward the amount with the appropriate form to the State Department of Taxation. Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from HARPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the State Department of Taxation.
- P-2 **FIRPTA Withholding Required If Seller is a Foreign Person.** Under the Internal Revenue Code, if Seller is a foreign person or entity (non-resident alien, corporation, partnership, trust, or estate), Buyer must generally withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward this amount to the Internal Revenue Service ("IRS"). Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from FIRPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the IRS.
- P-3 **Additional Disclosures Required by Foreign Buyers and Sellers.** Buyer and Seller understand that under statutes and ordinances such as the Agricultural Foreign Investment Disclosure Act of 1978, and the International Investment and Trade in Services Survey Act, among others, disclosures are required by foreign Buyers and/or Sellers under certain conditions.
- P-4 **Government Restrictions Disclosure.** Buyer is aware that the Property is subject to all applicable federal, state and county laws, statutes, regulations, codes, ordinances, rules, procedures, restrictions, and requirements, including but not limited to, those concerning land use, zoning, building permits and requirements, setbacks, height limitations, and allowable uses.

#### SECTION Q: SPECIAL TERMS

[ X ] Q-1 (Please number)

Q-1(a). Starting April 1, 2017, Escrow is authorized to deduct \$3,500.00 per month until Closing from the Earnest Money Deposit as non-refundable monthly payments which shall be credit to Purchase Price.

Q-1(b). It is Buyer's intent to create a 2-lot subdivision with Buyer receiving one 12.5-Acre lot and Seller receiving one 12.763 acre lot. The exact size of all lots is approximate and subject to changing in the final subdivision process. Buyer discloses they will be seeking a deferral agreement of improvements until the start of development of Buyer's project.

Q-1(c). Buyer has the right to extend Closing for 90 days by providing Seller with forty-five (45) days prior written notice. If the Closing is extended, Buyer shall continue to make monthly payments from Escrow of \$3,500/month.

Q-1(d). Seller agrees to cooperate with Buyer with all governmental applications. All applications and due diligence shall be done by Buyer, at Buyer's sole expense. In addition, if required by Buyer, Seller shall be the applicant on any governmental permits, subdivisions, and anything else required by Buyer.

(See attached Addendum for additional Special Terms).

DS

WF

11/21/2016

BUYER'S INITIALS & DATE

DS

MR

11/23/2016

SELLER'S INITIALS & DATE



**SECTION R: BROKERAGE FIRMS SERVICES AND DISCLAIMERS**

- R-1 **Scope of Service.** Seller's Brokerage Firm and Buyer's Brokerage Firm, including their owners, agents and employees (collectively the "Brokerage Firms"), recommend that Buyer and Seller each consult their own accountant, appraiser, architect, attorney, contractor, estate planner, insurance advisor, land use professional, surveyor, environmental consultant, title insurer, zoning expert, and other professionals should they have any questions within those fields about this sale. Buyer and Seller understand and acknowledge that neither party is relying upon the Brokerage Firms for any of the foregoing services or advice.
- R-2 **Disclaimers by Brokerage Firms.** Buyer and Seller understand that the Brokerage Firms have not made any representations or warranties, and have not rendered any opinions about: (a) the legal or tax consequences of this transaction; (b) the legality, validity, correctness, status or lack of any building permits which may have been required for the Property; (c) the size of any improvements on the Property, or the land area of the Property or the location of the boundaries; (d) the existence or non-existence of mold, asbestos or hazardous materials on the Property; (e) compliance of the Property with law, including but not limited to the Americans with Disabilities Act and land use laws.
- R-3 **Obligations.** Brokerage Firms shall not be held liable to either Buyer or Seller for the failure of either Buyer or Seller to perform their obligations pursuant to this PSA.
- [ ] R-4 **Disclosure of Real Estate Licensing Status.** Hawaii law requires that licensees disclose that they hold a real estate license in any transaction in which they are purchasing or selling real property as a principal, or in which they are buying for themselves, immediate relatives, or an entity in which they have an interest. If applicable, the licensee(s) in this transaction disclose the following: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION S: "ACCEPTANCE DATE", OTHER DEFINITIONS, MISCELLANEOUS**

- S-1 As used in this PSA, the term "**Acceptance Date**" means the date on which this PSA becomes binding upon the parties (i.e. when both parties have signed this PSA.)
- S-2 As used in this PSA, the term "**day**" means a calendar day unless the term "business day" is used. The term business day shall mean Monday through Friday except Federal or Hawaii holidays. All dates and times are based on Hawaii Standard Time (UTC-10). Unless otherwise specified in writing in this PSA, contingencies herein shall expire at 5:00 PM HST on the day stated.
- S-3 **Time is of the Essence.** Except as otherwise provided in this PSA, time is of the essence in the performance by all parties in their respective obligations to this PSA.
- S-4 **Complete Agreement.** This PSA constitutes the entire agreement between Buyer and Seller and supersedes and cancels any and all prior negotiations, representations, warranties, understandings or agreements (both written and oral) of Buyer and Seller. No variation or amendment of this PSA shall be valid or enforceable without written approval by Buyer and Seller. All agreements and representations about the Property must be set forth in writing and the parties agree that to be effective any representation made by a Brokerage Firm or any party hereto must be set forth in writing in this PSA or an amendment hereto. Buyer and Seller shall each hold harmless and release the Brokerage Firm(s) from any claims based upon any alleged representation which is not set forth in writing as stated in this paragraph.
- S-5 **Assignment.** Buyer shall not have any right to assign any of its rights, or to delegate any duties or obligations under this PSA without the prior written consent of Seller except that consent shall not be required in the event Buyer assigns its rights under this PSA to an entity where Buyer owns at least fifty percent (50%) of the controlling interest. For the purposes of this paragraph, assignment and/or delegation shall be deemed to include any sale, transfer, assignment or other event which, directly or indirectly, results in a change of fifty percent (50%) or more in the controlling interest in Buyer. This PSA, and each and every term and provision hereof, shall inure to the benefit of, and be binding upon and enforceable against, Buyer and its respective legal representatives, successors, and permitted assigns.
- S-6 **Representations and Warranties.** Each party hereby represents and warrants to the other as follows:
- If it is an entity, it is duly organized, validly existing and in good standing under the laws of the state of its incorporation or organization, and is qualified to conduct business, and is in good standing in the state(s) in which it conducts business.
  - It is in compliance with all laws, rules and regulations that govern the operation of a business in which it is involved.
  - It has all the requisite power and authority to carry on its business as it is now being conducted.
  - It has been duly authorized by all necessary action on its part and possesses all the requisite power and authority to execute, deliver and perform this PSA and to hereby consummate the transactions contemplated herein.
  - It knows of no reason why it cannot consummate the transactions contemplated herein.
  - There are no actions, suits or proceedings existing, pending or, to the knowledge of it, threatened against or affecting it before any court, arbitrator or governmental or administrative body or agency that would affect the validity or enforceability of this PSA or that would affect the performance of its obligations hereunder.

SS  
WF 11/21/2016  
BUYER'S INITIALS & DATE

DS  
MR 11/23/2016  
SELLER'S INITIALS & DATE



Offer Date November 18, 2016, 8:00 [ ] AM [ ] PMBuyer's Name William Frampton et al/assigns

Signature

Title

Buyer's Name

Signature

Title

Buyer's Name

Signature

Title

**SECTION T: ACCEPTANCE OR COUNTER OFFER**

- [ ] T-1 **ACCEPTANCE OF OFFER.** Seller agrees to sell the Property at the price and terms offered above and acknowledges receipt of a copy of this PSA.
- [ ] T-2 **COUNTER OFFER.** Seller agrees to sell the Property at the price and terms offered above as amended by the attached Counter Offer and acknowledges receipt of a copy of the PSA.

**IN EITHER EVENT:**

T-3 Seller agrees to pay to Kokua Realty, LLC at Closing a commission for the sale of the Property pursuant to the commission agreement with Seller's Brokerage Firm, or in the amount of 6% of the purchase price + GET. Seller instructs Escrow to pay the commission directly to Brokerage Firm at closing in U.S. Dollars. These instructions cannot be changed without the written agreement of such identified Brokerage Firm and Seller. Seller further consents to such Brokerage Firm's sharing of the commission with another real estate Brokerage Firm which may have provided services to Buyer for this transaction.

Acceptance Date 11/23/16, 10:00 [ X ] AM [ ] PMSeller's Name Emmanuel Lutheran Church Maui

Signature

Title

Seller's Name Michael Reiley

Signature

Title

Seller's Name

Signature

Title

Seller is a Foreign Person [ ] Non-Hawaii Resident [ ] Owner/Occupant [ ] Other [ ]

WF

11/21/2016

BUYER'S INITIALS &amp; DATE

MR

11/23/2016

SELLER'S INITIALS &amp; DATE

ASSIGNMENT OF PURCHASE CONTRACT

0 Honoapiilani Highway, Wailuku, HI 96793

THIS ASSIGNMENT OF PURCHASE CONTRACT ("Assignment") is dated this 6<sup>th</sup> day of April, 2018, and is executed by and between WILLIAM FRAMPTON, a Hawaii resident (the "Assignor"), WAIKAPU DEVELOPMENT VENTURE LLC, a Hawaii limited liability company (the "Assignee"), and EMMANUEL LUTHERAN CHURCH OF MAUI, a Hawaii non-profit corporation (the "Seller").

W I T N E S S E T H:

That Seller and Assignor are parties to that certain Commercial Real Property Purchase and Sale Agreement reference dated November 18, 2016, together with any extensions and addenda thereof (collectively "Purchase Contract").

That the Assignor hereby assigns to the Assignee all of the right, title and interest of the Assignor in, to and under the Purchase Contract. This Assignment is an outright, immediate and absolute assignment of the Assignor's right, title and interest in said Purchase Contract.

That Seller hereby consents to the assignment of the Purchase Contract as described herein, and hereby releases Assignor from any and all future liabilities relating in any way to the Purchase Contract, except to the extent that the same relates to events occurring prior to the date of the Assignment.

AND THE ASSIGNOR warrants to the Assignee that the Assignor now is the lawful holder of said Purchase Contract with full right and title to assign the same; that said Purchase Contract is valid and enforceable and has not been altered, modified or amended in any manner whatsoever; that there are no outstanding assignments of said Purchase Contract; and that there are no existing defaults under said Purchase Contract.

AND, in consideration of the premises, the Assignor and Assignee covenant and agree that:

(1) The Assignor will execute and deliver to the Assignee, during the effectiveness of this Assignment, such further instruments as the Assignee may deem necessary to make this Assignment and the several covenants of the Assignor effective.

(2) Assignee hereby assumes all obligations of Assignor under said Purchase Contract for the performance and payment of all obligations arising or accruing from and after the date of this Assignment. Assignor agrees to indemnify, defend and hold harmless Assignee against all breaches and failures by Assignor with respect to any payment or performance which shall have accrued or was due prior to the date of this Assignment.

(3) It is hereby mutually agreed that the transfer herein and the covenants contained herein shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns, and that the covenant of any two or more persons herein shall be joint and several unless a contrary intention shall be clearly expressed elsewhere herein. The term "Purchase Contract" herein shall mean and include the Purchase Contract assigned hereby, as it may have been amended to the date hereof.

The parties hereto agree that this instrument may be executed in counterparts and via facsimile or other electronic means, each of which shall be deemed an original, and said counterparts, facsimiles or electronic signatures shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.

IN WITNESS WHEREOF, the Assignor, Assignee and Seller have executed these presents effective as of the day and year first above written.

William Frampton  
William Frampton (Apr 6, 2018)

WILLIAM FRAMPTON

"Assignor"

WAIKAPU DEVELOPMENT VENTURE LLC

Peter A. Horovitz

By: Peter A. Horovitz  
Its: Manager

"Assignee"

EMMANUEL LUTHERAN CHURCH OF MAUI

Michael F. Reiley  
Michael F. Reiley (Apr 6, 2018)

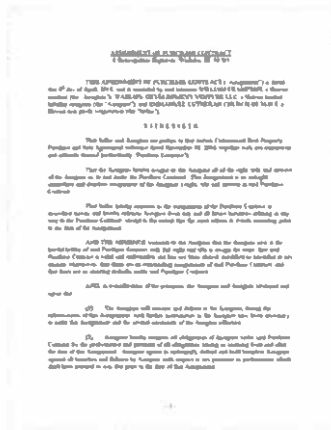
By: Michael Reiley  
Its: President

"Seller"

# Assignment of Contract









Adobe Sign Document History

04/06/2018



Created:	04/06/2018
By:	Peter Horovitz (pah@mhmaui.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA7qInckuVce1BXupADni7Smq0rB-8gzh1

## "Assignment of Contract" History

-  Document uploaded by Peter Horovitz (pah@mhmaui.com) from Acrobat  
04/06/2018 - 3:07:12 PM PDT - IP address: 107.167.137.10
-  Document e-signed by Peter Horovitz (pah@mhmaui.com)  
Signature Date: 04/06/2018 - 3:08:14 PM PDT - Time Source: server- IP address: 107.167.137.10
-  Document emailed to William Frampton (bill@mauiframpton.com) for signature  
04/06/2018 - 3:08:15 PM PDT
-  Document viewed by William Frampton (bill@mauiframpton.com)  
04/06/2018 - 3:08:44 PM PDT - IP address: 174.239.3.157
-  Document e-signed by William Frampton (bill@mauiframpton.com)  
Signature Date: 04/06/2018 - 3:21:48 PM PDT - Time Source: server- IP address: 174.239.3.157
-  Document emailed to Michael F. Reiley (mreiley@hnuenergy.com) for signature  
04/06/2018 - 3:21:49 PM PDT
-  Document viewed by Michael F. Reiley (mreiley@hnuenergy.com)  
04/06/2018 - 3:26:33 PM PDT - IP address: 67.53.32.118
-  Document e-signed by Michael F. Reiley (mreiley@hnuenergy.com)  
Signature Date: 04/06/2018 - 3:27:42 PM PDT - Time Source: server- IP address: 67.53.32.118



Adobe Sign

# EXHIBIT B

# **WAIKAPU DEVELOPMENT VENTURE LLC** **Detailed Timeline for Completion of Updated Project**



	KEY DATES / TIMING	ACTION ITEM/KEY EVENTS
1.	July 2016	<b>Project Vision &amp; Goal:</b> Maui-Based Project Team (" <i>the Team</i> ") of William Frampton, Vince BagoYo and Peter Horovitz formulated the Project Vision and Goal, to acquire suitable/appropriate subject property to develop a 100% Affordable Housing Project to develop quality, solid, dependable, attainable housing for local families and residents.
2.	July 2016 - December 2016	<b>Initial Meetings/Discussions with Emmanuel Lutheran Church of Maui and Due Diligence:</b> The Team had initial meetings and preliminary discussions with ELC to explore the Team's Vision and Goal; and also conducted thorough review/research, analysis and assessment regards to the practicality, financial feasibility, and estimated timeline (" <i>Due Diligence</i> ") of the proposed Project Vision and Goal; which may involve several concurrent/simultaneous elements/phases: (1) Acquisition/Purchase of a portion (approx. 12.5-acre) of subject property owned by Emmanuel Lutheran Church of Maui ("ELC"); (2) ELC and the Team request Approval from State Land Use Commission regards existing SLUC Petition; including proposed Amendment of Conditions/Timeline; Proposed sale of portion of Subject Property to the Team, and ultimate proposed Bi-furcation. (3) The Team would seek County Council Approval of Proposed 201-H Affordable Housing Project. (4) The Team would File Two (2) Lot Subdivision to create subject property regards to the Proposed Sale/Acquisition of approx. 12.5 Acres.
3.	November 21, 2016	Purchase and Sale Agreement (the "PSA") executed between Emmanuel Lutheran Church of Maui ("ELC"), as seller, and William Frampton, as buyer, for the sale of an approximately 12.5-acre portion of the Petition Area. PSA ultimately assigned to Waikapu Development Venture, LLC ("WDV").
4.	February 2017	<i>Request for Proposals:</i> WDV transmits Request for Proposal ("RFP") to several qualified local professionals/consultants to form Project Team to implement Project Vision and Goal; including:

		architect, land use planner, civil engineer, traffic engineer, archaeologist, market/economic analyst, and flora/fauna specialist.
5.	March 2017	<u>Select Project Team:</u> WDV executes proposals/contracts and forms Project Team comprised of qualified local professionals/consultants.
6.	March 2017 – May 2017	<u>Alternative Design Analysis for Master Plan:</u> Work with Architect and Project Team to explore/analyze several conceptual/preliminary designs for Master plan; several differing plans provide range of scopes/sizes/scales of the housing project; including total unit count, unit types/sizes/densities, affordable house price ranges, infrastructure/utility needs; traffic flow/pattern analysis, pedestrian access/circulation, community park/open-space network, etc.
7.	March 2017 – May 2017	<u>Community Outreach:</u> Arrange for initial Community Outreach meetings with various public and private agencies/groups - such as: <i>Maui Department of Housing &amp; Human Concerns ("DHHC")</i> ; <i>Planning Department</i> ; <i>Waikapu Community Association</i> ; <i>F.A.C.E. Maui</i> ; and <i>Maui Division of Catholic Charities</i> - to present/share the proposed Vision and Goal and project's Conceptual Master Plan; receive valuable comments and input/feedback towards improving design of Master Plan; and help to avoid unnecessary adverse impacts to the nearby/surrounding community's environmental and socio-economic resources.
8.	June 2017 - July 2017	<u>Select Final Design of Master Plan:</u> After thorough assessment/analysis with project consultants and professionals; as well as valuable input/feedback from various Public Agencies and Community Groups, Final Design of Master Plan is selected.
9.	July 2017 – October 2017	<u>Preparation of Studies/Reports for 201-H Application:</u> Project Team initiates preparation of professional studies and technical reports that are necessary to complete and thorough analysis of all factors, elements, and aspects of the proposed Affordable Housing Project; including: preliminary engineering report, traffic analysis, market demand study/feasibility, archaeological report, flora/fauna inventory and assessment, etc.
10.	January 2018	<u>Early Consultation &amp; Government Agency Review Process RE: 201-H Application</u> – Under coordination of Maui DHHC, WDV transmits required number of copies of <i>DRAFT 201-H Affordable</i>

		Housing Application to Maui DHHC for their subsequent transmittal of said application to all relevant County and State Agencies for agency review and comment.
11.	April 6, 2018	Mr. Frampton's rights under PSA assigned to WDV (with the consent of ELC).
12.	April 9, 2018	ELC's Motion for Extension of Time to Complete Project filed with the Land Use Commission. Included with this Motion was a copy of WDV's draft Application for Affordable Workforce Housing Subdivision.
13.	April 12, 2018	WDV's Motion to be a Co-Petitioner, or in the Alternative to Become a Party, or in the Alternative to Intervene ("WDV's Party Motion") filed with the Commission.
14.	April 19, 2018	ELC's Memorandum in Support of WDV's Party Motion filed with the Commission.
15.	May 9, 2018	Hearing on ELC's and WDV's Motions held by the Land Use Commission.
16.	June 1, 2018	Large lot subdivision application filed with County to subdivide Petition Area into Lot A-1 (12.5 acres) and Lot A-2 (12.763 acres).
17.	June 4, 2018	<u>File Application for Two (2) Lot Subdivision and Preliminary Subdivision Plat with County Department Public Works:</u> WDV filed Application and Preliminary Plat for Two (2) Lot Subdivision with County Public Works to subdivide Petition Area into Lot A-1 (12.5 acres) and Lot A-2 (12.763 acres). County Public Works issues letter to note formal "Acceptance" of the said Application and Preliminary Subdivision Plat. County assigns <u>File Number</u> to Application of <u>Subdivision File No. 3.2390</u> , and the 45-Day deadline for Preliminary approval begins.
18.	June 6, 2018	<u>COUNTY'S ALL DIRECTOR'S MEETING:</u> Under guidance/coordination of the County DHHC, the "All-Directors Meeting" was held at the Mayor's Lounge on the 9th Floor of the County Building in order to conduct a comprehensive review and assessment of the Proposed 201-H Residential Affordable Housing Project, including the proposed "List of Exemptions." This effort helped to assemble the pertinent Directors and/or Division Heads of several key County Departments and Agencies at one meeting; along with our Project Team of Professional Consultants so that we could help to ensure that the approval of our proposed project, along with the List of Exemptions, would not



		result in inadvertent adverse impacts upon the health, safety, and welfare of our community. Attending the meeting were representatives from several important County Departments and Divisions, including: <i>Fire and Public Safety</i> ; DHHC; <i>Parks &amp; Recreation</i> ; <i>Planning Department</i> ; <i>Police Department</i> ; <i>Public Works</i> , <i>Environmental Management</i> ; <i>Department of Transportation</i> ; and <i>Department of Water Supply</i> .
19.	June 22, 2018	Land Use Commission grants WDV's Party Motion and admits WDV as an intervenor.
20.	July 2018	<u><i>FOLLOW-UP/DETAILED AGENCY REVIEW</i></u> : After the June 6, 2018 <i>County Director's Meeting</i> , WDV met with (1) Dept. Public Works Engineering Div., & Highways/Roadways Maintenance Div.; (2) Dept. Water Supply Engineering Div.; (3) Dept. Fire & Public Safety Fire Prevention Bureau; and (4) Department of Planning - Current Div. & Long Range Div. for detailed analysis and discussions in order to address requested modifications to project design identified in pre-consultation meetings.
21.	July 16, 2018	County DSA issues <i>Preliminary Subdivision Approval of Two (2) Lot Subdivision</i>
22.	July 25, 2018	<i>Formal Filing of 201-H Application</i> - WDV files its final 201-H Application for Affordable Workforce Housing Subdivision with the DHHC in order for DHHC's subsequent transmittal of said 201-H Application to County Council for approval Council's 45-Day Timeline to take action begins.
23.	August 1, 22, & 28, 2018	<i>Maui County Council Land Use Committee Hearings</i> - WDV's 201-H Application is referred to Maui County Council Land Use Committee ("LUC") for public hearing and review. . The Council LUC met on August 1, 2018 and August 22, 2018; and reconvened on August 28, 2018 to review and make formal recommendation to the County Council regarding proposed 201-H Application.
24.	August 28, 2018	<u><i>LUC Unanimously Votes to Recommendation Approval</i></u> : Council LUC Unanimously Votes (8-0, 1 excused) to recommend the full Council's Adoption of WDV's 201-H Application.
25.	September 7, 2018	County Council Votes Unanimously (8-0, 1 excused) to Adopt Resolution No. 18-150
26.	October, 2018	ELC files detailed timeline for development of the ELC Project with the Land Use Commission.

27.	October, 2018	WDV files Motion to Approve Sale, Motion to Allow Subdivision, Motion to Bifurcate Docket, with the Land Use Commission.
28.	October 22, 2018	WDV's Motion to Approve WDV 201H Project filed with the Land Use Commission.
29.	November 7, 2018	<u>WDV's Housing Development Agreement</u> : Anticipated approval by DHHC of WDV's <u>Housing Development Agreement</u> and said document is filed for recordation at Bureau of Conveyances.
30.	November 15, 2018	Land Use Commission hearing on ELC's and WDV's respective motions. WDV must obtain State Land Use Commission approval to utilize portion of ELC's urbanized property for 201H project not later than 6 months after County Resolution.
31.	December 2018	County Public Works issues Final Subdivision Approval Letter and Final Plat for 2-Lot <del>of the</del> <del>large</del> <del>lot</del> Subdivision.
32.	December 2018 / January 2019	Parties Close on PSA for sale of Lot A-1 to WDV.

#### WDV'S CONSTRUCTION PLANS

33.	December 2018	<u>Topographic Survey</u> - WDV executes proposal from Licensed Surveyor to prepare detailed <u>Topographic Survey</u> of Lot A-1, and subsequently transmits said survey to Civil Engineer for preparing Construction Plans.
34.	January 2019	<u>Prepare Constructions Plans for Site Work and Grading</u> - After Detailed Topo Survey complete, Civil Engineer begins preparing Construction Plans for 74 Lot Subdivision per 201-H Plans (i.e. grading/grubbing plans and civil work including: roadways, curb, gutter, sidewalk, water, wastewater, electric/cable/phone).
35.	February 2019	<u>Early Consultation with County Agencies and Request new County Policy RE: "Fast Track Designation"</u> - Meeting with Public Works and other key reviewing agencies to insure the Project will receive " <u>Fast Track</u> " priority designation during approval process (per 100% Affordable); additional meetings to review preliminary plans an assess if any issues.

36.	March/April 2019	<i>File Grading/Grubbing Plans &amp; Site/Civil Construction Plans - File Detailed Construction Plans and Bonding (i.e. grading/grubbing plans and civil work including: roadways, curb, gutter, sidewalk, water, wastewater, electric/cable/phone)</i>
37.	May/June 2019	<i>Preliminary Bids/Estimates - Meetings with qualified Contractors to review plans and timeline;</i>
<b><u>WDV SITE WORK/CIVIL CONSTRUCTION</u></b>		
38.	Q2-Q4 2019	Prepare Detailed Construction Plans for the Affordable Houses (Single-Family and Duplex Units); building and obtain County approval and required permits for construction.
39.	Q3 2019	Obtain DLNR-SHPD approval of Monitoring Plan for ELC property prior to ground-breaking activities.
40.	Q3 2019	Prepare Soil Analysis Study of ELC property in consultation with the State Department of Health Hazard Evaluation and Emergency Response Office.
41.	Q3-Q4 2019	Site Blessing; then Dust/Silt Fence; then Grading/Grubbing plans. Per County Resolution 18-150, construction <u>must begin within 2 years of resolution</u> , and <u>completion deadline is 4 years from resolution</u> .
42.	2019-2020	Complete Site Work/Infrastructure/Utilities, including wastewater, water, electric/phone/cable.
43.	2020-2021	Construct Houses. Per County Resolution 18-150 deadline to complete construction is <i>September 7, 2022</i>
<b><u>FAMILIES/RESIDENTS QUALIFY FOR AFFORDABLE HOUSINES &amp; SELECTION</u></b>		
44.	Q3-Q4 2019	Begin working with Residents to <i>confirm eligibility for County Residential Workforce Housing Requirements</i> ; Assist Potential Buyers with Sign-Up for <i>Homebuyer Education Course</i> ;

45.	Q4 2019 Q1 2020	Encourage Potential Buyers to <i>Meet with Qualified Lenders</i> to Prepare for Financing and request <i>Pre-Qualification Letter</i> ; Interested/Qualified Buyers to <i>Complete Sales Application Packages</i>
46.	Q2 2020	<i>Sales Lottery</i> to select Qualified Buyers, Notify Selected Buyers; Buyers to <i>Review/Execute Sales Contract</i> and Provide Deposit/Fees
47.	Q3 2020	Buyers Move into first phase of homes

**RELEVANT  
EXCERPTS FROM  
MAUI ISLAND  
PLAN**

**EXHIBIT C**





*Prepared By:*  
County of Maui  
Planning Department  
Long Range Division

# Maui Island Plan

## General Plan 2030

*'A 'ohe hana nui ke alu 'ia.  
No task is too big when done together by all.*



*Prepared For:*  
The People of Maui



## **Cover Art**

**Left:** 18th Century Hawaiian Kapa; Cook-Foster Collection.  
Georg-August University; Göttingen, Germany

**Right:** Hoku Pa`a: Polaris, the North Star  
Traditional Hawaiian Kapa by practitioner Dalani Tanahy; Makaha, Hawaii 2008.  
Dyed with `olena, kukui, `uki`uki, alae`a, black walnut

*"Hoku Pa'a is a star I see every night above a curve in the mountains of the Makaha Range. I am reminded of its qualities and importance to seafarers who sailed all oceans; steadfast, reliable, immovable, the center of the sky around which all other stars and constellations revolved. This kapa design honors this renowned star."*

---

# Maui Island Plan

*Island of Maui*

*General Plan 2030*

---

For information regarding this plan please contact the County of Maui or the Maui County Department of Planning. Copies of this plan are available from the Maui County Department of Planning.

In loving memory, Christopher L. Hart, Robin Foster,  
Rae and Carl Lindquist

Published in the United States by  
The County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

The Maui Island Plan was adopted by Ordinance No. 4004 and took effect on December 28, 2012.



### ***LET THERE BE NO SMALL PLAN***

*Daniel Burnham,  
Founding Practitioner, City Beautiful Movement*

It is impossible to see the future, but we can envision how we want it to be and we can commit to doing all that is possible to see that our dreams and desires come true. Our Vision is one of hope, based on the values held by those who live on the land – hope that our decisions will keep the land, the people, and our heritage healthy and productive.

Conditions outside our present knowledge may require flexibility in achieving our goals; but as long as we remain guided by the values we hold in common, twenty years from now we will all be able to say, “We have been good stewards; we have been true to Maui.”

The Maui Island Plan is the result of five years of listening to the voice of Maui’s residents, hearing what is important to each and all of us - what we want and what we need, what we fear and what we dream – and then incorporating that into public policy.

Community involvement was critical to our planning; the process included large public outreach events, planning charrettes, public meetings, workshops, and public hearings. Over the last five years we traveled throughout the island. We listened to the youth with their strong ideals and hope for the future, and we listened to the wisdom and experience of our most senior residents. We listened to the concerns of our working parents and to the needs of our business community and community organizations. We garnered extensive input from our multicultural population.

One particular facet of Maui was prioritized by nearly everyone who participated in our community meetings: the desire to maintain the small towns and open countryside that is such a large part of who and what Maui is, while at the same time providing vibrant urban areas that will provide an equally positive quality of life for those who make their lives in our larger towns.

There is no conflict in these two goals. However, unless we hold these goals in equal esteem, we could sacrifice one goal to the other in the decisions that lie ahead. Our actions for one must always be balanced by our consideration for the other.

This Plan looks forward several generations, its recommendations will transform the way we manage our lands and plan for our communities. Key highlights of the Plan include:

- ◆ Adoption of a Directed Growth Plan. Growth areas are established where future growth is desired. This will make development more predictable for everyone, including County service and infrastructure providers. This will help reduce development costs, provide more affordable housing, and lower taxes to the public.

## ***EXECUTIVE SUMMARY***

---

- ♦ Protection of Maui's Small Towns and Rural Character. Outside of growth areas development will be limited to preserve our agricultural lands and open space. This will “keep the country - country”, a refrain repeated by many citizens.
- ♦ Affordable Housing. Housing for our workforce will remain affordable in perpetuity. Housing that is approved as “affordable” will not be converted to free market housing.
- ♦ Protection of Watersheds and Coastal Resources. Watershed and coastal zone management will be integrated to protect those areas of the island that contain critical marine resources, including coral reefs.
- ♦ Identification of Transit Corridors. Corridors will be protected from future development so that homes and businesses do not have to be condemned to make way for future transit facilities.
- ♦ Economic diversification. We will promote emerging industries such as high technology, renewable energy, niche tourism, local agriculture, health care, entertainment, and education. The important visitor industry will still grow, but at a comparatively smaller rate so that our economy will be more diversified.
- ♦ Integration of Land Use and Infrastructure Planning. We will implement a framework to ensure that our infrastructure and land use planning functions are integrated, so that infrastructure can be provided more effectively and efficiently. Financing tools will be developed so we can invest in water and wastewater systems, transit, parks, and other public facilities that will serve as a foundation for prosperity.

The steps we take now and in the next twenty years should be considered investments in our future, and in the future of Maui - its land, people, and heritage. We will need the wisdom to carry with us those values, traditions, and lessons from the past to light our path into the future towards the attainment of our Vision and goals. There is a lot to be done in a lot of areas. The responsibility to `ohana, `āina, and being pono calls us to action.

### ***Mohala i ka wai ka maka o ka pua.***

*Unfolded by the water are the faces of the flowers. Flowers thrive by the water, as people thrive where the living conditions are good. –Hawaiian `Ōlelo No`eau*

## **ACKNOWLEDGMENTS**

---

**Alan Arakawa, Mayor**  
**Keith Regan, Managing Director**  
**William Spence, Planning Director**  
**Michele McLean, Deputy Planning Director**

### **COUNTY COUNCIL**

Danny A. Mateo, Chair  
Joseph Pontanilla, Vice-chair  
Gladys Coelho Baisa  
Robert Carroll  
Elle Cochran  
Donald G. Couch, Jr.  
G. Riki Hokama  
Michael P. Victorino  
Mike White

### **MAUI PLANNING COMMISSION**

Wayne Hedani, Chair  
Bruce U'u, Vice-chair  
Donna Domingo  
John Guard, IV  
Kent Hiranaga  
Ward Mardfin  
Lori Sablas  
Warren Shibuya  
Jonathan Starr

### **MAUI GENERAL PLAN ADVISORY COMMITTEE**

Thomas Cannon, Chair	Lisa Hamilton	Warren Shibuya
Dick Mayer, Vice-chair	Kennard Kekona	Jeanne Skog
Joe Bertram III	Carl Lindquist	Warren Suzuki
John Blumer-Buell	Douglas MacCleur	Frank Sylva
Lesley Bruce	Hans Michel	Stacie Thorlakson
Thomas Cook	Susan Moikeha	Trevor Tokishi
Antoinette deNaie	Walette Pellegrino	Mercer Vicens
Kehau Filimoeatu	Hinano Rodrigues	Warren Watanabe
Stanley Franco		

### **PLANNING DEPARTMENT, LONG RANGE DIVISION**

John F. Summers, Planning Program Administrator	Daniel McNulty-Huffman, GIS Supervisor
Joy Paredes, Division Secretary	Mark King, GIS Analyst
David Yamashita, Planner Supervisor	Michael Napier, GIS Analyst
Simone Bosco, Senior Planner	Peter Graves, GIS Analyst
Stanley Solamillo, Senior Planner	Connie Tucker, GIS Technician
Kathleen Kern, Senior Planner	Richele Lesa, Office Operations Assistant
Mary Jorgensen, Senior Planner	

### **CONSULTANT TEAM**

**PRIMARY CONSULTANT**  
PlanPacific, Inc.  
Robin Foster, Vice-President

### **SUB-CONSULTANTS**

Chris Hart & Partners, Inc.  
Chris Hart, President  
Michael Summers, Senior Planner  
David Sereda, Landscape Architect  
Jennifer Maydan, Planner

### **SPECIAL STUDIES**

Fern Tiger & Associates – WalkStory / PlanStory  
John Knox & Associates – Housing / Economy  
Maui Economic Development Board – WalkStory/  
PlanStory  
RM Towill, Inc. – Public Facilities  
SMS Consulting – Socio-Economic Forecast  
Tom Dinell & Associates – Housing / Economy  
Wilson Okamoto & Associates – Infrastructure

## **TABLE OF CONTENTS**

### **ACKNOWLEDGMENTS**

### **EXECUTIVE SUMMARY**

## **INTRODUCTION** **I-1**

The Purpose of the Maui Island Plan .....	I-2
Maui Island History .....	I-6
Maui Today .....	I-14
Vision Statement and Core Values .....	I-16
<i>Map I-1: Character &amp; Context</i>	

## **CHAPTER 1. POPULATION** **I-1**

Background Information .....	I-2
Challenges & Opportunities .....	I-4
Goal, Objectives, Policies and Actions .....	I-7
<i>Map 1-1: Employment &amp; Population Density</i>	

## **CHAPTER 2. HERITAGE RESOURCES** **2-1**

Cultural, Historic, & Archaeological Resources .....	2-2
Background Information .....	2-3
Challenges & Opportunities .....	2-6
Goal, Objectives, Policies and Actions .....	2-10
Shoreline, Reefs, & Nearshore Waters .....	2-14
Challenges & Opportunities .....	2-15
Goal, Objectives, Policies and Actions .....	2-21
Watersheds, Streams, & Wetlands .....	2-26
Challenges & Opportunities .....	2-27
Goal, Objectives, Policies and Actions .....	2-30
Wildlife & Natural Areas .....	2-34
Challenges & Opportunities .....	2-35
Goal, Objectives, Policies and Actions .....	2-39
Scenic Resources .....	2-43
Challenges & Opportunities .....	2-44
Goal, Objectives, Policies and Actions .....	2-46

## **TABLE OF CONTENTS**

<b>CHAPTER 3. NATURAL HAZARDS</b>	<b>3-1</b>
Background Information .....	3-2
Challenges & Opportunities .....	3-4
Goal, Objectives, Policies and Actions .....	3-7
<b>CHAPTER 4. ECONOMIC DEVELOPMENT</b>	<b>4-1</b>
Background Information .....	4-2
Economic Diversification .....	4-3
Challenges & Opportunities .....	4-4
Goal, Objectives, Policies and Actions .....	4-5
Tourism .....	4-8
Challenges & Opportunities .....	4-10
Goal, Objectives, Policies and Actions .....	4-12
Agriculture .....	4-15
Challenges & Opportunities .....	4-16
Goal, Objectives, Policies and Actions .....	4-19
Emerging Sectors .....	4-21
Challenges & Opportunities .....	4-22
Goal, Objectives, Policies and Actions .....	4-25
Small Business Development .....	4-27
Challenges & Opportunities .....	4-28
Goal, Objectives, Policies and Actions .....	4-29
Health Care Sector .....	4-31
Challenges & Opportunities .....	4-32
Goal, Objectives, Policies and Actions .....	4-34
Education and Workforce Development .....	4-36
Challenges & Opportunities .....	4-38
Goal, Objectives, Policies and Actions .....	4-40
<b>CHAPTER 5. HOUSING</b>	<b>5-1</b>
Background Information .....	5-2
Challenges & Opportunities .....	5-3
Goal, Objectives, Policies and Actions .....	5-6
<b>CHAPTER 6. INFRASTRUCTURE &amp; PUBLIC FACILITIES</b>	<b>6-1</b>
Background Information .....	6-2
Solid Waste .....	6-3

## **TABLE OF CONTENTS**

Challenges & Opportunities .....	6-4
Goal, Objectives, Policies and Actions .....	6-5
Wastewater .....	6-8
Challenges & Opportunities .....	6-10
Goal, Objectives, Policies and Actions .....	6-11
Water .....	6-14
Challenges & Opportunities .....	6-20
Goal, Objectives, Policies and Actions .....	6-23
Transportation.....	6-26
Challenges & Opportunities .....	6-27
Goal, Objectives, Policies and Actions .....	6-29
Transit .....	6-33
Challenges & Opportunities .....	6-34
Goal, Objectives, Policies and Actions .....	6-35
Parks.....	6-38
Challenges & Opportunities .....	6-41
Goal, Objectives, Policies and Actions .....	6-42
Public Facilities .....	6-46
Goal, Objectives, Policies and Actions .....	6-48
Schools & Libraries .....	6-50
Challenges & Opportunities .....	6-52
Goal, Objectives, Policies and Actions .....	6-52
Health Care .....	6-55
Challenges & Opportunities .....	6-57
Goal, Objectives, Policies and Actions .....	6-58
Energy .....	6-62
Challenges & Opportunities .....	6-63
Goal, Objectives, Policies and Actions .....	6-65
Harbors & Airports .....	6-68
Challenges & Opportunities .....	6-70
Goal, Objectives, Policies and Actions .....	6-72
<i>Map 6-1: Water &amp; Sewerage Service Areas Map</i>	
<i>Diagram 6-1: Regional Transportation Network</i>	
<i>Diagram 6-2: Public Facility / Infrastructure Improvements</i>	

## **CHAPTER 7. LAND USE**

**7-1**

Agricultural Lands .....	7-2
Background Information .....	7-3
Challenges & Opportunities .....	7-4

## **TABLE OF CONTENTS**

Goal, Objectives, Policies and Actions .....	7-7
Rural Areas .....	7-11
Background Information .....	7-12
Challenges & Opportunities .....	7-12
Goal, Objectives, Policies and Actions .....	7-15
Urban Areas .....	7-17
Background Information .....	7-18
Challenges & Opportunities .....	7-18
Goal, Objectives, Policies and Actions .....	7-24

<b>CHAPTER 8. DIRECTED GROWTH PLAN</b>	<b>8-1</b>
--	------------

Background Information .....	8-2
Growth Boundary and Protected Area Types Table .....	8-5
Urban & Small Town Growth Area Goal & Policies .....	8-6
Rural Growth Area Goal & Policies.....	8-7
Protected Area Policy.....	8-9
Methodology for Identifying Growth Boundaries .....	8-9
Maui's Directed Growth Plan.....	8-12

*List of Maui Island Plan Directed Growth Maps*

*Map C1: Waihe'e*

*Map C2: Wailuku*

*Map C3: Waikapu / Kahului*

*Map C4: Ma'alaea*

*Map C5: Pulehu Road*

*Map S1: North Kihei*

*Map S2: South Kihei / Wailea*

*Map S3: Makena*

*Map U1: Makawao / Pukalani*

*Map U2: Oma'opio*

*Map U3: Kula*

*Map U4: 'Ulupalakua*

*Map N1: Spreckelsville / Pa'ia*

*Map N2: Ku'au / Ha'iku*

*Map W1: Kapalua*

*Map W2: Ka'anapali*

*Map W3: Lahaina Town*

*Map W4: Olowalu*

*Map E1: Hana*

*Map E2: Pu'uiki*

## **TABLE OF CONTENTS**

---

<b>CHAPTER 9. MONITORING &amp; EVALUATION</b>
---

<b>9-1</b>
------------

<b>WORKS CITED &amp; PHOTO CREDITS</b>
--

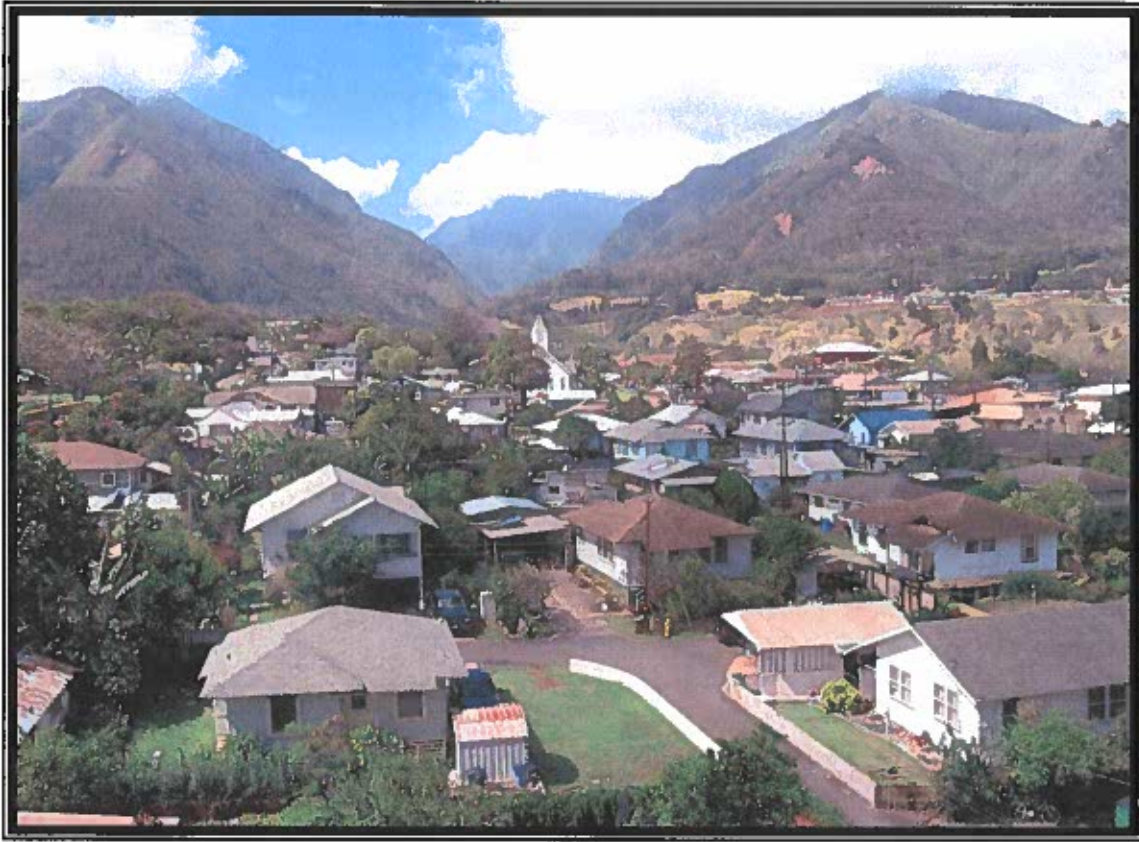
<b>APPENDIX</b>
-----------------

A. Glossary

B. Maui Island Plan Map Book



## **Chapter 5: Housing**



*Traditional neighborhood, Wailuku.*

**H**ousing is one of our most basic human needs. It is one of the fundamental building blocks in our communities and it is where our families gather and find shelter. All segments of our island have particular needs, whether it is the first home or apartment for young adults, or to accommodate the specified needs that come with age. Housing is not always treated as a human right. When adequate or appropriate housing is unattainable to a large portion of the population, it negatively impacts the entire community and decreases overall quality of life. We can do many things to promote an adequate and permanent supply of affordable for-sale and rental housing to meet resident needs. To meet our island's housing needs, we must rethink Maui's paradigm. Due to numerous factors, Maui's housing prices have escalated dramatically in the last decade. With some of the highest housing prices in the nation, many Maui residents are struggling to afford housing on the island.

### Background Information

The Housing chapter refers to, and is based on, the following studies and reports created specifically for the MIP:

1. Socio-Economic Forecast: The Economic Projections for the Maui County General Plan 2030, June 2006;
2. Land Use Forecast, November 2006; and
3. Maui Island Housing Issue Paper, December 2006.

The Maui housing market has been volatile in recent years, as illustrated in Figure 5-1.<sup>1</sup> There were significant variations in the price of new and existing single-family homes and condominiums on Maui between 1979 and 1999, but nothing like the swings that occurred after 1999. More recently, the real estate market on Maui has tended to stabilize but housing prices still remain significantly higher than housing prices in the 1990s.

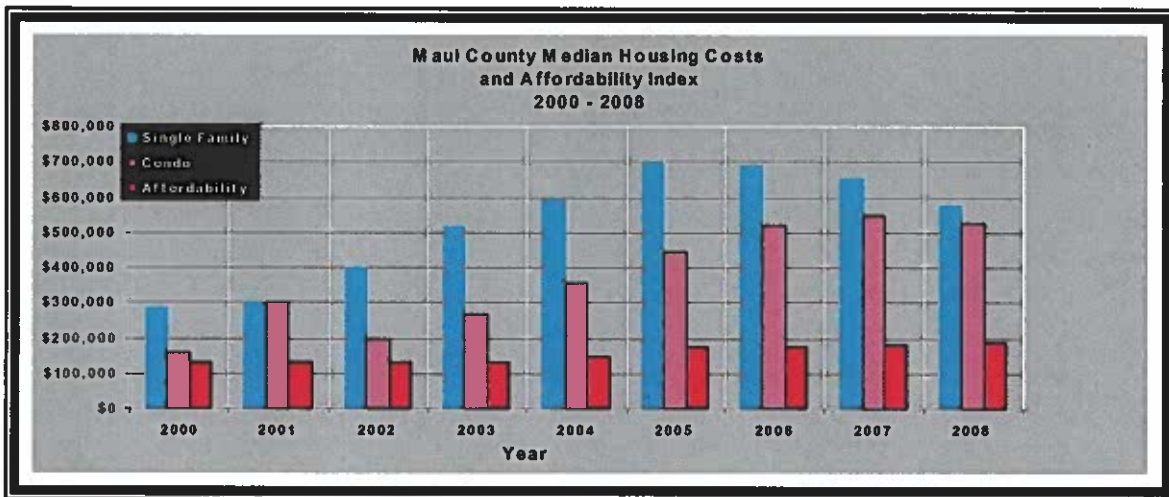


Figure 5 - 1. Maui Median Home Prices, Current Dollars.

Maui residents, by almost any measure, face a critical housing situation:

- They spend a higher percentage of their income on housing than almost anyone else in the United States;
- The cost of housing on Maui makes home ownership very unaffordable, as compared to the national average;
- The median price for single-family homes and condos, whether new or existing units, has been exceedingly above what people can afford, in recent years; and
- The home ownership rate for Maui is significantly lower than for the rest of the United States.

The dynamics of housing production and pricing are extremely complex. Many key drivers are far beyond the control of local government, including:

<sup>1</sup> (1) Median Single-Family and Condominium sales data from the Maui Board of Realtors, 2009; (2) Housing Affordability Index based on a two-wage household (Maui County Databook, 2000 - 2008) each earning the average wage and applying common loan eligibility standards.

## HOUSING

---

- National and international economic cycles;
- Federal Housing policies such as the reduced federal income tax for the well-to-do and mortgage interest deductions on second homes;
- Low interest rates that contribute to rising prices;
- Consumers' willingness to accept higher levels of household debt through "creative financing" mechanisms;
- Overall cost of construction;
- Offshore demand;
- High levels of speculation in some economic cycles; and
- The geographic and land constraints inherent with an island environment.<sup>2</sup>

These points suggest that relatively high prices are longstanding and will probably continue to be high as long as the State and Maui remain desirable and accessible to large offshore markets.

Maui County relies primarily on inclusionary zoning to increase the supply of affordable housing. Simply put, inclusionary zoning requires a developer of new housing to build a specified number of affordable dwelling units.

There is no one policy that by itself can lead to an adequate supply of affordable housing. Policies that may work well during times of economic growth may not be well suited to periods of financial downturn. Strategies that are focused on local residential use may not function well unless the vacation home and transient vacation rental markets are taken into consideration. Programs that are ideal when applied to large developments may be counterproductive when imposed on homeowners or small-scale builders.

### CHALLENGES AND OPPORTUNITIES

#### ***Need for Improved Economic Housing Cycle Monitoring***

There are some significant gaps in data currently available to county planners addressing affordable housing issues, especially as it relates to the interrelation between housing production and the economic cycle. Furthermore, the current reporting system needs to distinguish between housing used for the tourism and second-home markets and housing used by Maui residents. In addition, data on new housing sales are not as readily available as resale data. There is also a need for data exploring the use of offshore investment homes that remain unoccupied.<sup>3</sup>

A reduction in the supply of housing available for long-term residential use occurs when any owner – offshore or local – converts residential housing stock into non-residential uses. Non-residential uses can include vacation homes or transient vacation rentals (TVRs). The supply problem is compounded because many TVRs are also part-time vacation homes, with owners defraying mortgage costs by TVR use, thereby driving up housing costs.<sup>4</sup>

#### ***Competition From the "Offshore"***

The presence of affluent, non-resident buyers influences the housing market in several ways, all of which put upward pressure on prices. First, non-residents seeking a second home can typically outbid residents for houses and apartments being resold. Second, in a

---

<sup>2</sup> Knox, John M. and Tom Dinell (December 2006). *Maui Island Housing Issue Paper: A Discussion Paper for the Maui County General Plan Update, Summary of Recommendations.*

<sup>3</sup> Id.

<sup>4</sup> Id.

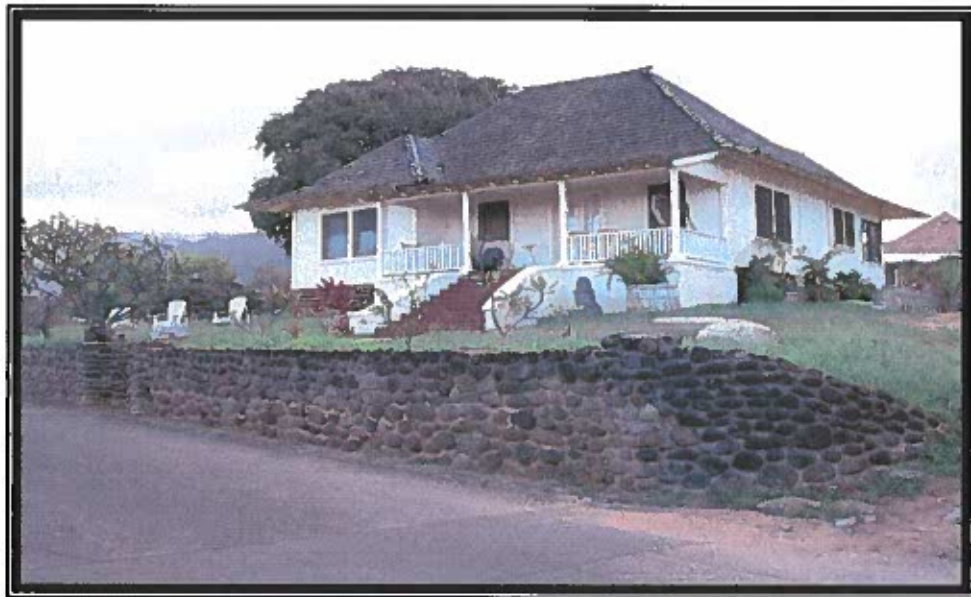


## HOUSING

### ***Market”***

strong market, developing higher-priced units generally produces greater profit per unit. Therefore, a relatively large proportion of new residential units and lots are being developed for upper-end buyers. Finally, when the building industry is focused on the upper-end market there are fewer resources for affordable housing.

Property taxation may be one tool to mitigate the impact of non-resident demand on Maui's housing prices. Property tax rates in Maui County and throughout the State are low compared to rates and supplementary fees charged by mainland municipalities, school districts, and public facility districts. Relatively low property taxes for single-family and multifamily residences make Maui properties more attractive to the offshore buyer. Property taxes can be made more progressive by increasing property tax rates and simultaneously increasing the home exemption to neutralize the rise in the tax for resident property owners and including a similar offset for owners of rental properties leasing to residents.<sup>5</sup>



*Sand Hills, Wailuku.*

### ***Maintaining the Stock of Affordable Housing***

The conveyance tax can also be used to fund the development of affordable housing. Through the enactment of State enabling legislation, Maui County could impose a surcharge on the conveyance tax with the proceeds to be deposited in the County's Affordable Housing Fund. Such legislation could permit the County to utilize a graduated scale so that the sellers of multi-million dollar homes pay a higher percentage surcharge than do those conveying more modest or affordable dwellings.

A great deal of affordable housing has been built in Hawai'i over the years. Much of it has slipped back into the market housing stock in relatively short periods of time, as the original buyers resell at market prices. Preserving affordable housing in perpetuity will be extremely important to help increase and maintain the supply of affordable housing units and reduce housing prices for Maui residents.

### ***Compact, Mixed-***

At the island and regional scale, increasing the density of housing is a more efficient use of land. It also saves on linear miles of roads, water lines, and other utilities that need to be

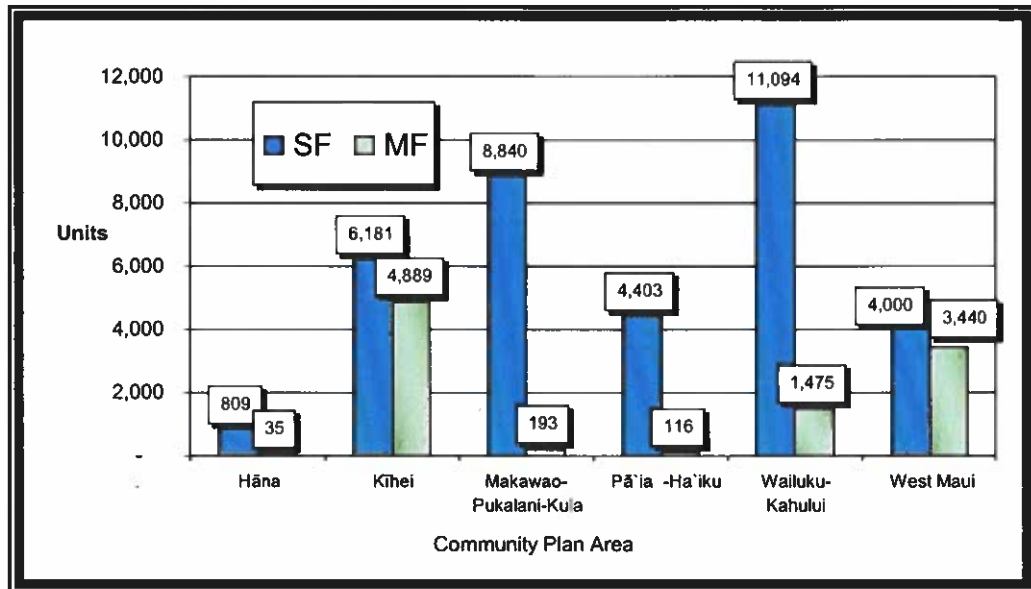
---

<sup>5</sup> Ibid., II-18.

## HOUSING

### *Income Communities with Expanded Housing Choices*

built and maintained. Increasing the density of housing also preserves more land for agriculture and open space. At the project scale, increased density can reduce land and building costs and thereby result in more affordable sale and rental prices. There are two general ways to increase density: (1) to develop a multifamily housing type rather than a single-family housing type; and (2) to increase the number of units per acre in either category.<sup>6</sup>



*Figure 5 – 2. 2005 Single-Family and Multifamily Dwelling Units by Maui Island Community Plan Area. Source: Existing Land Use Database, 2005.*

In 2005, single-family dwellings comprised 78 percent of the total housing stock on Maui.<sup>7</sup> Multifamily dwellings are typically less expensive than single-family dwellings and are often attractive to seniors and young adults. The limited supply of multifamily units has constrained consumer choice and exacerbated housing prices. Figure 5-2 illustrates the mix of single-family and multifamily dwellings in Maui's community plan areas. The Makawao-Pukalani-Kula, Pā'ia-Ha'ikū, and Wailuku-Kahului community plan areas offer limited multifamily housing opportunities.

Accessory or 'ohana dwellings can also play a significant role in increasing the affordable housing stock on Maui, whether such units are used to house family or become long-term rental units.

The dangers of concentrating people with few economic resources and limited educational skills in a single project are well known. The placement of rental housing projects in the same areas as for-sale housing provides for more diverse communities. The desired outcome is mixed income communities, which in turn contribute to the social well-being of the larger community.

With the number of people over age 65 growing in the coming decades, there is a need

<sup>6</sup> PlanPacific, Inc. (November 2006). *Land Use Forecast, Island of Maui, Maui County General Plan 2030, Technical Resource Study*.

<sup>7</sup> Id.

## ***HOUSING***

---

### ***Housing for Seniors and Those with Special Needs***

to work with the State, Federal government, community groups, landowners and others to find ways to provide affordable housing to senior citizens and those with special needs.

Hawai'i is the only state in the nation to have both State and County level zoning. Developers understand that it takes years to get all the necessary permits for a major project and that it will involve multiple jurisdictions. Getting through the regulatory process takes time and money. County policy can state that projects that provide for a specified percentage of affordable for-sale or rental housing units shall be fast tracked.

### ***Reduce Developers' Cost to Build Affordable Housing***

Lack of adequate infrastructure is frequently an impediment to the development of affordable housing. The County can play a proactive role in resolving infrastructure bottlenecks by working with developers to coordinate the planning and development of infrastructure within the Urban Growth Boundaries. The County can also adopt minimum and desirable infrastructure level-of-service standards so that the development process is more predictable and transparent.

## **GOAL, OBJECTIVES, POLICIES, AND ACTIONS**

### **Goal:**

- 5.1** Maui will have safe, decent, appropriate, and affordable housing for all residents developed in a way that contributes to strong neighborhoods and a thriving island community.

### **Objective:**

- 5.1.1** More livable communities that provide for a mix of housing types, land uses, income levels, and age.

### **Policies:**

- 5.1.1.a** Promote livable communities (compact/walkable/bikeable, access to transit) that provide for a mix of housing types and land uses, including parks, open space, and recreational areas.
- 5.1.1.b** Promote planning approaches that provide a mix of multifamily and single-family housing units to expand housing choices.
- 5.1.1.c** Discourage gated communities.
- 5.1.1.d** Provide incentives for the rehabilitation or adaptive reuse of historic structures to facilitate more housing choices.
- 5.1.1.e** Use planning and regulatory approaches to provide higher housing densities.

### **Implementing Actions:**

- 5.1.1-Action 1** Amend development codes to facilitate different types of housing, including mixed use, mixed housing types, clustering, and conservation subdivisions.

## ***HOUSING***

---

- 5.1.1-Action 2** Do a study to determine optimum permit processing times on affordable housing development approvals while ensuring that community and environmental standards are addressed.
- 5.1.1-Action 3** Establish the rules and mechanisms to establish a Maui “master list” of affordable housing projects and land entitled for affordable housing so that residents will be able to obtain an affordable unit in a fair and expeditious manner.
- 5.1.1-Action 4** Study successful models of affordable housing projects/units and adopt appropriate minimum design standards that satisfy the needs of Maui’s residents.
- 5.1.1-Action 5** Amend zoning and historic preservation ordinances/rules to support adaptive reuse opportunities.
- 5.1.1-Action 6** Develop incentives to promote projects that achieve the Leadership in Energy and Environmental Design (LEED) Silver or Gold certification.

### **Objective:**

- 5.1.2** Better monitoring, evaluation, and refinement of affordable housing policy in conjunction with the economic cycle.

### **Policies:**

- 5.1.2.a** Improve data on resident and nonresident housing.
- 5.1.2.b** Utilize the following approaches to promote resident housing and to minimize off-shore market impacts:
- (1) Ensure that the future housing stock is composed of a mix of housing types (multifamily, small lots, ohana units, co-housing, cottage houses, etc.);
  - (2) Encourage new housing in proximity to jobs and services, in places that are conducive/affordable to island residents; and
  - (3) Explore taxation alternatives and building fee structures.

### **Implementing Actions:**

- 5.1.2-Action 1** Develop appropriate incentives to encourage the production of required affordable housing during the different stages of an economic cycle.
- 5.1.2-Action 2** Develop and maintain a reporting system/database and related maps for the following:
- (1) Existing/newly constructed housing units that are affordable to very low-, low-, and moderate-income households;
  - (2) The location and quantity of housing that is used by visitors/second home; and
  - (3) Property tax information, including property land use designations, tax rates, acquisition price, and market value assessments.
- 5.1.2-Action 3** Explore the benefits and costs of revising the County’s property tax rates to make them more responsive to the needs of the citizens in the area of affordable housing.

## ***HOUSING***

---

**5.1.2-Action 4** Develop incentives for locating new workforce housing in proximity to jobs and services.

### **Objective:**

**5.1.3** Provide affordable housing, rental or in fee, to the broad spectrum of our island community.

### **Policies:**

**5.1.3.a** Consider regulations that can help keep affordable housing available at affordable rents.

**5.1.3.b** Seek to have ownership of affordable for-sale and rental housing vested in a non-profit community land trust, or other qualified housing provider, committed to keeping such housing affordable in perpetuity.

**5.1.3.c** Facilitate the use of public lands in urban areas that are suitable for affordable housing.

**5.1.3.d** Develop or support partnerships and initiatives that provide housing-related education/outreach.

**5.1.3.e** Support the continuing efforts of the County and its community partners to:

- (1) Disseminate information on different housing/financial assistance programs (loans, grants, etc.) including information on housing rehabilitation/restoration/adaptive reuse;
- (2) Provide housing-related counseling including budget, credit, and financial planning assistance; and
- (3) Create and maintain a comprehensive/master list of available affordable housing to help residents secure a unit that satisfies their need.

### **Implementing Actions:**

**5.1.3-Action 1** Consider the following actions in housing-related code amendments:

- (1) Give a higher priority to the construction of actual units and a lower priority to the provision of land, over the current alternative in-lieu fee payment;
- (2) Require recordation of a covenant to ensure that the required affordable units in a project remain affordable for perpetuity;
- (3) Consider that affordable houses be developed and available concurrently with market units;
- (4) Encourage the development of affordable “for-sale” and rental housing through incentives;
- (5) Consider a rent stabilization program to ensure that rental housing remains affordable;
- (6) For the sale prices of required affordable housing units, evenly distribute prices over the range of the subject income category; and
- (7) Expedite permitting for affordable housing projects approved pursuant to the residential workforce housing ordinance.



## ***HOUSING***

---

- 5.1.3-Action 2** Support/help in the creation of Community Development Corporations to facilitate the development and maintenance of affordable housing.
- 5.1.3-Action 3** Enhance our existing affordable housing financing program to include the following elements:
- (1) An affordable housing assessment on commercial and residential properties.
  - (2) A real estate transfer tax imposed on visitor units, TVRs, and residential housing that is not affordable for residents with household incomes of up to 200 percent of the island median household income.
- 5.1.3-Action 4** Explore flexible funding for the affordable housing fund/program based on County tax revenues.
- 5.1.3-Action 5** Actively pursue appropriate Federal, State, County, and private grants/subsidies to facilitate affordable housing projects.

### **Objective:**

- 5.1.4** Provide infrastructure in a more timely manner to support the development of affordable housing.

### **Policies:**

- 5.1.4.a** Prioritize the development of infrastructure that supports the development of affordable housing.
- 5.1.4.b** Utilize appropriate financing approaches and assistance tools to encourage the development of infrastructure and public facilities.
- 5.1.4.c** Tailor infrastructure requirements to correspond with appropriate level-of-service standards to help control housing costs and to maintain safety.

### **Implementing Actions:**

- 5.1.4-Action 1** Prioritize Capital Improvement Projects that commit to building appropriately planned affordable housing-related projects.

### **Objective:**

- 5.1.5** A wider range of affordable housing options and programs for those with special needs.

### **Policies:**

- 5.1.5.a** Ensure that residents with special needs have access to appropriate housing.
- 5.1.5.b** Encourage housing to be built or rehabilitated to allow the elderly and those with special needs to live in their homes.
- 5.1.5.c** Ensure and facilitate programs to assist those with special needs from becoming homeless.

## ***HOUSING***

---

- 5.1.5.d** Promote programs that stimulate the production of sustainable homeless shelters and alternative housing technologies.
- 5.1.5.e** Support programs that offer home modification counseling on low-interest retrofit loans and grants to those with special needs.

### **Implementing Actions:**

- 5.1.5-Action 1** Develop financing mechanisms to assist low-income elders and other high-risk/disadvantaged patients who need residential and institutional health care to remain in affordable housing that is part of a community development project.
- 5.1.5-Action 2** Create or assist in creating programs that provide affordable housing to seniors, the disabled, and those returning from mental health institutions, correctional institutions, and drug rehabilitation.
- 5.1.5-Action 3** Help in securing/leveraging federal grants, low income housing tax credits, and other resources that support affordable housing for special needs populations.
- 5.1.5-Action 4** Develop and maintain indicators to monitor homelessness.
- 5.1.5-Action 5** Partner with the private sector/nonprofit organizations to develop and maintain an adequate supply of emergency shelters and transitional housing.
- 5.1.5-Action 6** Amend the Zoning/Subdivision Codes to streamline and facilitate the development of elder care/assisted living facilities, as well as housing/facilities that are Americans with Disabilities Act-compliant.
- 5.1.5-Action 7** Waive County review fees to modify dwelling units to accommodate the needs of people with disabilities (reasonable accommodation).
- 5.1.5-Action 8** Explore the adoption of an aging-in-place ordinance.

### **Objective:**

- 5.1.6** Reduce the cost to developers of providing housing that is affordable to families with household incomes 160 percent and below of annual median income.

### **Policies:**

- 5.1.6.a** Support fast-track processing procedures for the following housing-related entitlements: affordable housing projects/units; indigenous Hawaiian housing/units; and special-needs housing units (seniors, disabled, homeless, etc.).
- 5.1.6.b** Require the construction of affordable for-sale and rental housing units as part of the construction of new housing developments.
- 5.1.6.c** Offer extra incentives in boom periods and withdraw incentives during slack periods.

## ***HOUSING***

---

### **Implementing Actions:**

**5.1.6-Action 1** Develop a comprehensive, flexible system of incentives to develop affordable housing, including:

- (1) Reduction or waiver of impact, assessment, and permit fees;
- (2) Density bonuses;
- (3) Exemptions from subdivision and zoning standards;
- (4) Building code modifications while maintaining health and safety; and
- (5) Possible use of publicly owned lands.

**5.1.6-Action 2** Streamline the permitting process as follows:

- (1) Within one year of this plan's adoption, adopt new administrative rules that streamline and clarify the permitting process;
- (2) Consider using outside consultants (third-party review);
- (3) Implement a one-stop permitting process; and
- (4) Adopt a set of standards so permitting is administrative and as ministerial as possible.

### **Objective:**

**5.1.7** Increased preservation and promotion of indigenous Hawaiian housing and architecture.

### **Policies:**

**5.1.7.a** Preserve, promote, and give priority to Hawaiian housing/architecture forms to preserve Hawaiian culture.

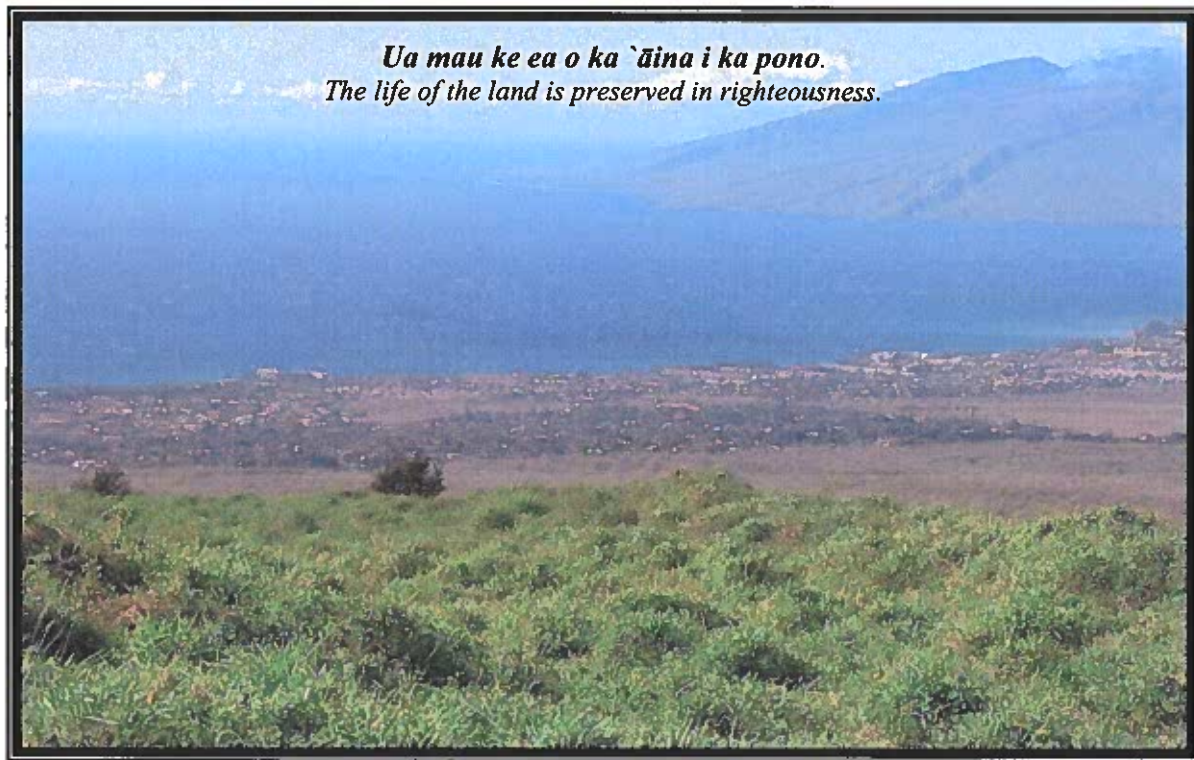
**5.1.7.b** Provide for indigenous architecture as an allowable structure for native Hawaiian uses to include hula and lā`au lapa`au.

### **Implementing Actions:**

**5.1.7-Action 1** Revise regulations to allow for indigenous Hawaiian architectural practices, styles, customs, techniques, and materials, in accordance with Section 46-1.55, Hawai'i Revised Statutes.

**5.1.7-Action 2** Encourage the use of alternative building materials (e.g., bamboo).

## ***Chapter 8: Directed Growth Plan***



*Ua mau ke ea o ka `āina i ka pono.  
The life of the land is preserved in righteousness.*

*An expansive view of Maui's Southern Coast, Kula.*

***T****hroughout the island, Maui's residents made it abundantly clear they had a determined desire to maintain, protect and preserve open land and the green vistas, and the rural character of Maui. This vision requires a unified commitment to the island and to future generations of Maui residents. The path we must tread to reach our desired destination cannot be traveled in total ease – it is a task that will require hard choices and individual sacrifices for our common and future good. The goal is not impossible to achieve, even in the face of population growth, but it will require the careful management and control of development so that growth can be a positive and enduring force that will enrich our residents.*

## ***DIRECTED GROWTH PLAN***

---

The Directed Growth Plan is the backbone of the Maui Island Plan (MIP). Taking into account population projections, it prescribes and outlines how Maui will grow over the next two decades, including the location and general character of new development. The Directed Growth Plan accommodates growth in a manner that provides for economic development, yet protects environmental, agricultural, scenic and cultural resources; economizes on infrastructure and public services; meets the needs of residents; and protects community character.

Chapter 2.80B, MCC, requires the adoption of urban and rural growth areas for the island of Maui. This is the first time Maui County has established growth boundaries, and it represents a significant shift towards a more orderly and predictable development pattern. Communities throughout Hawai'i and the country have used growth boundaries as part of a comprehensive directed growth plan to preserve agricultural lands, protect environmental resources, and create a more predictable land use planning process. Directed growth strategies use population projections and density assumptions to ensure an adequate supply of land is available for future growth, to limit sprawl, and to focus infrastructure investment to areas within the growth boundaries.

The Directed Growth Plan uses MIP goals, objectives, and policies as well as guiding land use principles as a foundation for establishing urban and rural growth boundaries. This chapter describes the types of growth boundary designations and the methodology applied in the identification of these designations. In addition, this section identifies planned protected areas.

This chapter contains figures to be used for illustrative purposes only. In the event a figure is inconsistent with a diagram or map of this chapter, the diagram or map shall control.

### **Background Information**

The following technical studies and reports provide base information for the Directed Growth Plan:

1. *Land Use Forecast (November 2006);*
2. *The Socio-Economic Forecast (June 2006);*
3. *Maui Island Housing Issue Paper, December 2006;*
4. *Infrastructure and Public Facilities Assessment Update (March and September 2007);*
5. *Maui Island Roadway Capacity Assessment (January 2007);*
6. *Scenic and Historic Resources Inventory & Mapping Study (June 2006);*
7. *WalkStory and PlanStory, A Report on the Response of Participants (December 2006);*
8. *Maui Island Plan Site Evaluation Methodology Memorandum (August 2007); and*
9. *Population and Economic Projections for the State of Hawai'i to 2040 (March 2012).*

The Department of Planning also conducted numerous regional design workshops and held meetings with State and County agencies, stakeholder groups, and the General Plan Advisory Committee to understand the perspectives of residents from all areas of the island on future growth and protected areas (see Introduction for additional information).

### **The Purpose of the Directed Growth Plan**

The primary purpose of the MIP is to establish a managed and directed growth plan to accommodate population and employment growth in a manner that is fiscally prudent, safeguards the island's natural and cultural resources, enhances the built environment, and preserves land use opportunities for future generations. The Directed Growth Plan is based on sound planning practices and principles and utilizes



## ***DIRECTED GROWTH PLAN***

---

information gathered from public outreach events, the General Plan Advisory Committee, and technical studies.

The Directed Growth Plan, which is grounded on the recommendations found throughout the MIP, establishes the location and general character of future development. The Directed Growth Plan will provide the framework for future community plan and zoning changes and guide the development of the County's short-term and long-term capital improvement plan budgets.

### **Planning for Future Growth**

As part of the *Land Use Forecast*, the demand for additional residential lands was determined by comparing build-out of existing residential land supply to the 2030 forecasted demand for residential units. The existing supply of residential land includes all lands that are community planned and zoned for either single-family or multifamily residential use. The forecasted demand for residential units takes into account both resident and nonresident demand to 2030. While an important goal of the General Plan update is to provide housing for Maui residents, the demand for housing from the offshore market cannot be ignored. If only resident demand was factored into the future need for residential units, competition between residents and nonresidents for the limited supply of residential units would likely lead to a worsening of the current high-priced housing situation, with residents being outbid by nonresidents. Therefore, both resident and nonresident demands are used to determine total future demand for residential housing. According to the land use forecast and the most recent DBEDT forecasts, an additional 10,845 residential units are needed to accommodate projected 2030 housing demand.<sup>1</sup> This demand was then allocated to each community plan region based on the land use forecast model output that predicts regional population and employment growth. Table 8-1 depicts total forecasted housing demand, the supply of existing housing units, and projected housing needs to 2030.

**Table 8 - 1: Projected Maui Housing Needs, 2010 - 2030**

<b>Total Needed Housing Units During 2010-2030 Planning Period</b>	
Projected 2030 Housing Demand	83,659
Minus the existing housing stock	54,070
Minus currently entitled housing units	<u>-18,744</u>
Equals approximate unmet housing demand	<b>10,845</b>

### **Types of Growth Boundaries and Protected Areas**

#### ***Urban and Rural Growth Boundaries***

Chapter 2.80B, MCC, requires the identification of both urban and rural growth boundaries (which can include small towns, rural residential, rural villages, and other community plan designations). The characteristics used to identify these boundaries and the policy intent for each of these areas is described in Table 8-2.

---

<sup>1</sup> The 2030 demand has been adjusted to reflect updated population forecasts released by the DBEDT (March, 2012).

## ***DIRECTED GROWTH PLAN***

---

### ***Protected Areas***

Part of the Directed Growth Plan is to ensure that future development patterns do not compromise Maui's unique and fragile natural resources. One tool to promote the protection and availability of passive and active recreational amenities and other environmentally sensitive areas is the identification of preservation areas, regional parks, greenways, greenbelts, and sensitive lands. Each type of protected area is described in Table 8-2. It is not the intent of the Protected Areas to regulate lands within the State Conservation District. In some instances, Conservation lands are included to provide context.

### **Urban, Small Town, and Rural Growth Areas**

The MIP is the first comprehensive plan to establish urban, small town, and rural growth boundaries in Maui County. These boundaries will encompass approximately 5,389 acres of new planned urban and small town growth areas. The Directed Growth Maps show Urban, Small Town, and Rural Growth Boundaries (UGB, STB, and RGB) - the space inside these boundaries is referred to as Urban, Small Town, and Rural Growth Areas respectively. These boundaries are depicted with lines on the Directed Growth Maps. The growth boundary line separates a growth area from a nongrowth area.

- The UGB denotes the areas within which urban-density development requiring a full range of services, such as new multi-user sewer and water, is supported in accordance with applicable land use laws. Growth boundaries are a long-range planning tool that will be used on Maui to evaluate proposals involving community plan amendments, changes in zoning, development proposals or utility extensions.
- The STB denotes areas that are less intensely developed than urban areas with fewer services and a lower level of infrastructure. These areas may be more self-sufficient than Rural Villages. Primary employment opportunities are often in nearby urban areas.
- The RGB is intended to identify and protect the character of our rural communities. It identifies an existing or future land use pattern that includes a mixture of small farms, low density residential housing, and a limited amount of urban uses consistent with the character and scale of our country towns. The intent of this boundary is to provide a framework for further and more detailed long-range rural planning during the community plan update process. Rural areas inherently possess a lower set of standards for infrastructure and public services than urban areas. As such, it is also the intent to apply lower level-of-service standards in RGBs.

The UGBs, STBs, and RGBs are used to identify and protect farms and natural areas from sprawl and to promote the efficient use of land, and the efficient provision of public facilities and services inside the boundary.

The UGBs, STBs, and RGBs take into account future growth projections through 2030, the availability of infrastructure and services, environmental constraints, and an approximate density of land development to determine the placement of the boundary. Land outside of the UGB is intended to remain rural in character with a strong agricultural and natural-resource presence. These boundaries are intended to be static "lines in the sand" until the time at which job and housing growth cannot be accommodated within the boundaries, which, if not addressed, could exacerbate the affordable housing problems facing Maui and have a negative impact on the overall quality of life. To ensure that an adequate supply of land is available, the MIP will be updated every ten years to provide for appropriate expansion to meet new

## Directed Growth Plan

Table 8 - 2: Growth Boundaries and Protected Area Types

GROWTH BOUNDARIES (See Maps C-1 to C-5, S-1 to S-3, U-1 to U-4, N-1 to N-2, W-1 to W-4, E-1 to E-2)		CHARACTERISTICS	PURPOSE	IMPLEMENTATION STRATEGY
GROWTH BOUNDARY TYPES	Urban	Urban areas contain a greater variety of land use types, including various housing types and densities, commercial, retail, industrial uses, and resort destination areas. Infrastructure is more complete and reflects the need to serve higher-density land uses	Ensure that future development occurs in an orderly fashion; allows in-fill and revitalization opportunities and encourages "new urbanism" and "neo-traditional design" techniques	Protect separation between communities through the use of Urban Growth Boundaries. Require community-based design processes and require design guidelines for future major development. Identify and promote redevelopment and in-fill opportunities. Encourage a mix of housing types and higher-density residential development to encourage resident housing opportunities
	Small Town	Small Towns are less intensely developed than urban areas with fewer services and a lower level of infrastructure. They may be more self-sufficient than Rural Villages. Primary employment opportunities are usually in nearby urban areas	Protect the integrity, unique sense of place, and economic viability of Maui's traditional small towns	Protect separation between communities through the use of Small Town Boundaries. Allow for expansion where appropriate. Utilize design guidelines and rural infrastructure standards to protect Small Town character
	Rural	Rural Areas contain a mixture of agricultural activities, low-density residential areas, and small villages  Rural Villages may contain limited amounts of State and County urban designated lands including residential and small clusters of businesses and civic uses mostly to support surrounding rural residential uses and agricultural activities. Level of government services is generally limited and many essential goods and services are located in a larger town. The level of infrastructure may be lower than Small Towns. Employment is generally a function of nearby Urban Areas or Small Towns.  Rural Residential Areas are primarily a residential development pattern with lower residential densities (0.5 to 10 ACRE/du), agricultural activities, and few services or employment opportunities. Limited commercial and civic uses (churches, schools) may be allowed in accordance with applicable community plan and zoning.	Provide a transition between Urban Areas and Small Towns and those areas in need of protection, including agricultural lands.  Contain the spread of residential uses into prime agricultural lands and provide a tool for designing villages with a mix of lots and lifestyle choices	Minimize expansion of infrastructure that could lead to urbanization. Define areas appropriate for additional rural development patterns. Promote an equitable tax/water rate structure that reflects actual land use. Adopt appropriate infrastructure and subdivision standards to protect rural character. Maintain the separation of communities through the use of boundaries. Allow for Rural Villages where appropriate. Utilize rural design guidelines and appropriate infrastructure and subdivision standards to protect rural character
PROTECTED AREA TYPES (See Diagrams NW-1, WC-1, S-1, N-1, NE-1, E-1, SE-1)				
PROTECTED AREA TYPES	Preservation	Areas with significant natural and environmental resources, scenic, open space, and recreational resources, historic resources and other important assets that warrant additional protection. Preservation areas may include accessory structures such as public restrooms, structures related to a cultural or historical resource, and other structures and ancillary uses consistent with the purpose and intent of the preservation area	Permanent protection of areas on the island that have significant environmental, ecological, cultural and recreational value and the degradation of the resource would result in an irremediable loss	Protection using regulation, easements, Transfer of Development Rights (TDR) program or fee-simple purchase in cooperation with land trusts, environmental organizations, the County of Maui, State of Hawaii and the Federal government. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process
	Park	Land areas devoted to passive (picnic facilities and gathering areas) and/or active (including, but not limited to, bike paths, hiking trails, ball fields, and tennis courts) uses that serve recreational needs	Ensure that recreational and open space needs keep pace with future growth and are appropriately located consistent with the Maui Island Plan's Directed Growth Plan	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process
	Greenbelt	Extensive area of largely undeveloped or sparsely occupied land established along natural corridors to protect environmental resources and to separate distinct communities. Greenbelts may include accessory structures and ancillary uses consistent with the purpose and intent of the greenbelt area	Ensure natural and undisturbed separation between communities and protect environmentally sensitive lands	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. Also implemented through the subdivision review process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process
	Greenway	Typically a long, narrow piece of land, often times used for recreation, pedestrian, and bicycle traffic. Greenways can include community gardens and can be used to link community amenities (e.g., parks, shoreline). Greenways may include accessory structures and ancillary uses consistent with the purpose and intent of the greenway area	Provide opportunities to inter-connect communities, ensure adequate recreational amenities, protect scenic resources, and link residential projects with service areas. Greenways may be improved to accommodate pedestrian, bicycle, equestrian and other similar uses	Acquisition, Transfer of Development Rights (TDR) program, and/or cooperative efforts with the development community during the design, project review and approval process. Also implemented through the subdivision review process. The appropriate community plan designation for this protected area type is park or open space as determined during a community plan update or the entitlement process
	Sensitive Land	Lands that contain development constraints including steep slopes greater than 35 percent, floodplains, significant drainage features, and adjacent intact forested areas	Protect areas with significant development constraints and ensure sensitive areas are taken into consideration during site design	An area that may require site design review and approval to ensure that areas with significant development constraints are avoided or appropriate mitigation measures are incorporated into projects



## ***Directed Growth Plan***

---

housing demand. In short, the boundaries will typically include at least a 10-year surplus of urban, small town, and rural lands.

In some cases the UGBs, STBs, and RGBs split ownership parcels and vary from the owners' suggested development project boundary. This was done for a variety of reasons, some of which are to protect valuable agricultural lands, natural resources, or limit susceptibility to hazards. Generally, however, specific areas were identified throughout the island to promote balanced growth at appropriate urban or rural densities. Altogether, the growth boundaries provide sufficient land supply to meet the needs of the County to 2030.

Maui's growth boundaries are one component of Maui's land use planning and regulatory system. State land use districts, community plan designations, zoning districts, and the growth boundaries work in concert to effectively manage land use. Table 8-3 portrays the Growth Boundary Types and the Corresponding State Land Use Districts.

**Table 8 - 3: Growth Boundary Types and Corresponding State Land Use Districts**

<b>GROWTH BOUNDARY TYPE</b>	<b>STATE LAND USE DISTRICT</b>
Urban	Urban
Small Town	Urban/Rural
Rural	Urban (limited amounts), Rural, and Agriculture

### **URBAN AND SMALL TOWN GROWTH AREA GOAL AND POLICIES**

The following goal and policies address Urban Growth Boundaries (UGBs) and Small Town Boundaries (STBs), and the development of land within and outside of these boundaries. They are broad in scope, and address the design intent of these areas, amendments to the boundaries, and infrastructure expansion within and outside of the boundaries. The policies set forth below establish the regulatory effect of the UGBs and STBs.

#### **Goal:**

- 8.1** Maui will have well-serviced, complete, and vibrant urban communities and traditional small towns through sound planning and clearly defined development expectations.

#### **Policies:**

- 8.1.a** The County, with public input, will be responsible for designating new growth areas where infrastructure and public facilities will be provided, consistent with the policies of the MIP and in accordance with State and County infrastructure plans.
- 8.1.b** Amendments to a UGB or STB shall be reviewed as a MIP amendment. A UGB or STB shall only be expanded if the island-wide inventory (maintained by the Department of Planning) of existing land uses (residential, commercial, industrial) indicates that additional urban density land is necessary to provide for the needs of the projected population growth within ten years of that inventory; or, during the decennial update of the MIP.

## ***Directed Growth Plan***

---

- 8.1.c** Community plans shall provide for urban density land use designations only within UGBs and Small Towns. The County may only support and approve State Urban Land Use Designations for areas within UGBs, STBs, and Rural Villages.
- 8.1.d** The unique character and function of existing small towns shall be protected to retain and preserve their sense of place.
- 8.1.e** New development shall be consistent with the UGBs, STBs, and all other applicable policies of the MIP. New urban-density development shall not be allowed outside of a UGB or STB.
- 8.1.f** The County, as a condition of development approval, shall require developers of privately owned infrastructure systems to provide financial insurance (bonding, etc.) for the operation and maintenance of these systems.
- 8.1.g** The County shall implement a zoning program to comprehensively redistrict and rezone lands within UGBs according to updated community plan policies and map designations.
- 8.1.h** The County will seek to focus capital improvements (schools, libraries, roads, and other infrastructure and public facilities) within the UGBs and STBs in accordance with the MIP.
- 8.1.i** The County will promote (through incentives, financial participation, expedited project review, infrastructure/public facilities support, etc.) appropriate urban infill, redevelopment and the efficient use of buildable land within UGBs to avoid the need to expand the UGBs.
- 8.1.j** The MIP's UGBs and STBs shall not be construed or implemented to prohibit the construction of a single-family dwelling on any existing parcel where otherwise permitted by law.

### **RURAL GROWTH AREA GOAL AND POLICIES**

The following goal and policies address Rural Growth Boundaries (RGBs) and the development of land within and outside of these boundaries. They are broad in scope, and address the design intent of these areas, amendments to the boundaries, and infrastructure expansion both within and outside of the boundaries. The policies set forth below establish the regulatory effect of the RGBs.

#### **Goal:**

- 8.2** Maui will maintain opportunities for agriculture and rural communities through sound planning and clearly defined development expectations.

#### **Policies:**

- 8.2.a** Amendments to a RGB shall be reviewed as an MIP amendment. A RGB shall only be expanded if an island-wide inventory of existing land uses (residential, commercial, industrial) indicates that additional lands are necessary to provide for the needs of the projected population growth within ten years of that inventory; or, during the decennial update of the MIP.

## ***Directed Growth Plan***

---

- 8.2.b** New development shall be consistent with RGB and all other applicable policies and requirements of the MIP. Public, quasi-public, civic, and limited commercial or industrial uses may be allowed in the RGB when the proposed uses demonstrate a public need and are consistent with the Community Plan and zoning.
- 8.2.c** Environmental protection and compatibility will be a top priority in rural growth areas.
- 8.2.d** All development within rural growth areas should avoid encroachment upon prime agricultural land.
- 8.2.e** Rural growth areas include Rural Residential Areas and Rural Villages. Rural residential areas may be designated when they are located in association with or on the border of urban growth areas or Small Towns; and/or when they provide for complete, self-sufficient rural communities with a range of uses to be developed at densities that do not require urban infrastructure.
- 8.2.f** Community plans shall provide for rural density land use designations only within RGBs; provided that limited community plan urban designations may be allowed within Rural Villages. New rural growth areas shall not be located where urban expansion may ultimately become necessary or desirable. New rural-density development shall not be allowed outside of a RGB.
- 8.2.g** New rural growth areas intended to be complete, self-sufficient rural communities must be located a significant distance from existing urban areas, distinctly separated by agricultural or open lands.
- 8.2.h** Urban-scale infrastructure and public facilities shall not be provided in rural areas except as described in the defined Level-of-Service (LOS) standards. There should be no expectations of urban services in rural areas.
- 8.2.i** Urban development standards shall not be required within RGBs except in fulfillment of Federal law.
- 8.2.j** The unique character and function of existing small towns and rural communities shall be protected to retain and preserve their sense of place.
- 8.2.k** Preserve rural landscapes in which natural systems, cultural resources, and agricultural lands are protected and development compliments rural character and contributes to the viability of communities and small towns.
- 8.2.l** The MIP's RGBs shall not be construed or implemented to prohibit the construction of a single family dwelling on any existing parcel where otherwise permitted by law.
- 8.2.m** The County shall implement a zoning program to comprehensively redistrict and rezone lands within RGBs, and to implement community plan policies and map designations.
- 8.2.n** At the time of zoning from agricultural to rural, Council will consider prohibiting restrictions on agricultural activity.

## ***Directed Growth Plan***

---

### **PROTECTED AREA POLICY**

- 8.3.a** The Protected Areas in Diagrams E-1, NW-1, N-1, NE-1, S-1, SE-1, and WC-1 should be concurrently reviewed with Table 8-2 and with any proposed land uses that may result in an adverse impact on a Protected Area. The County Council and the Administration should be notified if a Protected Area may be compromised by a development proposal.

### **Exceptions to Development Outside of Growth Boundaries**

During the life of the MIP, there will be a need for certain land uses that may have unique impacts or requirements due to the nature of the use, and would be more appropriately located outside of identified growth boundaries. These land uses may include heavy industrial operations, such as but not limited to, infrastructure facilities, baseyards, quarries, transfer stations, landfills, and uses generating noise or odor that are undesirable for an urban environment. In addition, there may be public/quasi-public, or nonprofit uses that enhance community services and well-being that are most appropriately located outside of urban and rural areas. These uses may include parks, campgrounds, educational centers, arts and cultural facilities, communication facilities, and health and safety related facilities. Alternative energy systems and other land uses related to emerging industries may also be suitable outside of urban, small town, and rural growth boundaries when consistent with community plans and zoning. Commercial uses may also be permitted when appropriate. These uses may be approved, pursuant to the County's special or conditional use permit process contained in Title 19, MCC, or the State Land Use Commission's special use permit process contained in Chapter 205, HRS, and Chapter 15-15, Hawai'i Administrative Rules, without an amendment to the MIP. The Maui Island Plan shall not be construed or implemented to prohibit existing, legally permitted uses or structures. Any dwelling or structure that was constructed with a building permit that was approved prior to the enactment of this Plan may be reconstructed as permitted by the original building permit(s), and such dwellings or structures may be expanded or modified with a building permit, subject to the provisions of the Maui County Code and applicable laws.

### **Methodology for Identifying Growth Boundaries**

To formulate the Directed Growth Plan, the County first developed a set of Guiding Land Use Principles. These are generally philosophical in nature, and were derived from the Focus Maui Nui WalkStory and PlanStory public outreach events; various community workshops; planning literature; public facilities, and infrastructure studies; and heritage resource, scenic and cultural resource studies.

### **GUIDING LAND USE PRINCIPLES**

- 1. Respect and encourage island lifestyles, cultures, and Hawaiian traditions:** The culture and lifestyle of Maui's residents is closely tied to the island's beauty and natural resources. Maintaining access to shoreline and mountain resources and protecting culturally significant sites and regions perpetuates the island lifestyle and protects Maui's unique identity. One of the most vital components of the island lifestyle and culture is Maui's people. In an island environment where resources are finite, future growth must give priority to the needs of residents in a way that perpetuates island lifestyles.
- 2. Promote sustainable land use planning and livable communities:** Managing and directing future growth on Maui should promote the concept of sustainability, and the establishment of livable communities. Sustainable practices include: 1) Focusing growth into existing communities; 2) Taking advantage of infill and redevelopment opportunities; 3) Promoting compact, walkable, mixed-use development; 4) Revitalizing urban and town centers; 5) Providing

## ***Directed Growth Plan***

---

transportation connectivity and multimodal opportunities; 6) Protecting and enhancing natural and environmental resources; 7) Protecting, enhancing, and expanding communities and small towns, where appropriate; and 8) Encouraging energy and water-efficient design and renewable energy technology.

3. **Keep “urban-urban” and keep “country-country”:** Given the high cost of developing public infrastructure and facilities to service remote areas, the significant environmental and social impacts associated with long vehicle commutes, and the desire to “keep the country-side country” it is preferable to develop compact communities and to locate development within or as close as possible to existing urban areas and employment centers.
4. **Protect traditional small towns:** Development within and adjacent to Maui’s traditional towns should be compatible with and perpetuate their unique character. Hard edges should be maintained around new and existing communities through the use of greenbelts and significant open space.
5. **Protect open space and working agricultural landscapes:** In light of continuing urbanization, the protection of agricultural and open-space resources will depend on a healthy agricultural industry and progressive planning and regulation. Planning should utilize agricultural lands as a tool to define the edges of existing and planned urban communities, apply innovative site design, create buffers along roadways, provide visual relief, and preserve scenic views.
6. **Protect environmentally sensitive lands and natural resources:** Environmentally sensitive lands, natural areas, and valued open spaces should be preserved. Native habitat, floodways, and steep slopes should be identified so future growth can be directed away from these areas. It will be important to plan growth on Maui in a manner that preserves habitat connectivity, watersheds, undeveloped shoreline areas, and other environmentally sensitive lands.
7. **Promote equitable development that meets the needs of each community:** Each region of the island should have a mix of housing types, convenient public transit, and employment centers. Where appropriate, all neighborhoods should have adequate parks, community centers, greenways, libraries, and other public facilities. No community should have a disproportionate share of noxious activities. Additionally, a fair, efficient, and predictable planning and regulatory process must be provided. A cornerstone of equitable development should reflect a focus on providing affordable housing for all of Maui’s residents over developing nonresident housing.
8. **Plan for and provide efficient and effective public facilities and infrastructure:** Many of Maui’s public infrastructure systems and facilities were constructed decades ago and are in need of repairs and upgrades to meet current and future demand. Growth should be planned for areas with existing infrastructure, or where infrastructure can be expanded with minimal financial burden to the public. Transportation infrastructure should be designed to be in harmony with the surrounding area.
9. **Support sustainable economic development and the needs of small business:** Land use decisions should promote and support sustainable business activities.
10. **Promote community responsibility, empowerment, and uniqueness:** The development of community plans should be a broad-based, inclusive process. The community plans shall be reviewed by the Community Plan Advisory Committees, the planning commissions, and approved by the Council. The MIP shall provide a framework for the updated community plans. Subsequent proposed community plan amendments should be subject, as much as possible, to local community input.

Following the development of these guiding principles, a more analytically rigorous list of evaluation criteria were developed to assist in the identification of areas appropriate for both development and

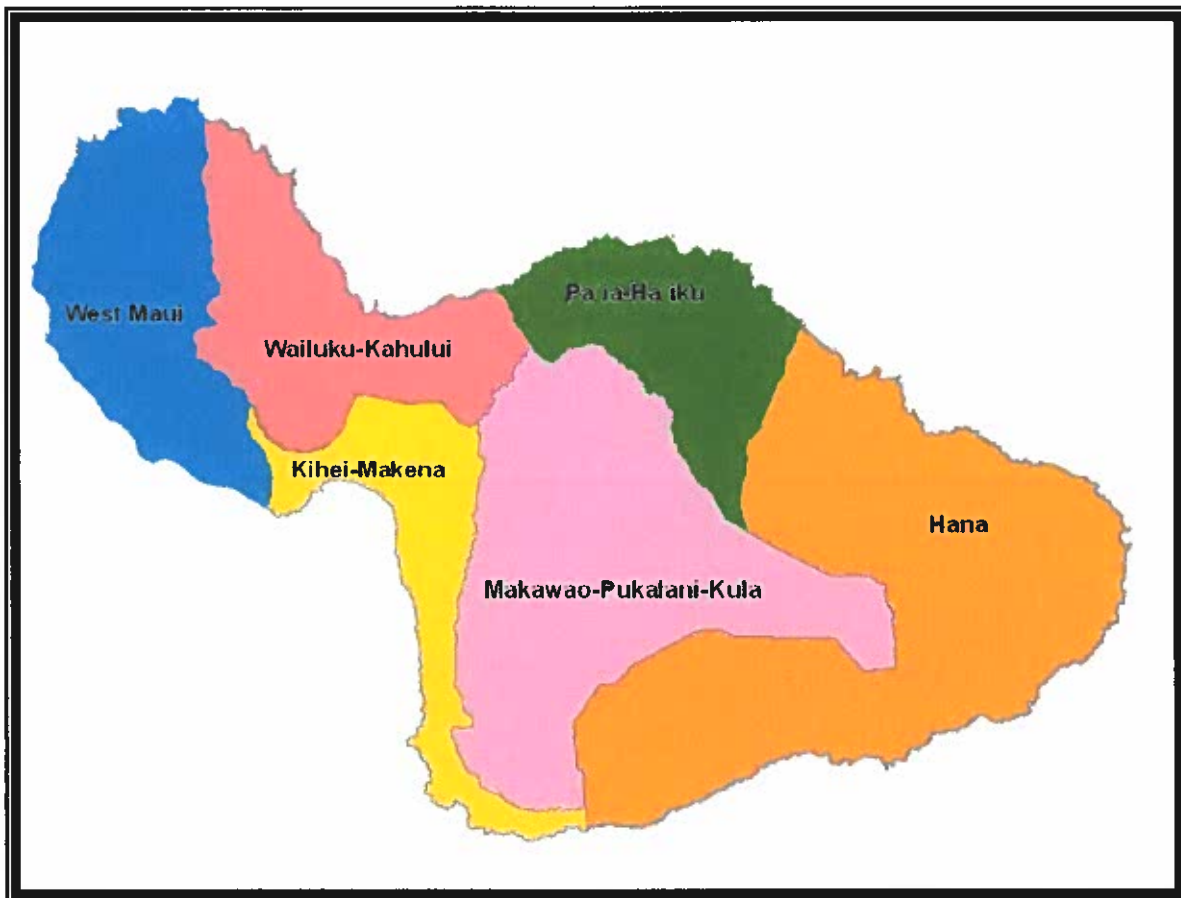
## *Directed Growth Plan*

---

protection. This approach included the application of a technique called “Suitability Analysis.” The process, also referred to as “McHargian Analysis” was refined by Ian McHarg at the University of Pennsylvania in the 1960s, and has been widely applied throughout the United States. The McHargian Analysis involves layered maps of geographic information superimposed on one another to identify areas that provide, first, opportunities for particular land uses, and second, constraints to development. With the advent of Geographic Information System (GIS) technology, it is now possible to understand the relationships between vast datasets and apply weighting derived by the community to prioritize growth areas and those areas appropriate for preservation.<sup>2</sup>

---

<sup>2</sup> A more complete discussion of the methodology used to develop the Plan’s growth boundaries can be found in: *Directed Growth Plan, Site Evaluation Methodology Memorandum*. Chris Hart & Partners, September 2007.



Community plan regions.

### **MAUI'S DIRECTED GROWTH PLAN**

*A primary objective of the Directed Growth Plan is to ensure that our urban and rural communities offer a high quality of life. Designing pedestrian-oriented communities, with a mix of uses to sustain daily needs, and close to places of employment makes for a more sustainable, vibrant, and livable environment. Providing parks and open space, tree-lined roadways, and easy connections to the natural and built environment promotes health and well-being. Beyond our urban boundaries, working agricultural landscapes, natural wildland areas, and undeveloped shorelines and beaches are vitally necessary to provide a sense of refuge and escape from the stresses of daily life.*



## ***Directed Growth Plan***

---

This section identifies planned growth areas to meet the housing, employment, and recreational needs of Maui's residents to 2030. Planned growth on Maui is largely directed to Wailuku-Kahului, Kīhei, and West Maui to protect the character of the existing small towns, rural areas, agricultural lands, and open space and to allow for more dynamic urban settlements with efficient public service delivery. For the next 20 years these three regions will serve as the island's primary urban centers. Development through the planning horizon will largely take place through infill and redevelopment, urban expansion, and new towns. Every effort is made to maximize the use of urban infill and redevelopment opportunities, to avoid the need to expand the urban, small town, and rural growth areas.

### **How to Read this Section**

For organizational purposes, the section is divided into regions that roughly correspond to the island's community plan areas. However, the regions and corresponding Directed Growth Maps do not always follow the community plan area map boundaries and may overlap with an adjacent community plan area. The section includes a brief description of the community plan region, challenges and opportunities affecting the region, growth anticipated in the region along with the new regional facilities needed to accommodate that growth. Next, each planned growth area is described in narrative followed by a table that includes background information, and planning guidelines for the planned growth area. This table, in most cases, indicates the net residential density<sup>3</sup>, number of dwelling units, the desired mix of dwelling unit types, and the type of commercial node that will be expected within the planned growth area. Commercial nodes are classified as "neighborhood serving", "convenience shopping", and "region serving". Table 8-4 describes the characteristics of these commercial nodes.

**Table 8 - 4: Characteristics of Commercial Nodes**

TYPE	CHARACTERISTICS
Neighborhood Serving	Small scale commercial activities that primarily serve the needs of the immediate neighborhood. Examples include, but are not limited to, the corner grocery store, bake shop, and shave ice stand.
Convenience Shopping	Commercial activities that serve the adjacent community. Examples include, but are not limited to, a small-to-mid size supermarket, bank, barber shop, and internet cafe.
Region Serving	Commercial activities that may serve the community plan region. Examples include, but are not limited to, large supermarkets, hardware and plumbing stores, and sporting goods stores.

The planning guidelines are not meant to be prescribed requirements; rather, they identify the intent of the planned growth area. Development of the planned growth area may reasonably vary slightly from the planning guidelines provided that the overall intent of the Planning guidelines is achieved.

This section also includes a summary of the significant planned protected areas identified in each community plan region. Planned protected areas include some of the island's most treasured cultural, environmental, and recreational resources. These resources can come in the form of a coastal ridge, a burial ground, or an urban park. The planned protected area can be for the public's benefit and use, or to allow the natural habitat to exist in an unaltered state. The intent of the Protected Area is to provide one additional layer of protection to those areas that contain any number of irreplaceable resources. The purpose and intent of each planned protected area is described after each planned growth area section.

---

<sup>3</sup> Net Residential Density means the total number of dwelling units to be developed at a specific site divided by the Net Residential Acres. Net Residential Acres means the gross area of a site intended for residential development minus the area of wetlands and waterbodies, parks and open space, roads and right-of-way, and other undevelopable land within the site.



## Directed Growth Plan

Planned protected areas were identified through the Plan's public involvement process. Several of the planned protected areas draw from the following plans and studies: 1. *Pali to Puamana Parkway Master Plan* (February 2005); 2. *North Shore Corridor Report* (Fall, 2006); 3. *Infrastructure and Public Facilities Assessment Update* (March and September 2007); 4. *Scenic and Historic Resources Inventory & Mapping Study* (June 2006); and 5. *Focus Maui Nui's WalkStory and PlanStory* public outreach events (December 2006). Each planned protected area shall be incorporated into appropriate community plan updates, green infrastructure plans, capital improvement plans, special district plans, related functional plans, and urban beautification efforts.



*View of Pi'ilani Highway.*

### **A REGIONAL FRAMEWORK**

In consideration of the guiding land use principles discussed above, the following four themes provide a broad island-wide framework for the identification of areas that are appropriate for future growth, the identification of areas that should be preserved, and the implementation of the directed growth plan.

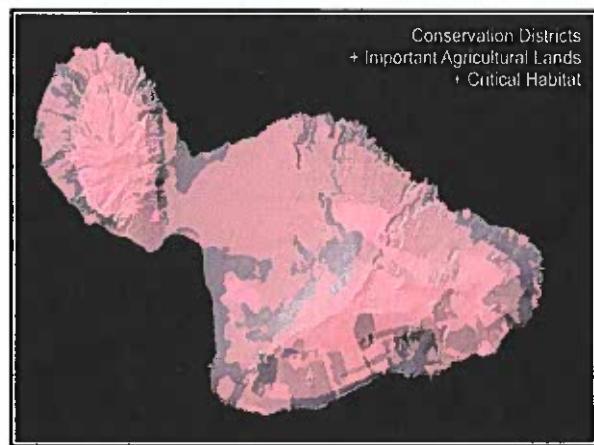
#### ***Theme One: Limit Development in Northwest and East Maui.***

East and Northwest Maui are the most remote, inaccessible, and undeveloped regions on Maui. Both regions possess rugged physical beauty, agricultural landscapes, and culturally-rich communities. The island's largest intact watersheds, and natural wildland areas, including Haleakalā National Park and the West Maui Mountains, are located in Northwest and East Maui.

Development in both areas is largely dispersed, employment is limited, and infrastructure and public facility capacity is restricted. Maui residents have a strong desire to protect the natural and cultural resources of these regions.

#### ***Theme Two: Protect Maui's agricultural resource lands, especially prime and productive agricultural lands.***

Maui's agricultural lands are an important resource for both current and future generations of island residents. Agricultural lands provide the opportunity for greater economic diversification; food and energy security; and better stewardship of land, water, and open space resources. Maui residents have expressed a strong desire to support the agricultural economy and protect the island's agricultural lands for both present and future generations.



*Example of overlay analysis.*

## ***Directed Growth Plan***

---

***Theme Three: Direct growth to areas proximate to existing employment centers, where infrastructure and public facility capacity can be cost-effectively provided, and where housing can be affordably constructed.***

Traffic congestion, affordable housing, and convenience are major quality of life issues that Maui residents care deeply about. The same is true for quality education, public safety, and a clean environment.

Given the high cost of developing public infrastructure and facilities to service remote areas, the significant environmental and social impacts associated with long vehicle commutes, and the broad desire to “keep the country-side country” it is preferable to locate development as close as possible to existing employment centers.

There currently exists undeveloped land that is within close proximity to Wailuku-Kahului, Kīhei Town, and Lahaina-Kā'anapali-Kapalua that is feasible for development. These lands are close to existing public facilities and major centers of employment.

***Theme Four: Within the Urban Growth Boundaries, promote livable, mixed-use communities, defined by a high quality of life.***

Maui's future growth will be accommodated largely within UGBs. These boundaries will encompass higher density mixed-use infill development, planned urban expansion, and the creation of new, self-sufficient towns.

A primary objective of the Directed Growth Plan is to ensure that our urban communities offer a high quality of life. Designing pedestrian-oriented communities with a mix of uses to sustain daily needs and close to places of employment makes for a more vibrant and livable environment. Providing parks and open space, tree lined roadways, and easy connections to the natural and built environment are necessary to promote health and well-being.



*Sketch of human-scale development.*

Beyond our urban boundaries, working agricultural landscapes, natural wildland areas, and undeveloped shorelines and beaches are vitally necessary to provide a sense of refuge and escape from the stresses of urban life.

### **WAILUKU-KAHULUI**

The Wailuku-Kahului community plan region encompasses the island's Civic Center, major commercial-industrial and shipping center, and the largest resident population of all community plan regions with 54,433 people in 2010. The community plan region also has the largest employment center with 32,898 jobs in 2010. The region is comprised of four distinct sub-regions: Wailuku, Kahului, Waikapū, and Waihe'e. A brief discussion of each sub-region is provided below.

**Wailuku.** Wailuku serves as the Civic Center for Maui and the seat of Maui County government. Wailuku is a culturally diverse town with strong ties to Maui's Hawaiian missionary and plantation history, and serves as the gateway to 'Iao Valley. Residential neighborhoods in

## ***Directed Growth Plan***

---

Wailuku are characterized by a rich mix of housing types, older homes, and a variety of lot sizes, generally laid out in a traditional street-pattern grid. Commercial areas are composed of smaller, older buildings primarily near the Main and Market Street intersection with some businesses intermixed with residential neighborhoods.

Beginning in the 1950s, Wailuku experienced a period of transition and decline as the resident population became more dispersed throughout the region, and Kahului grew into the commercial center of the island. As residents and businesses left Wailuku, the area began to deteriorate and blight conditions persisted. In the last decade, Wailuku has been undergoing revitalization initiated by community groups, the County, and local businesses.

**Kahului.** Kahului is the island's major commercial and industrial center. Shopping and community facilities, such as Queen Ka'ahumanu Shopping Center, Maui Arts and Cultural Center, and the University of Hawai'i Maui College, draw residents from all regions of the island. Kahului is also Maui's only shipping center with the island's major seaport and airport. Kahului first came to life in the modern era after World War II as Maui's population became decentralized and major projects such as "Dream City" and the Kahului Shopping Center were completed. Kahului's residential neighborhoods are separated from commercial uses and composed of larger suburban lots and wide curvilinear streets.

**Waikapū.** Waikapū is a small rural town between Wailuku and Mā'alaea on Honoapi'ilani Highway. The town is primarily residential with a small commercial component. Historically, Waikapū has been surrounded by sugarcane fields, providing a clear distinction between the town and other nearby communities. As Wailuku and Kahului grow southward, the separation between these sub-regions and Waikapū is being diminished.

**Waihe'e.** Waihe'e is another small rural town in the Wailuku-Kahului Community Plan region. It is the last town in the region along Kahekili Highway and serves as the eastern gateway to Northwest Maui. The sub-region is primarily residential with small-scale agriculture and family cultivated taro patches in the vicinity of Waihe'e Stream. Managing urbanization on the fallow agricultural lands south of the town will be important for maintaining the rural identity of the town.

### **CHALLENGES AND OPPORTUNITIES**

The Wailuku-Kahului community plan region has several key land use issues which must be considered when planning future development in the region. Some issues apply to the region as a whole while others are specific to a sub-region. Major land use threats and opportunities include:

#### ***Loss of Community Identity and Boundaries***

The Wailuku-Kahului community plan region is one of the fastest growing regions on Maui. The majority of the region's growth is occurring on vacant agricultural land at the edges of the sub-regions, particularly south of Wailuku and Kahului, with isolated areas of redevelopment opportunities. As these lands become urbanized, the region's individual towns begin to blend together and lose their unique identities. To prevent the creation of one large, sprawling urban mass, clear separation must be maintained between the area's four sub-regions through the use of regional parks, greenways and protected areas.

#### ***Auto- Dependency and Traffic Congestion***

The region's land use pattern and street layout, particularly in Kahului, has led to strong auto-dependency and traffic congestion. While a public bus system services the region, it is relatively new and is making steady progress in becoming a part of everyday life for residents. Adequate bike and pedestrian infrastructure are also lacking within the region, limiting the opportunity for multimodal transportation. Clear and distinct separation of

## ***Directed Growth Plan***

---

	land uses also significantly contributes to poor mobility and the need for a high number of private automobile trips.
<b><i>Lack of Housing Choices</i></b>	While the Wailuku-Kahului community plan region has the largest supply of residential units on Maui, only about 12 percent of the units are multifamily. This marked disparity between single-family and multifamily residential units provides residents with limited housing options in the Central Maui region. More multifamily units for purchase and rental are needed in the region to provide for a mix of housing prices and types.
<b><i>Lack of Kahului Downtown Core</i></b>	A major land use issue in the region is the lack of a downtown core in Kahului; the sub-region does not have an identifiable center or core with a pedestrian-friendly mix of land uses where people can gather and interact. A downtown core in Kahului will strengthen the sub-region and provide it with a unique identity. Infill and redevelopment projects, such as the Kahului Town Center Redevelopment and harbor revitalization efforts provide a unique opportunity to revitalize the area.
<b><i>Revitalization of Wailuku Civic Center District</i></b>	A key land use opportunity in the region is the revitalization of the Wailuku downtown and Civic Center District. Maintaining the identity of Wailuku as the County's Civic Center is an important land use goal. The <i>Wailuku Redevelopment Plan</i> (December 2000), prepared by the Maui County Department of Planning, offers key strategies for revitalizing the area. As part of the revitalization, increased mixed-use development, activity generators, streetscape beautification, additional public parking, and build out of the abutting Civic Center District with additional government office space is necessary.

### **Wailuku – Kahului – Planned Growth Areas**

Urban infill will be a major source of additional housing units in the Wailuku-Kahului community plan region. In addition, four new planned growth areas have been identified: Wai`ale, Pu`unani, Kāhili Rural Residential, and Waikapū Tropical Plantation Town. Planned growth areas are depicted in Figure 8-1 and on Directed Growth Map #C3 and #C4.

#### **New Regional Facilities Recommended – Wailuku-Kahului**

- Maui Lani Parkway extension
- Regional Park
- Central Fire Training Facility
- Dedicated County Fairgrounds
- Water Treatment Facilities
- Intermediate School
- Elementary School
- Relocation of the County Jail from Wailuku to an appropriate location in Pulehunui (Pu`unēnē).



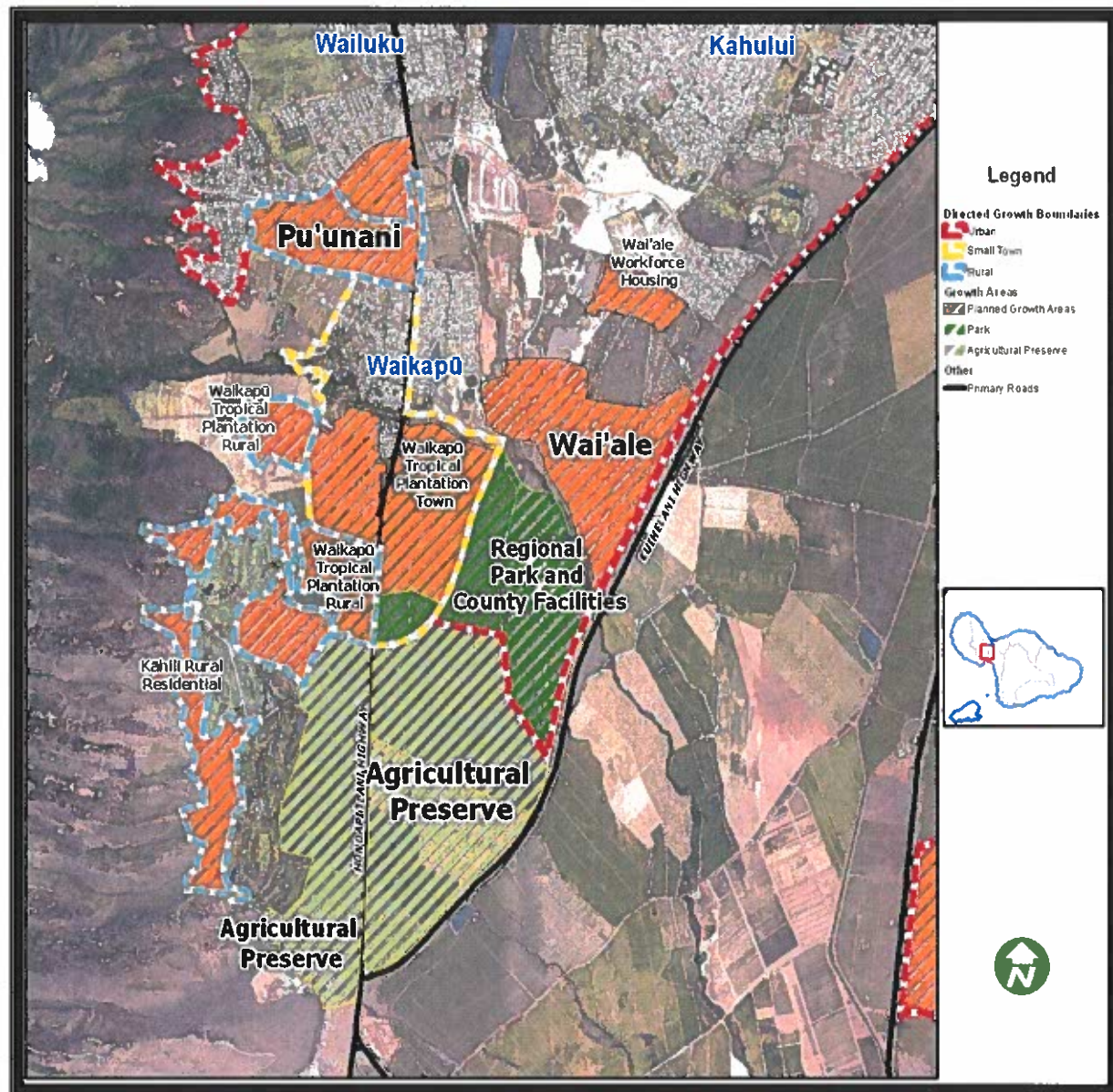


Figure 8-1: Wailuku-Kahului Planned Growth Areas.

### ***Kahului Infill and Redevelopment and Revitalization of Wailuku Town***

The plan proposes infill and redevelopment within Kahului. Much of Kahului is significantly underutilized and redevelopment will strengthen the economy, provide diverse housing opportunities within close proximity to jobs and services, and protect agricultural lands and the character of Maui's rural communities by making higher and better use of our existing urban areas. Redevelopment will also strengthen Kahului's identity, promote urban beautification and livability, and breathe vitality and life into the area.

The County should work with area landowners and the community to prepare the following studies: 1) Risk and Vulnerability Assessments (RVA); 2) specific area plans; and 3) supporting model development

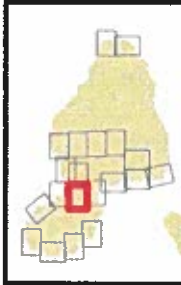
# CHAPTER 8

## Directed Growth Maps



# Maui Island Plan Directed Growth Map Waikapu / Kahului C3

- Legend**
- Growth Boundaries**
- Urban
  - Small Town
  - Rural
- Reference**
- 2011 Parcels
  - Primary Roads



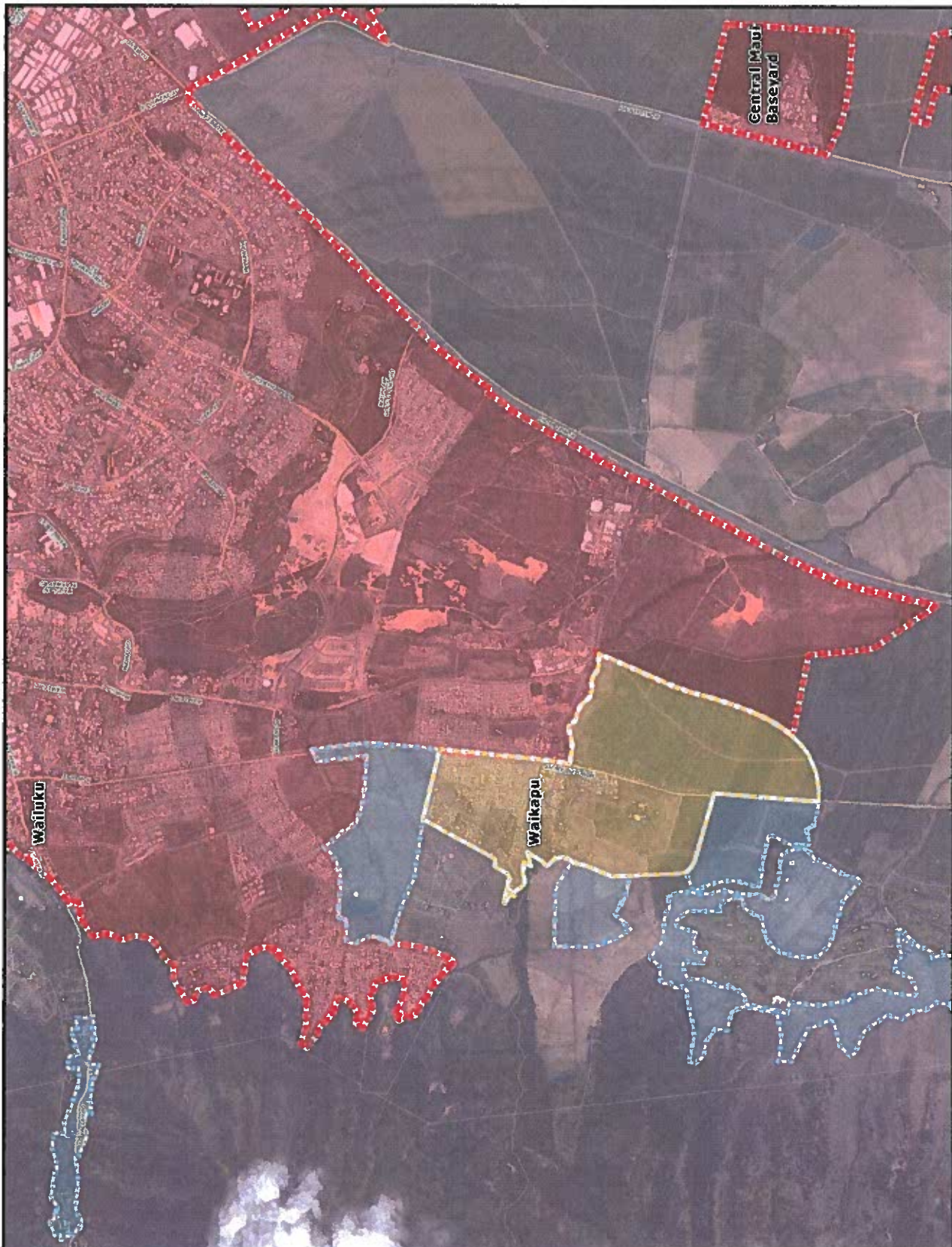
Product Code: MACET-20121218-02  
Copyright © December 18, 2012

Background Image: Worldview 2, 2010

This is not a zoning map. Please contact the Planning Department for zoning consultation.

PREPARED BY:

Long Range Planning Division  
Department of Planning  
County of Maui  
250 South High Street  
Waikuku, Hawaii 96793



# EXHIBIT D





DEPARTMENT OF  
**HOUSING AND HUMAN CONCERNS**  
COUNTY OF MAUI

ALAN M. ARAKAWA  
Mayor  
CAROL K. REIMANN  
Director  
JAN SHISHIDO  
Deputy Director

2200 MAIN STREET • SUITE 546 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165  
MAILING ADDRESS: 200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • EMAIL: [director.hhc@mauicounty.gov](mailto:director.hhc@mauicounty.gov)

**Memorandum**

To: County Departments

From: Carol Reimann, Director *CR*  
Department of Housing and Human Concerns

Date: January 5, 2018

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located Waiale Road, Wailuku, Hawaii  
TMK: (2) 3-5-02:11 (por)

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to Mr. Vince Bagoyo ("Project Consultant") at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before **February 9, 2018**.

We appreciate your assistance in providing comments to the draft application. Should you have any questions regarding the proposed project, please contact Mr. Vince Bagoyo at (808) 357-3842 or by email at [vbagovo-devgroup@hawaii.rr.com](mailto:vbagovo-devgroup@hawaii.rr.com).

**Distribution:**

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Civil Defense                       | <input checked="" type="checkbox"/> Police Department                   |
| <input checked="" type="checkbox"/> Environmental Management (2 copies) | <input checked="" type="checkbox"/> Public Works (1 CD, 2 hard copies)  |
| <input checked="" type="checkbox"/> Fire & Public Safety                | <input checked="" type="checkbox"/> Transportation                      |
| <input checked="" type="checkbox"/> Housing Division                    | <input checked="" type="checkbox"/> Water Supply <i>CR</i>              |
| <input checked="" type="checkbox"/> Parks & Recreation                  | <input checked="" type="checkbox"/> ZAED, Zoning & Enforcement Division |
| <input checked="" type="checkbox"/> Planning - <i>CR</i>                |   |

**Attachment**

*Bill 10 set of MDS*

cc: Mr. Buddy Almeida, Housing Administrator  
Mr. Vince Bagoyo (Waikapu Development Venture LLC)

TO SUPPORT AND EMPOWER OUR  
FOR PERSONAL WELL-BEING

EXHIBIT

**D**

ITS FULLEST POTENTIAL  
ALLIANCE



BAGOYO

DEVELOPMENT  
CONSULTING GROUP

January 8, 2018

Department of Transportation – Highway Division  
Maui District  
650 Palapala Drive  
Kahului, HI 96732

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

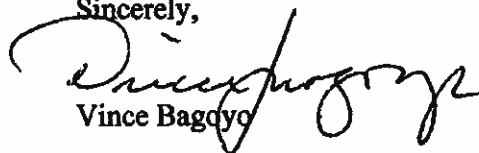
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago@devgroup@hawaii.rr.com](mailto:vbago@devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Department of Health  
Maui District  
54 High Street  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

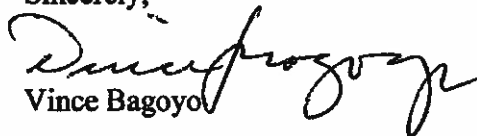
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago@devgroup@hawaii.rr.com](mailto:vbago@devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

DLNR- Land Division  
Maui District  
54 High Street  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

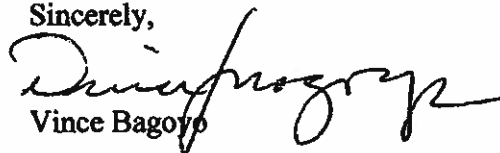
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

Waikapu Development Venture LLC

January 8, 2018

Land Use Commission  
State of Hawaii  
P.O. Box 2359  
Honolulu, HI 96804

**Subject:** Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

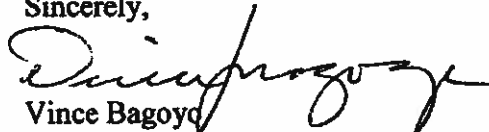
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoo Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

DEPARTMENT  
OF AGRICULTURE  
AND FORESTRY

January 8, 2018

Department of Agriculture  
State of Hawaii  
1428 S. King Street  
Honolulu, HI 96814-2512

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbagoyno-devgroup@hawaii.rr.com](mailto:vbagoyno-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyno

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

DEPARTMENT  
EDUCATION GROUP

January 8, 2018

Department of Health  
State of Hawaii  
P.O. Box 3378  
Honolulu, HI 96801-3378

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

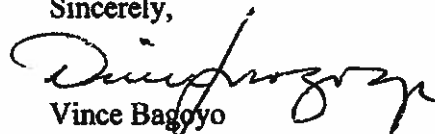
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC





BAGOYO

DEVELOPMENT  
SOLUTIONS GROUP

January 8, 2018

Hawaii Department of Defense  
Office of Emergency Management/Civil Defense  
3949 Diamond Head Road  
Honolulu, HI 96816-4495

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)


Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.m.com](mailto:vbago-yo-devgroup@hawaii.m.com).

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

U.S. Department of Interior  
Fish and Wildlife  
300 Ala Moana Blvd., Room 3-122, Box 50088  
Honolulu, HI 96850

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

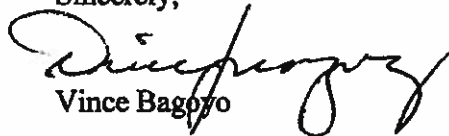
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bago-yo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Office of Hawaiian Affairs  
State of Hawaii  
560 N. Nimitz Hwy., Suite 200  
Honolulu, HI 96817

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bago-yo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

DEVELOPMENT VENTURE LLC

January 8, 2018

Office of Planning  
State of Hawaii  
P.O. Box 2359  
Honolulu, HI 96804

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbagoyno-devgroup@hawaii.rr.com](mailto:vbagoyno-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Department of Education  
State of Hawaii  
P.O. Box 2360  
Honolulu, HI 96804

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

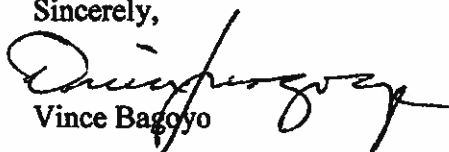
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-ov-devgroup@hawaii.rr.com](mailto:vbago-ov-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Department of Land and Natural Resources  
Commission on Water Resources Management  
P.O. Box 621  
Honolulu, HI 96809

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbagoyno-devgroup@hawaii.rr.com](mailto:vbagoyno-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bagoyno

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

DEVELOPMENT  
CONSULTING GROUP

January 8, 2018

U.S. Corps of Engineers  
Honolulu District  
Fort Shafter, Hawaii 96858-5440

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC





BAGOYO

January 8, 2018

Department of Transportation  
State of Hawaii  
869 Punchbowl Street  
Honolulu, HI 96813-5097

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

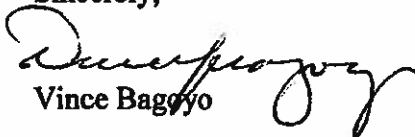
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bago-yo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Department of Land and Natural Resources  
State Historic Preservation Division  
601 Kamokila Blvd., Room 555  
Honolulu, HI 96707

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

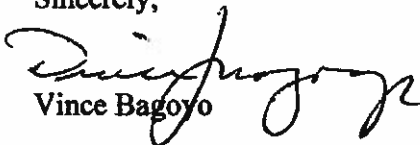
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,

  
Vince Bago-yo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



BAGOYO

January 8, 2018

Department of Hawaiian Homelands  
State of Hawaii  
91-5420 Kapolei Pkwy  
Honolulu, HI 96707

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

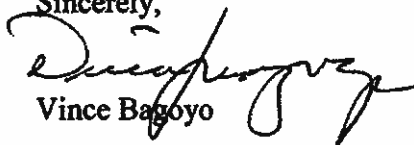
Gentlemen:

Transmitted herewith for your review and comment is a copy of the draft application for the proposed workforce housing project located at Waiale Road, Wailuku. Waikapu Development Venture LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units. The proposed project will be processed pursuant to 201H, HRS. The workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income.

Please review the draft application and send your comments to the undersigned at 1500 Kilinoe Place, Wailuku, Hawaii 96793 on or before February 9, 2018.

Should you have any questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

# **EXHIBIT E**

# **Application for Affordable Workforce Housing Subdivision**

**Pursuant to Section 201H-38, Hawai'i Revised Statutes (HRS)**



## **Affordable Workforce Housing Project**

**Located at Honoapi'ilani Highway  
Wailuku, Hawai'i • Island of Maui**

**TMK: 3-5-02:11 (por)**

Prepared for:

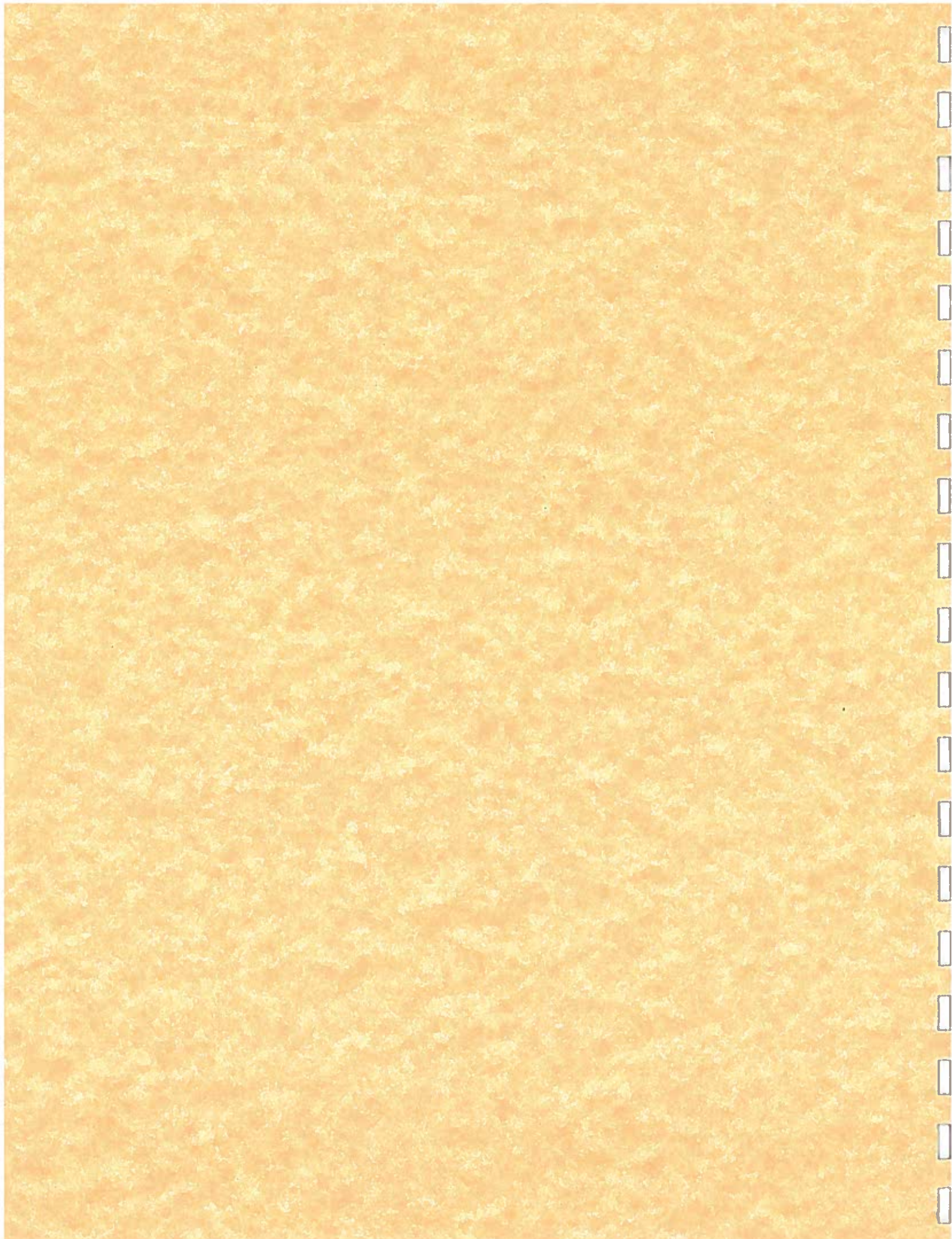
**Waikapū Development Venture LLC**

Prepared by:



**BAGOYO**  
DEVELOPMENT  
CONSULTING GROUP





# TABLE OF CONTENTS

## INDEX

Notarized Letter of Authorization

Proof of Ownership

Preface i

Executive Summary ii

## I. PROJECT OVERVIEW

A.	Property Location, Existing Use and Land Ownership	1
B.	Proposed Action	2
C.	Reasons for Justifying Request	5
D.	Entitlements Approvals Required	7

## II. DESCRIPTION OF THE EXISTING ENVIRONMENT

A.	Physical Setting	
1.	Project Site History	9
2.	Surrounding Land Uses	9
3.	Climate	10
4.	Topography and Soils Characteristics	10
5.	Flood and Tsunami Hazard	12
6.	Flora and Fauna	12
7.	Streams and Reservoirs	14
8.	Air Quality	15



9.	Noise	15
10.	Scenic and Open Space Resources	15
11.	Hazardous Materials	16
12.	Archaeological Resources	17
13.	Cultural Assessment	18
<b>B.</b>	<b>Socio-Economic Environment</b>	
1.	Population	18
2.	Housing	19
3.	Economy	22
4.	Employment	23
<b>C.</b>	<b>Public Services</b>	
1.	Police and Fire Protection	25
2.	Medical Facilities	25
3.	Schools	26
4.	Recreational Facilities (Parks)	27
5.	Solid Waste Disposal	28
<b>D.</b>	<b>Existing Infrastructure</b>	
1.	Roadways	28
2.	Drainage	30
3.	Water	31
4.	Wastewater	31
5.	Electric, Telephone and Cable TV	32

#### **E. Anticipated Infrastructure Improvements**

1. Roadways	32
2. Drainage	33
3. Wastewater	34
4. Water	34
5. Electric, Telephone and Cable TV	35

### **III. POTENTIAL IMPACTS AND MITIGATIVE MEASURES**

#### **A. Impacts to the Physical Environment**

1. Surrounding Land Uses	36
2. Topography and Landform	37
3. Wetlands and Streams	38
4. Flood and Tsunami Hazard	38
5. Flora and Fauna	39
6. Air Quality	39
7. Noise	40
8. Scenic and Open Space Resources	41
9. Hazardous Materials	41
10. Archaeological Resources	42
11. Cultural Assessment	42

#### **B. Impacts to the Socio-Economic Environment**

1. Population and Local Economy	43
2. Agriculture	44

3. Police, Fire, and Medical Services	44
4. Recreational and Educational Resources	45
5. Hydrology	45
6. Solid Waste Disposal	46
<b>C. Impacts to Infrastructure</b>	
1. Roadways	46
2. Water	47
3. Wastewater	48
4. Drainage	48
5. Electric, Cable and Telephone System	49
<b>D. Potential Cumulative Impacts</b>	49
a. Topography	51
b. Flora and Fauna	51
c. Noise and Air Quality	52
d. Visual Resources	52
e. Cultural Resources	53
f. Water Quality	53
g. Public Services	53
h. Housing and Land Use	55
i. Infrastructure	55
<b>E. Secondary Impacts</b>	56

#### **IV. CONSISTENCY AND RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS**

A.	State Land Use Districts	57
B.	Hawaii State Plan, Chapter 226, HRS	57
C.	State Functional Plans	64
D.	Maui Countywide Policy Plan- 2030 General Plan	65
E.	Kahului-Wailuku Community Plan	68
F.	County Zoning	70
H.	Coastal Zone Management Objectives and Policies	71
I.	Maui Island Plan	78

#### **V. NEIGHBORHOOD AND AGENCY INFORMATIONAL MEETINGS**

#### **VI. PROPOSED EXEMPTIONS REQUEST PURSUANT TO 201H-38, HRS**

#### **VII. APPENDICES**

A.	Location Map	
B.	Preliminary Site Plan	
C.	Archaeological Inventory Survey (AIS)	
D.	SHPD Acceptance Letter of AIS	
E.	Archaeological Monitoring Plan (AMP)	
F.	Preliminary Engineering Report	
G.	Traffic Impact Analysis Report	
H.	Biological Resources Survey	
I.	Aerial Photo and View Photos of Project Site	

- J. Market Demand Analysis Report
- K. House Models
- L. Zoning and Flood Confirmation Form
- M. ALISH Map
- N. Phase I Environmental Site Assessment

**VIII: LETTERS RECEIVED AND RESPONSES TO  
SUBSTANTIVE COMMENTS**

## *Index*





## **WAIKAPU DEVELOPMENT VENTURE, LLC**

2145 WELLS STREET NO.303 • WAILUKU • HI • 96793

PHONE: (808) 242-5700 • EMAIL: [bill@mauiframpton.com](mailto:bill@mauiframpton.com)

---

August 18, 2017

**SUBJECT:** Letter of Authorization to Prepare, File, Process and Seek Approval for State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications for the Subject Property located along Waiale Road in Vicinity of Waikapu, Maui, Hawaii; and, further identified as County Tax Map Key: (2) 3-5-002:011.

To Whom It May Concern,

Please note that by way of this Letter of Authorization, *WAIKAPU DEVELOPMENT VENTURE, LLC* ("WDV") hereby provides Vince Bagoyo, of *Bagoyo Development Consulting Group*; William Frampton, of *William Frampton Consulting, LLC*; and Peter Horovitz, Esq., of *Merchant Horovitz, LLLP* with authorization to act on our behalf and represent us in the preparing, filing, and processing of various State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications; including, but not limited to the following: (1) Application for an 100% Affordable Housing Project pursuant to *Hawaii Revised Statutes §201H-38*; (2) Application for County Subdivision pursuant to *Maui County Code Title 18*; and, (3) Petition to Amend and/or Modify Existing State Land Use Commission Docket No. A07-773 pursuant to *Hawaii Revised Statutes §205*, and *Hawaii Administrative Rules Title 15, Subtitle 3, Chapter 15*; for our proposed Project to be located on approximately 12.50 acres of land located along Waiale Road in the vicinity of Waikapu, Maui, Hawaii; and, further identified as a portion of Maui County Tax Map Key: (2) 3-5-002:011 (Portion).

It is noted that at this present time, *Emmanuel Lutheran Church of Maui* ("ELC") holds the title and full ownership of "LOTA"; which has an approximate area of 25.263 acres, and is identified as TMK: (2) 3-5-002:011. However, by way of a Real Estate Purchase and Sales Agreement (PSA); ELC and WDV are working together to file a 2-Lot Subdivision to which will subdivide LOT A into "LOT A-1" and "LOT A-2"; measuring 12.50 acres and 12.763 acres respectively. After Final Subdivision is granted; ELC will convey/transfer Fee Ownership of LOT A-1 to WDV for the proposed development of the aforementioned 201-H Affordable Housing Project. ELC will retain Lot A-2 for the proposed future development of a new School Campus and new Church. Since ELC still owns LOT A; ELC will also be preparing for a separate *LETTER OF AUTHORIZATION* which will authorize WDV and its representatives and consultants to prepare, file, process and seek approval of the same above-referenced State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications.

LETTER OF AUTHORIZATION

August 10, 2017

PAGE 2

---

If you have any additional questions, or if you require further information or documentation; please do not hesitate to contact us at 808-242-5700. Mahalo.

Sincerely,

WAIKAPU DEVELOPMENT VENTURE, LLC

By: VBP, LLC

Its: MANAGER

VBP, LLC



By: William Frampton

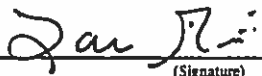
Its: MEMBER

CC: Vince Bagoyo - Bagoyo Development Consulting Group  
Peter Horovitz, Esq. - Merchant Horovitz, LLLP

NOTARY CERTIFICATE ON NEXT PAGE

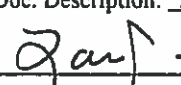
STATE OF HAWAII                   )  
  ) SS.  
COUNTY OF MAUI                 )

On August 18, 2017, before me appeared WILLIAM FRAMPTON, whose identity I verified, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable, in the capacity shown, having been duly authorized to execute such instrument in such capacity.

  
(Signature)

Print Name: Laura Gima  
Notary Public, State of Hawaii  
My Commission Expires: 02/29/2020

L.S.

Doc. Date: <u>08/18/2017</u>	No. Pages: 3
Name: <u>Laura Gima</u>	2 <sup>nd</sup> Circuit
Doc. Description: <u>Letter of Authorization</u>	
<u></u>	<u>8/18/17</u> <u>L.S.</u>
Notary Signature	Date (Stamp or Seal)
NOTARY CERTIFICATION	



## **EMMANUEL LUTHERAN CHURCH OF MAUI**

520 West One Street • Kahului • Hawaii • 96732

PHONE: (808) 877-3037

---

July 18, 2018

**SUBJECT:** LETTER OF AUTHORIZATION TO PREPARE, FILE, PROCESS, AND SEEK APPROVAL FOR PROPOSED §201H-38, HAWAII REVISED STATUTES, APPLICATION FOR AFFORDABLE HOUSING PROJECT FOR AN 100% AFFORDABLE HOUSING PROJECT FOR SUBJECT PROPERTY LOCATED ALONG WAIALE ROAD, IN VICINITY OF WAIKAPU, MAUI, HAWAII; AND, FURTHER IDENTIFIED AS COUNTY REAL PROPERTY TAX MAK KEY: (2) 3-5-002:011.

To Whom It May Concern,

Please note that by way of this Letter of Authorization, *Emmanuel Lutheran Church of Maui ("ELC")* hereby provides the following:

1. WAIKAPU DEVELOPMENT VENTURE, LLC.
2. VINCE BAGOYO, of *Bagoyo Development Consulting Group, LLC*.
3. WILLIAM FRAMPTON, of *William Frampton Consulting, LLC*.
4. PETER HOROVITZ, Esq., of *Merchant Horovitz, LLLP*.

with authorization to act on our behalf and represent us in the preparing, filing, and processing of various State of Hawaii and County of Maui Land Use Approvals, Permits, and Applications; including, but not limited a §201H-38, HRS APPLICATION FOR AFFORDABLE HOUSING PROJECT; to be filed with County of Maui Department of Housing and Human Concerns for a proposed 100% Affordable Housing Project pursuant to Hawaii Revised Statutes §201H-38. The 201-H Project will be located on approximately 12.50 acres of land located along Waiale Road in the vicinity of Waikapu, Maui, Hawaii; and, further identified as a portion of Maui County Tax Map Key: (2) 3-5-002:011 (Portion).

It is noted that at this present time, *Emmanuel Lutheran Church of Maui ("ELC")* holds the title and full ownership of "LOT A"; which has an approximate area of 25.263 acres, and is identified as TMK: (2) 3-5-002:011. However, by way of a Real Estate Purchase and Sales Agreement (PSA); ELC and WAIKAPU DEVELOPMENT VENTURE, LLC ("WDV") are working together to file a 2-Lot Subdivision to which will subdivide LOT A into "LOTA-1" and "LOTA-2"; measuring 12.50 acres and 12.763 acres respectively. After Final Subdivision is granted; ELC will convey/transfer Fee Ownership of LOTA-1 to WDV for the proposed development of the aforementioned 201-H Affordable Housing Project. ELC will retain Lot A-2 for the proposed future development of a new School Campus and new Church.

If you have any additional questions, or if you require further information or documentation; please do not hesitate to contact us at 808-242-5700. Mahalo.



LETTER OF AUTHORIZATION

July 18, 2018

PAGE 2

Sincerely,

EMMANUEL LUTHERAN CHURCH OF MAUI



TITLE: PRESIDENT

NAME: MICHAEL REILEY

CC: William Frampton - William Frampton Consulting, LLC  
Vince Bagoyo - Bagoyo Development Consulting Group, LLC.  
Peter Horovitz, Esq. - Merchant Horovitz, LLLP

*Notary Acknowledgment is attached. 7-18-18*





State of Hawaii

County of Maui }

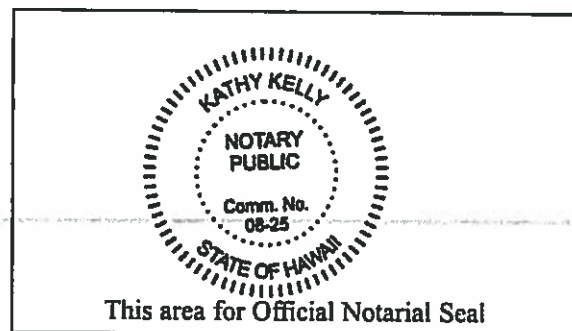
On July 18, 2018, before me, Kathy Kelly,  
(here insert name of notary)  
personally appeared Michael Reiley  
(name(s) of Signer(s))

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature Kathy Kelly (SEAL)

My Commission Expires: 2-3-20



### NOTARY PUBLIC CERTIFICATION

Doc. Date: 7-18-18

# Pages: 2

Notary Name: Kathy Kelly

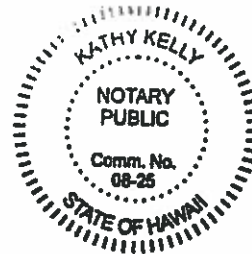
Judicial Circuit: 2

Doc. Description: Letter of

Authorization to prepare  
and seek approval for Proposed  
201H-38.

Notary Signature: Kathy Kelly

Date:



### ALL PURPOSE ACKNOWLEDGMENT





R-731 STATE OF HAWAII  
BUREAU OF CONVEYANCES  
RECORDED  
DEC 30, 2004 08:01 AM  
Doc No(s) 2004-264052



20 3/4 Z6

/s/ CARL T. WATANABE  
REGISTRAR OF CONVEYANCES  
CONVEYANCE TAX: \$675.00

LAND COURT SYSTEM	REGULAR SYSTEM
Return by Mail ( <input checked="" type="checkbox"/> ) Pickup ( ) To:	
MR RICHARD H SUTHEIMER EMMANUEL LUTHERAN CHURCH OF MAUI 520 WEST ONE STREET KAHULUI, HI 96732	TG: 200420153 - B TGE: A42016373 DORIE SCHOEPNER

Tax Key: (2) 3-5-002-001

Total No. of Pages: 12

LIMITED WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS:

That WAILUKU AGRIBUSINESS CO., INC., a Hawaii corporation, whose address is 255 East Waiko Road, Wailuku, Hawaii 96793, hereinafter called the "Grantor," in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration to Grantor paid by EMMANUEL LUTHERAN CHURCH OF MAUI, a Hawaii non-profit corporation, whose address is 520 West One Street, Kahului, Maui, Hawaii 96732, hereinafter called the "Grantee," the receipt whereof is hereby acknowledged, does hereby grant and convey unto the Grantee as a tenant in

severalty, all of Grantor's right, title and interest in and to the real property described in Exhibit "A" attached hereto and by this reference incorporated herein; subject, however, to all encumbrances noted on said Exhibit "A".

TO HAVE AND TO HOLD the same, together with any improvements thereon and the rights, easements, privileges, and appurtenances thereunto belonging or appertaining unto the Grantee, the heirs, representatives, administrators, successors and assigns of the Grantee, forever.

AND the Grantor covenants with the Grantee that the former is now seised in fee simple of the property granted; that the latter shall enjoy the same without any lawful disturbance; that the same is free from all encumbrances made by persons claiming by, through or under the Grantor, except the liens and encumbrances hereinbefore mentioned, and except also the liens and encumbrances created or permitted by the Grantee after the date hereof; and that the Grantor will WARRANT and DEFEND the Grantee against the lawful claims and demands of all persons claiming by, through or under the Grantor, except as aforesaid.

The terms "Grantor" and "Grantee", as and when used herein, or any pronouns used in place thereof, shall mean and include the masculine or feminine, or neuter, the singular or plural number, individuals or corporations, and their and each of their respective successors, heirs, personal representatives,

and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

The parties hereto agree that this instrument may be executed in counterparts, each of which shall be deemed an original, and said counterparts shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.


IN WITNESS WHEREOF, the Grantor and the Grantee have executed these presents on this 27th day of Dec, 2004.

APPROVED AS TO FORM:  
MANCINI, WELCH & GEIGER

WAILUKU AGRIBUSINESS CO., INC.

By Peter A. Horovitz

By

  
AVERY B. CHUMLEY  
President

Its

By

Its

Grantor

and permitted assigns, according to the context hereof. If these presents shall be signed by two or more Grantors or by two or more Grantees, all covenants of such parties shall for all purposes be joint and several.

The parties hereto agree that this instrument may be executed in counterparts, each of which shall be deemed an original, and said counterparts shall together constitute one and the same agreement, binding all of the parties hereto, notwithstanding all of the parties are not signatory to the original or the same counterparts. For all purposes, including, without limitation, recordation, filing and delivery of this instrument, duplicate unexecuted and unacknowledged pages of the counterparts may be discarded and the remaining pages assembled as one document.

IN WITNESS WHEREOF, the Grantor and the Grantee have executed these presents on this 27th day of Dec, 2004.

APPROVED AS TO FORM:  
MANCINI, WELCH & GEIGER

WAILUKU AGRIBUSINESS CO., INC.

By Peter A. Horovitz

By \_\_\_\_\_

Its \_\_\_\_\_

By Beverly Y. Crudele

Its Secretary

Grantor



EMMANUEL LUTHERAN CHURCH OF MAUI

By Richard H. Sudheimer  
Richard H. Sudheimer  
Its President

By Larry L. Niles  
Larry L. Niles  
Its Secretary  
Grantee

STATE OF HAWAII )  
COUNTY OF MAUI HAWAII ) SS.

On this 23rd day of December, 2004, before me personally appeared AVERY B. CHUMBLEY and BEVERLY Y. CRUDELE, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.

Nora Rosario TS.  
Print Name: Nora Rosario  
Notary Public, State of Hawaii.

My commission expires: 12-13-2006

STATE OF HAWAII

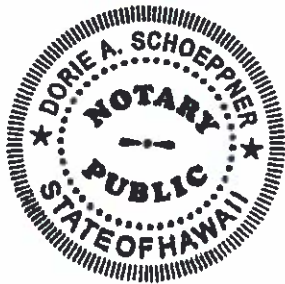
)

) SS.

COUNTY OF MAUI

)

On this 27th day of Dec, 20 04, before me personally appeared Richard H. Schneider and Lucy E. Niles, to me personally known, who, being by me duly sworn or affirmed, did say that such person(s) executed the foregoing instrument as the free act and deed of such person(s), and if applicable, in the capacities shown, having been duly authorized to execute such instrument in such capacities.



Dorie A. Schoepner  
Print Name:

Notary Public, State of Hawaii.

My commission expires: \_\_\_\_\_

Dorie A. Schoepner

Expiration Date: September 28, 2007

EXHIBIT "A"

All of that certain parcel of land (being portion(s) of the land(s) described in and covered by Grant 3152 to Henry Cornwell and Grant 3343 to Claus Spreckels) situate, lying and being on the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) at Waikapu and Wailuku, Island and County of Maui, State of Hawaii, being LOT A of the "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and thus bounded and described:

Beginning at a point at the southwesterly corner of this lot, being also the northwesterly corner of Lot B of Waikapu East (Large-Lot) Subdivision No. 3, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LUKE" being 5,563.76 feet south and 2,085.73 feet west and running by azimuths measured clockwise from true South:

1. Thence along the easterly side of Honoapiilani Highway (F.A.P. No. 13-G) on a curve to the left with the point of curvature azimuth from the radial point being: 271° 55' 48" and the point of tangency azimuth from the radial point being: 262° 39' 11", having a radius of 2,899.93 feet, the chord azimuth and distance being: 177° 17' 29.5" 469.02 feet to a point;
2. 172° 39' 11" 865.57 feet along same to a point;
3. 241° 16' 878.02 feet along R. P. 4529-B and 4549, L. C. Aw. 71 to Michael J. Nowlein, being also along Lot 9-A of Waiale Road and Kuikahi Drive Extension Subdivision to a point;
4. Thence along the remainder of Grant 3343 to Claus Spreckels, being also along Lot L of Waikapu East (Large-Lot) Subdivision No. 3 on a curve to the right with the

point of curvature azimuth  
from the radial point being:  
104° 32' 45" and the point  
of tangency azimuth from the  
radial point being: 284°  
39' 17", having a radius of  
1,600.00 feet, the chord  
azimuth and distance being:  
14° 36' 01" 3.04 feet to a  
point;

5. Thence along same on a curve to the left with the point of  
curvature azimuth from the  
radial point being: 104°  
39' 17" and the point of  
tangency azimuth from the  
radial point being: 99°  
00', having a radius of  
1,600.00 feet, the chord  
azimuth and distance being:  
11° 49' 38.5" 157.85 feet  
to a point;
6. 9° 00' 84.93 feet along same to a point;
7. Thence along same on a curve to the left, having a radius  
of 1,560.00 feet, the chord  
azimuth and distance being:  
354° 03' 30" 804.45 feet  
to a point;
8. 339° 07' 622.61 feet along the remainders of  
Grant 3343 to Claus Spreckels  
and Grant 3152 to Henry  
Cornwell, being also along  
Lot L of Waikapu East (Large-  
Lot) Subdivision No. 3 to a  
point;
9. 82° 00' 904.67 feet along the remainder of  
Grant 3343 to Claus  
Spreckels, being also along  
Lot B of Waikapu East (Large-  
Lot) Subdivision No. 3 to the  
point of beginning and  
containing an area of 25.263  
acres, more or less.

TOGETHER WITH an easement for roadway purposes over Roadway Lot L of "WAIKAPU EAST (LARGE-LOT) SUBDIVISION NO. 3" and the KUIKAHI DRIVE EXTENSION; provided, however, that if and when any of said roadway lots shall be conveyed to or acquired by any governmental authority as a public highway, then all private easement rights granted hereby in said roadway lots shall automatically terminate.

SUBJECT, HOWEVER, to the following:

1. Reservation in favor of the State of Hawaii of all mineral and metallic mines.
  2. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated June 2, 1986, and recorded in the Bureau of Conveyances of the State of Hawaii in Liber 19563 on Page 104, by and between Wailuku Agribusiness Co., Inc. and County of Maui, by its Department of Water Supply, re: private fire protection system
  3. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated March 14, 1990, and recorded in the said Bureau of Conveyances as Document No. 90-069334, by and between Wailuku Agribusiness Co., Inc. and Department of Water Supply of the County of Maui, re: private water system.
- Above agreement was amended by instrument dated August 24, 1990, and recorded as Document No. 90-164426.
4. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement dated March 14, 1990, and recorded in the said Bureau of Conveyances as Document No. 90-069335, by and between Wailuku Agribusiness Co., Inc. and Department of Water Supply of the County of Maui, re: private fire protection system.
  5. Existing sewerline Easement "S-1" (15 feet wide), as shown on survey map prepared by Warren S. Unemori, Land Surveyor, with Warren S. Unemori - Engineering, Inc., dated June 27, 1994, revised January 11, 1995 and February 17, 1995.

6. Grant to County of Maui dated March 30, 1994, and recorded in the said Bureau of Conveyances as Document No.

95-079773, granting an easement for sewerline purposes over Easement "S-1", being more particularly described therein.

Lack of joinder by C. Brewer Homes, Inc., now known as Hawaii Land & Farming Company, Inc., a Delaware corporation.

7. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Memorandum Concerning Grant of Various Property Rights dated --- (acknowledged August 19, 1999 and August 18, 1999), and recorded in the said Bureau of Conveyances as Document No. 99-189645.

8. Grant to Hawaii Land & Farming Company, Inc., a Delaware corporation, dated August 3, 1999, and recorded in the said Bureau of Conveyances as Document No. 99-189647, granting a perpetual Offsite Drainage Easement "D-1" in favor of Tax Key (2) 3-5-001-001 and (2) 3-4-007-002.

9. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Unilateral Agreement and Declaration for Conditional Zoning dated April 6, 2000, and recorded in the said Bureau of Conveyances as Document No. 2000-049836.

10. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Subdivision Agreement dated June 21, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-104990, by and between Wailuku Agribusiness Co., Inc., a Hawaii corporation, and the County of Maui, through its Department of Public Works and Waste Management.

11. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement to Grant Easement dated June 25, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-097114, by and between Wailuku Agribusiness Co., Inc., a Hawaii corporation, and Waiko Baseyard, LLC, a Hawaii limited liability company.

12. Grant to Waiko Baseyard, LLC, a Hawaii limited liability company, dated June 25, 2001, and recorded in the said Bureau of Conveyances as Document No. 2001-097115, granting a non-exclusive easement over and across a portion of the

"existing cane haul" road, being more particularly described therein.

13. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Private Fire Protection System Agreement dated March 21, 1997, and recorded in the said Bureau of Conveyances as Document No. 2002-046402, by and between Brewer Environmental Industries, Inc., a Hawaii corporation, and Wailuku Agribusiness Co., Inc., a Hawaii corporation.

14. Grant to Waikapu 28 Investment, LLC, a Hawaii limited liability company, dated January 30, 2003, and recorded in the said Bureau of Conveyances as Document No. 2003-058167, granting easements for utility purposes being more particularly described therein.

15. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Agreement for Allocation of Future Subdivision Potential dated November 3, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004-227693, by and between Wailuku Agribusiness Company, Inc. and Hawaii Land & Farming Company, Inc.

16. Designation of Easement "D-1" for drainage purpose shown on survey map prepared by Reed M. Ariyoshi, Registered Professional Land Surveyor, with Warren S. Unemori-Engineering Inc., dated September 21, 2004.

17. Designation of Easement "E-2" for electrical purpose shown on survey map prepared by Reed M. Ariyoshi, Registered Professional Land Surveyor, with Warren S. Unemori-Engineering Inc., dated September 21, 2004.

18. Grant to Maui Electric Company, Limited, a Hawaii corporation, and Verizon Hawaii Inc., a Hawaii corporation, dated Nov 23, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004, granting easements for utility purposes being more particularly described therein.

19. The terms and provisions, including the failure to comply with any covenants, conditions and reservations, contained in Declaration of Covenants, Conditions, Easements, Reservations and Restrictions dated Dec 27, 2004, and recorded in the said Bureau of Conveyances as Document No. 2004-20406-1



20. Any lien (or claim of lien) for services, labor or material arising from an improvement or work related to the land described herein.

21. Any unrecorded leases and matters arising from or affecting the same.

END OF EXHIBIT "A"

Tax Key: (2) 3-5-002-001



# COMMERCIAL REAL PROPERTY PURCHASE AND SALE AGREEMENT (PSA)

Hawaii Association of REALTORS® Standard Form  
Revised 2/14 (NC) For Release 11/16



**COPYRIGHT AND TRADEMARK NOTICE:** This copyrighted Hawaii Association of REALTORS® Standard Form is licensed for use by the entire real estate industry on condition that there shall be no alteration of the printed portions, pagination, or paragraph numbers or breaks. The use of this form is not intended to identify the real estate licensee as a REALTOR®. REALTOR® is a registered collective membership mark which may be used only by real estate licensees who are members of the National Association of REALTORS® and who subscribe to its Code of Ethics.

**NAR CODE OF ETHICS:** Buyer and Seller are aware that the National Association of REALTORS® holds its members accountable for their actions through a strict professional Code of Ethics, which includes a grievance system to address complaints. Non-members are not held to the same standards as members, nor are they required to participate in the grievance system.

Reviewed By: \_\_\_\_\_  
Principal Broker/Broker-In-Charge Keoni Fursse, R(PB)

Reference Date: November 18, 2016 Purchase Price: \$1,150,000.00 (See Paragraph D-2)

Closing Date: The Scheduled Closing Date shall be as set forth in Paragraph F-2.

0 Honoapiilani Hwy  
Property Reference or Address: Wailuku, HI (See Paragraph E-1)

Tax Map Key: Div. 2 /Zone 3 /Sec. 5 /Plat 002 /Parcel(s) 011 /CPR \_\_\_\_\_ (if applicable).

## IDENTIFICATION OF PARTIES:

## IDENTIFICATION OF BROKERAGE FIRMS:

<b>Buyer:</b> <u>William Frampton et al/assigns</u>	<b>Brokerage Firm:</b> <u>Kokua Realty, LLC</u>
	<b>Agent Name:</b> <u>Keoni Fursse</u>
<b>Street</b> _____	<b>Street</b> <u>296 Alamaha St Ste A</u>
<b>Address:</b> _____	<b>Address:</b> <u>Kahului, HI 96732-2412</u>
<b>Phone:</b> _____	<b>Phone:</b> <u>(808) 280-6556</u>
<b>Fax:</b> _____	<b>Fax:</b> <u>(808) 877-5078</u>
<b>E-mail:</b> _____	<b>E-mail:</b> <u>keoni@kokuarealty.com</u>

<b>Seller:</b> <u>Emmanuel Lutheran Church Maui</u>	<b>Brokerage Firm:</b> <u>Kokua Realty, LLC</u>
	<b>Agent Name:</b> <u>Uvette J. Sakamoto</u>
<b>Street</b> _____	<b>Street</b> <u>296 Alamaha St Ste A</u>
<b>Address:</b> _____	<b>Address:</b> <u>Kahului, HI 96732-2412</u>
<b>Phone:</b> _____	<b>Phone:</b> <u>(808) 269-5000</u>
<b>Fax:</b> _____	<b>Fax:</b> <u>(808) 877-5078</u>
<b>E-mail:</b> _____	<b>E-mail:</b> <u>uvette@kokuarealty.com</u>

**CONTRACT:** This is more than a receipt for money. It is a legally binding contract for the purchase of real estate. Read it carefully. Handwritten or typed provisions herein shall supersede any printed provisions if there is a conflict. FILL IN ALL BLANKS. WRITE "NA" IF NOT APPLICABLE. ITEMS WITH CHECK-OFF BOXES ARE OPTIONAL. ALL OTHERS ARE STANDARD PROVISIONS.

DS  
WF 11/21/2016  
BUYER'S INITIALS & DATE

DS  
MR 11/23/2016  
SELLER'S INITIALS & DATE

©Hawaii Association of REALTORS®  
Commercial Real Property Purchase and Sale  
Agreement  
Produced in conjunction with the Hawaii CCIM Chapter  
RR501 Rev. 2/14

Kokua Realty LLC, 296-A Alamaha St. Kahului, HI 96732  
Phone: (808)270-9116 Fax: (808)877-5078

Kara Heen

Produced with zipForm® by zipLogix 18070 Fifteen Mile Road, Fraser, Michigan 48026 [www.zipLogix.com](http://www.zipLogix.com)



0 Honoapiilani

**SECTION A: AGENCY DISCLOSURE**

**A-1 Agency.** Buyer and/or Seller in a real estate transaction in Hawaii may retain a real estate Brokerage Firm as their agent. In such case, Buyer and/or Seller is represented by the Brokerage Firm and all of its licensees. Hawaii law requires real estate licensees to disclose orally or in writing to Seller and/or Buyer whom the licensee represents. The form of representation may be one of the following:

- (a) **Seller's Agent.** Brokerage Firm represents Seller only unless a disclosed dual agency exists. Seller's Agent owes the highest duties to Seller, including confidentiality, loyalty, and due care and diligence.
- (b) **Buyer's Agent.** Brokerage Firm represents Buyer only unless a disclosed dual agency exists. Buyer's Agent owes the highest duties to Buyer, including confidentiality, loyalty, and due care and diligence.
- (c) **Dual Agent.** Brokerage Firm represents both Buyer and Seller. This commonly occurs when licensees in the Brokerage Firm representing Seller have Buyer clients looking for types of property similar to Seller's property. In such event, the Brokerage Firm and all of its licensees represent both Buyer and Seller and are dual agents. Dual agents must remain neutral in negotiations and must not advance the interest of one party over the other. A separate Dual Agency Consent Addendum is required under Hawaii law.
- (d) **No Agency Representation** (see A-2(d) below).

**A-2 Disclosure.**

- (a) **Seller Representation:** Seller is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (b) **Buyer Representation:** Buyer is represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®.
- (c) **Dual Agency Representation:** Seller and Buyer are represented by the Brokerage Firm Kokua Realty, LLC and all its licensees. Brokerage Firm is ☒ is not ☐ a member of the National Association of REALTORS®. A separate Dual Agency Consent Addendum is required.
- (d) **No Agency Representation:**
  - ☐ Seller is a Customer and is not represented by a Brokerage Firm.
  - ☐ Buyer is a Customer and is not represented by a Brokerage Firm.

It is recommended that Customers seek legal counsel prior to signing a PSA.

If requested, a licensee may present a Customer's PSA to Seller and report Seller's response. A licensee cannot, however, negotiate for or otherwise advise a Customer in the transaction.

Buyer and Seller acknowledge that oral or written disclosure relative to agency representation was provided to them before the signing of this PSA.

WF (Buyer's initials)

MR (Seller's initials)

**SECTION B: EARNEST MONEY DEPOSIT**

**B-1 Earnest Money.** Buyer shall deposit with Escrow (identified in Paragraph F-4), the sums set forth below (the "Earnest Money") in good funds on or before the deadlines required by this Paragraph B-1 or as otherwise agreed in writing by the parties. Buyer shall pay (from sources other than the Earnest Money or any interest accruing thereon) any and all escrow or other fees charged by Escrow pursuant to Paragraph F-6. All interest accruing on such sum shall become a part of the Earnest Money and shall be distributed as Earnest Money in accordance with the terms of this PSA.

- ☒ (a) An initial Earnest Money deposit in the amount of \$ 50,000.00 shall be paid within 5 business days of the Acceptance Date (or as otherwise agreed in writing by the parties) (defined in Paragraph S-1).
- ☐ (b) An additional Earnest Money deposit in the amount of \$ \_\_\_\_\_ shall be paid within \_\_\_\_\_ business days after the end of the Inspection Period (see Paragraph J-2).

**B-2 Interest on Earnest Money. (Choose (a) OR (b))**

- ☐ (a) Buyer to Earn Interest. The parties instruct Escrow to place Buyer's deposit(s) in an interest-bearing account with all interest to be credited to Buyer at closing. Buyer shall pay any processing fee required by Escrow and all costs of setting up, maintaining and closing the account. Fees/costs may exceed the interest earned.
- ☒ (b) Buyer not to Earn Interest. Buyer hereby waives the right to place Buyer's deposits in an interest-bearing account. Buyer understands any interest earned on such deposits shall belong to Escrow.

WF 11/21/2016  
BUYER'S INITIALS & DATE

MR 11/23/2016  
SELLER'S INITIALS & DATE

**SECTION C: ADDENDA**

C-1 **Addenda.** The following addenda, if checked, are attached to and made a part of this PSA.

☒ Existing "As Is" Condition ☐ Other \_\_\_\_\_  
☒ Other Dual Agency ☐ Other \_\_\_\_\_  
☐ Other \_\_\_\_\_ ☐ Other \_\_\_\_\_

**SECTION D: OFFER TO BUY AND PURCHASE PRICE**

D-1 **Offer to Buy.** Buyer offers to buy the Property described below on the terms and conditions contained herein, acknowledges receipt of a copy of the PSA, and agrees that this PSA shall be binding on Buyer if accepted by Seller on or before:  
 Date November 23, 2016 Time 4:00 AM ☐ PM ☒.

D-2 **Purchase Price.** Purchase price for the Property in U.S. Dollars shall be paid as follows:

\$ 50,000.00 Initial cash deposit of Earnest Money ("B-1(a)").  
 \$ \_\_\_\_\_ Additional cash deposit of Earnest Money ("B-1(b)").  
 \$ 525,000.00 Balance of down payment (or balance of purchase price if all cash) paid into Escrow before closing.

\$ 575,000.00 TOTAL CASH FUNDS FROM BUYER (exclusive of closing costs).

\$ 575,000.00 By way of New first mortgage at terms and conditions acceptable to Buyer.

\$ \_\_\_\_\_

\$ 1,150,000.00 TOTAL PURCHASE PRICE

Failure to make any of the scheduled deposits herein shall constitute a default, and the termination provisions of Paragraph O-1 shall apply.

**SECTION E: PROPERTY**

E-1 **Description.** Tax Map Key: Div. 2 /Zone 3 /Sec. 5 /Plat 002 /Parcel(s) 011 /CPR \_\_\_\_\_ (if applicable).  
 All of that ☒ fee simple ☐ leasehold Property zoned Public Quasi situated at the address set forth above described as follows: Approximately twelve (12.5) acres of vacant land in Wailuku, Maui, Hawaii.

The full legal description will be provided in the title report.

"Property" includes all improvements and fixtures except those owned by tenants and except as listed below:

**SECTION F: CLOSING**

F-1 **Closing.** For purposes of this PSA, "Closing" shall be the date when all appropriate conveyance documents are recorded. Buyer and Seller agree to promptly execute appropriate or customary documents when requested by Escrow.

F-2 **Scheduled Closing Date.** (Choose Paragraph F-2(a) OR F-2(b))

☐ (a) \_\_\_\_\_, or  
☒ (b) 30 days after the end of Inspection Period. If the Scheduled Closing Date falls on a day the Bureau of Conveyances of the State of Hawaii is closed, closing will be on the next day when documents can be recorded.

WF 11/21/2016  
 BUYER'S INITIALS & DATE

MR 11/23/2016  
 SELLER'S INITIALS & DATE

**F-3 Change to the Scheduled Closing Date. (Choose Paragraph F-3(a) OR F-3(b))**

- ☐ (a) **Extensions. There is no automatic right to extend.** If, for reasons beyond Buyer's or Seller's control, a party cannot perform its obligation to close by the Scheduled Closing Date, then such party may extend the Scheduled Closing Date up to \_\_\_\_\_ ( ) days by delivery of written notice to the other party prior to the Scheduled Closing Date. Thereafter, time shall be of the essence, and if a party fails to perform by the extended Scheduled Closing Date, such party shall be considered in default and the other party may elect to terminate this PSA pursuant to Paragraph O-1. The extended Scheduled Closing Date may not be further extended unless Buyer and Seller agree in writing. This provision relates only to the extension of the Scheduled Closing Date.
- ☒ (b) **Time is of the Essence.** Time is of the essence and the Scheduled Closing Date may not be extended unless Buyer and Seller agree in writing.

**F-4 Escrow.** This transaction shall be escrowed by: Fidelity National, Branch \_\_\_\_\_ ("Escrow").

Escrow officer: \_\_\_\_\_ Phone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Escrow officer email address: \_\_\_\_\_

Within the time period set forth in Paragraph B-1, Seller shall open an account with Escrow and provide Escrow with a copy of this PSA and escrow instructions.

**F-5 Prorations and Closing Adjustments.** At closing, Escrow shall prorate the following, if applicable, as of the date of closing: real property tax, lease rents, interest on assumed obligations, tenant rents, common area expenses and other items customarily prorated in commercial real estate transactions in Hawaii. When applicable, Escrow shall charge to Seller and credit to Buyer the amount of any tenant security deposits. Seller and Buyer agree to cooperate and use their best efforts to complete such prorations or adjustments that are not available at Closing no later than thirty (30) days after Closing. Such items of income and expense for the period prior to the date of Closing will be for the account of Seller and such items of income and expense for the period on and after Closing will be for the account of Buyer, all as determined by the accrual method of accounting, except that rent shall be prorated only to the extent actually collected. Bills received after Closing to the extent they relate to expenses incurred for services performed prior to Closing shall be paid by Seller, and those which relate to services performed after Closing (except as otherwise agreed to by the parties in writing) shall be paid by Buyer; provided, however, that Buyer's obligations under this PSA to assume and pay for services rendered after Closing pursuant to any service contracts shall not apply to any service contract that Buyer elected not to assume during the Inspection Period.

**F-6 Closing Costs.** The following allocates customary closing costs and are not intended to be an all-inclusive list. Escrow may charge the appropriate party other closing costs as agreed and directed in writing by the parties.

Charge to Buyer, if applicable:

50% of the premium for standard coverage title insurance and any additional costs relating to the issuance of extended coverage policy and endorsements (including a lender's policy)  
 Cost of drafting of agreement of sale or mortgage and note  
 Cost of obtaining Buyer's consents  
 Buyer's notary fees  
 50% of Escrow's fees  
 Any fees pertaining to any Buyer financing

Charge to Seller, if applicable:

50% of the premium for standard coverage title insurance  
 Cost of drafting of conveyance documents and bills of sale  
 Cost of obtaining Seller's consents  
 Seller's notary fees  
 Conveyance tax  
 50% of Escrow's fees  
 Recording fees  
 FIRPTA (Federal withholding)  
 HARPTA (State withholding)

**F-7 Assessments.** For purposes of Paragraphs F-7(a), F-7(b), and F-7(c), an assessment is defined as any obligation (not including prorations in Paragraph F-5) levied against the Property by a governmental body or any other entity with a legal right to assess. Assessments, if any, shall be charged as follows:

- (a) Any lump sum assessments levied against the Property prior to the Acceptance Date shall be paid by Seller ☒ or assumed by Buyer ☐.
- Exceptions, if any: \_\_\_\_\_
- (b) Any assessments against the Property authorized as of the Acceptance Date which are being paid in installments shall be paid in full by Seller ☒ or pro-rated by Escrow as of the date of closing ☐.
- Exceptions, if any: \_\_\_\_\_
- (c) If a new assessment is authorized against the Property between the Acceptance Date and the Scheduled Closing Date, such assessment shall be paid as Buyer and Seller shall agree, and if Buyer and Seller cannot reach an agreement within five (5) days of both parties being aware of the new assessment, either party may terminate this PSA and the termination provisions of Paragraph O-2 shall apply.

DS  
 WF 11/21/2016  
 BUYER'S INITIALS & DATE

©Hawaii Association of REALTORS®  
 Produced in conjunction with the Hawaii CCIM Chapter

DS  
 MR 11/23/2016  
 SELLER'S INITIALS & DATE



- [ NA ] F-8 **Lessor or Other Consents.** The obligations of Buyer or Seller hereunder are conditioned upon obtaining consents of the following lessor or other identified person or entity prior to Closing or such earlier time as may be required by this PSA: \_\_\_\_\_ . Neither Buyer nor Seller may waive this condition without the consent of the other. Buyer and Seller agree to cooperate and take all reasonable action to obtain such consents.

**F-9 Risk of Loss.**

- (a) **Minor Damage.** In the event of loss or damage to the Property or any portion thereof that is not "major" (as hereinafter defined), Seller shall notify Buyer within five (5) days of Seller being made aware of such loss or damage, and this PSA shall remain in full force and effect provided Seller performs any necessary repairs or, at Seller's option, assigns to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy and Seller shall be fully released from any additional claims. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer, subject to the terms and conditions of this PSA.
- (b) **Major Damage.** In the event of a "major" loss or damage, Seller shall notify Buyer in writing of such damage within five (5) days of Seller being made aware of such loss or damage. In such event, Buyer may terminate this PSA by written notice to Seller within thirty (30) days of the loss or damage, in which event the Earnest Money shall be returned to Buyer. If Buyer does not elect to terminate this PSA within ten (10) days after Seller sends Buyer written notice of the occurrence of major loss or damage, then Buyer shall be deemed to have elected to proceed with Closing, in which event Seller shall, at Seller's option, either (1) perform any necessary repairs, or (2) assign to Buyer all of Seller's right, title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies or condemnation awards relating to the Property. In the event that Seller elects to perform repairs upon the Property, Seller shall use reasonable efforts to complete such repairs promptly and the Scheduled Closing Date shall be extended for a reasonable time in order to allow for the completion of such repairs. If Seller elects to assign to Buyer Seller's title and interest to any claims and proceeds Seller may have with respect to any casualty insurance policies, the Purchase Price shall be reduced by an amount equal to the deductible amount under Seller's insurance policy. Upon Closing, full risk of loss with respect to the Property shall pass to Buyer.
- (c) **Definition of "Major" Loss or Damage.** For purposes of this PSA, "major" loss or damage refers to the following:  
 (1) loss or damage to the Property or any portion thereof such that the cost of repairing or restoring the Property to a condition substantially identical to that of the Property prior to the event of damage would be, in the opinion of a contractor reasonably selected by Buyer, equal to or greater than an amount equal to five percent (5%) of the Purchase Price; or  
 (2) any loss due to a condemnation which impairs the current use of the Property.

- F-10 **Possession.** Seller agrees to give Buyer possession at Closing or \_\_\_\_\_ , subject to tenant leases, if any.

**SECTION G: TITLE**

- G-1 **Preliminary Title Report.** Within Seven ( 7 ) days after the Acceptance Date, Seller shall cause Fidelity National (the "Title Company") to deliver a preliminary title report (the "Title Report") on the Property to Buyer.

- G-2 **Title.** Seller agrees to convey the Property with warranties vesting marketable title in Buyer, free and clear of all liens and encumbrances EXCEPT: (a) easements, covenants, conditions, reservations or restrictions now of record and (b) \_\_\_\_\_ .

[ X ] G-3 **Title Objections; Permitted Exceptions; Cure of Title Objections.**

- (a) **Title Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Title Report.
- (b) **Permitted Exception.** Any item contained in the Title Report to which Buyer does not so object shall be deemed a "Permitted Exception".
- (c) **Cure of Title Objections.** In the event Buyer shall timely notify Seller of objections to any item contained in the Title Report, Seller shall have the right, but not the obligation, to cure the Title Objections. Seller shall inform Buyer in writing (the "Seller's Title Cure Notice") not later than five (5) business days after receipt of Title Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Title Cure Notice shall be deemed Seller's election not to cure the Title Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2 and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

- [ X ] G-4 **Vesting and Tenancy.** Title shall vest in Buyer(s) as follows (provide full legal names and marital status for individuals, trust information, name and form of business entity, etc.):

- [ ] (a) \_\_\_\_\_  
 [ X ] (b) to be determined by Buyer by written notice to Seller and Escrow Officer not later than five (5) business days prior to Closing.

BS  
 WF 11/21/2016

BUYER'S INITIALS & DATE

BS  
 MR 11/23/2016

SELLER'S INITIALS & DATE

## SECTION H: FINANCING CONTINGENCIES

**[ X ]H-1 Financing Contingency.** Buyer's obligation to buy the Property is subject to Buyer obtaining the loan (the "Loan") described in this PSA. Buyer is obligated to use Buyer's commercially reasonable efforts to obtain the Loan.

Buyer is obligated to deliver to Seller a conditional loan commitment letter not later than 150 days after the Acceptance Date, and a final loan approval letter not later than 30 days after the end of the Inspection Period.

If Buyer does not obtain the conditional loan commitment letter or the final loan commitment letter within the time periods specified above, Buyer may terminate this PSA by providing written notice of such failure and Buyer's termination of this PSA to Seller and Escrow on or before expiration of such specified time periods.

Buyer may increase the amount of Buyer's Cash Funds and thereby reduce the amount of the Loan or waive this Financing Contingency and purchase the Property on an all cash basis. If Buyer elects either of these two options, Buyer shall promptly give written notice of such election to Escrow and to Seller, together with evidence of Buyer's ability to do so.

**H-2 Seller's Right to Terminate PSA for Financing Contingency.** If Paragraph H-1 is applicable, Seller's obligation to sell the Property is contingent upon Buyer using Buyer's commercially reasonable efforts to obtain the Loan within the time periods specified in Paragraph H-1 above. If any such obligation is not met by the end of the applicable time period, Seller may elect to terminate this PSA by delivering to Buyer written notice of termination within Seven ( 7 ) days (seven days if left blank) of the expiration of the time period or the date stated in Paragraph H-1, and Paragraph O-2 ("Termination Provision") shall apply. However, this right of Seller to terminate shall no longer apply if Buyer has elected to proceed pursuant to Paragraph H-1 and has provided Seller with reasonable assurance of Buyer's ability to do so. Seller shall have the right to inquire with Buyer's lender regarding the status of Buyer's financing.

## SECTION I: CONTINGENCY PROCEDURES

**I-1 Contingencies.** Buyer's obligation to buy and Seller's obligation to sell the Property may be subject in this PSA to satisfaction of one or more conditions (each called a "Contingency").

As used in this PSA, the term "Benefited Party" shall mean (a) Buyer, as to each Contingency which must be satisfied before Buyer is required to close on the purchase of the Property from Seller; and (b) Seller, as to each Contingency which must be satisfied before Seller is required to close on the sale of the Property to Buyer.

**If a Contingency is not satisfied within the specified time period for meeting such Contingency ("Contingency Period"), the Benefited Party may elect to terminate this PSA and Paragraph O-2 ("Termination Provision") shall apply; or to waive the Contingency. Unless otherwise expressly stated, the time period within which all Contingencies in this PSA must be satisfied shall be 5:00 PM, Hawaii Standard Time, on the last day of the Inspection Period identified in Paragraph J-2.**

**If the Benefited Party wishes to terminate this PSA because a Contingency for that party's benefit has not been satisfied, the Benefited Party must deliver to Escrow a written notice terminating this PSA prior to the expiration of the Contingency Period or such other termination period which may be set forth in a specific contingency in this PSA. If the Benefited Party fails to deliver the written notice to Escrow within such time period, the Contingency shall be deemed to be waived.**

**Each party understands the requirement to act upon each Contingency according to the strict deadlines described therein.**

## SECTION J: INSPECTION; MAINTENANCE AND WARRANTIES

**J-1 Inspection of Property.** At Buyer's sole cost and expense Buyer may (personally or by any expert, professional, or other representative of Buyer's choice): (a) inspect the Property or any portion thereof; (b) inspect all fixtures and improvements included in the sale; (c) inspect, investigate the Property, including, but not limited to all public records relating to the Property; (d) inspect all applicable laws and regulations which may affect the Property; and (e) inspect all financial and administrative records of Seller pertaining to the ownership and operation of the Property, except appraisals, material relating to negotiations with other buyers and material that is attorney-client privileged.

On or before 5 days after the Acceptance Date, Seller shall deliver to Buyer copies of the following documents (applicable only if checked), to the extent such documents are in the possession or control of Seller.

☒ Plans and Specifications  
☐ Ground Lease  
☐ Rent Roll  
☒ Tenant Leases  
☐ Financial Statements for \_\_\_\_\_ years & Year-to-date  
☐ Inventory of Tangible Personal Property  
☐ Management Contracts  
☐ Service Contracts  
☒ Existing Surveys  
☒ Soils Report

<input checked="" type="checkbox"/>	Environmental Report(s)
<input checked="" type="checkbox"/>	Architectural Report
<input checked="" type="checkbox"/>	Structural Engineering Report
<input type="checkbox"/>	Electrical Engineering Report
<input type="checkbox"/>	Mechanical Engineering Report
<input type="checkbox"/>	Building Maintenance Reports
<input type="checkbox"/>	ADA Report
<input type="checkbox"/>	Condominium Documents
<input type="checkbox"/>	Other:
<input checked="" type="checkbox"/>	Other: All other reports & studies

03  
WF 11/21/2016  
BUYER'S INITIALS & DATE

DS  
MP 11/23/2016  
SELLER'S INITIALS & DATE



**J-2 BUYER'S RIGHT TO INSPECT THE PROPERTY AND TO TERMINATE THIS PSA BECAUSE BUYER IS NOT SATISFIED WITH THE PROPERTY ENDS ON 270 DAYS AFTER ACCEPTANCE ("INSPECTION PERIOD").**

Seller shall provide Buyer and Buyer's representatives reasonable access to the Property during the Inspection Period, including Seller's records (except for excluded records described above) for this purpose, during reasonable hours with reasonable prior notice to Seller. The obligation of Buyer to purchase the Property is contingent upon Buyer's approval of the results of such inspection on or before the expiration of the Inspection Period. All inspections must be completed within the Inspection Period. In consideration of Seller making the Property and records available, Buyer agrees to perform a thorough investigation of the Property, including but not limited to any investigation deemed prudent by Buyer relating to the following: building improvements, environmental matters, mold, termite infestation, compliance with the Americans with Disabilities Act and any pending assessments against the Property. Buyer agrees that Buyer will rely on Buyer's own due diligence investigation and not upon information provided by Seller, Seller's Brokerage Firm, or Buyer's Brokerage Firm.

If Buyer disapproves of the results within such time period, Buyer may elect to terminate this PSA pursuant to Paragraph O-2. **If Buyer fails to elect to terminate prior to the end of the Inspection Period, Buyer shall have waived this contingency.**

Prior to the expiration of the Inspection Period, Seller may make changes to existing tenant leases and/or enter into new tenant lease agreements without the approval of the Buyer, however, Seller shall provide Buyer with at least five (5) days advance written notice that Seller intends to execute such documents along with copies of such documents. After the expiration of the Inspection Period, Seller shall not, without the written consent of Buyer, make any changes to existing tenant leases, enter into any new leases that extend beyond the Scheduled Closing Date, or enter into any other agreements that cannot be terminated upon forty-five (45) days' notice. The existing tenant leases will be assigned to Buyer at Closing and Buyer will assume the obligations of the Seller under the existing tenant leases, either as part of the instrument conveying the Property to Buyer or in a separate instrument, as elected by Seller. Seller will use commercially reasonable efforts to obtain estoppel certificates from all tenants on the Property, dated not earlier than thirty (30) days prior to Closing; provided, however, delivery of such estoppel certificates shall not be a condition of Closing unless otherwise specified in this PSA.

Buyer agrees to indemnify, defend and hold Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm harmless from any actions, suits, liens, claims, damages, expenses, losses and liability for damage to personal or real property or personal injury to the extent arising from or attributable to any acts performed by Buyer or Buyer authorized agents in exercising Buyer's inspection rights, if any, under this PSA (excluding any and all losses, claims, suits, damages and expenses, including reasonable attorneys' fees resulting from the mere discovery of, disclosure of, or injury or death resulting from, any pre-existing physical or environmental condition on, in, under or about the Property). This agreement to indemnify Seller, Seller's Brokerage Firm, and Buyer's Brokerage Firm shall survive any termination of this PSA.

☒ **J-3 Property Condition Maintenance.** Seller shall maintain the Property in the same condition and repair as when Buyer inspected the Property pursuant to Paragraph J-1.

☒ **J-4 Existing Warranties, Plans, etc.** Seller shall provide to Buyer at closing all existing warranty documents in Seller's possession covering the improvements and personal property being sold to Buyer; and, to the extent legally permissible, all originals and copies in Seller's possession of as-built blueprints, specifications, and copies of architectural or engineering drawings relating to the Property.

Buyer understands: (a) any warranties delivered by Seller to Buyer represent obligations of other persons, not Seller; (b) the warranties and other documents are provided for informational purposes only; (c) the warranties and other documents may not reflect improvements as built; and (d) Seller does not promise that any such warranties are transferable to Buyer, and that Buyer must contact the providers of such warranties to determine whether the warranties are transferable to Buyer.

**SECTION K: SURVEY**

☐ **NA K-1 Survey.** Within \_\_\_\_\_ ( ) days after the Acceptance Date, Seller shall, at Seller's sole cost and expense, provide Buyer with a current map (with surveyor's stamp and dated after the Acceptance Date) and accompanying report to show the perimeters of the Property and the location of any improvements in the vicinity of the perimeter Property lines. This survey and map may not address whether improvements on the Property are in compliance with State and/or County requirements, and/or subdivision covenants, conditions, and restrictions. If Buyer objects to any matters shown in such survey, Buyer shall notify Seller pursuant to Paragraph K-2 below.

☐ Buyer elects to have an ALTA survey prepared and agrees to pay the increase in cost to obtain an ALTA survey.

☐ **NA K-2 Survey Objections; Permitted Exceptions; Cure of Survey Objections.**

(a) **Survey Objections.** Buyer shall have ten (10) days prior to the expiration of the Inspection Period to send written notice of any objections that Buyer may have in regard to the Survey.

(b) **Permitted Exception.** Any matter shown on the Survey to which Buyer does not so object shall be deemed a "Permitted Exception".

(c) **Cure of Survey Objections.** In the event Buyer shall timely notify Seller of objections to any matter shown on the Survey, Seller shall have the right, but not the obligation, to cure the Survey Objections. Seller shall inform Buyer in writing (the "Seller's Survey Cure Notice") not later than five (5) business days after receipt of Survey Objections whether Seller shall cure such objections. Unless otherwise expressly stated, Seller's failure to deliver Seller's Survey Cure Notice shall be deemed Seller's election not to cure the Survey Objections, and Buyer's election not to terminate this PSA prior to the expiration of the Inspection Period in accordance with Paragraphs J-2, and O-2 shall be deemed Buyer's waiver of any objections that Seller has not elected to cure.

WF 11/21/2016

BUYER'S INITIALS & DATE

©Hawaii Association of REALTORS®  
Produced in conjunction with the Hawaii CCIM Chapter

MR 11/23/2016

SELLER'S INITIALS & DATE

RR501 Rev. 2/14 (NC) For Release 11/16

**SECTION L: ASBESTOS AND HAZARDOUS MATERIALS**

- L-1 Asbestos Disclosure.** Buyer is aware that asbestos materials are hazardous to one's health, particularly if asbestos fibers are released into the air and inhaled. In the past (before 1979, but possibly since) asbestos was a commonly used insulation material in heating facilities and in certain types of floor and ceiling materials, shingles, plaster products, cement and other building materials. Buyer is aware that Buyer should make appropriate inquiry into the possible existence of asbestos on the Property. Structures having "popcorn" or "cottage cheese" type ceilings may contain asbestos fibers or asbestos-containing material. Such ceilings should not be disturbed since it could release asbestos fibers in the air. Any disturbance should be done only by licensed abatement contractors.
- L-2 Hazardous Waste and Toxic Substances Disclosure.** Buyer is aware that federal and state laws place strict liability on property owners for dangers caused by hazardous waste management and may require that such owner pay for the cost of the cleanup of hazardous substances and other toxic substances. Buyer is aware that Buyer should make appropriate inquiries into the past use of the Property and should seek an environmental assessment to ascertain the possible existence of such hazardous substances or materials on or under the Property. Buyer is aware Buyer may have liability for hazardous substances located on or under the Property even if Buyer did not cause such substances to be on or under the Property.
- ☐ **L-3** Buyer ☒ Seller ☐ will perform a Phase I Environmental Assessment at its sole cost and expense. Seller shall complete an Environmental Questionnaire required by the person/entity performing the Phase I Environmental Assessment.

**SECTION M: INTERNAL REVENUE CODE SECTION 1031 EXCHANGE**

- ☒ **M-1 Right to Exchange/Cooperation.** Either Seller or Buyer may assign all of its right, title and interest in this PSA with respect to all or any portion of the Property to an affiliated entity and/or a qualified intermediary in order to facilitate a like-kind exchange transaction, which includes the Property, pursuant to Section 1031 of the Internal Revenue Code. Seller and Buyer will remain liable under this PSA, subject to the limits set forth herein, following any such assignment and shall indemnify, defend and hold the other party harmless from any additional cost, liability or expense suffered or incurred by reason of such assignment or cooperation with the exchange. Seller and Buyer further agree to cooperate with the other in effecting such transaction, including, without limitation, consenting in writing to the assignment of this PSA to any such qualified intermediary and/or any affiliated entity; provided that any such exchange transaction, and the related documentation, shall: (a) not require the other party to execute any contract (other than as set forth above), make any commitment, or incur any obligations, contingent or otherwise, to third parties which would expand the obligations beyond this PSA or incur any additional costs, (b) not delay the Closing or the transaction contemplated by this PSA, or (c) not include acquiring title to any other property. The obligations of Seller and Buyer under this Paragraph shall survive the Closing and shall not be merged therein.

**SECTION N: ELECTRONIC (Digital or Fax) SIGNATURES AND COUNTERPARTS**

- N-1** Electronically executed copies of this PSA and any related documents shall be fully binding and effective for all purposes whether or not originally executed documents are transmitted to Escrow. Electronic signatures on documents will be treated the same as original signatures; however, each party agrees to promptly forward original executed documents (if any) to Escrow. The parties understand that conveyance, mortgage and other recordable documents must be delivered in original form and will not be acceptable if signed only electronically.
- N-2** This PSA and any addenda and related documents may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so signed, shall be deemed to be an original, and all of which taken together shall constitute one and the same document, binding upon all of the parties, notwithstanding that all of the parties do not sign the original or the same counterpart.

**SECTION O: TERMINATION PROVISIONS**

- O-1 Termination Due to Default.** In the event that Buyer is in default for failure to perform Buyer's obligations under this PSA (Seller not being in default), Seller may retain the initial deposit and all additional deposits provided for herein as liquidated damages. Buyer shall be responsible for any costs incurred in accordance with this PSA.

In the event that Seller is in default for failure to perform Seller's obligations under PSA (Buyer not being in default), Buyer may (a) seek specific performance of this PSA or (b) if the remedy of specific performance is not available, bring an action for damages for breach of contract. Seller shall be responsible for any costs incurred in accordance with this PSA.

In addition to the foregoing remedies, Buyer and Seller agree to the following additional remedies, if any:

---



---



---



---



---

US  
WF

11/21/2016

BUYER'S INITIALS & DATE

US  
MR

11/23/2016

SELLER'S INITIALS & DATE

- O-2 **Termination Due to Contingencies.** If the party for whose benefit a contingency exists, elects to terminate this PSA because the contingency has not been satisfied, that benefited party shall deliver to the other party a written notice of termination. If the benefited party so terminates this PSA, Buyer and Seller shall promptly execute all cancellation documents requested by Escrow. Buyer shall return to Seller all documents delivered by Seller to Buyer in connection with Buyer's inspection of the Property, and Escrow shall, unless otherwise agreed to in this PSA, return to Buyer all deposits previously made, less the amount of any escrow expenses or fees chargeable to Buyer. Thereafter, neither Buyer nor Seller shall have any further rights or obligations under this PSA.
- O-3 **Attorneys' Fees.** In the event of default by a party and/or a legal action or arbitration (including a claim by a Brokerage Firm for commission), the prevailing party shall be entitled to recover all costs incurred including reasonable attorney's fees.

#### SECTION P: TRANSACTIONS INVOLVING FOREIGN OR NON-RESIDENT BUYER AND SELLER

- P-1 **HARPTA Withholding Required if Seller is a Non-Resident of the State of Hawaii.** Under Hawaii law, if Seller is a non-resident person or entity (corporation, partnership, trust, or estate) of the State of Hawaii, Buyer must withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward the amount with the appropriate form to the State Department of Taxation. Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from HARPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the State Department of Taxation.
- P-2 **FIRPTA Withholding Required if Seller is a Foreign Person.** Under the Internal Revenue Code, if Seller is a foreign person or entity (non-resident alien, corporation, partnership, trust, or estate), Buyer must generally withhold a specified percentage of the "amount realized" by Seller on the sale of the Property and forward this amount to the Internal Revenue Service ("IRS"). Such withholding may not be required if Seller obtains and provides Buyer with an authorized exemption or waiver from withholding. If Seller does not provide Buyer with a certificate of exemption or waiver from FIRPTA not later than two (2) business days prior to Closing, Escrow is hereby authorized and instructed to withhold/collect from Seller the required amount at closing and forward it to the IRS.
- P-3 **Additional Disclosures Required by Foreign Buyers and Sellers.** Buyer and Seller understand that under statutes and ordinances such as the Agricultural Foreign Investment Disclosure Act of 1978, and the International Investment and Trade in Services Survey Act, among others, disclosures are required by foreign Buyers and/or Sellers under certain conditions.
- P-4 **Government Restrictions Disclosure.** Buyer is aware that the Property is subject to all applicable federal, state and county laws, statutes, regulations, codes, ordinances, rules, procedures, restrictions, and requirements, including but not limited to, those concerning land use, zoning, building permits and requirements, setbacks, height limitations, and allowable uses.

#### SECTION Q: SPECIAL TERMS

[ X ] Q-1 (Please number)

Q-1(a). Starting April 1, 2017, Escrow is authorized to deduct \$3,500.00 per month until Closing from the Earnest Money Deposit as non-refundable monthly payments which shall be credit to Purchase Price.

Q-1(b). It is Buyer's intent to create a 2-lot subdivision with Buyer receiving one 12.5-Acre lot and Seller receiving one 12.763 acre lot. The exact size of all lots is approximate and subject to changing in the final subdivision process. Buyer discloses they will be seeking a deferral agreement of improvements until the start of development of Buyer's project.

Q-1(c). Buyer has the right to extend Closing for 90 days by providing Seller with forty-five (45) days prior written notice. If the Closing is extended, Buyer shall continue to make monthly payments from Escrow of \$3,500/month.

Q-1(d). Seller agrees to cooperate with Buyer with all governmental applications. All applications and due diligence shall be done by Buyer, at Buyer's sole expense. In addition, if required by Buyer, Seller shall be the applicant on any governmental permits, subdivisions, and anything else required by Buyer.

(See attached Addendum for additional Special Terms).

DS

WF

11/21/2016

BUYER'S INITIALS & DATE

DS

MR

11/23/2016

SELLER'S INITIALS & DATE



**SECTION R: BROKERAGE FIRMS SERVICES AND DISCLAIMERS**

- R-1 Scope of Service.** Seller's Brokerage Firm and Buyer's Brokerage Firm, including their owners, agents and employees (collectively the "Brokerage Firms"), recommend that Buyer and Seller each consult their own accountant, appraiser, architect, attorney, contractor, estate planner, insurance advisor, land use professional, surveyor, environmental consultant, title insurer, zoning expert, and other professionals should they have any questions within those fields about this sale. Buyer and Seller understand and acknowledge that neither party is relying upon the Brokerage Firms for any of the foregoing services or advice.
- R-2 Disclaimers by Brokerage Firms.** Buyer and Seller understand that the Brokerage Firms have not made any representations or warranties, and have not rendered any opinions about: (a) the legal or tax consequences of this transaction; (b) the legality, validity, correctness, status or lack of any building permits which may have been required for the Property; (c) the size of any improvements on the Property, or the land area of the Property or the location of the boundaries; (d) the existence or non-existence of mold, asbestos or hazardous materials on the Property; (e) compliance of the Property with law, including but not limited to the Americans with Disabilities Act and land use laws.
- R-3 Obligations.** Brokerage Firms shall not be held liable to either Buyer or Seller for the failure of either Buyer or Seller to perform their obligations pursuant to this PSA.
- R-4 Disclosure of Real Estate Licensing Status.** Hawaii law requires that licensees disclose that they hold a real estate license in any transaction in which they are purchasing or selling real property as a principal, or in which they are buying for themselves, immediate relatives, or an entity in which they have an interest. If applicable, the licensee(s) in this transaction disclose the following: \_\_\_\_\_

**SECTION S: "ACCEPTANCE DATE", OTHER DEFINITIONS, MISCELLANEOUS**

- S-1** As used in this PSA, the term "Acceptance Date" means the date on which this PSA becomes binding upon the parties (i.e. when both parties have signed this PSA.)
- S-2** As used in this PSA, the term "day" means a calendar day unless the term "business day" is used. The term business day shall mean Monday through Friday except Federal or Hawaii holidays. All dates and times are based on Hawaii Standard Time (UTC-10). Unless otherwise specified in writing in this PSA, contingencies herein shall expire at 5:00 PM HST on the day stated.
- S-3 Time is of the Essence.** Except as otherwise provided in this PSA, time is of the essence in the performance by all parties in their respective obligations to this PSA.
- S-4 Complete Agreement.** This PSA constitutes the entire agreement between Buyer and Seller and supersedes and cancels any and all prior negotiations, representations, warranties, understandings or agreements (both written and oral) of Buyer and Seller. No variation or amendment of this PSA shall be valid or enforceable without written approval by Buyer and Seller. All agreements and representations about the Property must be set forth in writing and the parties agree that to be effective any representation made by a Brokerage Firm or any party hereto must be set forth in writing in this PSA or an amendment hereto. Buyer and Seller shall each hold harmless and release the Brokerage Firm(s) from any claims based upon any alleged representation which is not set forth in writing as stated in this paragraph.
- S-5 Assignment.** Buyer shall not have any right to assign any of its rights, or to delegate any duties or obligations under this PSA without the prior written consent of Seller except that consent shall not be required in the event Buyer assigns its rights under this PSA to an entity where Buyer owns at least fifty percent (50%) of the controlling interest. For the purposes of this paragraph, assignment and/or delegation shall be deemed to include any sale, transfer, assignment or other event which, directly or indirectly, results in a change of fifty percent (50%) or more in the controlling interest in Buyer. This PSA, and each and every term and provision hereof, shall inure to the benefit of, and be binding upon and enforceable against, Buyer and its respective legal representatives, successors, and permitted assigns.
- S-6 Representations and Warranties.** Each party hereby represents and warrants to the other as follows:
- (a) If it is an entity, it is duly organized, validly existing and in good standing under the laws of the state of its incorporation or organization, and is qualified to conduct business, and is in good standing in the state(s) in which it conducts business.
  - (b) It is in compliance with all laws, rules and regulations that govern the operation of a business in which it is involved.
  - (c) It has all the requisite power and authority to carry on its business as it is now being conducted.
  - (d) It has been duly authorized by all necessary action on its part and possesses all the requisite power and authority to execute, deliver and perform this PSA and to hereby consummate the transactions contemplated herein.
  - (e) It knows of no reason why it cannot consummate the transactions contemplated herein.
  - (f) There are no actions, suits or proceedings existing, pending or, to the knowledge of it, threatened against or affecting it before any court, arbitrator or governmental or administrative body or agency that would affect the validity or enforceability of this PSA or that would affect the performance of its obligations hereunder.

11/21/2016  
 WF  
 BUYER'S INITIALS & DATE

11/23/2016  
 MR  
 SELLER'S INITIALS & DATE

Offer Date November 18, 2016, 8:00 [ ] AM [ ] PMBuyer's Name William Frampton et al/assignsSignature William FramptonTitle BUYER

Buyer's Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Buyer's Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

**SECTION T: ACCEPTANCE OR COUNTER OFFER**[ ] T-1 **ACCEPTANCE OF OFFER.** Seller agrees to sell the Property at the price and terms offered above and acknowledges receipt of a copy of this PSA.[ ] T-2 **COUNTER OFFER.** Seller agrees to sell the Property at the price and terms offered above as amended by the attached Counter Offer and acknowledges receipt of a copy of the PSA.**IN EITHER EVENT:**

T-3 Seller agrees to pay to Kokua Realty, LLC at Closing a commission for the sale of the Property pursuant to the commission agreement with Seller's Brokerage Firm, or in the amount of 6% of the purchase price + GET. Seller instructs Escrow to pay the commission directly to Brokerage Firm at closing in U.S. Dollars. These instructions cannot be changed without the written agreement of such identified Brokerage Firm and Seller. Seller further consents to such Brokerage Firm's sharing of the commission with another real estate Brokerage Firm which may have provided services to Buyer for this transaction.

Acceptance Date 11/23/16, 10:00 [ X ] AM [ ] PMSeller's Name Emmanuel Lutheran Church MauiSignature Michael ReileyTitle PresidentSeller's Name Michael Reiley

Signature \_\_\_\_\_

Title \_\_\_\_\_

Seller's Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Seller is a Foreign Person [ ] Non-Hawaii Resident [ ] Owner/Occupant [ ] Other [ ]

WF11/21/2016

BUYER'S INITIALS &amp; DATE

MR11/23/2016

SELLER'S INITIALS &amp; DATE



)

)

)

## Preface

Waikapu Development Venture, LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units pursuant to 201H, Hawaii Revised Statutes (HRS). The proposed project consists of 68 single-family units and 12 duplex units. The proposed development is located at Waiale Road, Wailuku, Island of Maui, Hawaii further identified as TMK: (2) 3-5-002:011 por. The subject property consists of approximately 12.5 acres. The project will be developed under the 210H, HRS and the housing units will be affordably-priced to families making 70 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council. The proposed subdivided residential lots will range from approximately 3,200 square feet to 6,500 square feet along with approximately 29,000 square feet of land for neighborhood passive park.

The proposed project does not involve the use of State and County lands or funds, and there are no other triggers for an environmental assessment pursuant Chapter 343, HRS. As noted, the project will be developed pursuant to 201H, HRS.

This document provides a basis for review and analysis of the proposed affordable workforce residential housing project.



## **Executive Summary**

**Project Name:** Waikapu Development Venture Affordable Workforce Housing Project

**Type of Document:** 201H, Hawaii Revised Statutes Affordable Housing Application

**Accepting Authority:** Department of Housing and Human Concerns  
County of Maui  
2200 Main Street, Suite 546  
Wailuku, Hawaii 96793  
Contact: Ms. Jo-Ann Ridao, Director  
Phone: (808) 270-2805

**Approving Authority:** Maui County Council

**Location:** TMK: (2) 3-5-002:011 por  
Waiale Road, Wailuku  
Island of Maui, Hawaii

**Applicant:** Waikapu Development Venture, LLC  
2145 Wells Street, Suite 303  
Wailuku, Maui, Hawaii 96793  
Contact: Mr. William Frampton  
Phone: (808) 357-1954

**Consultant:** V. Bagoyo Development Consulting Group, LLC.  
1500 Kilinoe Place  
Wailuku, Hawaii 96793  
Contact: Vince G Bagoyo, Jr.  
Phone: (808) 357-3842

**Existing Land Use Designations:** State Land Use District: *Urban*  
County Zoning: *Public-Quasi-Public*  
Community Plan – *Public-Quasi-Public*  
Maui Island Plan – *Urban Growth Boundary*  
Special Management Area – *Not in SMA*

**Project Summary:** The applicant (“Waikapu Development Venture, LLC”) is proposing to develop 80 affordable workforce residential housing units on approximately 12.5 acres of land located at Waiale Road, Wailuku, Island of Maui, Hawaii and further

identified as TMK: (2) 3-5-002:011 por. The proposed project will be 100 percent affordable to qualified individuals earning within the 70 percent to 140 percent of Maui median income as set forth by the County of Maui, Department of Housing and Human Concerns' Affordable Sales Price Guidelines. The proposed workforce housing project will consist of 68 single-family units and 12 duplex units. The proposed 12 duplex units will be sold to qualified individuals earning 70 percent to 80 percent of Maui median income and the 68 single-family units will be sold to qualified individuals earning 81 percent to 140 percent of Maui's median income. The basic parameters of the allocation for affordability are as follows:

- a) 15% (12 units) of the total project will be priced to families earning 70% to 80% of Maui's median income.
- b) 15% (12 units) of the total project will be priced to families earning 81% to 100% of Maui's median income.
- c) 50% (40 units) of the total project will be priced to families earning 101% to 120% of Maui's median income.
- d) 20% (16 units) of the total project will be priced to families earning 121% to 140% of Maui's median income.

The project will also include a neighborhood passive park. Related improvements include

[

[

[

[

[

[

[

[

[

C

103

10

103

1



0

1

1



identified as TMK: (2) 3-5-002:011 por. The proposed project will be 100 percent affordable to qualified individuals earning within the 70 percent to 140 percent of Maui median income as set forth by the County of Maui, Department of Housing and Human Concerns' Affordable Sales Price Guidelines. The proposed workforce housing project will consist of 68 single-family units and 12 duplex units. The proposed 12 duplex units will be sold to qualified individuals earning 70 percent to 80 percent of Maui median income and the 68 single-family units will be sold to qualified individuals earning 81 percent to 140 percent of Maui's median income. The basic parameters of the allocation for affordability are as follows:

- a) 15% (12 units) of the total project will be priced to families earning 70% to 80% of Maui's median income.
- b) 15% (12 units) of the total project will be priced to families earning 81% to 100% of Maui's median income.
- c) 50% (40 units) of the total project will be priced to families earning 101% to 120% of Maui's median income.
- d) 20% (16 units) of the total project will be priced to families earning 121% to 140% of Maui's median income.

The project will also include a neighborhood passive park. Related improvements include

grading, the construction of drainage system,  
construction of internal roadway, utilities, and  
construction of residential dwelling units.

The proposed project will be filed pursuant 201H,  
Hawaii Revised Statutes (HRS). This document has  
been prepared to serve as project's 201H  
application. It provides a basis for review and  
analysis of the proposed affordable workforce  
residential housing project along with the proposed  
neighborhood passive park and related  
improvements.

## ***I. Project Overview***





## **I. PROJECT OVERVIEW**

### **A. PROPERTY LOCATION, EXISTING USE AND LAND OWNERSHIP**

The applicant for the proposed workforce housing project is Waikapu Development Venture, LLC ("Applicant") and whose mailing address is 2145 Wells Street, Suite 303, Wailuku, Maui, Hawaii 96793. The applicant is buying a portion of TMK: (2) 3-5-002:011 por, approximately 12.5 acres from Emmanuel Lutheran Church (ELC), current owner of the subject property. The applicant entered into a purchase agreement with ELC to buy the approximately 12.5 acres for the proposed project (see attached executed purchase agreement). The subject parcel is identified as TMK: (2) 3-5-002:011 por. It is also known as Lot A of the Waikapu East (Large Lot) Subdivision. The proposed project will encompass the southern 12.5 acres of the 25.263-acre parcel. The remaining northern portion of the property is owned and utilized by Emmanuel Lutheran Church. The property is bordered by the undeveloped Lot J of the Waikapu East (Large Lot) Subdivision to the north, Waiale Road to the East; Honoapiilani Highway to the West, and the Valley Isle Fellowship Church and Waiale Elua Subdivision to the south.

The proposed project consists of 68 single-family lots and 12 duplex units for a total of 80 residential workforce units. The project will have lot sizes ranging from approximately 3,200 square feet to 6,500 square feet. Proposed improvements include paved roadways, concrete curbs, gutters and sidewalks; landscaping, underground utilities, and a neighborhood green (see Appendix B, Preliminary Site Plan). The subject property is within the State Land Use Urban District, County zoned public-quasi, Community Plan public quasi, and Maui Island Plan Urban Growth Boundary. The proposed project will be sold in fee as house and lot package.

The subject property is adjacent to existing recently-developed 411 affordable workforce housing subdivision known as Waikapu Gardens Subdivision Phase I and recently-completed 56 Waikapu Gardens Phase II affordable workforce housing project. Immediately south of the proposed project is the 70 lots Waiale Elua affordable workforce housing project. The proposed project is an ideal extension of the existing Waikapu Gardens Phases I and II subdivisions affordably-priced for Maui's working families.

The subject site is currently vacant and the north portion of the property is planned to be used by the Emmanuel Lutheran Church's proposed school. The proposed project site that is under purchase agreement consists of approximately 12.5 acres which will be conveyed to the applicant upon completion of the subdivision of the subject parcel.

## **B. PROPOSED ACTION**

The applicant (Waikapu Development Venture, LLC) is requesting approval of its proposed project pursuant to 201H, Hawaii Revised Statutes, for the use of the subject property for affordable workforce residential housing subdivision. Upon receipt of applicant's 201H, HRS application approval, the applicant proposes to develop approximately 68 improved lots and single-family dwelling units and 12 duplex units for a total of 80 residential units. The residential lots will range in size approximately 3,200 square feet to 6,500 square feet and will be sold in fee simple (see Appendix B, Preliminary Site Plan). The proposed residential workforce housing project will be 100 percent affordable to qualified individuals earning within the 70 percent to 140 percent of the Maui median income as set forth by the County of Maui, Department of Housing and Human Concerns Affordable Sales Price Guidelines. The 12 duplex units will be sold to qualified individuals earning 70% to 80% percent of Maui's median income. The 68 single-family residential lots will be sold to individuals earning 81% to 140 percent of Maui's median income. Along with the proposed affordable housing



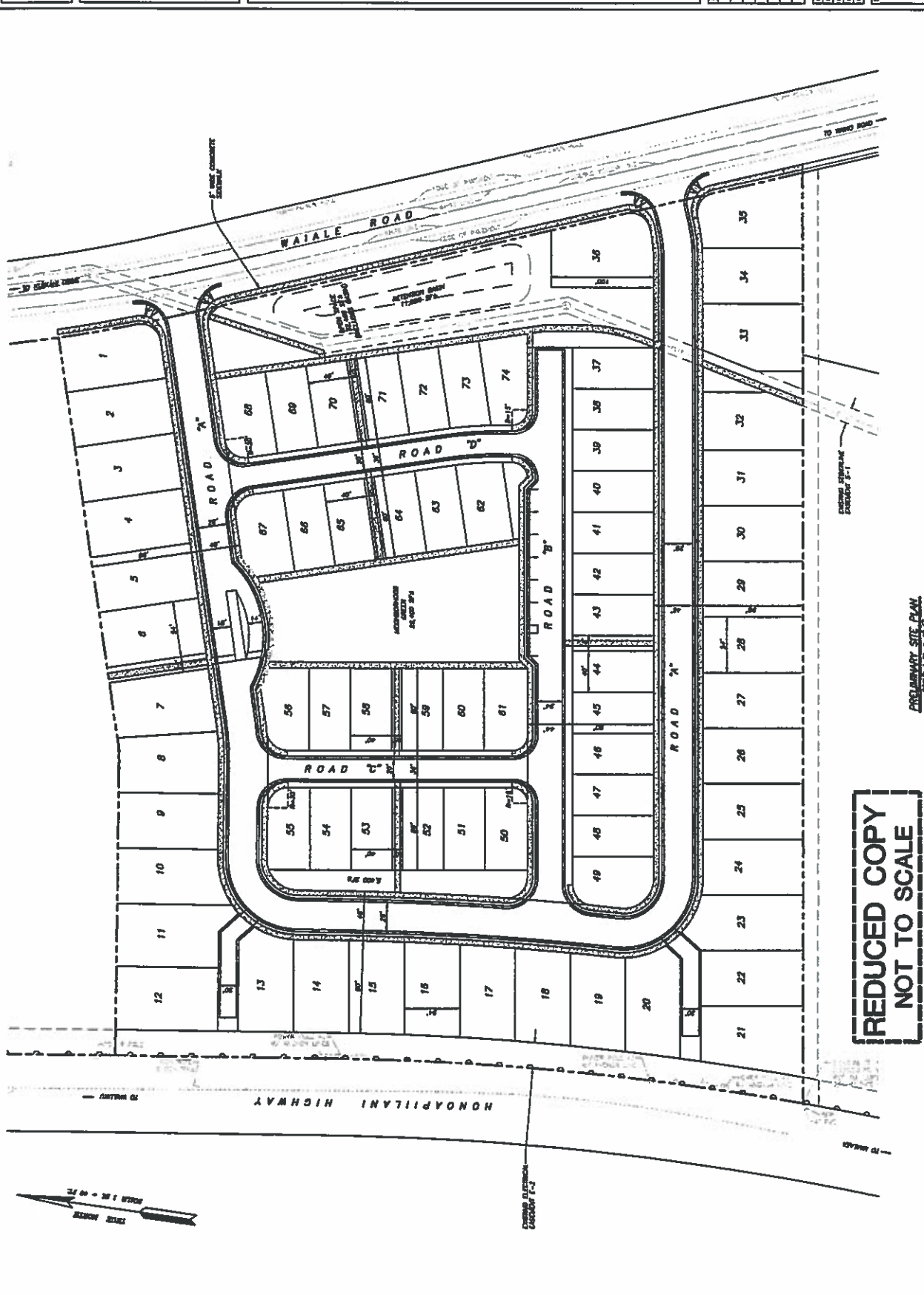
APPROVED FOR THE  
STATE OF HAWAII  
DATE: 10-10-10  
BY: [Signature]

WAIKAPU DEVELOPMENT VENTURE  
T.M.K.: (2) 3-5-002: 011  
WAIKAPU, WAILUKU, MAUI, HAWAII  
PRELIMINARY SITE PLAN

NO.	DATE	REVISION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

OWNER: KOTOMO ENGINEERING, INC.  
PROJECT NO.: 1000-10  
PROJECT NAME: WAIKAPU DEVELOPMENT VENTURE  
DATE: 10-10-10

SHEET NO. 1 OF 1



project, the applicant is proposing to include a neighborhood passive green park measuring approximately 29,000 square feet. Also planned are related infrastructure improvements required for the proposed project, such as grading, the construction of internal roadways, drainage systems, utilities, and construction of residential dwelling units. The sales price for the proposed affordable house-lot package will be based on the Maui Department of Housing and Human Concerns' Affordable Sales Guidelines for qualified families earning 70 percent to 140 percent of Maui's median income. The proposed project will be sold as house and lot package in fee simple.

A market demand study for the proposed project was prepared by R.W. Spangler, LLC (see Appendix K referred to as Market Demand Study). The primary objectives of the market demand study is to identify and analyze the current supply and demand conditions specific to the subject market; and identify, measure and forecast the effect of anticipated developments or other factors on future supply. The market demand study prepared for the proposed project has concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable housing to address the substantive shortage of entry-level housing priced for Maui County households within the 70% to 140% of Maui's Area Median Income (AMI). The above conclusion by the market demand study is based on its detailed findings and supported by the following:

- a) Strong local new housing demand: annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected demand of which roughly one-third is from buyers under 141% of AMI;
- b) Suitability of proposed project physical characteristics relative to Central Maui demand preferences (two-to-four-bedrooms, principally detached single-family);
- c) Proposed project housing pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017;

- d) Proposed project size is only 2.8% of the projected Maui housing demand through 2025 for 71% to 140% MI;
- e) Excess demand for affordable projects reflected by the complete pre-sale absorption prior to construction within the local and extended Maui-wide markets; and
- f) Shortage of new development and inventory.

Based on project's preliminary market demand study prepared by R.W. Spangler, LLC (See attached Appendix K referred to as Market Demand Study) – the report shows that there is a very strong demand for affordably-priced single-family housing subdivision in Central Maui, especially families earning 70 percent to 140 percent of Maui's median income. These are the working families that this proposed affordable housing project will serve. There's a great demand for affordably-priced single-family residential housing project on Maui.

According to the Hawaii Housing Planning Study, 2011 prepared by SMS Research and Marketing Services, Inc. for the County of Maui, among Maui's 53,621 households in 2011, about 56 percent were homeowners. The study further reports that a "significant number of Maui households live in overcrowded conditions or are double-up with other families". In the past four years, crowding has begun to increase and is presently over 11 percent, according to Hawaii Housing Planning Study, 2011. According to SMA Research, Housing Demand Survey measures demand as interest in moving to a new housing unit. In 2006, Maui County demand led the State. Nearly 45 percent of all Maui County households expressed a desire to move to a new home in the near future, the study notes. Based on these conclusive findings by SMS Research's Hawaii Housing Planning Study, 2011, the applicant's proposed affordable housing project will undoubtedly help meet the housing demand on the island of Maui, especially families earning between 80 percent to 140 percent of Maui's median income.

The proposed single-family dwelling unit sizes will range from approximately 1,200 square feet to 1,800 square feet, 3-bedroom/2-bath home and the duplex units will range in size 700 square feet to 900 square feet, 2-bedroom/1 bath unit. Refer to Appendix L that shows the preliminary house floor plans for the proposed project.

The applicant's market demand Consultant, R.W. Spangler, LLC, has researched the current prevailing sales prices for similar affordable housing project in the Central Maui area, more specifically, the 411-affordable housing project in Waikapu recently developed by Spencer Homes Development. The price range being proposed by the applicant will meet those earning 70 percent to 140 percent of Maui's median income families and affordably-priced for Maui's working families.

The estimated cost of the subdivision improvements is approximately \$4 million and the estimated cost for the construction of the dwelling units is approximately \$18 million. Construction of the subdivision improvements and the dwelling units and related infrastructure improvements is anticipated to begin as soon as all permitting approvals of applicant's 201H application have been received. The applicant anticipates that the completion of the project is expected to take 36 months to complete barring no unanticipated delays.

### **C. REASONS FOR JUSTIFYING THE REQUEST**

The proposed project will provide affordable single-family dwelling units for sale to those earning 70 percent to 140 percent of Maui's median income families with sales price according to Maui Department of Human Concerns' Affordable Sales Guidelines. The entire proposed project will be 100 percent affordable. The project is adjacent to Waikapu Gardens affordable housing project and the recently-approved Waiale Elua affordable workforce housing project. The proposed site is located in very close proximity of old Waikapu residential village

town and Waiolani residential subdivision. The proposed project is designed to be compatible with existing residential subdivision within Waikapu town village and neighboring subdivision.

With the 2012 median price of single-family units at \$465,000, many Maui working families earning 80 percent to 140 percent of the median income are unable and have difficulty purchasing a house and lot package at the current median sales price. With this proposed affordable housing project, it will allow families the opportunity to purchase a home that they can comfortably afford.

As noted earlier in this report, based on the project market demand study prepared by R.W. Spangler, LLC (see Appendix K) there is a great need for affordable housing dwelling units within the price range as proposed by the applicant those families earning 80 percent to 140 percent of Maui's median income. The median price of a single-family home in Maui County soared to over \$760,000 in March 2017, the highest month benchmark in more than a decade, according to the Realtors Association of Maui. But it remains to be seen whether the highest middle-of-the-road home value seen since the third quarter of 2006 is a aberrant spike or part of a trend toward ever-higher price tags for Maui homes. With the increase of median price of single-family units and lack of housing supply, many Maui working families earning 70 percent to 140 percent of the median income are unable and have difficulty purchasing a house at the current median sales price. With this proposed affordable workforce housing project, it will allow families the opportunity and entry to homeownership.

According to the Wailuku-Kahului Community Plan District it encourages the development of affordable housing within the region. Under the community plan, its housing policy goal specifically states that "*a sufficient supply and choice of attractive, sanitary and affordable housing accommodations for the broad section of residents, including the elderly*". Similarly, the Maui Countywide Policy Plan adopted by Ordinance No. 3732 and took effect on March 24, 2010, states in its



goals, objectives, policies, and action to *“expand housing opportunities for residents”* in order to *“reduce the affordable housing deficit for residents”*. With the applicant’s proposed affordable housing project at the proposed site will meet a significant community need as noted within the Wailuku-Kahului Community Plan District and in the Maui Countywide Policy Plan.

**D. ENTITLEMENTS APPROVALS REQUIRED**

The proposed affordable workforce housing project will be developed 100 percent affordable targeting families earning 70 percent to 140 percent of Maui’s median income as set forth by Maui County Department of Housing and Human Concerns’ Affordable Sales Guidelines. This application is filed and processed and approved by Maui County pursuant to 201H, HRS. Under Section 201H-38, Hawaii Revised Statutes promotes the development of affordable housing project by providing exemptions from *“all statutes, ordinances, charter provisions, and rules of any government agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon”* provided that the proposed housing project is consistent with the purpose and intent of 201H-38, HRS, and meets minimum requirements of health and safety. This proposed project will be consistent and in compliance with the requirements pursuant to 201H, HRS.

The subject property is within the State Land Use Urban District. Pursuant to 201H-38, Hawaii Revised Statutes, the applicant is requesting exemptions from Community Plan Amendment (CPA) and Change-In Zoning (CIZ) processes, as well as other County requirements to expedite the implementation and delivery of the proposed affordable workforce housing units to Maui’s residents without compromising health and safety considerations. This project meets the intent of Maui Countywide Policy Plan and the Wailuku-Kahului Community Plan District goals and objectives relating to providing and expanding affordable housing opportunities for Maui’s residents.

The proposed action does not involve the use of any State and County funds or lands, it is not within the shoreline area or conservation district, and it is not within any historic site designated in the National Register or Hawaii Register; hence, there are no other triggers for an environmental assessment pursuant to Chapter 343, Hawaii Revised Statutes.

As noted above, the proposed project site is in the Urban Growth Boundary (UGB) designation within the approved Maui Island Plan (MIP) and it is outside of protected areas per MIP..



## ***II. Description of the Existing Environment***



## **II. DESCRIPTION OF THE EXISTING ENVIRONMENT**

### **A. PHYSICAL SETTING**

#### **1. Project Site History**

The subject site is currently vacant. The project area is located along the northeastern alluvial slopes of the West Maui Mountains in Waikapu and Wailuku *ahupua`a*. It is bounded by Honoapiilani to the west, Waiale Road to the east, and a recent housing project to the south. During the mid-1800's this area was cleared for sugar cane and pineapple agriculture. According to the former owner, Wailuku Agribusiness Company the site was formerly used for sugar cultivation until the late 1970's when sugar production ended. All of these above noted operations at the subject site have ceased operation and the said site is now fully vacant.

#### **2. Surrounding Land Uses**

The Waikapu village town community is located immediately west of the subject property. Waikapu town is an old plantation community originally developed as a sugar plantation village. Today, Waikapu is primarily a residential community with limited lands allocated for commercial use along Honoapiilani Highway. South of the subject property are 467 Waikapu Gardens Phase I and II affordable workforce housing subdivisions and recently approved 70 lots Waiale Elua affordable housing project. There are newer residential subdivisions that have been developed southwest or mauka of the subject property. Such residential projects are: Waiolani subdivision and Waiolani Elua residential projects. Kehalani subdivision located west or mauka of the subject property; and Wailuku Heights subdivision located about west of the subject property.

North boundary of the project site is Kehalani commercial Center and east of the property is Maui Lani Parkway commercial center. The Maui Tropical Plantation is located at the southern extent of Waikapu, approximately a mile south west of the subject property. The eastern boundary of the property is along Waiale Road and west of the property is Honoapiilani Highway. Honoapiilani Highway provides access to Wailuku Town, South and West Maui, as well as Waiehu and Waihee communities.

3. **Climate**

Maui's climate is relatively consistent through out the year. The island's climate varies from terrain. Characteristic of most of Maui's climate, the proposed project site experiences mild and uniform temperatures year-round, moderate humidity and consistent northeasterly trade winds.

Average temperatures at the project site (based on temperatures recorded at Kahului Airport) range from low 60 to high 80 degrees Fahrenheit.

August is historically the warmest month, while January and February are the coolest. Based on rainfall data from the Maui County Data Book, annual precipitation rainfall average is 20 to 30 inches per year. Winds blow predominantly out of the north-northeasterly direction.

4. **Topography and Soils Characteristics**

The existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet at the Waiale Road (eastern boundary).

The subject property has average slope of approximately 4.8%. As noted earlier in this report, the project site is currently vacant and was previously used for pineapple and sugar cultivation.



According to the “Soil Survey Geographic database for the Island of Maui (September 2014) prepared by the United States Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and Iao silty clay (IaA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. Iao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

The State Department of Agriculture has established three categories of Agricultural Lands of Importance to the State of Hawaii (ALISH). These are: “Prime” agricultural lands which have soil quality, growing season, and moisture supply needed to produce sustained high yield of crops economically when treated and managed according to farming methods; “Unique” agricultural lands which have the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and of high yields of specific crop when treated and managed according to modern farming methods; and, “Other” important agricultural lands are lands other than Prime or Unique agricultural lands that are also of statewide or local importance for agricultural use.

As indicated by the ALISH map (refer to Appendix N) a portion of the subject property falls within the “Prime” agricultural land category and a portion falls within the “Other” land category. The small portion of the subject property that is classified “Prime” agricultural land is located at the western portion of the property. According to the former landowner, Wailuku Sugar Company, this portion of the property was used for sugar cane cultivation and it ceased operation in 1970s and it has remained vacant since the closure of its sugar cane operation. As noted earlier in this report, the subject property is undeveloped and is not presently used in any agricultural cultivation.

5. **Flood and Tsunami Hazard**

The proposed project site is located near the base of the West Maui Mountains. According to Panel Numbers 150003 0391E of the Flood Insurance Rate Map (FIRM), dated September 29, 2009, prepared by the United States Federal Emergency Management Agency (FEMA), the project site is situated in Flood Zone X. Flood Zone X represents areas outside of the 0.2% annual chance flood plain. The classification of the subject property as Flood Zone X is further confirmed by the Maui County Planning Department's Zoning and Flood Confirmation Form (refer to Appendix M) and no flood development permit is required.

6. **Flora and Fauna**

As noted earlier in this report, a portion of the project site was formerly used by its former owner, Wailuku Agribusiness Company, for sugar cane and pineapple cultivation and the site has been vacant and remained fallow since it ceased sugar operation in the early 1970s.

Biological resources survey (flora and fauna survey) was conducted at the property by Robert W. Hobdy (Environmental Consultant) on July 2017 (refer to Appendix I). Flora and fauna survey field work of the project site was performed by the Consultant. The primary objectives of the field survey were to: a) document what plant, and animal species occur on the property or may likely occur in the existing habitat; b) document the status and abundance of each species; c) determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered; and d) determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

According to the flora and fauna field survey by Mr. Robert Hobdy, the vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest and concern. Just one common indigenous plant, 'uhaloa was found growing in the area. No Federally listed Endangered or Threatened plant species (USFWS, 2017) were found, nor do any plants that are candidates for such status occur on the project area. No special plant habitats were identified during his field inspection of the project site. According to Mr. Hobdy the proposed project is not expected to have any significant negative impacts on the botanical resources of the area.

With respect to fauna survey, a walk-through survey method was conducted by the consultant in conjunction with the botanical survey. According to the consultant, all parts of the project site were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. In addition, an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaii hoary bat. According to Mr. Hobdy, the wildlife within the project area was composed primarily of non-native species. Just two species were native in Hawaii: the endemic and endangered Hawaiian hoary bat and the indigenous globe skimmer dragonfly (see Appendix I). A single bat was detected in one portion of the project area. It was recommended by Mr. Hobdy to seek guidance with U.S. Fish and Wildlife Service to protect this bat. It is further recommended by Mr. Hobdy that trees greater than 15 feet in height should not be removed between the months of April and mid-September. The globe skimmer dragonfly is common throughout Hawaii and it carries no protective status and is of no particular environmental concern. There was no Blackburn's sphinx moth or nene (Hawaiian goose) found nor seen in or around the project area.

As a result of these findings by Mr. Hobdy, it is determined that there is little of environmental concern beyond the recommendations offered with regard to animal life within the proposed project. The development of the proposed project is not expected to have a significant negative impact on the native wildlife resources in this part of West Maui.

7. **Streams and Reservoirs**

Waikapu stream is located about half a mile south of the proposed project site. Waikapu stream is perennial stream which originates in the upper reaches of Waikapu Valley, ultimately discharging into Kealia pond, in the Maalaea flats. According to the Hawaii Stream Assessment, the Waikapu Stream has no listed tributaries and flows to the sea year-round. The said assessment also found that the Waikapu Stream was important for taro cultivation in the past and that Waikapu Valley may contain valuable cultural and historical sites (Hawaii Cooperative Park Service, 1990). It is important to note that some families at Waikapu Village (located about a mile southwest upstream or mauka of the proposed project site) began to rehabilitate old taro patches and began cultivating taro at new rehabilitated taro patches. There is a plantation reservoir located west or mauka across Honoapiilani Highway of the project site and specifically located below the existing Wailuku Heights residential subdivision. This reservoir is used and maintained by Wailuku Water Company.

There are no identified wetlands on the project site. Nothing remotely approaching the three essential criteria that define a federally- recognized wetland, namely: hydrophytic vegetation; hydric soils; and, wetland hydrology occurs within this dry project site.

**8. Air Quality**

There are no point sources of airborne emissions within close proximity of the project site. Air quality in the vicinity of the project site may be affected by a variety of sources, including dust from construction activities south of the project site. Vehicular traffic on nearby roadways including, Honoapiilani Highway and Waiale Road are the primary sources of pollutants. However, these sources are intermittent and prevailing winds quickly disperse the particulates generated by these temporary sources. These activities do not result in adverse regional air quality impacts.

Overall, air quality in the Central Maui region, and more specifically, air quality in Waikapu-Wailuku-Kahului regions is considered excellent.

**9. Noise**

Traffic noise from Waiale Road located east of the subject project and Honoapiilani Highway located west of the subject property are the predominant sources of noise in the vicinity of the project site. However, this activity is temporary in nature. Also, on intermittent basis, noise from construction activities at Maui Lani Parkway and Kehalani subdivision located east and northwest, respectively, of the subject property are the secondary sources of background noise, as well as natural conditions such as wind and rain.

**10. Scenic and Open Space Resources**

Waikapu Valley and the West Maui Mountains, including Haleakala Mountain to the east define the scenic resources of the project site. Immediately south boundary of the project site is Valley Isle Fellowship Church and the proposed Waiale Elua affordable workforce housing

project. Also, north of the project site is Kehalani Commercial Center. The subject property has an unobstructed view of the East Maui Mountain and Haleakala Mountain and the West Maui Mountains. The project site is not part of a scenic corridor.

**11. Hazardous Materials**

An Environmental Site Assessment – Phase I Investigation was conducted for the subject property by Vuich Environmental Consultants, Inc. Both site reconnaissance and records review of the subject property, as well as the surrounding areas, were completed. The Phase I Environmental Site Assessment (ESA) was conducted to determine if the site may be contaminated with hazardous or toxic substances or waste resulting from current or past activities, unauthorized dumping or disposal, or migration of contaminants from adjacent or nearby properties. The goal of the ESA is to identify *recognized environmental* conditions on the property that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products. These release conditions apply to structures on the property as well as the soil, groundwater, or surface water of the property. The study objectives are to characterize the environmental setting of the subject property, to identify any obvious activity of environmental concern that may have occurred at or near the site, and to evaluate potential migration pathways for any identified contaminants. It may also address any activities that affect future considerations for potential environmental impairment to the property.

As noted above, Vuich Environmental Consultants, Inc. has performed the Phase I ESA in conformance with the scope and limitations of the ASTM Standard 1527-00 for the subject property. According to the ESA report prepared by the consultant, the subject site is not listed in any federal or state database hazardous site. The assessment revealed no evidence of

recognized environmental conditions in connection with the property. The report finds no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property (see Appendix O for more detailed information).

## **12. Archaeological Resources**

An archaeological inventory survey was conducted on the subject property by Archaeological Services Hawaii, LLC ("Consultant"). The archaeological inventory survey was conducted by the Consultant on May 2004 and July 2004, and updated in May 2016 in response to request by SHPD. The purpose of the archaeological survey was to determine the presence/absence, nature, and extent and significant of any cultural and archaeological resources in the proposed project area. A total of 25 backhoe trenches were strategically placed by Consultant's personnel in various areas of the subject property. Subsurface testing included the excavation of a series of 25 mechanical backhoe test trench excavations across accessible areas throughout the subject property.

No significant cultural remains were encountered during trenching and representative stratigraphic profiles were recorded. Based on the negative results of the fieldwork, according to the Consultant, no further inventory level work is recommended prior to commencing construction activities. Further discussions and details on the result of the archeological inventory survey can be found in Consultant's attached report identified as Appendix C. The archaeological report has been accepted by the State Historic Preservation Division on July 1, 2016 (see Appendix D, SHPD acceptance letter).

Also, an archaeological monitoring plan (AMP) has been prepared by Archaeological Services Hawaii, LLC for the proposed project site (see



Appendix E- Archaeological Monitoring Plan dated May 2018). Per AMP, archaeological monitoring will be performed for all disturbing activities associated with the development of the proposed project.

**13. Cultural Assessment**

Chris Hart & Partners, Inc. conducted a cultural impact analysis (CIA) of the project area for the project's State Land Use Urban District Boundary amendment under LUC Docket No. A07-773. In LUC's Conclusion of Law and Decision and Order for the project's urban boundary approval the CIA analysis included consideration of the history of the project area which have been in heavy industrial agricultural operations for the past century, research on nearby parcels in the vicinity of the project area, and review of informant interviews and archival research conducted for several projects in the vicinity of the project area, specifically Waiolani Mauka Subdivision and the Spencer Homes project. Based on the results of the CIA analysis by Chris Hart & Partners, Inc. the project will not have any adverse effects on Native Hawaiian traditional and customary rights which would require protection under Article XII, Section 7, of the Hawaii State Constitution.

**B. SOCIO-ECONOMIC ENVIRONMENT**

**1. Population**

The population of the Island of Maui has increased dramatically over the last two (2) decades. The 2000 population was estimated at 117,644, an increase from 1990 of 91,361 (County of Maui 2030 General Plan - Countywide Policy Plan). According to the Maui Countywide Policy Plan, Maui's resident population is expected to grow from 129,471 in 2005 to 176,686 in 2030. This is a 1.46% annual growth rate which

equates to a 36.5% increase in population over the 25-year period. These projections, according to draft Maui Island Plan indicate a population increase of 16% between 2010 and 2020, and an increase of 12% between 2020 and 2030.

According to the *Socio-Economic Forecast* as noted in the Maui Island Plan, the total population is not expected to increase equally throughout the island, rather, there are specific regions where population growth is more likely to occur. To further illustrate the population growth that will likely occur, there are four community plan regions that are in close proximity of the proposed project site, namely: Kihei-Makena, Wailuku-Kahului, Makawao-Pukalani-Kula, and Paia-Haiku regions. The combined population growth within these regions is: population in 2005 is 107,621; in 2010 is 112,716, and in 2020 is expected to grow at 130,774, and in 2030 the combined population in these regions will reach at a staggering 146,777 (according to Maui Countywide Policy Plan). Within the Wailuku-Kahului District the population in 2015 is approximately 52,343 and it is expected that the population by 2030 will be 64,853. The Wailuku-Kahului district represents the largest population center with 37% of the island residents.

Because of the proposed project unique central location between Wailuku-Kahului Community Plan District and Kihei-Makena Community Plan District, and its close proximity with Paia and Upcountry Community Plan regions, the proposed project will help meet the demand for affordable housing units in these Maui community plan districts.

## **2. Housing**

According to the SMS Hawaii Housing Planning Study, 2011 prepared for the County of Maui, among Maui's 53,621 households in 2011, about 56

percent were homeowners and 93 percent of them owned their property fee simple. The report further stated that a significant number of Maui households live in overcrowded conditions or are ‘doubled-up’ with other families. According to the SMS report, in the past four years, crowding has begun to increase and is presently over 11 percent. Since 2003, doubling up has increased to 10 percent in 2006 and 13 percent in 2011.

In the County of Maui 2030 General Plan – Countywide Policy Plan rightfully notes that “shelter is among the most basic of human needs.” The affordability, quality, and location of housing – including the degree of crowding within the home and within the neighborhood – play an enormous role in the quality of life of Maui County’s residents.

The SMS Socio-Economic Forecast for Maui County notes that the island of Maui’s housing supply in the year 2000 is estimated at 40,041 units of which 32 percent or 12,852 were located in the Wailuku-Kahului Community Plan District. This region accounts for the largest percentage of housing units on the island. Demand for housing in this community plan region in the year 2000 was estimated at 13,528 units. Housing demand in the Wailuku-Kahului district is projected to grow to 16,826 units in the year 2010 while the expected number of households is estimated at 15,985 units. By the year 2020, the projected housing demand will reach 20,054 units compared to household count of 19,051, according to SMS findings.

A Market Demand Study for the proposed 80-unit Waikapu Development Venture affordable workforce housing project was prepared for the project by R.W. Spangler, LLC in August 2017 see Appendix K, Market Demand Study). The market demand study is to analyze the residential real estate market as it relates to the proposed project. In particular, the report studied economic trends and demographics, and supply and demand

factors for residential property. The study also gathered as much information as possible on real estate sales on Maui while focusing on the Central Maui market. The objectives of the market analysis were: (1) to define and delineate the market area; (2) to identify and analyze the current supply and demand conditions specific to the proposed project's market; (3) identify, measure and forecast the effect of anticipated developments or other factors on future supply. The demand market study by R.W. Spangler, LLC concluded that the proposed development will be well received by the local market and will be an incremental, et important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 70% to 140% of Area Median Income (AMI). According to the Market Demand Study by ACM Consultants, Inc. the demand for housing still exist and many who are willing to buy in today's market are finding it easier to obtain financing, as compared to the late 2000. The report further notes that it is safe to assume that as economic conditions continue to improve, housing units within the affordable and workforce segments will be the most sought after. As the market conditions improve, the proposed project can expect to see heightened demand, due to its Central Maui location and affordable price points. This proposed affordable workforce housing project will give entry-level market participants an opportunity for home ownership. The Housing Demand Survey prepared for Maui County by SMS (2011) shows nearly 47 percent of all Maui County households expressed a desire to move to a new home in the near future.

According to the recent report by Realtors Association of Maui, the median price for single-family home on Maui in July 2017 was 17% more than it was at the same time last year, but that's just the new normal in 2017. For the fourth time this year, the median price median of a home in Maui County was above \$700,000, according to the recent report from the

Realtors Association of Maui. The year-to-date median price for single-family home is now 13% higher than the same time period of last year (705,000 versus \$626,000). According to the project's market demand study the proposed 80-unit affordable workforce housing project is well positioned to meet the housing demand in Central Maui region.

According to Maui County Department of Housing and Human Concerns' Affordable Sales Guidelines the median household income for the Island of Maui in 2017 is 74,100 as compared to the median income in 2016 at \$81,100. The 2017 median income for the Island on Maui is approximately 10% less than last year's median income.

### 3. Economy

The Wailuku region is the island's center of governmental activities, as well as a focal point for professional and business services. Combined with neighboring Kahului, the region's economic character includes a wide range of commercial, service, and governmental activities. Another important economic engine in Kahului region is the harbor and airport transportation systems critical to Maui's economy. Also, within the Kahului region is the University of Hawaii Maui College and the Maui Center for Cultural Arts that contributes significantly to our economy in the region.

In the Kihei-Makena Community Plan region is one of the island's well-planned visitors resort destination, the primary economic engine for the island of Maui. In the same region, is the home of the research and technology park which contributes significantly to the island's economy.

Since the closure of HC&S sugar cane cultivation last year 2016, approximately 36,000 (more or less) acres that may be available for future

agricultural activities that may add to Maui's economy. Also, another important agricultural activity that contributes significantly to Maui's economy is Monsanto Seed Farm located approximately 6 miles south east of the proposed project area, which currently employs approximately 500 Maui residents

Another important economic engine within the region are tourism-related activities such as the popular Maui Ocean Center located at Maalaea (located south of the project area) and the Maui Tropical Plantation located at the base of Waikapu Valley at West Maui Mountain. These two tourism-related activities are located within 1 to 3 miles south and southwest of the proposed project site.

Another important key economic driver that fuels the economy within the region and the island of Maui are healthcare-related businesses such as the Maui Medical Group, Keiser Permanente, and the 200+ beds Maui Medical Center Hospital. There are also elderly long-term residential facilities in the region that substantially contribute to region's economy such as Hale Makua, Hale Mahaolu and Roselani elderly residential complexes. These facilities are located within a mile to 2 miles north of the subject project site. It is estimated that these health-care related facilities have a combined number of direct employees of approximately over 2,000.

#### 4. **Employment**

The Island of Maui recorded a 2.9 percent unemployment rate in April 2017, up from 2.8 percent rate recorded in March, and unchanged from the 2.9 percent rate reported in April of last year. Important to note, the State Department of Labor and Industrial Relations is attributing the Maui Region hospital privatization as being mostly responsible for a large

growth of workers in the educational and health services jobs sector in July 2017. The educational and health services category increased by 2,300, according to the report. Maui County unemployment rate dipped to 2.7 percent in July, down from 3.4 percent in June and from 3.3 percent a year ago, the State Department of Labor and Industrial Relations reported. According to recent report, Maui County's economic picture is marked by impressive tourism industry rebound, which is the major economic drivers for Maui's economy.

According to the project's market demand report, the strength of the economy is largely measured by job growth, which exhibited signs of improvement. Maui County saw a net gain of 1,000 jobs or a 1.3 percent increase in the first quarter of 2017 over the same quarter of 2016. Jobs gained the most in Arts, entertainment & recreation (500 jobs), followed by Natural Resource, Mining, and construction (200 jobs). The largest private sector job losses occurred in accommodations (200 jobs lost). Government added 100 jobs in the quarter. Maui County employment is heavily concentrated in government and hospitality industry.

According to the Maui County Data Book, 2015, total wage and salary jobs in Maui County is approximately 73,230, and by 2020 to 2030, it is projected to be approximately 77,140 and 84,170, respectively. Most of the jobs are in accommodations and food services; trade; government; and other services. It is anticipated according to recent report by First Hawaiian Bank – Economic Forecast that robust tourism propels Maui's economy in 2016. The report further confirms that visitor sector has led the way and looks promising as more capacity comes on line; County's labor market is strong; and construction, which has been bolstered by public infrastructure, seems ready to break out as greater commercial construction leads into more residential building activity.



## **C. PUBLIC SERVICES**

### **1. Police and Fire Protection**

Police protection for the Wailuku-Kahului region is provided by the Maui Police Department (MPD) located at Wailuku Station headquartered at its main station at Kaahumanu Avenue in Wailuku located approximately 2 miles north of the project area. The Maui Police Department provides investigative services, uniform patrol services, technical support, and traffic services as stated in its mission to protect the residents on Maui County. As noted earlier, the station is located in very close proximity of the project site.

Fire prevention, protection, rescue, and emergency services for the Wailuku-Kahului region are provided by the Maui County Department of Fire and Public Safety. The department has 2 stations to service the Wailuku-Kahului region that is in close proximity of the project site. The Wailuku station is located in Wailuku town approximately 2 miles north of the project site and the Kahului station is located at Dairy Road, Kahului located approximately 2.5 miles east of the project site.

### **2. Medical Facilities**

State-owned Maui Memorial Medical Center (MMMC) and now managed by Keiser Permanente effective July 1, 2017, the only major medical facility on the island, services the Wailuku-Kahului region. Acute, general, and emergency care services are provided by the 200+ beds Maui Health System (MHS) facility located in Mahalani Street, Wailuku, about 2 miles north of the subject property. Also, the Kula Hospital managed by Keiser Permanente located approximately 20 miles east of the subject property provides emergency and long-term care services.

In addition, Keiser, Maui Medical Group, Maui Medical Clinic, and Liberty Dialysis Clinic serve health care needs for the Island of Maui, all located in Wailuku and Kahului, about 2 miles north of the subject property. Dental and other medical offices are also located within Wailuku-Kahului region to serve its residents and visitors, and are within 2 miles or less from the proposed project site.

**3. Schools**

The State Department of Education (DOE) operates 8 schools in the Wailuku-Kahului region, as well as several privately-operated schools serving elementary, intermediate, and high school students. Public school facilities within the Wailuku-Kahului District area include: H. Perrine Baldwin High (grades 9-12), Maui High School (9-12), Iao Intermediate (grades 6-8), Wailuku Elementary (K-5), Waihee Elementary (K-5), Maui High (9-12), Pomaikai Elementary (K-5), Kahului Elementary (K-5), Lihikai Elementary (K-5), and Maui Waena Intermediate (6-8). Puu Kukui Elementary School (K-5) located in Wailuku.

Privately-operated schools serving Wailuku-Kahului region include St. Anthony School (grades K-12), Kaahumanu Hou Christian School (grades K-12), Emmanuel Lutheran School (K-6), and Maui Adventist School (grades 1-8).

University of Hawaii Maui College (part of University of Hawaii system) located in Kaahumanu Avenue, Kahului serves the college needs of Maui residents. The college has recently become a full pledge four-year university.

According to the Maui County Data Book, 2015, the following public and privately-operated schools 2010 enrollment within the Wailuku-Kahului region is shown in the following table:

<u>Schools</u>	<u>Enrollment</u>	<u>Grades</u>
Baldwin High School	1,398	9-12
Maui High School	1,906	9-12
Iao Intermediate	918	6-8
Wailuku Elementary	694	K-5
Puu Kukui Elementary	692	
Waihee Elementary	752	K-5
Kahului Elementary	954	K-5
Lihikai Elementary	901	K-5
Maui Waena Intermediate	1043	6-8
Pomaikai Elementary	574	K-5
St. Anthony School	272	K-12
Kaahumanu Hou Christian	112	K-12
Emmanuel Lutheran	179	K-6
Maui Adventist	20	1-8

*Source: Maui County Data Book, 2015*

#### 4. Recreational Facilities (Parks)

Within the Wailuku-Kahului Community Plan District, there are many recreational activities opportunities as well, including shoreline and boating activities at the Kahului Harbor and adjoining beach parks, organized recreational activities provided/offered at County Parks. Within close proximity of the project site is the Waikapu Community Center located about half a mile west of the project area. Other Maui County owned parks within the Wailuku-Kahului region are the Papohaku Park and Wailuku Community Center, War Memorial Athletic complex,

Wailuku Little League baseball fields, Sakamoto Swimming Pool, Keopuolani Regional Park, 65-acre Maui regional park, and Maui Lani Parkway Park. All this county owned recreational facilities are all located within approximately 2 to 3 miles north of the project site. A nearby park adjacent to the Hale Makana O Waiale Affordable Housing complex contains a baseball field, basketball court, and playground equipment. This park is located less than a mile north of the project site. Other recreational facilities in the Wailuku area include Iao Park, Wells Park, Wailuku Pool, Wailuku Gym, and Wailuku Elementary School Park. In addition, there are several golf courses in the Wailuku-Kahului region located within close proximity of the project site, namely: Kahili and Kamehameha golf courses, The Dunes at Maui Lani Golf Course, and Maui County-owned Waiehu Golf course. These golf courses are within 1 to 3 miles of the project site.

5. **Solid Waste Disposal**

Solid waste collection services for single-family residential are provided by Maui County Department of Environmental Management. It is collected once-a-week basis and disposed at the Maui County's 55-acre Central Maui Landfill, located approximately 4 to 6 miles east of the subject property. This county-owned landfill is managed and operated by Maui County Department of Environmental Management.

D. **EXISTING INFRASTRUCTURE**

1. **Roadways**

Honoapiilani Highway is under the jurisdiction of the State of Hawaii Department of Transportation and is the main artery linking Waikapu to Central, South, and West Maui. Honoapiilani Highway is located west of

the project site. It is a two-lane undivided State Highway which runs in the north-south direction into Wailuku town. There is no direct access from Honoapiilani Highway into the subject property.

Kuihelani Highway is located approximately 4,500 feet east of the project site. The highway is under the jurisdiction of the State of Hawaii Department of Transportation. It is a two-way, four-lane divided State arterial highway which also runs in a north-south direction. The posted speed limit on Kuihelani Highway varies at 30 to 55 miles per hour (mph). There is an existing traffic signal at the Kuihelani Highway-Waiko Road intersection. The southern terminus of Kuihelani Highway is its intersection with Honoapiilani Highway. The northern terminus is at its intersection with Puunene Avenue, where it turns to Dairy Road in Kahului.

Waiko Road is a two-lane County collector roadway that connects Honoapiilani Highway and Kuihelani Highway. Immediately east of Honoapiilani Highway, where Waiko Road provides access to a residential community. The posted speed limit on Waiko Road is 20 miles per hour (mph). Further east, Waiko Road provides access to industrial subdivision located east of the project site. There is also a heavy vehicle restriction on Waiko Road near its intersection with Honoapiilani highway that prohibits vehicles weighing over 10,000 pounds from entering and exiting Waiko Road via its intersection with Honoapiilani Highway.

Waiale Road is a two-lane collector road running north from Waiko Road. It turns into Lower Main Street. The section of Waiale Road from Waiko Road to Kuikahi Drive was improved to 36' of pavement as part of the Waikapu Gardens Subdivision. Waiale is proposed to be extended from the intersection with Waiko Road southward to intersect with Honoapiilani Highway in the vicinity of the Tropical Plantation.

## **2. Drainage**

A Preliminary Engineering Report (PER) together with drainage report was prepared by Otomo Engineering, Inc. for the proposed project (refer to attached Appendix G). The project site is currently vacant. According to the PER, the existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet at the Waiale Road (eastern boundary), with an average slope of approximately 4.8%.

According to Soil Survey Geographic Database for the Island of Maui, State of Hawaii (September 2014) prepared by the U.S. Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and Iao silty clay ((IaA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. Iao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

According to Panel Number 150003 0391E of the Flood Insurance Rate Map (FIRM), dated September 29, 2009, prepared by the U.S. Federal Emergency Management Agency (FEMA), the project site is situated Flood Zone "X" which represents areas outside of the 0.2% annual chance floodplain.

There are no drainage improvements within the project site. The onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. It is estimated that the present onsite runoff for a 50-year, 1-hour runoff from the entire project site is 13.0 cfs (refer to Appendix G, "Preliminary Engineering Report") and approximately 15,625 cubic feet of runoff volume. There is an existing

drainage channel which conveys storm runoff from the Kehalani Community to the north to an existing retention basin further south of the property and on the makai side of Waiale Road.

**3. Water**

Domestic water and fire flow for the Waikapu area are serviced from the 300,000-gallon Waikapu tank and 1.5 million gallon Kehalani mid-level storage tank. A series of 8-inch and 12-inch waterlines traverse along West Waiko Road from the Waikapu tank to Honoapiilani Highway. As part of the existing Waikapu Gardens Subdivision, a 12-inch waterline was installed from Waiko Road, through the center of the subdivision and reduced to 8-inch waterlines to provide distribution throughout the subdivision. A 12-inch waterline was connected to the existing waterlines in the Waikapu Gardens subdivision and installed along the southern boundary line of the Valley Isle Fellowship. Separately to the north of the project site, there is an existing 12" waterline along Kuikahi Drive that services the surrounding properties and continues east at the intersection with Waiale Road.

The source for this water system is the Mokuhaul wells in Happy Valley.

**4. Wastewater**

According to project's Preliminary Engineering Report (refer to Appendix G), there is a 12-inch gravity sewer lines traversing through a portion of the property entering along the southern boundary and continues north exiting the property and enters the Waiale Road right-of-way. Wastewater collected from the Waikapu area is transported to the Kahului Wastewater Treatment Plant in Naska managed by the Maui Department of Environmental Management.



5. **Electric, Telephone and Cable TV**

There is an existing electrical transmission system traversing along Waiale Road and Waiko Road fronting the proposed project site. The existing system currently provides service to the adjacent properties and surrounding area.

Maui Electric Company, Ltd., Verizon Hawaii, and Time Warner Oceanic Cable provide electrical, telephone, and cable television services, respectively.

E. **ANTICIPATED INFRASTRUCTURE IMPROVEMENTS**

1. **Roadways**

The subdivision roadway will access onto Waiale Road at two locations along the frontage of the property. There will be no direct access from the individual lots onto Waiale Road and Honoapiilani Highway. Based on the Traffic Impact Analysis Report (see Appendix H, TIAR), left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project. From Waiko Road, vehicles can head west to Honoapiilani Highway or east to access Kuihelani Highway. Vehicles on Waiale Road which continue north can access to Kuikahi Drive and eventually exit to Lower Main Street.

The interior subdivision streets are intended to be dedicated to the County. The main loop road will have a 52-foot right-of-way, concrete curbs, gutters and sidewalk on at least one side. The interior roadways will have 36-foot right-of-way with 20 feet of pavement, concrete curbs and gutters. Sidewalks and pedestrian lanes will be constructed to provide access throughout the property such as to the neighborhood green

concrete wheel chair ramps will be constructed at appropriate locations to comply with ADA standards.

A Traffic Impact Assessment Report (TIAR) (refer to Appendix H for more detailed information), was prepared for the proposed project by Austin, Tsutsumi & Associates, Inc (August 2017). There were several study intersections that were studied as part of the Traffic Impact Assessment Report by the project's traffic engineer. The report analyzed these intersections for the potential impacts due to the proposed project. Based on the Traffic Impact Analysis Report, left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project. According to the TIAR, generally, all movements at each study intersections operate at LOS D or better during the AM and PM peak hours of traffic.

## **2. Drainage**

The project's drainage system will be designed to accommodate the increase runoff generated by the development of the entire project site. As noted in the project's PER (see Appendix G) the estimated post development runoff from the project site will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to the retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site. According to the PER, there will be no increase in runoff sheet flowing from the project site after construction of

the development. This is in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

Development of the project will also include implementation of site specific best management practices (BMPs) during construction to provide erosion control and minimize impacts on downstream properties.

**3. Wastewater**

It is estimated that the proposed project will generate approximately 28,000 gallons per day of wastewater based on the 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary. The gravity sewer system will be constructed along the eastern boundary of the project site which continues in the northerly direction towards Lower Main Street. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant.

**4. Water**

Based on the preliminary site plan for the project, the domestic water demand, as determined by the Domestic Consumption Guidelines set forth by the Department of Water Supply (DWS), the average daily water domestic demand for the project is calculated to be approximately 50,397 gallons per day. Waterlines will be extended from the existing 12-inch waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection throughout the project site and service each proposed lot. In accordance with DWS standards, the fire flow demand for a single-family residential development is 1,000 gallons per minute for a 2-hour duration and 1,250 gallons per minute for duplex units. Fire hydrants will be installed according to existing County standards.

**5. Electric, Telephone and Cable TV**

The proposed electrical, telephone and cable TV distribution systems to the subject subdivision will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distribution systems will be installed underground and service laterals will be provided for each lot. Street lights will be installed along the subdivision streets in accordance with existing County standards.



### ***III. Potential Impacts and Mitigative Measures***





### **III. POTENTIAL IMPACTS AND MITIGATIVE MEASURES**

#### **A. Impacts to the Physical Environment**

##### **1. Surrounding Land Uses**

As noted earlier in this report, the project site is located in close proximity of Waikapu and Wailuku Town and it is bounded by Honoapiilani Highway to the west and Waiale Road to the east. South of the subject property are Waikapu Gardens Phase I and II affordable workforce housing subdivisions and recently approved 70-lots Waiale Elua workforce housing project. The project site sits in very close proximity to the two major master planned communities in Central Maui, Maui Lani and Kehalani residential subdivisions. Also, north of the project are Kehalani Commercial Complex and Maui Lani Parkway Commercial Center. About less than half a mile east of the project site are fully-developed light industrial subdivision such as the Consolidated Baseyard Subdivision, a light industrial development developed a few years ago and Rojac Trucking Baseyard industrial subdivision. About a mile east of the proposed project is A& B Properties Hawaii, Inc.'s proposed 540-acre Waiale Master Planned Residential Project. A & B's planned project will be a village concept with mixed uses including single-family and multi-family uses are being proposed. The Maui Tropical Plantation is located at the southern extent of Waikapu, approximately a mile south west of the subject property.

The proposed project consists of 80-unit affordable workforce residential project. The proposed action will result in a subdivision compatible with surrounding residential uses. The proposed project site is an ideal

extension of the existing Waikapu Gardens affordable workforce and the recently approved Waiale Elua affordable housing subdivision. The proposed workforce housing project will undoubtedly meet and consistent with the affordable housing policy as stated in the County of Maui 2030 General Plan-Countywide Policy Plan. The proposed affordable housing subdivision is consistent and compatible with its neighboring residential subdivisions.

## **2. Topography and Landform**

The 12.5-acre project site existing ground slopes in the west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet above mean sea level at the Waiale Road (eastern boundary), with an average slope of approximately 4.8%.

The design intent of the proposed project will be to limit the need for extensive grading as much as possible, some grading will be undertaken within the project site to provide the desired grade for the subdivision roadways and house sites construction. As noted earlier in this report, the onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. Also noted earlier, onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to a retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site.

The project's drainage system will be designed to accommodate the increase in runoff generated by the proposed development of the entire

project site (refer to Appendix G, "Preliminary Engineering Report", for detailed information of drainage plans). Drainage patterns of proposed improvements will be maintained to ensure impacts to downstream properties are minimized. With the proposed drainage improvements, adverse impacts to topography and landforms resulting from minimum grading activities are not expected. The adjoining and downstream properties will not have any additional increase of runoff due to this proposed development. Development of the project site will also include best management practices (BMPs) during construction to provide erosion control and minimize any potential impacts to downstream properties. There are no anticipated adverse impacts to topography and landforms from grading activities of the project site.

3. **Wetlands and Streams**

There are no wetlands on the subject property or in the immediate vicinity of the property. Waikapu Stream on the south will not be affected by the proposed project. Drainage generated from the subject property will not be discharged directly into Waikapu Stream. According to the Preliminary Engineering Report prepared by Otomo Engineering, Inc. for the proposed project, the drainage runoff from the project site will be contained at the proposed retention basin to be located at the eastern boundary of the property site along Waiale Road. The retention basin will have adequate capacity to store the anticipated drainage runoff from the proposed project. The proposed project is not anticipated to have an adverse impacts on wetlands and Waikapu stream.

4. **Flood and Tsunami Hazard**

As previously stated in this report, the subject site is located in Flood Zone "X" according to Flood Insurance Rate Map (FIRM), September 29, 2009.

Flood Zone “X” represents areas outside of the 0.2% annual chance flood plain. Best Management Practices (BMPs) will be implemented to mitigate any future or potential flooding on the site. Furthermore, the subject site is not located within the tsunami inundation zone. No adverse impacts are anticipated.

5. **Flora and Fauna**

According to the flora and fauna survey conducted by Mr. Robert Hobdy, July 2017 (see Appendix I), the vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest or concern. No federally listed Endangered or Threatened plant species were found, nor do any plants that are candidates for such status occur on the project area. According to Mr. Hobdy, a single bat was detected in one portion of the project area. It is recommended by Mr. Hobdy that trees greater than 15 feet in height should not be removed between the months of April and mid-September. The U.S. Fish and Wildlife Service will be consulted for any further guidance.

6. **Air Quality**

Emissions from construction equipment and vehicles used during construction activities may temporarily affect the ambient air quality within the immediate vicinity of the project site. However, these temporary air quality affects can be minimized by instituting Best Management Practices (BMPs) during project construction. In addition, dust control will be instituted such as dust barriers, watering graded areas, and/or sprinklers to control dust during construction of the project.

On a long-term basis, upon completion of the proposed affordable workforce residential project, it is not anticipated to generate adverse impact on air quality on or in close proximity of the project site.

7. **Noise**

Ambient noise conditions may be temporarily affected during construction activities at project site. Construction equipment machinery will likely be the dominant noise-generating source during construction period. Best Management Practices (BMPs) will be instituted, including equipment maintenance and vehicle maintenance, are anticipated to reduce noise levels. Construction activities will be limited to daytime working hours. In addition, heavy trucks, dump trucks, and material transport vehicles will be advised not to use upper Waiko Road to minimize noise in the residential area of Waikapu town village.

Construction-period noise will be mitigated in accordance and strict adherence with Title 11, Administrative Rules, Chapter 46, Community Noise Control of the State Department of Health. All construction equipment and onsite vehicles will be equipped with mufflers as required in Section 11-46 (b)(1)(A). Required permit conditions for construction activities may include, where appropriate:

“No permit shall allow construction activities creating excessive noise before 7:00 A.M. and after 6:00 P.M. of the same day”

“No permit shall allow construction activities which emits noise in excess of ninety-five dB(A) except between 9:00 A.M. and 5:30 P.M. of the same day”

Once project is completed, the proposed single-family affordable residential project is not anticipated to generate significant long term adverse noise conditions. These conclusions were drawn based on the existing and surrounding residential uses in the area.

8. **Scenic and Open Space Resources**

As previously noted in this report, Haleakala is visible to the east of the project site and West Maui Mountains to the west define the scenic resources of the project site. The project is not part of a scenic corridor and will not affect views from inland vantage points. As such, the proposed project is not anticipated to have an adverse impact upon the visual character of the surrounding areas.

9. **Hazardous Materials**

As noted earlier in this report, the subject project site was not listed on any hazardous database listings. There was no evidence of any historic misuse or significant spills of hazardous or regulated substances on the subject property, except for some minor soil staining as a result of vehicle and construction equipment activities. A Phase I Environmental Site Assessment Investigation was conducted on the property by Vuich Environmental Consultant, Inc. Based on its findings as a result of the Phase I environmental site investigation, there are no hazardous or regulated substances found on the property site. As noted earlier in this report, the subject property is not in any state or federal database hazardous site listings. Further, the environmental assessment report finds no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property (see Appendix O). BMPs will be instituted during the construction of the subject property. No adverse impacts are anticipated per environmental consultant's findings.

**10. Archaeological Resources**

As noted earlier in this report, an archaeological inventory survey was conducted by Archaeological Services Hawaii, LLC (“Consultant”). The archaeological inventory survey (AIS) was conducted on May 2004 and July 2004, updated in May 2016. The purpose of the AIS was to determine the presence/absence, nature, and extent and significant of any cultural and archaeological resources in the proposed project area. No significant remains were encountered during trenching and representative stratigraphic profiles were recorded. Based on the negative results of the field work, according to the Consultant, no further inventory level work is recommended prior to commencing construction activities. Further discussions and details on the results of the AIS can be found on Appendix C. The AIS report has been accepted by the State Historic Preservation Division on July 1, 2016 (see Appendix D. Archeological monitoring plan (AMP) has been prepared for the proposed project by Archaeological Services Hawaii, LLC dated May 2018 (see Appendix E). Peer AMP, archaeological monitoring will be performed during the development of the proposed project. The proposed project does not anticipate any adverse impact on archaeological and cultural resources of the area.

**11. Cultural Assessment**

As noted earlier in this report, Chris Hart and Partners, Inc. conducted a cultural impact analysis (CIA) of the project area for the project’s State Land Use Urban District Boundary Amendment under LUC Docket No. A07-773. The project’s urban boundary designation was approved by LUC and further found that the project will not have any adverse effects on Native Hawaiian traditional and customary rights which would require protection under Article XII, Section 7, of the Hawaii State Constitution.



## **B. Impacts to the Socio-Economic Environment**

### **1. Population and Local Economy**

The proposed project, on the short-term, should not impact the population parameters. On the other hand, the proposed project will create immediate construction employment during the development of the project.

Estimated construction costs for the subdivision site work and vertical construction of the dwelling units will be approximately \$22 million. As noted above, the proposed project will create construction jobs for local residents during the development of the project. This projected employment will have a multiplier effect on local material suppliers and retail businesses that can be expected to benefit from the proposed project. Also, in the long-term, residential homeowners will require services related to home improvements and maintenance which will further support local businesses, thereby creating more employment opportunities.

Both long and short-term basis, the proposed action should not affect population parameters. The proposed project is not considered population generator from a long-term perspective. The proposed project is anticipated to meet existing demand demands for affordable housing by current residents that are waiting for affordably-priced housing project. This project does not significantly (if any) affect/increase population parameters within the Kahului-Wailuku Community Plan District.

No mitigative measures are necessary in response to the anticipated increased short-term as well as long-term employment and no additional mitigative measures are required regarding population since the proposed project is not a population generator.

## **2. Agriculture**

The approximately 12.5-acre project site is situated in a region of existing and ongoing urban development. As noted earlier in this report, the subject property based on the ALISH map, falls within the “Prime” agricultural land category (see Appendix N, ALISH Map). As noted earlier in this report, the project site that falls within the prime agricultural land category was used for sugar cane and pineapple cultivation over three decades ago. The sugar operation and any agricultural activity have ceased operation and the subject property has been vacant and remained fallow.

As noted earlier in this report, immediately south and west boundary of the project site are existing residential developments. On the north and east of the project site are Kehalani commercial center and Maui Lani Parkway commercial complex, respectively. Use of the property for the proposed single family affordable workforce housing project is not anticipated to adversely impact agricultural productivity on the island. Since proposed action will not affect agricultural production on the island, no mitigative measures are expected to be required.

## **3. Police, Fire, and Medical Services**

The proposed action is not anticipated to impact the service capacity and capability of police, fire, and emergency medical operations. The proposed project will not expand nor extend the existing service area limit for emergency medical services. There are existing police, fire, and medical facilities in very close proximity of the project site. Additionally, internal roadways within the proposed single-family residential subdivision will be constructed in accordance with Maui Fire Department standards. No further mitigative measures are expected to be required.

#### 4. **Recreational and Educational Resources**

As noted earlier in this report, the proposed action is not a population generator that will increase population parameters within the Kahului-Wailuku Community Plan District, hence, the proposed project is not expected to generate the need for additional recreational facilities or services. Park facilities are currently available at neighboring Waikapu Community Center and at the Waikapu Gardens Subdivision adjacent to the proposed project site. The County is proposing to develop approximately 242-acre parcel for its proposed Central Maui regional park located less than half a mile south east of the project site. Also, a 65-acre regional sports complex recently open located about a mile east of the project site. Also, the Maui Parkway county park located less than a mile east of the project site is available for community use. There are many other County parks and recreational facilities within the Wailuku-Kahului Community Plan District that are located within the 2-4 miles from the project site. With respect to schools for the project's anticipated residents, the applicant acknowledges that the project is located in the Central Maui Impact Fee District and further acknowledges that decisions on which schools will serve new residential areas are determined at the local level by the complex area superintendent who is responsible for all schools on Maui. The applicant will work closely with the State Department of Education (DOE) to ensure that the proposed project meets with all DOE's applicable rules and regulations concerning appropriate assessment policy. No further mitigative measures are expected to be required.

#### 5. **Hydrology**

There will be no anticipated short-term impact to groundwater as a result of construction activities on the project site. Therefore, no mitigation measure is expected to be required.

As a precautionary measure, Best Management Practices (BMPs) will be strictly enforced during the project construction.

**6. Solid Waste Disposal**

A solid waste management plan will be developed for the disposal of any construction materials during the subdivision and development of the proposed project. Once construction is completed, it is anticipated that the project solid waste collection and disposal will be provided by the County of Maui's Department of Environmental Management.

After subdivision is completed, residents will be encouraged to implement waste recycling programs to reduce the amount of waste to the County's Central Maui Landfill site.

**C. Impacts to Infrastructure**

**1. Roadways**

A detailed Traffic Impact Assessment Report (TIAR) for the proposed project was completed on August 11, 2017 by Austin, Tsutsumi and Associates, Inc. Refer to Appendix H for detailed traffic assessment for the project. The TIAR for the proposed project address the following:

- Assess existing traffic operating conditions within the study area;
- Traffic Projections for Base Year 2020 (without the project);
- Estimate the vehicular trips that will be generated by the proposed project;
- Traffic projections for the project for future year 2020 (with project);

- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the proposed project.

To mitigate potential traffic concerns as a result of the development of the proposed project, based on the Traffic Impact Analysis Report (TIAR), it is recommended by the project's traffic consultant that two northbound left-turn storage lanes along Waiale Road are recommended for the entrance into the two proposed project accesses, to remove left turn vehicles from mainline through traffic. According to TIAR, left-turn storage lanes should accommodate a minimum 50 feet of storage length (see Appendix H, Traffic Impact Analysis Report).

## 2. Water

As noted earlier in this report, the proposed project will be served by the Maui County Department of Water Supply (DWS) system. The domestic water demand, as determined by the Domestic Consumption Guidelines set forth by the Department of Water Supply, for the project is anticipated to be approximately 50,397 gallons per day (gpd). Waterlines will be extended from the existing 12-inch waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection for the proposed project. In accordance with DWS standards, the fire flow demand for a residential development is 1,000 gallons per minute for a 2-hour duration for a single-family subdivision and 1,250 gallons per minute for duplex units. Fire hydrants will be installed at the appropriate spaced intervals along the subdivision roadways in conformance with the County's applicable standards.

### 3. **Wastewater**

As noted earlier in this report, the proposed project will generate approximately 28,000 gallons per day of wastewater based on the proposed 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary. The gravity sewer system will be constructed along the eastern boundary of the project site which continues in the northerly direction. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant located in Naska (Kahului). See Preliminary Engineering Report by Otomo Engineering, Inc., dated July 2017, identified as Appendix G for more detailed information. According to the project's PER, the sewer system for the proposed project will be constructed per County standards.

### 4. **Drainage**

According to the Preliminary Engineering Report (PER) by Otomo Engineering, Inc. prepared for this project (refer to Appendix G) it is estimated that the post development runoff from the project site will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. The project's drainage system will be designed to accommodate the increase in runoff generated by the development of the entire project site. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to the retention basin at the eastern end of the subject property along Waiale Road. According to the PER, there will be no increase in runoff sheet flowing from the project site after construction of the proposed project. The drainage will be in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

With the proposed drainage improvements for the project no further adverse impact is anticipated on downstream properties.

**5. Electric, Cable and Telephone System**

The proposed electrical, telephone, and cable TV distribution systems to the subject subdivision will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distribution systems will be installed underground. Street lights will be installed along the subdivision streets at intervals to be determined by the electrical engineer in strict adherence to rules and regulations. No further adverse impact is anticipated with the proposed improvements.

**D. Potential Cumulative Impacts**

Cumulative impacts are defined as the potential impact on the environment which results from the incremental impact of action when added to other past, present, and near or long-term foreseeable future actions.

This potential cumulative impact analysis evaluates present and reasonably foreseeable future projects in the area that have the potential to contribute to cumulative effects of such actions. The analysis uses the best available information and data to assess these projects and their potential impacts.

The following criteria were considered in identifying the past, present and reasonable foreseeable future projects that could result in potential cumulative impacts to the region's resources:

- Projects that are of a similar nature could affect similar resources or are located in close proximity to the proposed project.



- Projects that have the potential to generate environmental impacts and when addressed collectively with the proposed project, could result in potential cumulative impacts to the environment.

To fully assess the potential cumulative impacts, the proposed affordable workforce housing project was grouped with the following housing projects in the vicinity having similar scope and scale:

- **Waikapu Gardens Subdivision Phase I:** This fully developed affordable housing project encompasses approximately 95 acres located south of the proposed project site. This affordable residential subdivision consists of 411 single-family residences, as well as park. This housing project is a fee simple project was developed by Spencer Homes and completed over ten years ago.
- **Waikapu Gardens Phase II.** This affordable housing project encompasses approximately 10 acres located south of the project site. This affordable housing subdivision consists of 56 single-family residences. This project was developed by Spencer Homes and completed over two years ago.
- **Waiolani Mauka Subdivision:** This single-family housing subdivision consists of approximately 28-acre parcel located mauka side of the Honoapiilani Highway in Waikapu west of the project site. This residential development consisting of 108 residential lots was completed a few years ago.
- **Waiko Baseyard Light Industrial Subdivision (Rojac):** This light industrial subdivision encompasses approximately 14.9 acres that contains 19 lots, ranging in lot size from 13,000+ square feet to 2.8 acres. This LI subdivision is completed and fully developed. This subdivision is located the makai or south east of the proposed project site.

In considering the potential impacts of the proposed affordable workforce housing project, together with the projects that are listed above, the following parameters were examined: (a) topography; (b) flora and fauna; (c) noise and air quality; (d) visual resources; (e) cultural resources; (f) water quality; (g) public services; and (h) infrastructure. In assessing the potential cumulative impacts of these projects that are listed above, a qualitative approach was used. It is worth noting that cumulative impact considerations may change as new projects are presented or proposed projects are modified in scope and scale. Accordingly, the assessment presented in this report is intended to identify potential issues, concerns and mitigative measures based upon available information. Potential cumulative impact concerns relating to each of these resource parameters are herein presented below.

**a. Topography**

All of the above noted projects were completed and fully developed. Minimum alterations to topographic features were applied due to their respect to existing landforms to ensure that visual impacts are minimized, drainage patterns are maintained and all infrastructure design and construction criteria were met. Because of these projects' sensitivity to the existing landform, the cumulative impacts of these projects were not adverse to the regional topography.

**b. Flora and Fauna (Plant and Animal Life)**

Prior to the development of the above subject projects, each of the projects has prepared and reviewed the flora and fauna resources affected by their respective actions. The above noted lands were formerly used for sugar and pineapple cultivation or ranching activities and there were no adverse impacts on the flora and fauna parameters that were encountered during the development and construction of these projects.

**c. Noise and Air Quality**

Short term construction related noises were experienced for each during the construction of the above noted projects. All projects complied with Department of Health noise regulations and BMPs were implemented during the construction and resulted in minimum construction-related noises. There were no significant point sources of noise encountered during the construction of the above projects and no adverse impacts to surrounding communities.

As with noise and air quality was temporarily affected during the construction of the above noted projects. BMPs were instituted during the construction of the above projects and were all in compliance with the Department of Health and County of Maui grading requirements. There were no new point sources of air emissions associated with any of the above mentioned projects. From a cumulative stand point, the projects had no adverse impact upon regional conditions.

**d. Visual Resources**

The visual landscape of Waikapu Town has changed minimally since the above noted projects were completed. The Waikapu Gardens affordable housing project site, formerly used as agricultural land has been replaced by residential use. Consolidated Baseyard Subdivision and Waiko Light Industrial Subdivision, both completed projects, are situated in areas where light and heavy industrial uses have previously operated under special uses and/or conditional permits.

These above completed projects, residential and light industrial projects, collectively reflect a visual character more urban in scale, that have replaced lands formerly used for agricultural purposes. The landscaping buffers and

architectural designs used in the subdivision of these projects have provided visual relief from surrounding properties.

**e. Cultural Resources**

Based on archaeological studies and cultural impact assessments conducted for each project that are noted above, appropriate mitigative measures were utilized to address potential archaeological concerns/issues. Approved monitoring plans were prepared for these above noted projects and archaeologists monitored the project during the development to ensure that no cultural resources are affected during projects construction. Collectively, these above noted projects have no adverse affect on cultural and archaeological resources and practices in the Waikapu region.

**f. Water Quality**

Surface runoff and other non-point source pollutants can affect water quality if unmitigated. All the above noted projects were subjected to the NPDES permitting process and BMPs to control erosion and sediment loss were implemented during construction activities for each of the project. Additionally, all the projects have complied and will comply with Maui County drainage regulations to provide required mitigation, including drainage storage basins to ensure that runoff velocities are controlled and water quality effects minimized. From a regional water quality standpoint, projects' compliance with federal, state, and local regulatory requirements helped to mitigate potential adverse impacts to water quality.

**g. Public Services**

With regards to public services, the Waikapu Gardens affordable housing project that was completed a few years ago and has an effect on parks and

recreation and schools due to the residential nature of the project. The impact on public services of this affordable housing project was met by the developer as part of its entitlement process.

Since the proposed housing project is 100% affordable pursuant to the Department of Housing and Human Concerns Affordable Sales Guidelines, the proposed project is exempt from the park assessment fee pursuant to the Maui County Code. The proposed project will provide a passive neighborhood green within the project site.

The applicant for this proposed affordable housing project will meet and will work closely with the State Department of Education (DOE) prior to the development of the project to ensure compliance of DOE's rules and regulations. The applicant acknowledges that the project is located in the Central Maui Impact Fee District and further acknowledges that decisions on which schools will serve new residential areas are determined at the local level by the complex area superintendent who is responsible for all schools on Maui. It is important to note that a new Puu Kukui Elementary School located in Wailuku was completed.

Due to the nature of the other projects such as Consolidated Baseyard, Waiko Baseyard (Rojac), and the proposed Waiko Light industrial project, in reviewing the cumulative impact on public services, it was concluded that their effects would be minimal since these industrial projects do not generate the need for parks and recreation and schools. Other services, such as police, fire and emergency medical services, are currently servicing the Waikapu region and would not extend the current limits of service.

**h. Housing and Land Use**

The availability of affordably-priced housing projects is an island-wide concern for working families and policy makers. As noted in the County of Maui 2030 General Plan – Countywide Policy Plan – shelter is among the most basic of human needs. The affordability, quality, and location – plan an enormous role in the quality of life of Maui County’s residents.

Cumulatively, the Waikapu Gardens Phases I and II affordable housing projects and the recently-approved Waiale Elua affordable housing project he applicant’s proposed affordable single-family housing project will undoubtedly increase the availability of affordably-priced housing units for the island of Maui.

**i. Infrastructure**

Infrastructure requirements for the completed projects as noted above were met by respective developers/applicants. Water and wastewater requirements for Waikapu Gardens affordable residential projects, Waiolani mauka and Pikake residential subdivisions and Waiko baseyard industrial project are serviced by the County systems. Waterline improvements including storage tank were completed to serve these projects and meet all applicable rules and regulations of the County and state agencies. Wastewater transmission and treatment services for Waikapu Gardens, Waiolani Mauka and Pikake residential subdivisions and Waiko Baseyard subdivision are provided by the County of Maui Environmental Management. Applicable wastewater assessment fees were required of each applicant. Likewise, the applicant’s proposed affordable workforce housing subdivision will be served by the County systems. The proposed project will be designed and constructed to ensure compliance with all county’s rules and regulation and guidelines. There are no anticipated adverse impacts to the county’s systems.

Each project noted above including the proposed residential subdivision in this application was and is responsible for addressing and mitigating drainage impacts. Collectively, through these measures, it is anticipated that there will be no adverse impacts to downstream or adjacent properties.

The infrastructure component that were examined for these subject projects are roadway systems. These above noted completed projects were each required to prepare traffic impact analysis reports and made appropriate improvements on roadway systems as recommended in their respective TIAR and each project traffic impacts were mitigated by each respective applicant/developer. For the applicant's proposed 80-unit affordable workforce housing project, the TIAR prepared for this project reviewed the cumulative conditions for the Waikapu area including the existing completed projects noted above. See Appendix H (Traffic Impact Analysis Report, dated August 11, 2017, prepared by Austin Tsutsumi and Associates). The traffic analysis made several assumptions and recommendations to mitigate potential impacts on the roadway systems in Waikapu region and the applicant will comply with the recommendations and conditions set forth by approving county and state agencies.

#### **E. SECONDARY IMPACTS**

Secondary impacts are impacts that have the potential to occur later in time in the future but are still reasonably foreseeable. They can be seen as actions by others that are taken because of the presence of the project. Related to the proposed affordable workforce housing subdivision, secondary impacts include the creation of a larger residential population center which may lead to new additional regional demands for public services in the Wailuku-Kahului community plan district. It is anticipated that public service needs as a result from the proposed project will be met through additional revenues from the developed house lots through property tax assessments and other related fees and impact assessments.



[

[

[

[

[

[

[

[

[

[

[

[

[

[

[

[

[

[

[

***IV. Consistency and Relationship  
To Land Use, Plans,  
Policies, and Controls***



## **IV. CONSISTENCY AND RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS**

### **A. STATE LAND USE DISTRICTS**

Pursuant to Chapter 205, Hawaii Revised Statutes, all lands in the State of Hawaii have been placed into one (1) of four (4) land use districts category by the State Land Use Commission. These land use districts have been designated “Urban”, “Rural”, “Agricultural”, and “Conservation”. The proposed project site is presently classified “Urban” within the State Land Use District Designation. Reclassification of the project site is not required since the site is currently in urban designation, hence, the proposed project use is consistent with the State Land Use District urban designation.

### **B. HAWAII STATE PLAN, CHAPTER 226, HAWAII REVISED STATUTES**

Chapter 226, HRS, also known as the Hawaii State Plan, is a long-range comprehensive plan which serves as a guide for the future long-range development of the State by identifying goals, objectives, policies, priorities, as well as implementation mechanisms. The proposed project is consistent with the following State goals, objectives, and policies of the Hawaii State Plan:

#### **Chapter 226-4, HRS, State Goals**

- (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii’s present and future generations.

- (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring and of participation in community life.

#### **Objectives and Policies of the Hawaii State Plan**

The proposed reclassification and project's affordable housing application pursuant to 201H-38, Hawaii Revised Statutes is consistent and in conformance with the following objectives and policies of the Hawaii State Plan:

#### **Chapter 226-5, HRS, Objectives and Policies for Population**

- (a) It shall be the objective in planning for the State's population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.
- (b)(1) Manage population growth statewide in a manner that provides increase opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each County.
- (b)(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.
- (b)(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

#### **Chapter 226-6, HRS, Objectives and Policies for the Economy**

- (b)(6) Strive to achieve a level of construction activity responsive to, and consistent with, State growth objectives.

- (b)(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.

**Discussion and Response:**

The proposed project conforms with the objectives and policies of HRS 226-4, 5, and 6 for the economy, potential growth activities, and population. The proposed 12.5-acre 80-unit affordable workforce housing project will provide a wide-range of economic activities through construction of the subdivision improvements and housing development for working families in the Kahului-Wailuku Community Plan region and for the island residents. It is anticipated that the development of this project will generate significant expenditures by the developer during the construction of the site work for subdivision and construction of the residential dwelling units. With the infusion of new capital expenditures on this project, these investments are expected to favorably impact the Maui economy on a broad scale, and in multitude of ways. With the capital investment during the initial phase of the subdivision development and construction of the housing units, significant direct new construction job opportunities are expected to be created by this project.

The proposed development is intended to reflect and meet the housing needs at affordably priced single-family residential subdivision for Maui's working families. The architectural design of the proposed dwelling units will be similar to its neighboring affordable housing projects.

**Chapter 226-11, HRS, Objectives and Policies for the Physical Environment - Land-Based, Shoreline, and Marine Resources**

- (a)(2) Effective protection of Hawaii's unique and fragile environmental resources.
- (b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.
- (b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

**Chapter 226-12, HRS, Objectives and Policies for the Physical Environment-  
Scenic, Natural Beauty, and Historic Resources**

- (b)(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

**Discussion and Response:**

The proposed project meets with stated objective and policies of HRS 226-11 & 12 for physical environment, scenic and historic resources. The planning and design concept of the proposed project will reflect similar architectural character of the neighboring residential development in Waikapu town, the history, location and topography and setting of the site. View corridors and topographic features will be maintained and highlighted in the project design. The historical setting of the regions will be reflected in the proposed project's traditionally-based planning and design of the subdivision. The project's design concept will embrace similar architectural design of its neighboring residential development and will meet the intent and stated objectives of HRS 226-11 & 12.

Based on thorough field assessment of the site by the applicant's consultant, no rare or endangered plant and animal species or habitats are present on site. The applicant will comply with the recommendation by the project's flora/fauna consultant to protect any native habitats within the project site.

**Chapter 226-13, HRS, Objectives and Policies for the Physical Environment-  
Land, Air, and Water Quality**

- (b)(2) Promote the proper management of Hawaii's land and water resources.
- (b)(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.
- (b)(7) Encourage urban developments in close proximity of existing services and facilities.



**Discussion and Response:**

The proposed 12.5-acre 80-unit affordable workforce housing project will be designed to be complimentary to the neighboring existing residential development in Waikapu Town village and will meet the needs of Maui's working families.

The proposed project is located along the main thorough fare to west and central Maui and in very close proximity to Kahului and Wailuku regions as well as Paia and South Maui regions. The project is inland and will not have any impact on our shoreline resources. Also, the project is in close proximity to existing public services and facilities that are critical to the success of the project.

**Chapter 226-19, HRS, Objectives and Policies for Socio-Cultural Advancement – Housing**

- (a)(2) The orderly development of residential areas sensitive to community needs and other land uses.
- (b)(1) Effectively accommodate the housing needs of Hawaii's people.
- (b)(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.
- (b)(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.
- (b)(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.

**Discussion and Response:**

The proposed affordable residential housing project meets the stated objectives and policies of HRS 226-19 for the orderly development of residential areas sensitive to community needs. The proposed project effectively accommodate the housing needs of Maui's residents and will increase homeownership opportunities at an affordably-priced dwelling units. The design of the project is consistent with the surrounding residential subdivision (refer to Appendix L,

house floor plans models). The proposed project is centrally located within the Wailuku-Kahului Community Plan region and it is conveniently accessible to public facilities and services.

**Priority Guidelines of the Hawaii State Plan**

The proposed project is consistent with the following priority guidelines of the Hawaii State Plan:

**Chapter 226-103, HRS, Economic Priority Guidelines**

- (1) Seek variety of means to increase the availability of investment capital for new and expanding enterprises:
  - A. Encourage investments which:
    - (i) Reflect long-term commitments to the State;
    - (ii) Rely on economic linkages within the local economy;
    - (iii) Diversify the economy;
    - (iv) Reinvest in the local economy;
    - (v) Are sensitive to community needs and priorities; and
    - (vi) Demonstrate a commitment to provide management opportunities to Hawaii's residents.

**Discussion and Response:**

As noted earlier in this report, the proposed 12.5-acre parcel proposed affordable workforce residential housing project will provide a variety of economic activities for the Waikapu Town and in the Kahului-Wailuku Community Plan regions. Because of the anticipated large investment capital that will be infused in the development of the proposed affordable housing project, short-term construction employment opportunities will be created as a result from the development of the subdivision. Approximately \$22 million dollars will be invested for the construction of the proposed project, thereby creating short-term construction related jobs. The project will contribute, because of its infusion of capital investment, to the growth of Maui's economic base.

**Chapter 226-104, HRS, Population Growth and Land Resources Priority**

**Guidelines**

- (a)(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaii's people.
- (b)(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.
- (b)(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.
- (b)(12) Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.

**Discussion and Response:**

The proposed project is in keeping with HRS 226-104 Priority Guidelines on Population, Growth and Land Resources. The project is located within the existing urban core of Waikapu and Wailuku Town where adequate public facilities and services are already available such as water and wastewater services for the proposed project. In addition, the project is located in very close proximity to parks, schools, medical facilities, fire and police services and other public facilities that serve the Wailuku-Kahului Community Plan District. The proposed affordable workforce housing project will meet the existing and projected housing needs for Maui's working families. The project location is far inland and will not have any impact on the shoreline or conservation lands.

**Chapter 226-106, HRS, Affordable Housing Priority Guidelines**

- (1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low and moderate-income and gap group households.
- (1) Give a higher priority to the provision of quality development of housing that is affordable for Hawaii's residents and less priority to development of housing intended primarily for individuals outside of Hawaii.

**Discussion and Response:**

The proposed affordable housing project meets the stated Affordable Housing Policy Guidelines for the provision of affordable housing pursuant to Chapter 226-106, HRS. The project site has been fallow and hasn't been used for agricultural purposes for decades. The site is centrally-located within the Wailuku-Kahului Community Plan region and surrounded with existing residential housing development, the proposed project is complementary and consistent with its neighboring residential developments. The proposed project will be 100 percent affordable under the Maui county affordable housing guidelines meeting those families within the 70 percent to 140 percent of Maui's median family income.

**STATE FUNCTIONAL PLANS**

The State Functional Plans (SFP) define actions for implementation of the Hawaii State Plan through the identification of needs, problems and issues, and recommendations on policies and priorities, which address the identified areas of concern. The proposed affordable workforce housing project is consistent with the stated objectives of the following State functional plans:

**a. State Agricultural Functional Plan**

As noted earlier in this report, the subject property is currently designated "Urban" within the State Land Use District designation. The property has been vacant and remained fallow for decades and hasn't been used for any agricultural activities. The subject property is in very close proximity to existing urban uses, particularly, residential development. The proposed residential use is consistent

with the its current urban designation. The proposed use is not anticipated to adversely impact agricultural productivity on the island.

**b. State Housing Functional Plan**

As noted in the Maui County's Housing Planning Study, conducted by SMS for the Maui County Department of Human Concerns and Housing, there's critical need for affordable housing especially for working families in Maui County. According to the SMS report, a significant number of Maui households live in overcrowded conditions or are "double-up" with other families. This growing public demand for affordable workforce housing indicates a current shortage of affordable single-family housing especially in the Wailuku-Kahului Community Plan District. With the proposed 80-unit affordable workforce residential homes planned within the subject property will help to address a critical community need.

**COUNTYWIDE POLICY PLAN – COUNTY OF MAUI 2030**  
**GENERAL PLAN**

The Countywide Policy Plan was adopted by Ordinance No. 3732 (2010) and took effect on March 24, 2010. This Policy Plan that was recently adopted is an update and an amendment to the Maui County's 1990 General Plan. As noted in the subject policy plan, Maui County has experienced significant changes economically, demographically, socially, and physically that must be addressed in the scope of the Countywide Policy Plan.

The purpose of the Countywide Policy Plan is to provide broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future. The Countywide Policy Plan further provides the policy framework for the development of the Maui Island Plan and the nine community plans.

The newly adopted Countywide Policy Plan advances the following core themes:

- Protect the natural environment
- Preserve local cultures and traditions
- Improve education
- Strengthen social and healthcare services
- Expand housing opportunities for residents
- Strengthen the local economy
- Improve parks and public facilities
- Diversify transportation options
- Improve physical infrastructure
- Promote sustainable land use and growth management
- Strive for good governance

According to the Countywide Policy Plan, shelter is among the most basic of human needs. The affordability, quality, and location of housing – including the degree of crowding within the home and within the neighborhood – play an enormous role in the quality of life of Maui County’s residents.

The proposed 80-unit affordable workforce residential housing project meets the following stated goals, objectives, policies and actions of the Countywide Policy Plan – County of Maui 2030 General Plan:

**“E. Expand Housing Opportunities for Residents”**

**Goal:**

Quality, island-appropriate housing will be available to all residents.

**Objective:**

1. Reduce the affordable housing deficit for residents.

**Policies:**

- a. Ensure that an adequate and permanent supply of affordable housing, both new and existing units, is made available for purchase or rental to our resident and/or workforce population, with special emphasis on

providing housing for low to moderate income families, and ensure that all affordable housing remains affordable in perpetuity.

- b. Seek innovative ways to lower housing costs without compromising the quality of our island lifestyle.
- c. Seek innovative methods to secure land for the development of low and moderate income housing.
- k. Ensure residents are given priority to obtain affordable housing units developed in their communities, consistent with all applicable regulations.
- l. Establish pricing for affordable housing that is more reflective of Maui County's workforce than the United States Housing and Urban Development's median income estimates for Maui County.

**Objective:**

- 2. Increase the mix of housing types in towns and neighborhoods to promote sustainable land use planning, expand consumer choice, and protect the County's rural and small town character.

**Policies:**

- b. Design neighborhoods to foster interaction among neighbors.
- c. Encourage a mix of social, economic, and age groups within neighborhoods.
- d. Promote infill housing in urban areas at scales that capitalize on existing infrastructure, lower development costs, and are consistent with existing or desired patterns of development.

**Objective:**

- 3. Increase and maintain the affordable housing inventory.

**Policies:**

- a. Recognize housing as basic human need, and work to fulfill that need.
- b. Prioritize available infrastructure capacity for affordable housing.
- g. Minimize the intrusion of housing on prime, productive, and potentially productive agricultural lands and regionally valuable agricultural lands.



- h. Encourage long-term residential use of existing and future housing to meet residential needs.

**Discussion and Response:**

The proposed affordable workforce housing project is consistent and meets the stated goals, objectives, and policies of the Maui County's Countywide Policy Plan – 2030 General Plan. Conformance with the objectives and policies of the Maui County Policy Plan is achieved by the proposed project as it will provide needed affordable workforce housing for working families on Maui. The project will be 100 percent affordable meeting families with income of 70 percent to 140 percent of Maui's median income pursuant to Maui's Affordable Housing Guidelines. The project design (refer to Appendix L, identified as floor plans models) is consistent and complementary with is neighboring residential subdivisions in Waikapu Town. The project site is in close proximity to existing urban core of Kahului-Wailuku Community Plan District and Waikapu Town village and the availability of existing infrastructures for the proposed project.

**KAHULUI-WAILUKU COMMUNITY PLAN**

The project site is located within the Kahului-Wailuku Community Plan region, one (1) of nine (9) community plan regions established in the County of Maui. Each region's growth and development is guided by a Community Plan. The County's Community Plan reflects current and anticipated conditions in the Wailuku-Kahului region and advances planning goals, objectives, policies and implementation considerations to guide decision-making in the region. The primary purpose of the Community Plan is to outline a detailed agenda for carrying out these policies and objectives. The Kahului-Wailuku Community Plan was adopted by the County of Maui through Ordinance Number 3061, Bill Number 29, and became effective on June 5, 2002. The Community Plan land use map designates the subject property as "Public-Quasi-Public". As part of the project's Section 201H application, an exemption from the community amendment process is being sought.



The Wailuku-Kahului Community Plan identified the lack of affordable housing as one of its major problems. Similarly, the Countywide Policy Plan and the 2011 SMS report entitled "Housing Planning Study for Maui County" is one of Maui's challenges to address in order to meet this critical need and demand for affordable housing. It further recognizes that providing affordable housing opportunities for residents, specifically those earning below 70 percent to 140 percent of the Maui's median income, needs to be addressed and should be front and center of Maui's policy decision makers.

The proposed project is consistent with the following goals, objectives, and policies of the Kahului-Wailuku Community Plan:

**Goal:**

**Housing:**

A sufficient supply and choice of attractive, sanitary and affordable housing accommodations for the broad cross section of residents, including the elderly.

**Objectives and Policies:**

- (1) Utilize a project district planning approach for major housing expansion areas which will allow flexibility in project planning and will provide for flexible development standards and a mix housing types which can result in more efficient site utilization and potential reductions in housing development costs.
- (2) Provide efficient land areas for new residential growth which relax constraints on the housing market and afford variety in type, price, and locations of units. Opportunities for the provision of housing are presently constrained by a lack of expansion areas. This condition should be relieved by a choice of housing in a variety of locations, both rural and urban in character.

- (3) Seek alternative residential growth areas within the planning region, with high priority given to the Wailuku and Kahului areas. This action should recognize that crucial issues of maintaining important agricultural lands, achieving efficient patterns of growth, and providing adequate housing supply and choice of price and location must be addressed and resolved.
- (8) Promote efficient housing designs in order to reduce residential home energy and water consumption.

**Discussion and Response:**

The proposed affordable housing project is consistent and meets the stated goals, objectives and policies of the Wailuku-Kahului Community Plan. As clearly noted earlier in this report, this proposed housing project will be 100 percent affordable based on Maui's Affordable Housing Guidelines those earning 70 percent to 140 percent of Maui's median income. The project site is centrally-located and surrounded with existing residential neighborhoods and it is in very close proximity to public facilities within community plan region. Equally important, existing infrastructures required for the project are available at the site. Designs of the dwelling units are compatible and consistent with its residential neighbors.

**COUNTY ZONING**

The proposed housing project site is zoned "Public-Quasi-Public", according to Maui County zoning. While the current zoning does not allow for the proposed residential uses, this 201H application has been prepared for submittal with the Maui County Council through the Maui County Department of Housing and Human Concerns. Included in this 201H filing is a request to exempt the proposed project from the County's Title 19 zoning provisions which will allow the proposed project to be developed for affordable workforce residential housing project.

## **COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES**

Pursuant to Chapter 205A, Hawaii Revised Statutes, projects should be evaluated with respect to Coastal Zone Management (CZM) objectives, policies and guidelines. The subject parcel is not located within the County of Maui's Special Management Area, however, the applicability of coastal zone management considerations has been reviewed and assessed.

### **Recreational Resources:**

#### **Objectives:**

Provide coastal recreational opportunities accessible to the public.

#### **Policies:**

- (A) Improve coordination and funding of coastal recreational planning and management; and
- (B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

- (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
- (ii) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;
- (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shoreline with recreational value;

- (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreations;
- (v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
- (vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
- (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

**Discussion and Response:**

The proposed project site is located inland, miles away from the coastline. As such, there should be no adverse impact on coastal recreational opportunities or adverse affect on existing public access to the shoreline.

**Historic Resources:**

**Objective:**

Protect, preserve and, where desirable, restore those **natural** and **manmade** historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

**Policies:**

- (A) Identify and analyze significant archaeological resources;
- (B) Maximize information retention through preservation of remains and artifacts or salvage operations; and
- (C) Support state goals for protection, restoration, interpretation, and display of historic resources.

**Discussion and Response:**

The proposed project does not have an adverse affect on historical or cultural resources. Archaeological Services Hawaii, LLC, project's archaeological consultant for the project conducted an archaeological inventory survey of the site to assess any presence and/or absence of any historical and archaeological resources on the proposed project site. Based on the archaeological consultant's survey (refer to Appendix C) there are no archeological and historical resources on the project site.

**Economic Uses:**

**Objective:**

Provide public or private facilities and improvements important to the State's economy in suitable locations.

**Policies:**

- (A) Concentrate coastal dependent development in appropriate areas;
- (B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- (C) Direct the location and expansion of coastal dependent developments to areas presently designated and use for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
  - (i) Use of presently designated locations is not feasible;
  - (ii) Adverse environmental affects are minimized; and
  - (iii) The development is important to the State's economy.

**Discussion and Response:**

The proposed project is not a coastal dependent development. The project

site is miles inland from the shoreline. The proposed project will stimulate the economy through the generation of construction jobs and related job opportunities during the development of the housing subdivision. The proposed project is consistent with the objective and policy for economic use.

**Coastal Hazards:**

**Objectives:**

Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

**Policies:**

- (A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
- (B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, point and non-point pollution hazards;
- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (D) Prevent coastal flooding from inland projects; and
- (E) Develop a coastal point and nonpoint source pollution control program.

**Discussion and Response:**

As noted earlier in this report, the project site is in Flood Zone "X", which represents areas outside of the 0.2% annual chance flood plain, according to FEMA. In addition, tsunami inundation parameters do not apply to the subject project.

## **Beach Protection**

### **Objective:**

Protect beaches for public use and recreation.

### **Policies:**

- (A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion.
- (B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- (C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

### **Discussion and Response:**

The proposed project is located miles inland, away from the shoreline and as a result, there is no anticipated adverse impact on beaches.

## **Marine Resources:**

### **Objective:**

Implement the State's ocean resources management plan.

### **Policies:**

- (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- (B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

- (C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
- (D) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- (E) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- (F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

**Discussion and Response:**

As previously stated, the proposed project is located miles inland, away from the ocean and is therefore, no anticipated adverse impact on marine or coastal resources. Appropriate Best Management Practices (BMP) will be utilized to ensure that construction runoff is appropriately captured, minimizing any impact on coastal waters.

**Scenic and Open Space Resources:**

**Objective:**

Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

**Policies:**

- (A) Identify valued scenic resources in the coastal zone management area.



- (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
- (C) Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources.
- (D) Encourage those developments which are not coastal dependent to locate in inland areas.

**Discussion and Response:**

The proposed affordable housing project will not adversely impact the scenic and open space resources. The project will not involve significant alteration of the existing topographic character of the project site and will not impact public views to and along the coastal shorelines.

**Public Participation**

**Objective:**

Stimulate public awareness, education, and participation in coastal management.

**Policies:**

- (A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management;
- (B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concern with coastal-related issues, developments, and government activities; and

- (C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

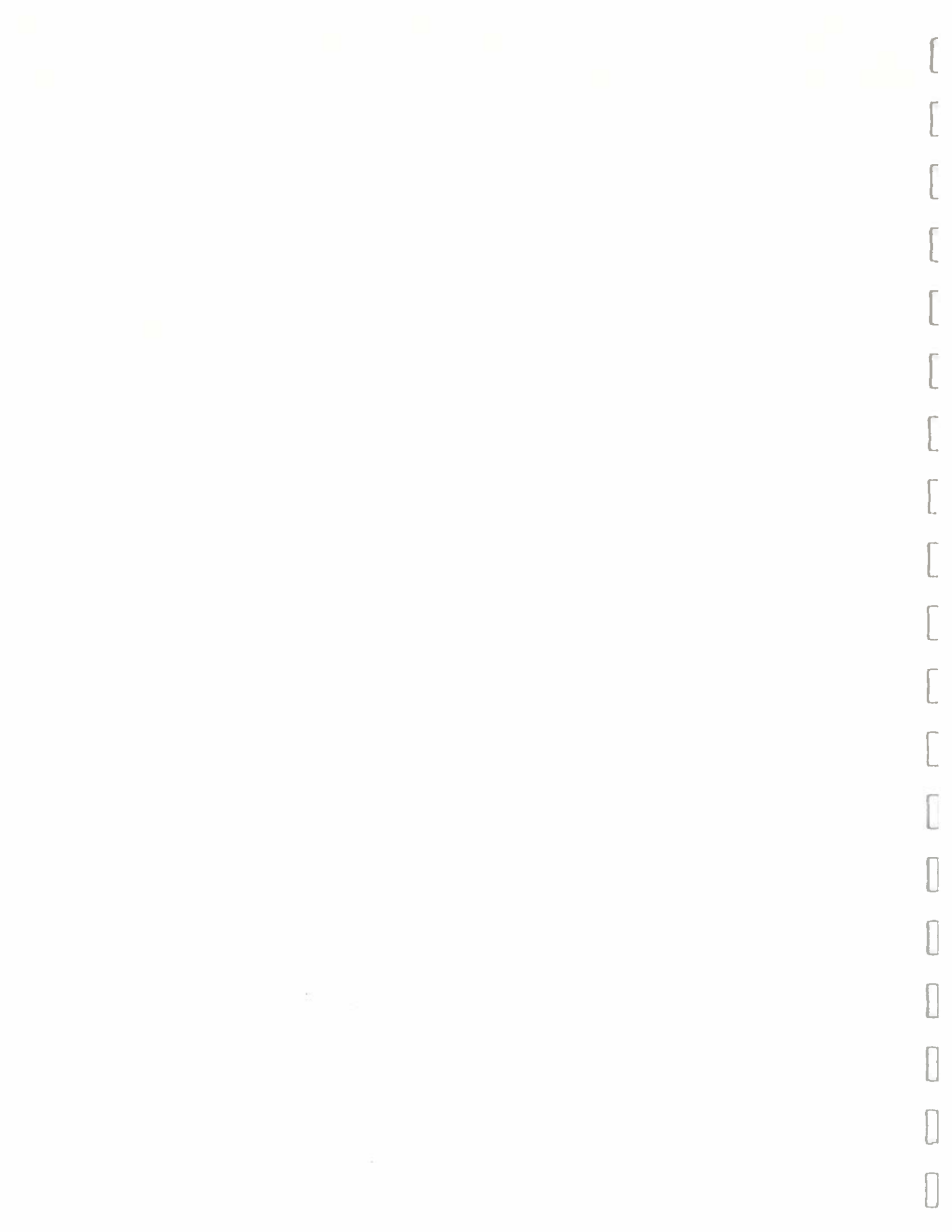
**Discussion and Response:**

The project will meet county public awareness, education and participation objectives. Opportunities for agency and further public review of the proposed action are provided through the notification review and comment processes of the County.

**MAUI ISLAND PLAN**

The Maui Island Plan was adopted by Ordinance No. 4004 and took effect on December 28, 2012, provides direction for future growth, the economy, social, and environmental decisions on the island through 2030. The project site is located within the “Urban Growth Boundary” in the Maui Island Plan’s Kahului-Wailuku region. It is further designated that the subject property is “Outside of Protected Areas” in the Maui Island Plan (MIP). The proposed affordable workforce housing project is consistent with the MIP’s designation. The proposed project meets the goals, objectives, and policies as stated in Chapter 5 of the Maui Island Plan.

***V. Neighborhood and Agency  
Informational Meetings***



## **NEIGHBORHOOD AND AGENCIES INFORMATIONAL MEETINGS**

The project's applicant held two (2) meetings with the Waikapu Community Association, representing members of the Waikapu community, Waiolani subdivision and the Waikapu Gardens Phases I and II subdivisions, located west and south of the proposed project site, respectively. Also, two (2) meetings were held with the members of the board of F.A.C.E. Maui affordable housing alliance representing various faith-based community organizations on Maui advocating for the development of workforce housing projects for Maui's working families. The applicant also met with the staff of Maui Catholic Charities to discuss the proposed project.

The primary purpose of the community meetings with various community organizations is to present the proposed workforce housing project, and more importantly, to solicit input and comments from the members of the community. At the said meetings, the applicant presented an overall summary of the proposed workforce housing project; which included background information, environmental setting; project location; proposed vision/design concepts; proposed allocation and distribution of the sizes/unit types (estimated costs and median income ranges); anticipated physical improvements and other pertinent project data. The goal was to provide enough information to the members of the community association so that they could assess the project and share with the applicant if they have any preliminary concerns/issues or questions. Overall, the meetings were a great opportunity to share the applicant's proposed project with the Waikapu residents and community leaders. The project was well-received and there were several supportive/positive comments regarding the housing project for working families. It was also presented that the project will be 100 percent affordable based on Maui's Affordable Sales

Guidelines and will meet families earning 70% - 140% of Maui's area median income. The applicant also presented proposed preliminary house floor designs that are envisioned for the proposed project. It is further noted that the architectural design will be consistent and complementary with its neighboring residential housing developments at Waikapu town community.

The project's applicant also met with the various County agencies to discuss the proposed project and to solicit further input and to address additional concerns/comments from their earlier written comments of the draft 201H, HRS application. The meeting was coordinated by the Maui County Department of Housing and Human Concerns. A brief summary about the project and the vision and infrastructural improvements for the proposed project to mitigate potential impacts of the proposed workforce housing project. County agencies that were represented during the meeting include: Department of Planning, Department of Public Works, Department of Water Supply, Parks and Recreation Department, Department of Transportation, Department of Fire and Public Safety, Department of Housing and Human Concerns, Maui Police Department, and staff from the Council's Land Use Committee.

***VI. Proposed Exemptions Request  
Pursuant to 201H-38, HRS***





WAIKAPU DEVELOPMENT VENTURE, LLC IS PROPOSING THE DEVELOPMENT OF A 20111 AFFORDABLE WORKFORCE HOUSING PROJECT ("the PROJECT"); AND AS SUCH, THE PROJECT IS REQUESTING THE FOLLOWING EXEMPTIONS LISTED BELOW FROM STATE OF HAWAII REVISED STATUTES ("HRS") AND MAUI COUNTY CODE ("MCC") PURSUANT TO *SECTION 20111-38, HAWAII REVISED STATUTES ("HRS")*.

**A. EXEMPTION FROM TITLE 2, MCC, ADMINISTRATION AND PERSONNEL**

1. An exemption from Chapter 2.80B, MCC, General Plan and Community Plans, shall be granted to permit the Project to proceed without obtaining a Community Plan Amendment.

**B. EXEMPTIONS FROM TITLE 8, MCC, HEALTH AND SAFETY; CHAPTER 8.04 REFUSE COLLECTION AND LANDFILLS**

1. An exemption from Section 8.04.040, MCC, Disposal Permits — Application and suspension, shall be granted to exempt the Project from the requirement of acquiring a *Disposal Permit*.
2. An exemption from Section 8.04.050, MCC, Disposal Charges, shall be granted to exempt the Project from *Disposal Charges*.

**C. EXEMPTIONS FROM TITLE 12, MCC, STREETS, SIDEWALKS, AND PUBLIC PLACES**

1. An exemption from Chapter 12.08, MCC, Driveways, shall be granted to exempt the Project from *Driveway Permit and Inspection Fees*.
2. An exemption from Section 12.08.100, MCC, Standards and Specifications, shall be granted to allow driveways within the 15-foot reserve area adjacent to an intersection and allow the maximum driveway width for the duplex units to exceed Twenty-Two (22) feet.
3. An exemption from Chapter 12.24A, MCC, Landscape Planting and Beautification; shall be granted to exempt the Project from requiring compliance with the *Landscape Planting Plan* as it pertains to requiring *One (1) Tree per Residential Lot*. The Project is comprised of seventy-four (74) Residential Lots, and thus, the Landscape Planting Plan will include the planting of no less than 74 Landscape Trees. However, the Project requests the flexibility within the precise location of each tree as it may not be feasible to plant a tree in the front area of every single residential lot because of the need for various required physical improvements — such as driveways, infrastructure, and utility systems. Planting trees in close proximity to these types of physical improvements may have inadvertent and negative consequences which may negatively affect the ability for the tree to grow/thrive into healthy mature tree. As such, the Project will include planting of 74 trees, however, some trees may need to be placed in other more feasible

and appropriate areas within the common areas of the Project so that the trees can thrive and grow to mature age. Such areas could include the Neighborhood Green and/or along the several Pedestrian Pathways leading to the Neighborhood Green.

#### **D. EXEMPTIONS FROM TITLE 14, MCC, PUBLIC SERVICES**

1. An exemption from Section 14.05.090, MCC, Fire Protection, shall be granted to exempt the Project from providing *Fire Protection* for the portions of the Property along Honoapiilani Highway.
2. An exemption from Chapter 14.35, MCC, Wastewater Assessment Fees for Facility Expansion for the Wailuku/Kahului Wastewater Treatment System, shall be granted to exempt the Project from having to pay *Wastewater Assessment Fees*.
3. An exemption from Chapter 14.76, MCC, Impact Fees for Traffic and Roadway Improvements in Wailuku-Kahului, Maui, Hawaii; shall be granted to exempt the Project from having to pay any *Traffic Impact Fees* should such fees be adopted prior to issuance of building permits for the Project.

#### **E. EXEMPTIONS FROM TITLE 16, MCC, BUILDINGS AND CONSTRUCTION**

1. Exemptions from MCC Chapters 16.04C, Fire Code, 16.18B, Electrical Code, 16.20B, Plumbing Code, and 16.26B, Building Code, shall be granted to exempt the project from *Fire, Electrical, Plumbing, and Building* permit fees, as well as inspection fees.
2. An exemption from Chapter 16.04C.160, MCC, Fire Code, as it pertains to permit fees in Subsection 1.12.8 shall be granted to exempt the project from permit fees required by the Fire Code.
3. An exemption from Section 16.04C.440, MCC, Fire Code, as it pertains to *dimension* in Subsection 18.2.3.6.1 shall be granted to exempt the Project from providing an *Unobstructed Width of Twenty (20) feet* for the *Interior Subdivision Roadways* (Roadways C and D) (Please refer to Exhibit 3 — Typical Section of Roadways C and D).
4. An exemption from Section 16.04C.470, MCC, Fire Code, as it pertains to Subsection 18.4.6 shall be granted to exempt the Project from providing fire protection for the portions of the Property along Honoapiilani Highway.
5. An exemption from Section 16.25B.3600, MCC, Improvements to Public Streets, as it relates to *Urban Standards for Curbs and Gutters*, shall be granted for the portion of the Project adjacent to *Waiale Road* (Please refer to Exhibit 1 — Typical Section of Waiale Road).

#### **F. EXEMPTIONS FROM TITLE 18, MCC, SUBDIVISIONS**

1. Exemptions from Section 18.04.030, MCC, Administration, and Section 18.16.020, MCC, Compliance; shall be granted to exempt the Project from

requirements of obtaining a *Change in Zoning, and Community Plan Amendment*.

2. Exemptions from Section 18.16.050, MCC, Minimum Right-of-Way and Pavement Widths, shall be granted to allow the *Internal Subdivision Roadways* (Roadways C and D) to have a *Minimum Right-of-Way Width of Thirty-Six (36) feet and Minimum Pavement Width of Twenty (20) feet* (Please refer to Exhibit 3 — Typical Section for Roadways C and D).
3. An exemption from Section 18.16.070A, MCC, Intersection Angles, shall be granted to allow the Right-of-Way Lines at Intersections to have a Minimum Corner Radii of Fifteen (15) feet.
4. An exemption from Section 18.16.220, MCC, Size and Shape, shall be granted to allow *Lot Sizes, Widths, Shapes, and Orientation, and Minimum Building Setback Lines*, within the Project that are not consistent with, and not in conformance with the provisions of Title 19, Chapter 19.31, MCC., Public/Quasi-Public District.
5. An exemption from Section 18.16.230, MCC, Lots — Minimum Sizes, shall be granted to allow Lot Sizes within the Project that are *not consistent with, and not in conformance with* the provisions of Chapter 19, Chapter 19.31, MCC, Public/Quasi-Public District.
6. An exemption from Sections 18.20.040, and 18.20.080, MCC, as they relate to the *Urban Standards for Curbs, Gutters*; shall be granted for the portions of the Project adjacent to Waiale Road (Please refer to Exhibit 1- Typical Section of Waiale Road).
7. An exemption from Section 18.20.070, MCC, shall be granted to allow the following exemptions as it relates to the *Construction of Sidewalks* along the Internal Subdivision Roadways A, B, C, and D (Please refer to Exhibit Nos.,2 and 3 — Typical Sections of proposed Internal Roadways:
  - Roadway A — Four (4) feet wide Concrete Sidewalks will be provided on both sides of portions of Roadway A; and the Sidewalks will be in compliance with applicable American Disabilities Act ("ADA ") requirements.
  - Roadway B — Five (5) feet wide Concrete Sidewalks will be provided on One Side of portions of Roadway B; and the Sidewalks will be provided on one side of portions of Roadway B; and the Sidewalks will be in compliance with all ADA requirements.
  - Roadways C and D — The Project is exempt from constructing Sidewalks on both sides of the Internal Subdivision Roadways C and D.
8. An exemption from Section 18.40, MCC, Driveways, shall be granted to allow driveways within the 15-foot reserve area adjacent to an intersection and allow the maximum driveway width for the duplex units to exceed twenty-two (22) feet.
9. An exemption from Chapter 18.40, MCC, Guidelines for Acceptance, shall be granted to allow the County to accept the subdivision roadways and utilities within the subdivision roadways based on the exemptions granted as part of the approved Resolution.

## G. EXEMPTION FROM TITLE 19, MCC, ZONING

1. An exemption from Chapter 19.31, MCC, Public/Quasi-Public District, shall be granted to permit the development and use of the subject parcel for single-family and two-family (duplex) Residential purposes. Permitted uses shall be based on Chapter 19.08, MCC, Residential District, and Chapter 19.10, MCC, Two-family (Duplex) District. The Project shall be exempt from all Development Design Standards set forth in Chapter 19.31, MCC. Further, this exemption shall allow the Subdivision of the Property in the Plat Configuration as generally shown in the Project Site Plan and exhibit 4. The following Zoning District Standards shall apply to the Project:

- PERMITTED USES: *Single-Family and Two-Family (Duplex) Residential Units; as well as, accessory buildings located on the same lot, the use of which is customary, incidental, usual, and necessary to that of the main building or to the use of the land.*
- MINIMUM LOT SIZE: 3,000 Square Feet
- MAXIMUM HEIGHT: No Building shall exceed Two (2) Stories or Thirty (30) feet in height.
- MINIMUM LOT WIDTH: Forty (40) feet
- YARDS (BUILDING SETBACKS: The Yards (Building Setbacks) to be as follows:
  - SINGLE-FAMILY AND TWO-FAMILY (DUPLEX) DWELLINGS:
    - Front Yard: Ten (10) feet **minimum**
    - Side Yard: Single-story is six (6) feet minimum; and two-story is ten (10) feet **minimum**; exterior stairs and landing decks accessing second story duplex units may extend to **within** six (6) feet of the side yard property line on one side only.
    - Rear Yard: Fifteen (15) feet **minimum**
  - GARAGES AND CARPORTS:
    - Front Yard: Zero (0) feet — lot line
    - Side Yard: Zero (0) feet — lot line
    - Rear Yard: Zero (0) feet — lot line

And as shown on Exhibit 4.

- **TOTAL NUMBER OF RESIDENTIAL LOTS IN PROJECT:**

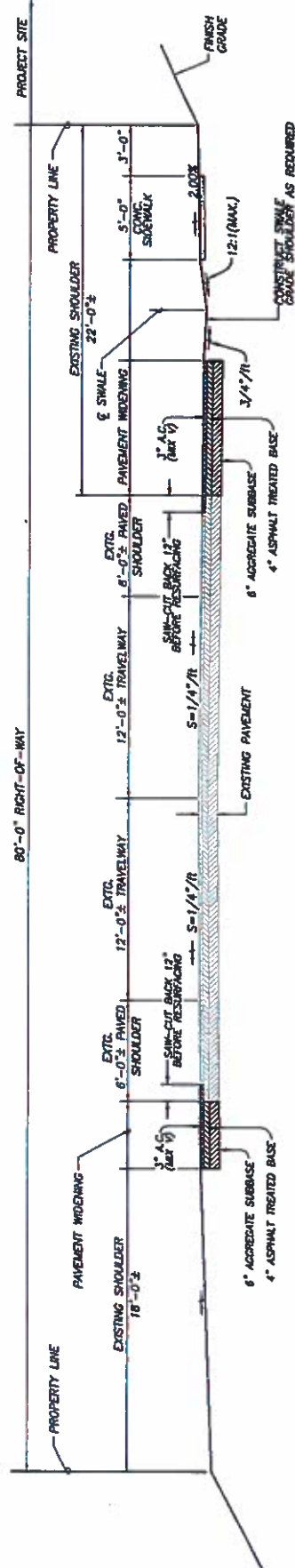
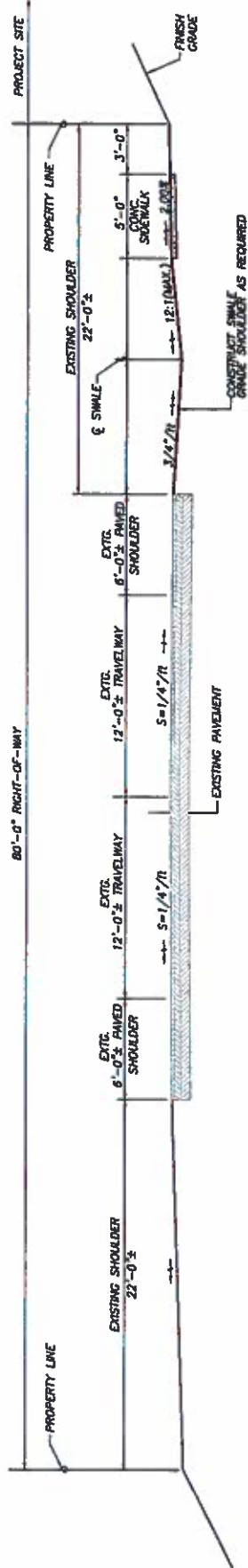
- Single-Family Lots: 68 lots
- Two-Family (Duplex): 6 lots
- Total No. Lots: 74 Lots

- **TOTAL NUMBR OF UNITS IN PROJECT:**

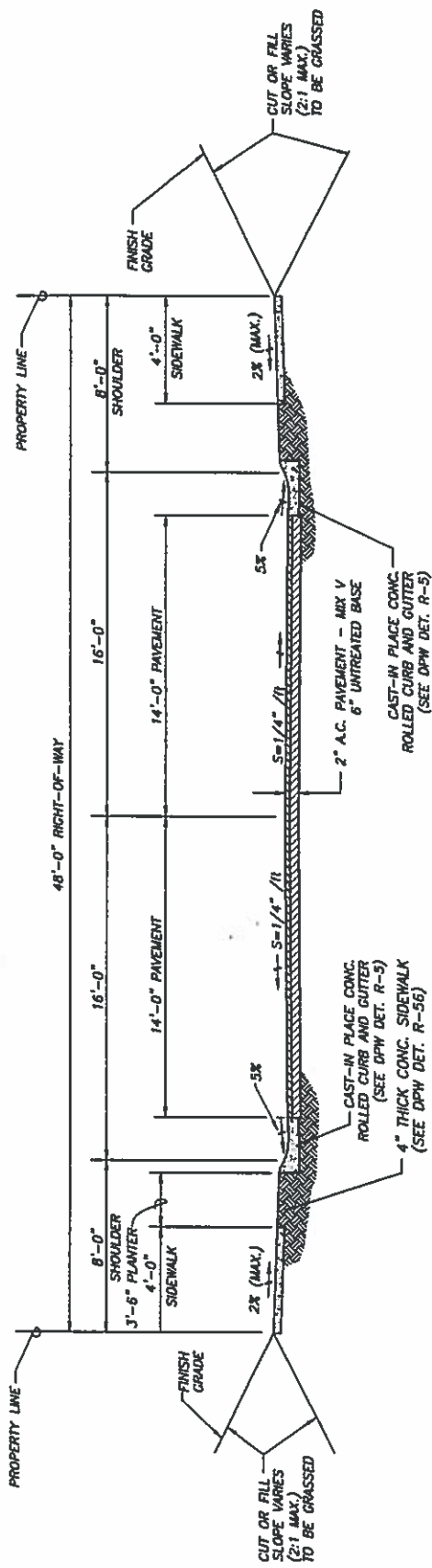
- Single-Family Units: 68
- Two-Family (Duplex): 12
- Total No. Units: 80

**H. EXEMPTIONS PURSUANT TO MAUI CODE REGARDING PROJECTS COMPRISED OF 100% RESIDENTIAL WORKFORCE HOUSING UNITS**

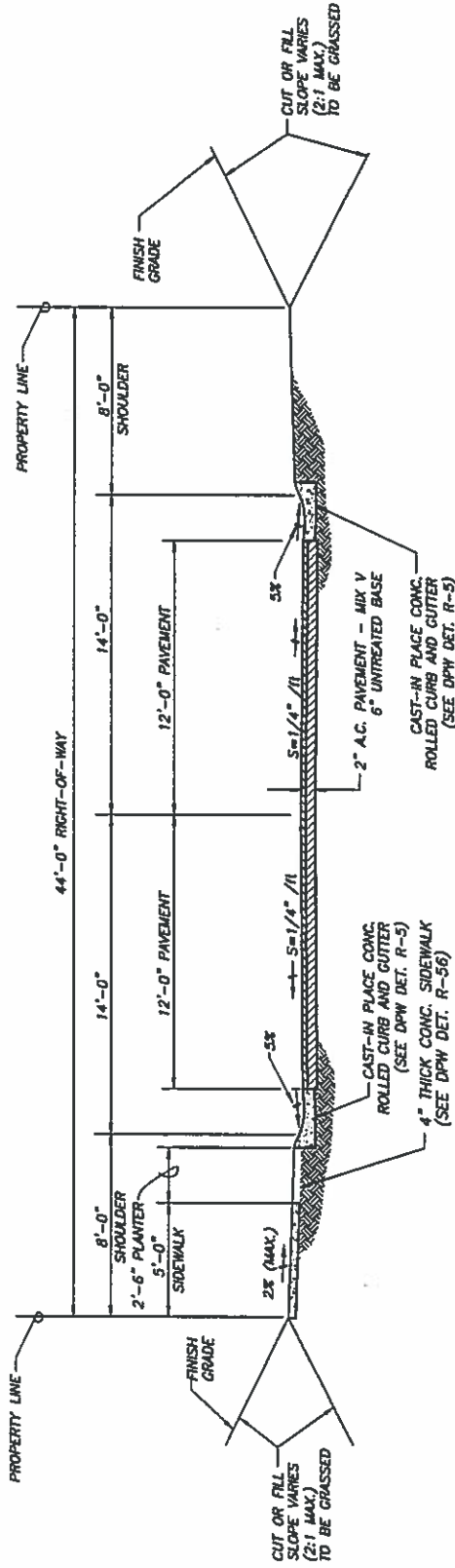
1. Section 12.08.050D, MCC, as it pertains to *Driveway Permit Fees*.
2. Section 14.12.030, MCC, as it pertains to exemption from Chapter 14.12, MCC.
3. Section 16.18B.107, MCC, as it pertains to the *Electrical Permit Fee* in Section 107.1C.
4. Section 16.20B.103.4, MCC, as it pertains to the *Plumbing Permit Fee* in Section 103.4.1.3.
5. Section 16.26B.108, MCC, as it pertains to the *Building Permit Fee* in Section 108.2.
6. Section 18.16.320 (1) (5), MCC, as it pertains to the *Park Assessment Fee*.
7. Section 20.08.090D, MCC, as it pertains to *Grading and Grubbing Permit Fee*.





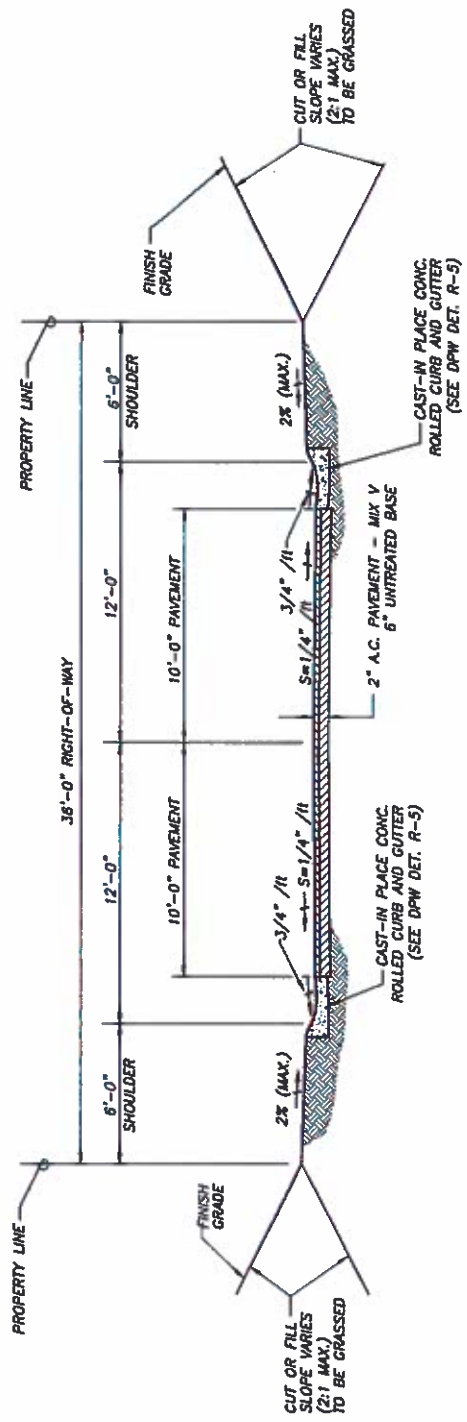


TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "A" (48 FT. RIGHT-OF-WAY)  
NOT TO SCALE



TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "B" (44 FT. RIGHT-OF-WAY)  
NOT TO SCALE

- NOTES:
1. ROAD "B" ROW SHALL INCLUDE ON STREET PARALLEL PARKING STALLS, WHERE OCCURS.



**TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "C" & "D" (36 FT. RIGHT-OF-WAY)**  
NOT TO SCALE



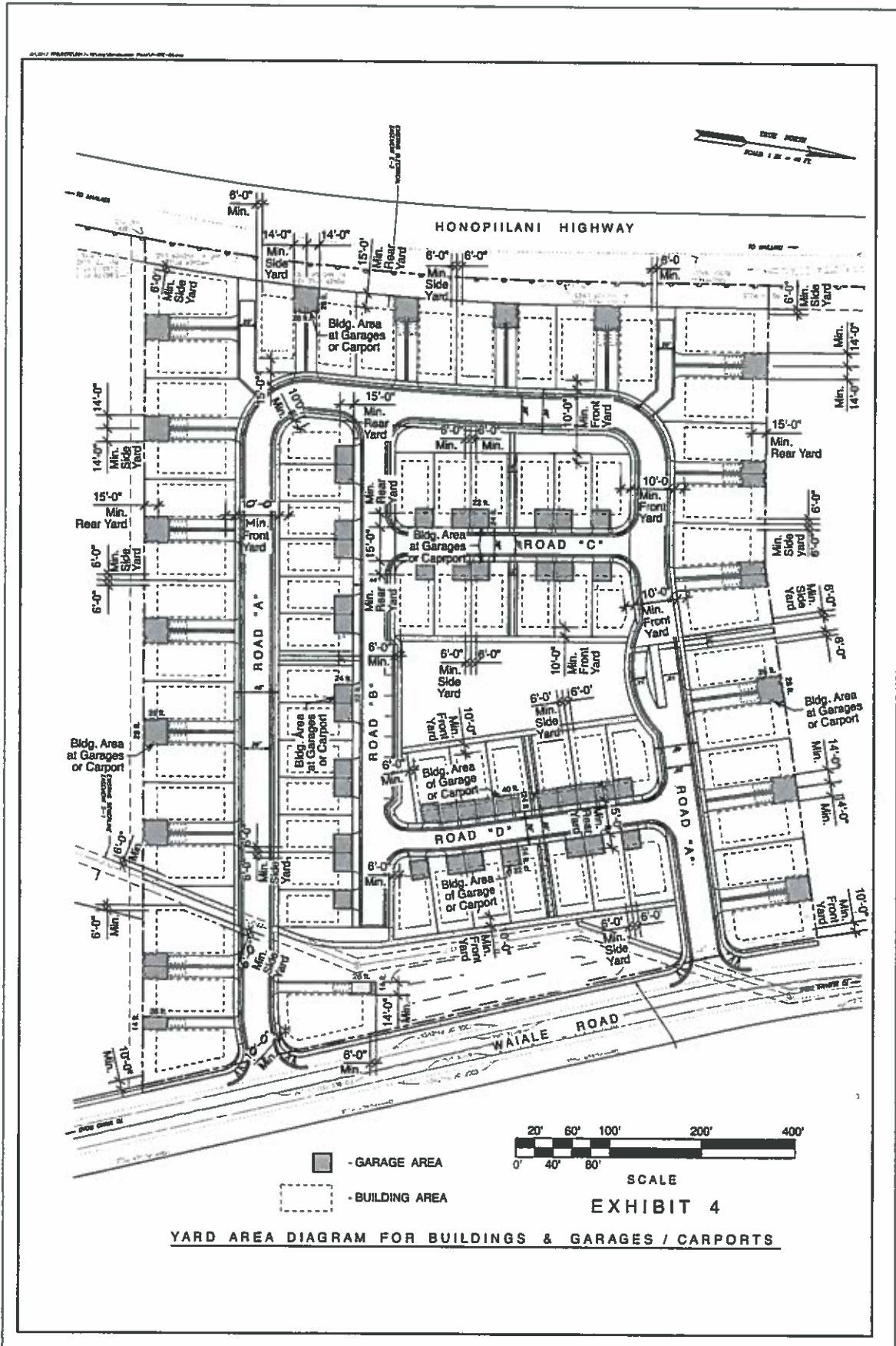


EXHIBIT 4  
YARD AREA DIAGRAM FOR BUILDINGS & GARAGES / CARPORTS



## ***VII. Appendices***

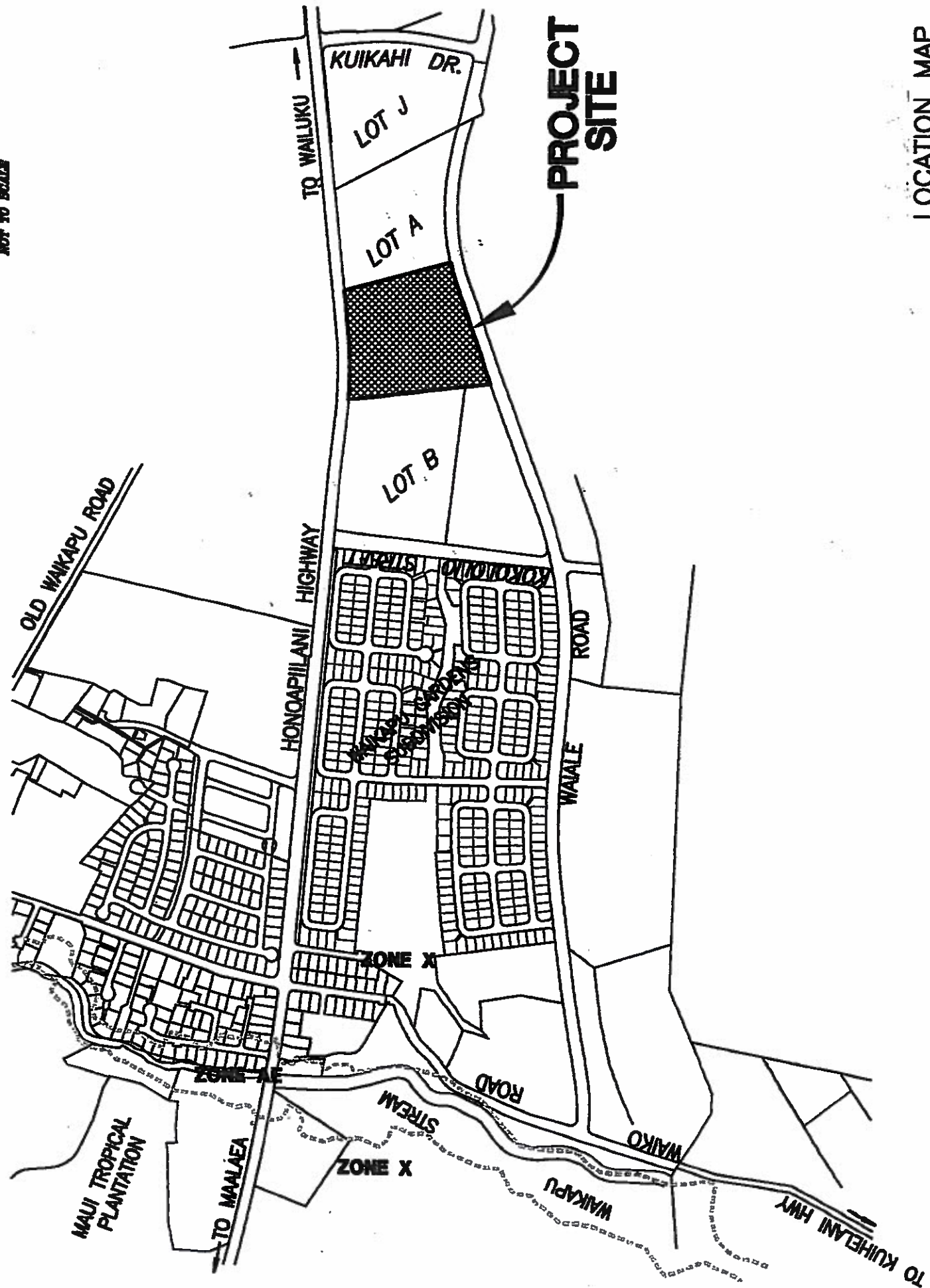


## ***Appendix A***

### ***Location Map***



TRUE NORTH  
NOT TO SCALE



LOCATION MAP





## ***Appendix B***

### ***Preliminary Site Plan***







***Appendix C***

***Archaeological***

***Inventory Survey (AIS)***



ASH

**FINAL ARCHAEOLOGICAL INVENTORY SURVEY  
OF A 50-ACRE PARCEL OF LAND  
WAIKAPU AND WAILUKU *AHUPUA*'A, WAILUKU DISTRICT MAUI ISLAND  
TMK [2] 3-5-002:011 and 012 (formerly 3-5-002:001 pors.)**

by  
Diane Guerriero, B.A., Lisa Rotunno-Hazuka  
and Jeffrey Pantaleo, M.A.

for  
The Emmanuel Lutheran Church and Valley Isle Fellowship  
One Main Plaza Ste 400  
Wailuku, HI 96793

**REVISED MAY 2016**

July 2004

**Archaeological Services Hawaii, LLC  
16 South Market Street, Suite G  
Wailuku, Hawaii 96793**

## ABSTRACT

Archaeological Services Hawaii, LLC, of Wailuku, conducted an archaeological inventory survey (AIS) within a 50-acre parcel of land in Wailuku and Waikapū *ahupua'a*, Wailuku District, Maui Island, TMK [2] 3-5-002:001 pors. The AIS field work was conducted from 4-7 May 2004 during due diligence procedures as the Emmanuel Lutheran Church (ELC) and the Valley Isle Fellowship (VIF) were in the process of purchasing the project area from Wailuku Agribusiness. Upon completion of the field work, a post-field summary letter was provided to ELC and VIF and the property was subsequently purchased. Due to the proposed plans to subdivide and develop the parcel, the AIS report was prepared and submitted to the State Historic Preservation Division (SHPD) in 2004. The parcels were subsequently subdivided into two approximate 25.0 acre parcels and assigned TMK's [2] 3-5-002:011 for the north and [2] 3-5-002:012 for the south. Approximately 12-years later, the development plans for the parcels were re-vitalized; however it was determined that the AIS report was never reviewed. Thus, in February 2016, another copy of the report was provided to the SHPD.

The proposed development consists of the construction of two churches, the Emmanuel Lutheran Church (ELC) and the Valley Isle Fellowship (VIF), as well as an affordable residential subdivision. The ELC and residential subdivision are planned for the northern section, Parcel 11, and the VIF will be constructed in the southern half, Parcel 12. The purpose of the investigation was to determine the presence/absence, nature, extent, and significance of cultural resources (if applicable) in the project area that could be adversely affected by proposed development.

The scope of work for the current investigation included a pedestrian survey with subsurface backhoe testing. Results of the pedestrian survey identified one historic property, a disturbed segment of State Site 50-50-04-5474, the Kama Ditch, situated within the southwestern portion of the project area. Also noted was a metal sluice gate, designated Feature 1 of Site 5474. The ditch, constructed around 1905 to 1907, provided water to the sugarcane and subsequent pineapple fields and was supposedly abandoned approximately 30 years ago. Site 5474 was assessed as significant under Criterion "a" because of its association with the plantation era and Criterion "d" for its information content under the Federal and State historic preservation guidelines.

A total of 25 backhoe trenches (TR1-25) were selectively placed in areas that contained no active farming. Trenches ranging in length from 5 to 7 meters were excavated until sterile subsoil was



reached. No significant cultural remains were encountered during trenching and representative stratigraphic profiles were recorded.

Based on the negative results of fieldwork, no further inventory level work is recommended prior to commencing construction activities. However, due to the presence of numerous archaeological sites and Native Hawaiian burials in neighboring parcels, archaeological monitoring during all ground-altering activities is recommended. Prior to the commencement of construction, Archaeological Monitoring Plans (AMP) will be prepared and submitted to SHPD for review and approval. An AMP for the proposed affordable residential subdivision in Parcel 11 was recently submitted to the SHPD; however review of the AMP is pending approval of this AIS report.

## TABLE OF CONTENTS

ABSTRACT .....	2
TABLE OF CONTENTS .....	4
LIST OF FIGURES .....	5
LIST OF TABLES .....	6
INTRODUCTION .....	7
PROJECT AREA .....	7
ENVIRONMENT .....	8
HISTORICAL SUMMARY .....	12
Early Historical Accounts .....	13
Historic Land Use .....	14
PREVIOUS ARCHAEOLOGY .....	21
SETTLEMENT PATTERN .....	25
SITE EXPECTABILITY .....	25
METHODS .....	26
SCOPE OF WORK .....	26
RESULTS OF FIELDWORK .....	27
Backhoe Trench 1 and Backhoe Trench 2 .....	31
Backhoe Trench 3 .....	31
Backhoe Trench 4 .....	32
Backhoe Trench 5 .....	32
Backhoe Trench 6 .....	34
Backhoe Trench 7 .....	34
Backhoe Trench 8 .....	35
Backhoe Trench 9 .....	35
Backhoe Trench 10 .....	36
Backhoe Trench 11 .....	38
Backhoe Trenches 12 through 14 .....	38
Backhoe Trenches 15 and 16 .....	40
Backhoe Trench 17 .....	40
Backhoe Trench 18 .....	40
Backhoe Trench 19 .....	41
Backhoe Trench 20 .....	41
Backhoe Trench 21 .....	43
Backhoe Trench 22 .....	43
Backhoe Trench 23 .....	43
Backhoe Trench 24 .....	45
Backhoe Trench 25 .....	45
SITE 50-50-04-5474 .....	46
INITIAL SIGNIFICANCE EVALUATION .....	57
DISCUSSION .....	58
RECOMMENDATIONS .....	59
REFERENCES .....	60

## LIST OF FIGURES

Figure 1. Location of Project Area on U.S.G.S. Quadrangle.....	9
Figure 2. Tax Map Key 3-5-002 Showing Project Area and Locations for Proposed ELC and VIF.....	10
Figure 3. Overview of Project Area (top) View to East-Northeast; (bottom) View to Northwest.....	11
Figure 4. USGS Map Showing Project Area (Red) and Previous Archaeological Studies in Close Proximity to Subject Parcel.....	20
Figure 5. Topographic Map Showing TR's 1-25, Site 50-50-04-5474 and Waiale Housing to South.....	30
Figure 6. Overview of Trench 3, View to West.....	32
Figure 7. Representative Stratigraphic Profiles for Trenches 1-5, (top) TR2 North Wall (bottom) TR4 South Wall.....	33
Figure 8. Trench 5, View to North.....	34
Figure 9. Trench 8, View to North.....	35
Figure 10. Trench 9, View to South.....	36
Figure 11. Representative Stratigraphic Profiles for Trenches 6 through 10, (top left) TR7 South Wall, (top right) TR9 South Wall and (bottom) TR10 West Wall.....	37
Figure 12. Trench 14, View to North.....	38
Figure 13. Representative Stratigraphic Profiles for Trenches 11-15 (top) TR11 South Wall and (bottom) TR12 North Wall.....	39
Figure 14. Trench 17, View to East.....	40
Figure 15. Trench 20, View to West.....	41
Figure 16. Representative Stratigraphic Profiles for Trenches 16 through 20, (top) TR17 East Wall, (bottom) TR18 East Wall.....	42
Figure 17. Trench 21, View to North.....	43
Figure 18. Representative Stratigraphic Profiles for Trenches 21-25 (top) TR23 East Wall (bottom) TR25 North Wall.....	44
Figure 19. Trench 23, View to East.....	45
Figure 20. Trench 25, View to East.....	45
Figure 21. Enlarged USGS Map Showing Kama Ditch from South side of Iao Stream to its Terminus at Reservoir by Waikapū.....	46
Figure 22. Registered Map 1261 by Monsarratt 1882 Showing a Portion of Wailuku.....	48
Figure 23. Map Key of Wailuku from Bailey House Archives likely from Late 1800's early 1900's (no date or drafters name available, original map is missing only this copy remains).....	49
Figure 24. Enlarged Key Map of Wailuku Showing Iao Stream, Kama Ditch-Site 5474 and Old Mill Ditch.....	50
Figure 25. Illegible Photograph of Map for Wailuku Sugar Co. in Iao Valley from Bailey House Archives (By J.K. Kahookele 1907).....	51
Figure 26. Enlarged Central Section of Wailuku Sugar Company Map from 1907 Showing Kama Auwai and Bailey's Ditch (note map designates Iao Stream as Wailuku Stream).....	52
Figure 27. Enlarged Western Section of Wailuku Sugar Company Map from 1907 Showing Kama Auwai and Bailey's Ditch (note map designates Iao Stream as Wailuku Stream).....	53
Figure 28. Aerial Photograph of Southwestern Quadrant of Project Area Showing.....	54
Figure 29. Photograph of Site 5474 Kama Ditch (View to North).....	55
Figure 30. Overview Photograph of Project Area and Site 5474 (Kama Ditch) Feature 1 (Sluice Gate) along Southwest Side (View to South).....	55
Figure 31. Photograph of Site 5474 Feature 1 Metal Sluice Gate of Kama Ditch-Note infill of Silt (View to East).....	56

### **LIST OF TABLES**

Table I. LIST OF LCAs AND GRANTS IN WAIKAPŪ (Source: Waihona 'Aina Corp. 2004) .....	19
Table II. Backhoe Trench Stratigraphic Summary Table TR's 1-10 .....	28
Table III. (cont) Backhoe Trench Stratigraphic Summary Table TR's 12-25 .....	29

## **INTRODUCTION**

At the request of potential landowners, the Emmanuel Lutheran Church (ELC) of 520 One St. Kahului, Hi. 96732 and Valley Isle Fellowship (VIF) of 473 S. High St. of Wailuku, Hi. 96793, and through an agreement with current landowner, Wailuku Agribusiness; Archaeological Services Hawaii, LLC (ASH) conducted an archaeological inventory survey (AIS) according to the rules and regulations set for Hawaii Administrative Rules (HAR) §13-276. The AIS was performed of an approximate 50-acre parcel of land slated for subdivision and development in Wailuku, Waikapū and Wailuku *ahupua`a*, Wailuku District, Maui Island, TMK [2] 3-5-002:011 and 012 (formerly a portion of Parcel 1-TMK 3-5-002:001) (Figs. 1 and 2).

The purpose of this investigation was to determine the presence/absence, extent, and significance of cultural resources in the project area. The AIS was comprised of a pedestrian survey and mechanical trench excavations (n=25). The survey was conducted from May 4-7, 2004, by Mr. Paul Titchenal, (M.A.) and supervisor Ms. Diane Guerriero, (B.A.) and one historic property, Site 50-50-04-5474, a portion of Waihe'e Ditch, along with a metal sluice gate, Feature 1 of site 5474 was documented along the southwestern/western side of the parcels (see Figure 1).

## **PROJECT AREA**

The project area is located along the northeastern alluvial slopes of the West Maui mountains in Waikapū and Wailuku *ahupua`a*. It is bounded by Honoapi'ilani Highway to the west, Waiale Road to the east, a cane haul road and retention basin to the north, and a recent residential housing project to the south, constructed after the AIS procedures (Fig. 2).

The project area consists of two adjoining 25-acre parcels within a portion of the former Wailuku Agribusiness landholdings (TMK [2] 3-5-002:001 pors.) and contains numerous individual farm plots with bananas, sweet potatoes, and fallow sugar cane and a sod farm. The northern 25.0 acre parcel is owned by Emmanuel Lutheran Church (ELC) and the southern acreage is the Valley Isle Fellowship (VIF) parcel.

The south-eastern and eastern portions of the project area have been impacted by previous sand-mining and agricultural activities, the western portion by agricultural activities and the central portions are actively under agricultural production. The Kama Ditch (State Site 50-50-04-5474)

bisects a portion of the southwestern section of the project area and is oriented roughly north-south (see Figures 2 and 3). The County of Maui sewer line easement bisects the central south section and a portion of the central, east section.

### **ENVIRONMENT**

The project area is situated along the northwestern margin of the isthmus of Maui Island, located below Waikapū Valley on the southwest and Iao Valley on the northwest. The terrain of the project area, altered by commercial agricultural production and previous sand-mining activities, is relatively flat along the western and eastern peripheries with a slope to the east in the central portion. Elevation ranges from 300 feet above mean sea level (AMSL) along the eastern boundary to 400 feet above mean sea level along the western boundary. Rainfall averages between 20-30 inches a year, predominantly occurring during the winter months between November and February (Armstrong 1973).

Vegetation in the project area is dominated by non-native plant species, these include: *koa haole* (*Leucaena glauca*), *kiawe* (*Prosopis pallida*), *wilelaiki* or Christmasberry (*Schinus terebinthifolius*), cane grass (*Setaria sp.*) growing in areas formerly cultivated with sugarcane, fallow pineapple (*Ananas sp.*), active and fallow sweet-potato (*Ipomoea sp.*), banana (*Musa sp.*), papaya (*Carica sp.*), various vegetables and non-native grasses and weeds. Native plant species observed include 'ilima (*Sida fallax*), 'uhaloa (*Waltheria americana*), and popolo (*Solanum nelsonii*).

Soils in the project area include Iao clay (Icb), 3-7% slopes, and Pu'uone sand (PZUE) 7-30% slopes. The Iao clay, occur on slopes between 3-7degrees, on smooth alluvial fans and valley fill. Permeability is moderately slow, runoff is medium, and erosion hazard is slight to moderate. This soil is used for sugarcane and home sites. The Pu'uone sands, occur on slopes between 7-30 degrees, on mid coastal plains near the ocean, and developed in material derived from marine coral and shells. This type of sand is transported and deposited by both alluvial and aeolian forces. Permeability is rapid above the cemented layer, runoff is slow, and erosion hazard is moderate to severe. This soil is used for pasture and home sites (Foote et al. 1972).



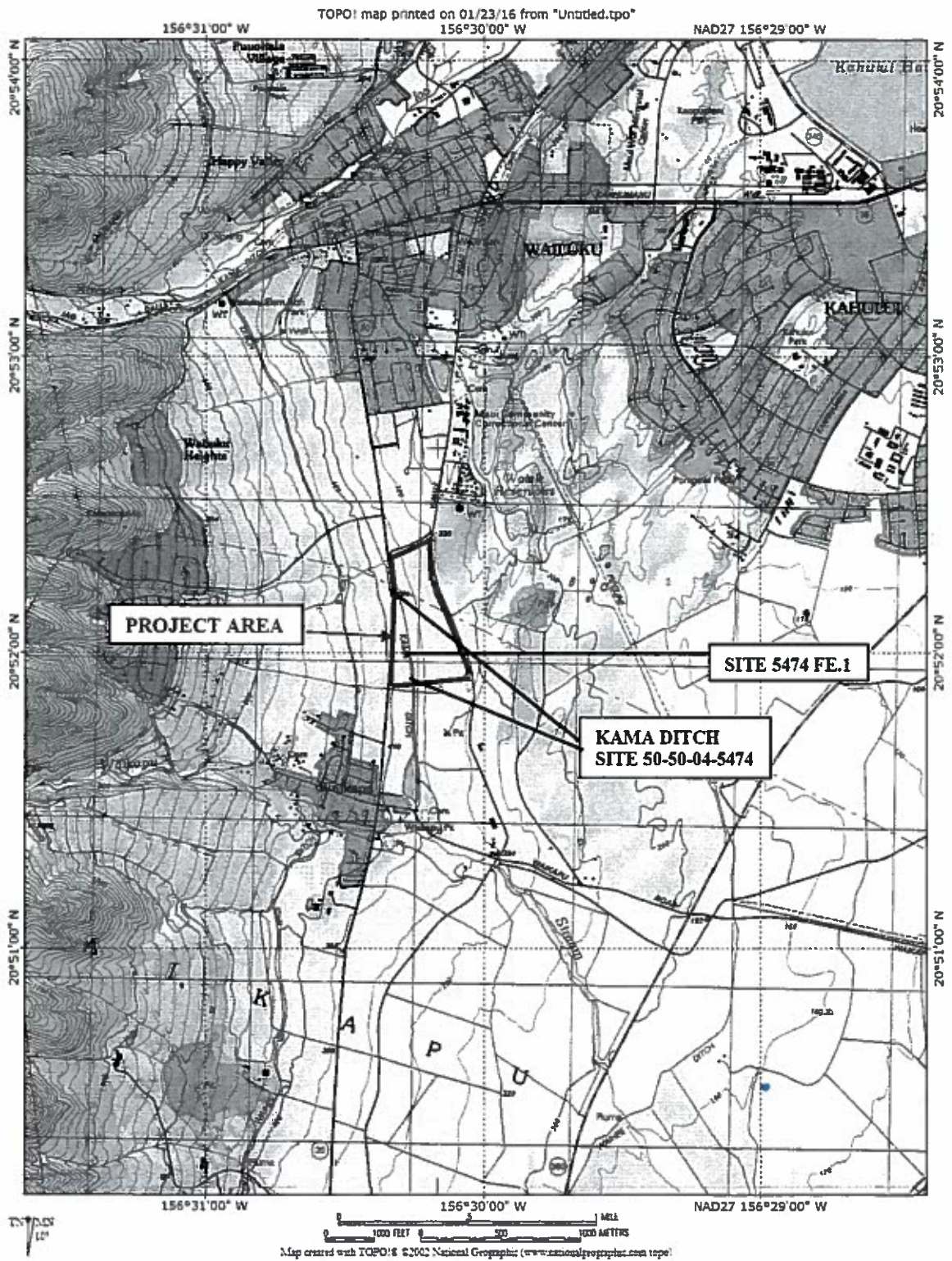


Figure 1. Location of Project Area on U.S.G.S. Quadangle







**Figure 3. Overview of Project Area (top) View to East-Northeast; (bottom) View to Northwest**

## HISTORICAL SUMMARY

Traditionally, the division of Maui's lands into districts or *moku* and subdistricts were said to have been "performed by a *kahuna* named Kalaiha'ohia, during the time of the *ali'i Kaka'alaneo* (Beckwith 1970:383). Further land divisions within the *moku* were *ahupua'a*, which ideally incorporated all the natural resources necessary for traditional subsistence strategies.

*Ahupua'a* boundaries were said to have been established about 500 years ago and remain largely unchanged (Sterling 1998:3); thus, it is expected that the current boundaries of Waikapū approximate its prehistoric ones.

The district of Wailuku contains the other *ahupua'a* of Waiehu, Waihe'e, and Kahakuloa to the north, and Waikapū and Pulehunui to the south.

The Wailuku District is considered one of Hawai'i's *wahi pana*, legendary places. Specific to Waikapū are many important legendary and traditional accounts.

The island of Maui was named for the demigod Maui (Pukui et al. 1974), a trickster hero known throughout Polynesia. The Hawaiian creation chant Kumulopo described Maui an ancestor of the Hawaiian people and descendant of Wakea, the mythical ancestor of all Hawaiians (Beckwith 1970:227, Pukui and Elbert 1986:381). Kamakau (1991:129) says that the island was originally called *'Thi-kapalau-maewa*, and that it was called Maui only after Maui became famous for his exploits.

Historical research of Waikapū *ahupua'a* was summarized in Smith (in Brisbin et al. 1991), and Titchenal (1996). Creed (1993) has written extensively on the settle pattern and traditional background of the Waikapū *ahupua'a*. The reader is referred to these studies for detailed information. A brief summary of the history and land use of the subject area is included here.

The current project area is located in Waikapū *ahupua'a*, in an area which is referred to as Waikapū Commons, in the district of Wailuku. The literal meaning of Waikapū is "water of the conch" (Pukui et al. 1974:223). Legends and oral traditions of Waikapū *ahupua'a* include the story describing the origin and meaning of Waikapū. During ancient times a great conch shell (*pu*) was hidden in a cave on the south side of the stream, about a mile inland. Hence the name *Wai-ka-pu*, "water-of-the-conch" (Handy and Handy 1972:497-498). Another account places the

cave in the valley, a mile or more above the village. The conch was heard in the valley frequently, but never witnessed by the people. A dog, named Puapualenalena, coveted the conch and finally succeeded in stealing it after which its sound was not heard again.

Another interpretation comes from Stoddard (1894, in Wong-Smith, 1992), who says the name comes from a *kapu* Kamehameha I put on the stream during the battle of 'Iao Valley in 1790 (Fredericksen 2004:5).

“ It was at Kalepolepo that Kamehameha the Conqueror beached his canoes. If the oldest inhabitant of Ma'alaea claims this distinction for his port, believe him not. I have the facts, from an eye-witness. The sea was dark with victorious canoes; Kamehameha landed at Kalepolepo, and a kapu was put upon the nearest stream. It became sacred to royalty, as was the custom and is known as Waikapū to this hour – that is forbidden water.”

A number of battles took place in the Waikapū region, including Fornander's (1969:153) account of the battle of the Waikapū Commons or the *Ahulau ka pi'ipi'i Kakanihūa*. The following account describes the battle on the sand hills southeast of Wailuku:

...The detachment or regiment known as the Alapa, mustering 800 men, was selected for this hazardous expedition, and with high courage they started across the isthmus of Kamaomao, now known as the Waikapū common, as the legend says, “to drink the waters of Wailuku that day. “...Little did this gallant troop apprehend the terrible fate that awaited them...Kahekili distributed his forces in various directions on the Wailuku side of the common, and fell upon the Hawaii corps d'armee as it was entering among the sandhills southeast of Kalua, near Wailuku. After one of the most sanguinary battles recorded in Hawaiian legends,...the gallant and devoted alapa was literally annihilated; only two out of the 800 escaped alive to tell Kalaniopuu of this Hawaiian Balaclava (Fornander 1969:153).

### Early Historical Accounts

Since Hawaiians had no formal written language, early historical accounts of Hawaii were recorded by early Hawaiian historians and foreigners to the islands. These descriptions are invaluable as they provide vivid representations of the area and its use.

This area, called *Na Wai 'Eha*, fed by the four streams of Waikapū, Waihe'e, Waiehu, and Wailuku, prospered with the abundance of water. This valuable resource contributed to the population concentration of Wailuku and its surrounding area, which evolved into a substantial

Hawaiian settlement and central place of religious and political power on Maui during the pre-contact period and post contact period.

Foreigners visiting Maui in the early 1800's provided several descriptions of the region of Waikapū. The reader is referred to Wong-Smith (1991: Appendix A, in Brisbin et al. 1991) noteworthy summary of historic references to Waikapū for a more complete treatment of the subject.

Early historical references to Waikapū indicated that the valleys of Waikapū and Wailuku supported substantial populations in the 17<sup>th</sup> century:

The first village of any note on the way to Wai-lu-ku is Wai-ka-pu. It contains a population of about 500. Here the forces of Kamehameha the Great once assembled for battle at the sounding of the conch shell. Hence the name, Wai-ka-pu (water of the conch or trumpet) (Bates 1854:309).

### Historic Land Use

With the arrival of the missionaries in Hawaii in 1820 every aspect of Hawaiian society was influenced. A Western-style government began to take form. In 1839, Kamehameha III (Kauikeaouli) promulgated a declaration of rights known as Hawaii's Magna Carta and, just a year later, Hawaii's first constitution was written.

The Wailuku District was utilized in historic times for many ventures. These included fishing, cultivation of taro, sweet potatoes, sugar cane, and cattle ranching.

According to Kame'eleihiwa (1992) by the mid-1800s, foreign demand for land was so great and the political power of chiefs so weak that the government privatized land ownership, first by distributing large tracts of lands to chiefs through a process called the Mahele and smaller parcels to *maka'ainana* as Land Commission Awards, and later by sale of mostly small parcels as Royal Patent Grants. Privatization opened the door to the transfer of Hawaiian lands to foreigners.

During the Mahele in 1848, Hawai'i was divided into thirds and distributed in three categories. Under the conditions of the Mahele together with the Kuleana Act of 1850: 24% of lands (1 million acres) went to King Kamehameha III; 39% (1.6 million acres) was divided between 251

chiefs; and 36% (1.9 million acres) was identified as government lands (Farber 1997:21). The amount of lands offered to *ali'i* were determined through genealogical rank.

Under the Land Commission Guidelines, for *Maka'ainana* to claim land, the claimant must have lived on the land before 1839 and could only claim it under cultivation and/or house lot. "At the time, the term *Maka'ainana* included foreigners who had sworn an oath of allegiance to the *Mo'i*" (Kame'eleihiwa 1992:295). According to Pickett, the process was as follows: *Maka'ainana* were required to give statements themselves, as well as submit evidence from witnesses defined as Native and Foreign testimonies. Lands were to be surveyed that were only accomplished by 'qualified' non-native surveyors. *Kanaka Maoli* (full blooded Hawaiians) were expected to pay for their individual surveys. Each claim was issued a Land Commission Award (L.C.A.) number, commutation fees were required, and another number called a Royal Patent (R.P.) was also issued (Pickett 2003).

"In 1848, there were approximately 88,000 Hawaiians, but only 14,195 applications were made...of the 14,195 *kuleana* claims, only 8,421 were actually awarded" (Kame'eleihiwa 1992:295). The *Maka'ainana* received less than 1% of the land.

Within a short time, large tracts of land were turned over to commercial agriculture, primarily sugarcane cultivation.

Countless Native Hawaiians lost their land use rights as a result of the Great Mahele of 1848, with the establishment of a system of private land ownership. Many landless Native Hawaiians signed on as laborers in the emerging sugar industry, which began on Maui in the 1820s.

According to Creed (1993, Vol. I, 1993, p.vii) the Mahele became a significant period because it was the first extensive written record on how land was being, and had been used. And accordingly the majority of LCAs in Waikapū were awarded to Hawaiians.

There are many indications in the LCAs that Waikapū was well on its path into "foreign" ways, nevertheless indications are still rife that that it is still a thriving traditional community as well. People are still growing hala, raising *wauke* for clothing of tapa (*kapa*), and have small fish ponds, but the most telling traditional feature of the landscape is its taro (Ibid., p.47).



Creed also suggests the possible and the documented site types of Waikapū *ahupua`a*. Creed extracted the previous land use information from the Mahele records. These are: traditional agricultural sites, habitation sites, burials, boundary walls and markers, canoe landings at Ma`alaea, caves, springs and waterways, traditional activity areas, roads, trails, religious structures and areas (Ibid., p.19-21).

Handy and Handy (1972:497) provided descriptions of native Hawaiian planting techniques in Waikapū during the 1930s:

...Spreading north and south from the base of Waikapū to a considerable distance below the valley are the vestiges of extensive wet-taro plantings, now almost obliterated by sugar-cane cultivation; a few here and there are preserved in plantation camps and under house and garden sites along the roads. Among these gardens there were in 1934, a few patches of dry Japanese taro. Far on the north, just above the main road and at least half a mile below the entrance to the main canyon, an extensive truck garden on old terrace ground showed the large area and the distance below and away from the valley that was anciently developed in terraced taro culture. (Handy and Handy, 1972:497)

The traditional waterway of the Kama Ditch, also referred to as *Kamaauwai* ditch or *Kama`auwai* became an issue of great controversy of water rights (Sterling 1998:86). Two ancient *`auwai*, *Kamaauwai* and *Kalaniauwai* and the Wailuku mill water courses were all mentioned by Chief Justice Allen during the water court case in 1967 (Ibid).

The 1867 landmark court case, Peck vs. Bailey, set the precedent for ownership of water rights. Peck (Wailuku Sugar) argued that their water rights were paramount over the rights of Bailey's heirs. The judge ruled, "Each owner held the right to the water used on their portion of land". This decision greatly impacted traditional Hawaiian customs by breaking the traditional connection between the shared use of water and growing taro. Under customary Hawaiian law, the chiefs controlled and parceled out the use of water. Water was one of the most important aspects of traditional law, as Hawaii's staple crop, taro, depended on the stable delivery of water.

By the nineteenth century, however, sugar replaced taro as Hawai'i's dominant crop. This decision made possible the rapid expansion of the sugar industry and the subsequent growth of population in central Maui.

Sugarcane cultivation was introduced to the region in the early historic period by a Spaniard named Antone Catalina, who manufactured cane syrup at Waikapū in 1828, thus establishing the

beginning of the commercial sugar industry in the Wailuku District. Antone Catalina was granted LCA 205, a 13.61 acre parcel in the *ili* of Halepalahalaha in 1846 by Hoapili-Wahine (Maui's Governing Chiefess). Catalina along with James Louzada were partners in the Waikapū sugar industry.

James Louzada from Waimea, Hawaii established the Waikapū Sugar Plantation in 1863 and introduced cattle production to the Waikapū area. "Mahele records state that Louzada was allowed to take over *konohiki* land that had not been worked for some time, and turned the taro patches and house in productive and livable condition. For this hard work, the 26 acres of land (LCA 225) were granted to him and his Hawaiian heirs by Puupahoehe" (Creed, Vol. II, 1993, p.6 in Fredericksen, 2004).

During the Mahele of 1848-1851, the Wailuku District was declared Crown Lands and numerous Land Commission Awards and Grants were awarded in Waikapū *ahupua`a* (Table 2.)(Fig. 6). According to Wai'hona data base a total of 104 out of 132 claims were awarded in Waikapū.

After the Mahele, government land in Waikapū was put under the Ministry of Instruction. "On November 15, 1875, the secretary of the Board of Education informed the Minister of Public Instruction that he was directing that a royal patent be made (Grant 3152) to Henry Cornwell (Kapu Louzada, the sister of James Louzada married Henry Cornwell), for the remainder of property belonging to the Board of Education, which had been sold to him at auction for \$15,050. (Creed, Vol. I, p.68).

In 1889, ½ interest in Waikapū sugar lands was bought by Claus Spreckles. The remaining acres continued to be held by G.W. Macfarlane & Co., the previous partner of Louzada and Catalina in Waikapū Sugar Mill (Fredericksen, 2004:13).

It was at this time that the Spreckels Ditch also referred to as the "Waihee Ditch" was built across the Waikapū *ahupua`a* in order to provide needed water for sugar production (Creed, v. I, p. 68, in Fredericksen, 2004:13).

In 1882, Princess Ruth sold one-half of the Crown Lands of Hawai'i to Claus Spreckels in order to settle her debts with him. Spreckels already held a lease (purchased from Henry Cornwell) for 16,000 acres of Wailuku *ahupua`a* (Waikapū Commons), dating from 1878 (R.P. 3152). Worried

about what Spreckels might do with half of the Crown Lands, King Kalakaua gave him (Grant 3343) in 1882, a 24,000 acre portion of the southeastern section of Wailuku *ahupua`a*, in return for the surrender of his claim. Claus Spreckles established the Hawaiian Commercial and Sugar Company in 1882. In 1898, control of HC&S passed from Claus Spreckels to that of S.T. Alexander and H.P. Baldwin.

After several changes in ownership the Waikapū Sugar Plantation passed into the control of Wailuku Sugar Company in 1894 (Maui News, February 3, 1926). The present project area was held by the Waikapū Sugar Company, (Grant 3152), that was awarded to H. Cromwell. These lands eventually passed into control of Wailuku Sugar Company.

Another water system utilized in the sugar production is the Kama Ditch system. This system crosses the present project area in the western portion. According to Fredericksen (2004), "this system was probably rebuilt by the Wailuku Sugar Company following their takeover of Waikapū Sugar Company in 1894, and followed an ancient route called *Kamaauawai*."

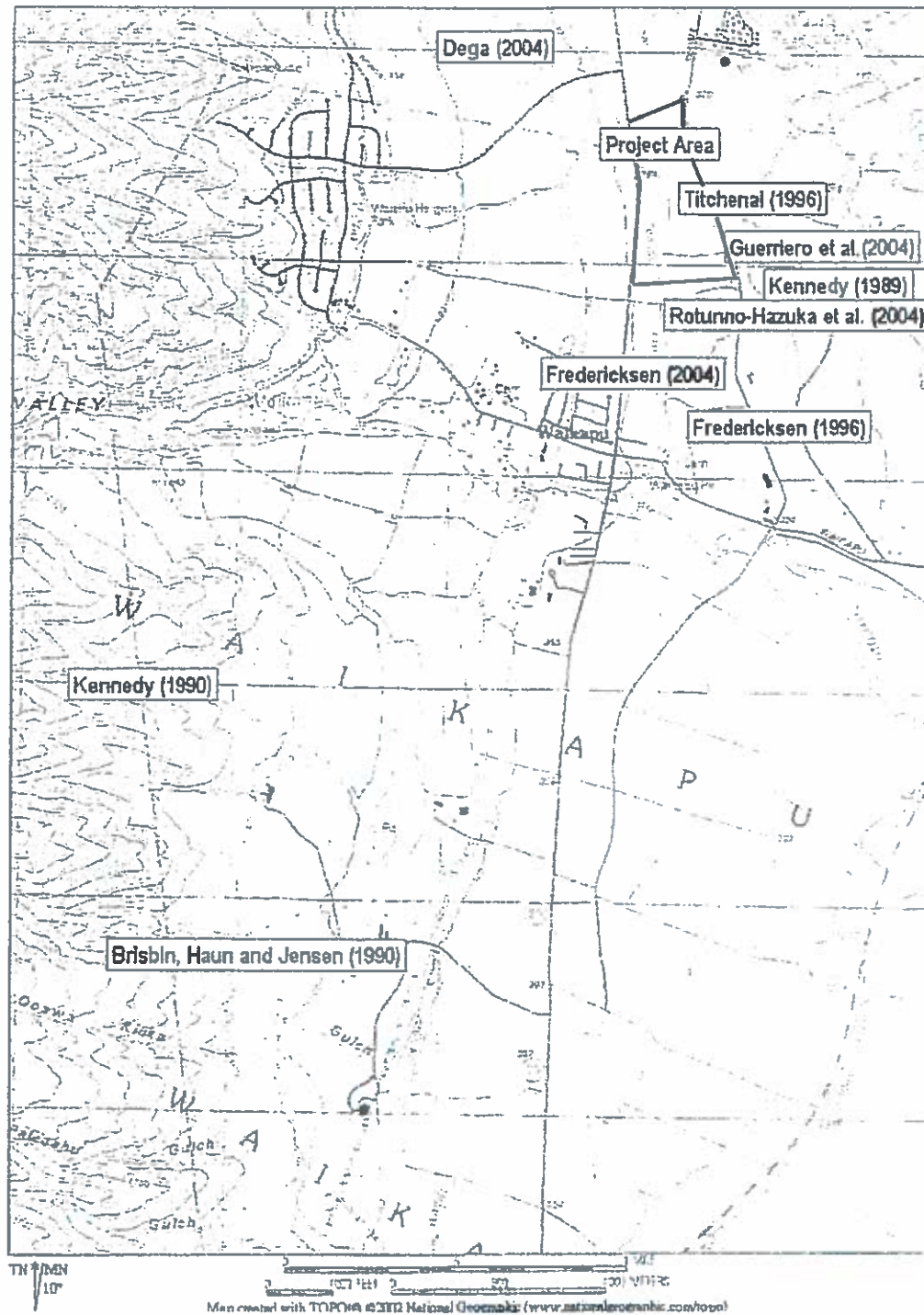
Originally, the *Kamaauawai* or Kama Ditch system served mostly *kuleana* lands (Wilcox, 1996, p.125 in Fredericksen, 2004:13). The source of this water system originates in Iao Valley, which lies northwest of the present project area, and travels southeast towards Waikapū Stream. This system became a controversial issue of water rights in the 1867 Peck vs. Bailey case as previously mentioned.

Table I. lists the awarded Land Grant (3152) where the present project area is located and selected LCA claims that are located in close proximity to the present project area.



**Table I. LIST OF LCAs AND GRANTS IN WAIKAPŪ (Source: Waihona 'Aina Corp. 2004)**

NAME	L.C.A.	R.P.	GRANT	COMMENTS	ACREAGE
H. Cornwell			3152	Present project area within awarded land	256.113
Wm. McLane	3201			Land given in 1822 by Puupahoehe	3.85
Keliiolelo	3525			Taro land and houselot	1.77
Wm. Crowningburg	433			Houselot; 14 patches (son-in-law of <i>konohiki</i> Puupahoehe	5.93
C. Louzada / H. Cornwell			2951	No land use indicated	17
Spreckles		3152		Waikapū Commons	16,000



**Figure 4. USGS Map Showing Project Area (Red) and Previous Archaeological Studies in Close Proximity to Subject Parcel**

## PREVIOUS ARCHAEOLOGY

Thomas Thrum and John Stokes explored ancient sacred sites on Maui during the early 1900's. Later, Winslow Walker compiled their information to conduct the earliest island wide archaeological survey where sites were re-visited and documented in a rough draft manual (1931). Thrum's study indicated that there were four *heiau* in the *ahupua`a* of Waikapū. Two *heiau* were reported to be in Waikapū village, located below the road "abreast of T. Everett's", and one below the Catholic Church, which had been both destroyed, and the names forgotten (Thrum, 1909-1918:59, in Creed, vol.I:22). Many ancient sites have been destroyed with the introduction of sugarcane and pineapple cultivation and as well as modern development.

Winslow M. Walker who recorded prominent sites in 1931 for the Bishop Museum, is considered to be another pioneer of early archaeology. Walker reported an unnamed *heiau* and c. 60 petroglyphs on 11 boulders, located 0.25 miles from the village of Maalaea at the base of the foothills of the West Mountains. He also notes an ancient village, with house and shelter sites. During the State wide inventory of historic sites, these were numbered Site 1441 (McGregor Point C-shapes) and Site 1287 (Maalaea Complex). He wrote that along the coast between Ma'alaea and McGregor Point (above the Highway):

...at least 45 (shelters) were noted. The shelters are low walled semi-circular or oval enclosures built against some large rock or group of rocks. Shells and pebbles are found around these sites (Walker unpublished)

Also during the State wide inventory near Ma'alaea Bay, in front of what is currently known as "Buzz's Wharf restaurant", Site 1440, a *piko* stone and Site 1286, and a grindstone were recorded.

In 1994, Archaeological Consultants of the Pacific conducted an archaeological inventory survey for the proposed Maui Ocean Center (TMK 3-6-01:1 & 19) at Ma'alaea Harbor (Kennedy 1994). Initially, a surface survey was performed in 1986 and noted one historic property (State Site 50-50-09-1604) the "Ebisu Jinja" fishing shrine. During the subsequent subsurface testing, human burials were identified and designated Sites 50-50-04-3553 and 3554) (Kennedy 1994).

No previous archaeological investigations have been conducted within the subject project area; however, several studies have been conducted in the vicinity (Dega 2004, Donham 1991, 1995; Fredericksen 2004, Kennedy 1988, 1989; Pantaleo 2003, Titchenal 1996).

In 1988, Archaeological Consultants of Hawaii conducted a preliminary archaeological survey of Phase Ia of the Waikapū Master Plan (TMK 3-4-04:25 por.). No surface cultural remains were identified. The entire parcel was previously disturbed by pineapple cultivation. Due to the presence of numerous L.C.A.'s within the project area, subsurface testing was recommended near the eastern boundary of L.C.A. 5280 to determine presence/absence of subsurface cultural remains associated with house clusters that were once located in this area. These house sites may have been associated with high ranking individuals and taro cultivation.

Archaeological subsurface testing was subsequently undertaken at Phase Ia of the Waikapū Master Plan (Kennedy 1989). A total of six backhoe trenches were excavated in the vicinity of the eastern boundary of L.C.A. 5280 (TMK 3-5-02: por. 1). No subsurface cultural remains were encountered in all of the trenches. Kennedy (1989:4) concluded that sugarcane and other recent activities destroyed any subsurface deposits that may have once existed.

Aki Sinoto Consulting (Titchenal 1996) conducted an archaeological inventory survey of the proposed retention basin and adjoining lands in Waikapū and Wailuku *ahupua`a*, Wailuku District, Maui Island (TMK 3-5-01:17, por.: 3-5-02:1, por.), located east of the current project area. No surface cultural remains were located during the surface survey, and no subsurface cultural remains or deposits were identified in the thirteen backhoe trenches excavated in selected localities throughout the project area.

Xamanek Researches (Fredericksen 2004) recently conducted an archaeological inventory survey for the Waikapū affordable housing subdivision (TMK 3-5-02: por. 01 and 3-8-07:101), located adjacent to; south of the present project area. One previously identified historic property was noted during the inventory survey. State Site 50-50-04-5474 consists of a approximate 2000- foot portion of the **Kama** Ditch and a substantial reservoir (Reservoir No. 6). No other cultural remains were identified during the survey, it was estimated that approximately 40% of the project area was previously impacted by sand mining activities in the last 20 or so years and that much of the remainder of the 100-acre study area was most recently planted in pineapple. Determination by the SHPD architecture branch that sufficient information was collected at Site 5474 **Kama**

Ditch to document the site and that the proposed demolition of the bulk of Site 5474 for proposed development was approved.

Scientific Consultants (Dega 2004) conducted an archaeological inventory on 348.613-acre parcel in Wailuku near Waikapū, Wailuku *Ahupua`a*, Wailuku District, Maui Island (TMK 3-5-001: por. of 001). Eight historic sites were documented during the survey, two of which were recorded during a previous project. State Site 50-50-04-5473 represents Hopoi Reservoir, this reservoir predates Hopoi Camp and was present at least by 1922. Hopoi camp was not identified during the survey. State Site 50-50-04-5474, the Kama Ditch, was identified east of the Hopoi reservoir running in a north-south direction to Waikapū. State Site 50-50-04-5493 was designated for another unnamed ditch running in a north-south direction occurring along the western flank of the parcel. State Site 50-50-04-5197 represents the Waihe`e Ditch, constructed between 1905 and 1907. The four other sites consist of a combination of historic-modern roadways (Site 5489), a system of smaller historic ditches (Site 5490), a historic artifact scatter on the surface (Site 5491), and several clearing mounds likely created during the plantation era (Site 5492). Twenty-seven subsurface testing trenches revealed homogenous soil matrices across the project area.

SHPD (Donham 1991) conducted a field inspection of the water pipeline easement across Waikapū stream, Waikapū, Maui Island (TMK 3-5-4:14; 3-6-4:2). No surface structural remains were identified in the easement corridor; however, terraces were noted west of the easement and cattle pens and probable former terraces were noted east of the easement. Donham stated that extensive earthmoving activities that previously occurred within the pipeline easement on both sides of the stream destroyed any agricultural features.

SHPD (Donham 1995) conducted a field inspection of the Richardson family in Kukuialamaka, Waikapū, Wailuku District, Maui Island (TMK 3-5-4:22). State site number 50-50-04-4001 was assigned to the cemetery.

The Waikapū sand mining project by Wailuku Agribusiness, Ltd. has also been undergoing archaeological monitoring by Archaeological Services Hawaii, LLC, and Aki Sinoto Consulting since 1999. The project area is located along Waiale Road to the south of the present project area. Scattered human remains were recently found in a previous deposited spoil pile (Rotunno-Hazuka et al., in prep.).

The Ameron sand mining operations located within the Maui Lani acreage (3-6-07: 130 pors), located east of the present project area in the adjoining Wailuku *ahupua`a* has been ongoing since 1990. The Bishop Museum conducted archaeological monitoring from 1990-1992. In 1992, monitoring procedures were undertaken by Aki Sinoto Consulting and Archaeological Services Hawaii, LLC. To date, four area with human remains have been identified. The remains, designated SIHP 50-50-04-5556-Features 1-4, were disturbed prior to sand mining activities (Guerriero 2004).

The Hawaiian Cement sand borrow site, (TMK 3-9-07: 101) located in Wailuku and Waikapū *ahupua`a*, adjoining the Ameron borrow site to the south and southeast, have also been monitored by Archaeological Services Hawaii, LLC, since 1999. To date, remains representing fifty pre-Contact native Hawaiian burials, have been encountered (SIHP 50-50-04-4200, 4201, and 4202). No other cultural remains have been discovered (Rotunno-Hazuka and Pantaleo 2004).

In 1998, Archaeological Consultants of the Pacific, Inc., performed inventory procedures at the above referenced project area. During these procedures, three historic properties were identified which consisted of Native Hawaiian burials (SIHP 4200, 4201) and a three-tier rock terrace (4202). All historic properties were identified in Phase A and consisted of SIHP 4200 (4 individual burial features), and 4201 (solitary individual burial feature) adjacent to Site 4202 (the tiered terrace). Due to these findings, archaeological monitoring was recommended "during initial grubbing and grading as well as the beginning stages of mining (Kennedy and Moore 1999: 39).

Another series of burials was encountered at a sand mining operation located south of the Hawaiian Cement sand burrow site and southeast of the present project area, at the Maui Scrap Metal Company in Waikapū (Fredericksen 1996). Sand from the site transported to Lahaina for use at the Sewer Plant was found to contain human remains. From November 1994 to March of 1995, a mechanical sifter was used to screen the sand and recover the human remains. A minimum of 22 individuals was disturbed during sand mining activities. The origin of the burial site was established and designated (Site 3525).

An archaeological inventory survey was conducted by Aki Sinoto Consulting, in association with Archaeological Services Hawaii for the proposed Village Mixed Use (VMX) Industrial Park, located east and northeast of the project area at TMK 3-8-07:89 and 102 pors. (Sinoto et. al. 2000). No surface cultural materials were identified during the pedestrian survey, and no buried



cultural remains or deposits were recovered in the eight backhoe trenches. The survey also noted that roughly 75% of the surface area had been previously disturbed through vegetation clearing, and mass grading.

### **SETTLEMENT PATTERN**

Early prehistoric settlement in Waikapū *ahupua'a* was situated along the coastal areas where the majority of known *heiau* were situated. Settlements probably concentrated around these religious structures overlooking fishponds, sheltered bays, and other coastal areas rich in marine resources. During the late prehistoric period, populations expanded into the upland valleys of West Maui, including Waikapū and Iao Valley, where irrigated pond fields existed. These upland settlements were characterized as "extensive terrace and pond field agricultural systems with dispersed, rather than centralized, residential structures throughout and on the margins of these agricultural complexes (Titchenal 1996:11).

Archaeological studies and oral traditions suggest that the intermediate areas, such as the Wailuku sand dunes and the open *kula* lands between the Waikapū Stream and Iao Stream Valley, were less desirable areas for traditional habitation. However, recent results of archaeological studies suggest that other activities such as human interment took place in the dune areas. The open *kula* lands although historical impacted from over a hundred year use in sugar cane cultivation may have supported large agricultural dryland taro fields with associated habitation settlements utilizing the traditional watercourse from the *Kamaaurwai* (Kama Ditch).

### **SITE EXPECTABILITY**

Due to extensive previous disturbances from sand-mining activities, from sugarcane and pineapple cultivation, and with current active agriculture production, the probability of encountering cultural remains through inventory level testing is low. Based on the results of previous archaeological investigations in the vicinity, and the presence of LCA's in the area, isolated artifacts associated with pre-Contact occupation and buried architecture or cultural layers associated with historic plantation activities and habitation may be present in the project area.

Based on the results of previous and recent archaeological investigations in the vicinity of the Wailuku sand dune areas and the Wailale / Lower Main corridor, the potential for human burials

is present, however the degree of surface alteration in the subject area may minimize the potential for intact remains in primary context.

### **METHODS**

Archaeological and historical background researches were undertaken to determine the nature and extent of potential cultural resources in the project area. A review of previous archaeological investigations in the vicinity was conducted at the State Historic Preservation Division (SHPD) libraries of the Department of Land and Natural Resources (DLNR) at both the Maui and O'ahu offices. Additional references were researched at the Hamilton Library and the Hawaii State Library. Historic land tenure records were researched at the Bureau of Conveyances and Land Management Branch of DLNR, and at the Survey Division of the State Department of Accounting and General Services.

The fieldwork for the current survey was conducted from 5-7, May 2004 by Mr. Paul Titchenal (M.A.), under the supervision of Ms. Diane Guerriero (B.A.), and under the overall direction of Ms. Lisa Rotunno-Hazuka (B.A.) and Principal Investigator, Mr. Jeffrey Pantaleo (M.A.).

The survey entailed initially conducting a pedestrian surface survey of the entire parcel. Since portions of the parcel had been previously disturbed, subsurface testing through backhoe trenching was deemed appropriate. Excavations were conducted by Goodfellow Brothers Inc., utilizing a backhoe with a 2.5 feet wide bucket. The trenches were selectively located to permit a representative sampling of the subject area. A total of twenty-five backhoe trenches were selectively placed in areas that contained no active farming. Trenches ranging in length from 5 to 7 meters. The backhoe excavation was undertaken with the supervision of the archaeologist and terminated when sterile subsoil or bedrock was reached. Representative profiles were recorded and soils were described. Locations of trenches were plotted on a base map provided by the client. Color photographs on 35mm format were taken of project area and trench overviews. During the course of this project, all accepted standard archaeological procedures and practices were followed. Field notes, maps, and photographs, are being curated by Archaeological Services Hawaii, LLC, in Wailuku.

### **SCOPE OF WORK**

Based on DLNR-SHPD rules for inventory survey, the following specific tasks were determined to constitute an appropriate scope of work for the project:



1. Conduct background review and research of existing archaeological and historical documentary literature relating to the project area and its immediate vicinity—including examination of Land Commission Awards, ahupua'a records, historic maps, archival materials, archaeological reports, and other historical sources;
2. Undertake thorough surface examination of the project area to locate all extant surface features;
3. Conduct detailed recording of all potentially significant sites including scaled plan drawings, written descriptions, and photographs, as appropriate; and clear vegetation where needed for adequate visibility;
4. Complete a location map of the project area showing identified surface features;
5. Conduct limited subsurface testing at selected features to determine the presence or absence of potentially significant buried cultural deposits or features, and to obtain suitable samples for radiocarbon age determinations;
6. Conduct processing and analysis of recovered materials, as warranted; and
7. Synthesize data, prepare, and submit a draft report to SHPD for review, and revise and submit final report.

### **RESULTS OF FIELDWORK**

A total of 25 backhoe test trenches were executed at selected localities for subsurface sampling within the two parcels in areas that would not disrupt active farming. Table II presents descriptive summaries of TR1-25. Trenches 1-6, 15, 16, and 23-25 were excavated within the northern parcel, and trenches 7-14 and 17-22 were excavated in the southern parcel. Test trenching was not conducted within the extreme central portion of the project area, due to dense active farming (Fig. 5). Representative stratigraphic profiles and photographs for TR1-25 are depicted on Figures 7-20. Descriptive summaries for Trenches 1-25 are presented below.

Test trenches were orientated either north-south or east-west and averaged 6.0 meters in length by 2.0 meters in depth, and were placed approximately 100 meters apart. A three layer stratigraphic sequence was identified within the trenches, where Layer I was usually disturbed at least 50 centimeters below surface. Within the south central portion, remnant sand dune matrices were identified along the 350 to 400 foot elevation contour within TR's 10, 17-23 (see Fig. 5). Also noted was the segment of the Kama Ditch, Site 5474 situated within the southwestern portion of the project area and is further discussed at the end of the trench descriptions

Table II. Backhoe Trench Stratigraphic Summary Table TR's 1-10

TRENCH (TR)	LOCATION	ORIENT.	DIMENSION	STRATIGRAPHY	COMMENTS
1	Located in the extreme northwest portion of project area. East of Honoapiʻilani Highway.	80 / 260 Az.	6.6 m (L) x .80 m (W) x 1.5 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3), agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2); Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2), colluvial deposited with water affected pebbles, cobbles and small boulders.	Previous surface disturbance with past and present agriculture farming. Level surface area. North Profile. No cultural remains identified.
2	South of TR 1. East of Honoapiʻilani Highway.	90 / 270 Az.	7 m (L) x .80 m (W) x 1.5 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3), agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2) with gravel inclusions; Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2), colluvial deposit with water affected pebbles and cobbles.	Previous surface disturbance with past and present agriculture farming. On level surface area. East Profile. No cultural remains identified.
3	Southeast of TR 2 and TR 1. East of Honoapiʻilani Highway.	70 / 250 Az.	5 m (L) x .80 m (W) x 1.4 m (H)	Layer I - Fine, Silt; Dark Brown, (10YR3/3); agricultural layer. Layer II - Very Fine, Silt; Dark Grayish Brown (10YR 3/2); Layer III - Fine, Silt; Dark Grayish Brown (10YR 3/2); gravelly.	Previous surface disturbance with past and present agriculture farming. On slight slope towards east. North Profile. No cultural remains identified.
4	East of TR 3. East of Honoapiʻilani Highway and west of existing sugar cane hauling road.	80 / 260 Az.	6.2 m (L) x .80 m (W) x 1.3 - 1.6 m (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; Dark Brown (10YR 3/3).	Previous surface disturbance with past and present agriculture farming. On level surface area. South Profile. No cultural remains identified.
5	Located in the extreme northeast portion of the project area. North of TR 4 and east of TR-6.	70 / 250 Az.	6 m (L) x .80 m (W) x 1.5 m (H)	Same as TR-4 without sand inclusions identified in TR-4 Layer I	Previous surface disturbance with past and present agriculture farming. On level surface area. North Profile. No cultural remains identified.
6	Located along the northern project area boundary, west of TR-5 and east of TR-1.	90 / 270 Az.	4.8 m (L) x .80 cm (W) x 1.6 (H)	Same as TR-3	Previous surface disturbance with past and present agriculture farming. On slight slope towards east. South Profile. No cultural remains identified. No cultural remains identified.
7	Located in the extreme southern portion of project area. East of Honoapiʻilani Highway and adjacent to; east of the existing sewerline easement.	100 / 280 Az.	5.5 m (L) x .80 cm (W) x 1.4 (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; with sand and gravel inclusion, river bed inclusions noted in North and South Profiles. Dark Brown (10YR 3/3). Layer III - Fine, Silt; Dark Brown to Dark Yellowish Brown (10YR 3/3 - 3/4).	Previous surface disturbance with past sand mining activities and agriculture farming. Historic debris noted within area. Level surface area. South Profile. No cultural remains identified.
8	Located in the extreme southeastern portion of project area. East of Honoapiʻilani Highway and TR-7	60 / 240 Az.	5.5 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - Fine, Silt; with sand inclusions, Dark Brown to Dark Yellowish Brown (10YR 3/3-3/4); agricultural layer. Layer II - Fine, Silt; Dark Brown (10YR 3/3). Layer III same as Layer II with many water affected and sub-angular cobbles and pebbles.	Level ground surface. North Profile. No cultural remains identified.
9	North of TR 8 and west of sugar cane hauling road.	90 / 270 Az.	6 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - mottled Silt; with sand inclusions, Brown (7.5 3/2); agricultural layer. Layer II - remnant Aeolian Sand; (10YR 5/4); Yellowish Brown. Layer III - Transitional Layer, Sandy Silt; Brown (10YR 5/3), Layer III - Silt; Dark Brown (10YR 3/3).	Level ground surface in open fallow field of sweet potatoes. South Profile. No cultural remains identified.
10	West of TR 9. Adjacent to; east of the existing sewerline easement.	180 / 360 Az.	6 m (L) x .80 cm (W) x 1.5 m (H)	Layer I - Mottled Silty Sand, Very Dark Grayish Brown, (10YR 3/2) with charcoal flecks. Layer II - Sand Silt, Brown to Dark Brown (10YR 5/3-4/3); Layer III - Aeolian Sand Silt Very Dark Grayish Brown (10YR 3/2); Layer IV - Very Fine Grain Sand Pale Brown (10YR 6/3); Layer V - BOE - Coarse Sand Light Brown Gray (10YR 6/2).	Previous surface disturbance with past and present agriculture farming. West Profile. No cultural remains identified.
11	East of TR 10. Adjacent to; east of the existing sewerline easement.	180 / 360 Az.	6 m (L) x .80 cm (W) x 1.5 (H)	Layer I - Silty Loam; Very Dark Grayish Brown (10YR 3/2); Layer II - Silt; Dark Brown, (10YR 3/3); Layer III - Silt; Dark Brown (10YR 3/3).	Previous surface disturbance with past and present agriculture farming. Level ground surface area. South Profile. No cultural remains identified.

Table III. (cont) Backhoe Trench Stratigraphic Summary Table TR's 12-25

TRENCH (TR)	LOCATION	ORIENT.	DIMENSION	STRATIGRAPHY	COMMENTS
12	Located in the extreme southeast portion of project area. Adjacent to ; east of, Honoapiʻilani Highway.	110 / 290 Az.	8 m (L) x .80cm (W) x 1.8 (H)	Layer I - Silty Loam, Very Dark Grayish Brown (10YR 3/2); Layer II - Silt; Dark Brown, (10YR 3/3); Layer III - Silt; Dark Brown (10YR 3/3), with many water affected basalt cobbles and pebbles.	Level ground surface area on upper slope. North Previous surface disturbance with past agricultural farming. North Profile. No cultural remains identified.
13	North of TR 12. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	5.5 m (L) x .80 cm (W) x 1.8 (H)	Same as TR - 12	Level ground surface area on upper slope. North Previous surface disturbance with past agricultural farming. East Profile. No cultural remains identified.
14	North of TR 13. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	5 m (L) x .80 cm (W) x 1.7 m (H)	Same as TR - 12, and 13	Level ground surface area on upper slope. North Previous surface disturbance with past agricultural farming. North Profile. No cultural remains identified.
15	North of TR 14. Adjacent to; east of, Honoapiʻilani Highway.	100 / 280 Az.	8 m (L) x .80cm (W) x 2 m (H)	Same as TR - 12, 13, 14	Level ground surface area on upper slope. North Previous surface disturbance with past agricultural farming. East Profile. No cultural remains identified.
16	North of TR 15. Adjacent to; east of, Honoapiʻilani Highway.	180 / 360 Az.	5 m (L) x .80cm (W) x 1.6 m (H)	Same as TR - 12, 13, 14 and 15	Level ground surface area on upper slope. North Previous surface disturbance with past agricultural farming. Profile. No cultural remains identified.
17	West of TR 10. Adjacent to; west of, the sewerline easement and east Honoapiʻilani Highway.	170 / 350 Az.	8 m (L) x .80 cm (W) x 1.7 m (H)	Layer I - Silty Sand, Grayish Brown (10YR 3/4); Layer II - Aeolian Sand, Yellowish Brown (10YR 5/6); Layer III - Silt, Very Dark Brown.	On slope surface area, below a field of agricultural farming of sweet potatoes. East Profile. No cultural remains identified.
18	South of TR 17 and east of TR 7 Adjacent to; east of, Honoapiʻilani Highway and the existing sewerline.	180 / 360 Az.	5 m (L) x .80 m (W) x 1.8 m (H)	Same as TR - 17 with the exception of a disturbed sand layer below Layer I.	On slope surface area. East Profile. No cultural remains identified.
19	West of TR 18. and east of TR - 12. Adjacent to; east of the Kama Ditch.	180 / 360 Az.	5 m (L) x .80cm (W) x 2.2 m (H)	Same as TR - 18	Level ground surface on farm access road along upper slope. East Profile. No cultural remains identified.
20	North of TR 19. Adjacent to; east of the Kama Ditch.	180 / 360 Az.	5.6 m (L) x .80 cm (W) x 2.8 m (H)	Same as TR - 18 and 19.	On slope surface area along upper slope. West Profile. No cultural remains identified.
21	East of TR 22. Adjacent to; West of the sewerline easement.	120 / 300 Az.	5.5 m (L) x 1.6 m (W) x 2.5 m (H)	Same as TR - 18, 19 and 20.	Level ground surface. West Profile. No cultural remains identified.
22	West of TR 21. Adjacent to; east of the Kama Ditch.	90 / 270 Az.	8 m (L) x .80 cm (W) x 2.5 m (H)	Same as TR - 18 thru 21	Level ground surface. East Profile. No cultural remains identified.
23	North of TR 21. Adjacent to; west of the sewerline easement	90 / 270 Az.	6.5 m (L) x .80 cm (W) x 3.5 m (H)	Same as TR - 18 thru 22	Level ground surface. East Profile. No cultural remains identified.
24	Northwest of TR 23. Placed in an open unplanted agricultural field. West of existing sewerline easement	180 / 360 Az.	4 m (L) x 2 m (W) x 2 m (H)	Same as TR - 4 and 5	Level ground surface. West Profile. No cultural remains identified.
25	East of TR 24. Adjacent to; east of existing sewerline easement. Placed in a fallow sweet potato field.	90 / 270 Az.	4.6 m (L) x 1.2 m (W) x 1.9 m (H)	Same as TR - 4 and 5	Level ground surface. North / northwest Profile. No cultural remains identified.



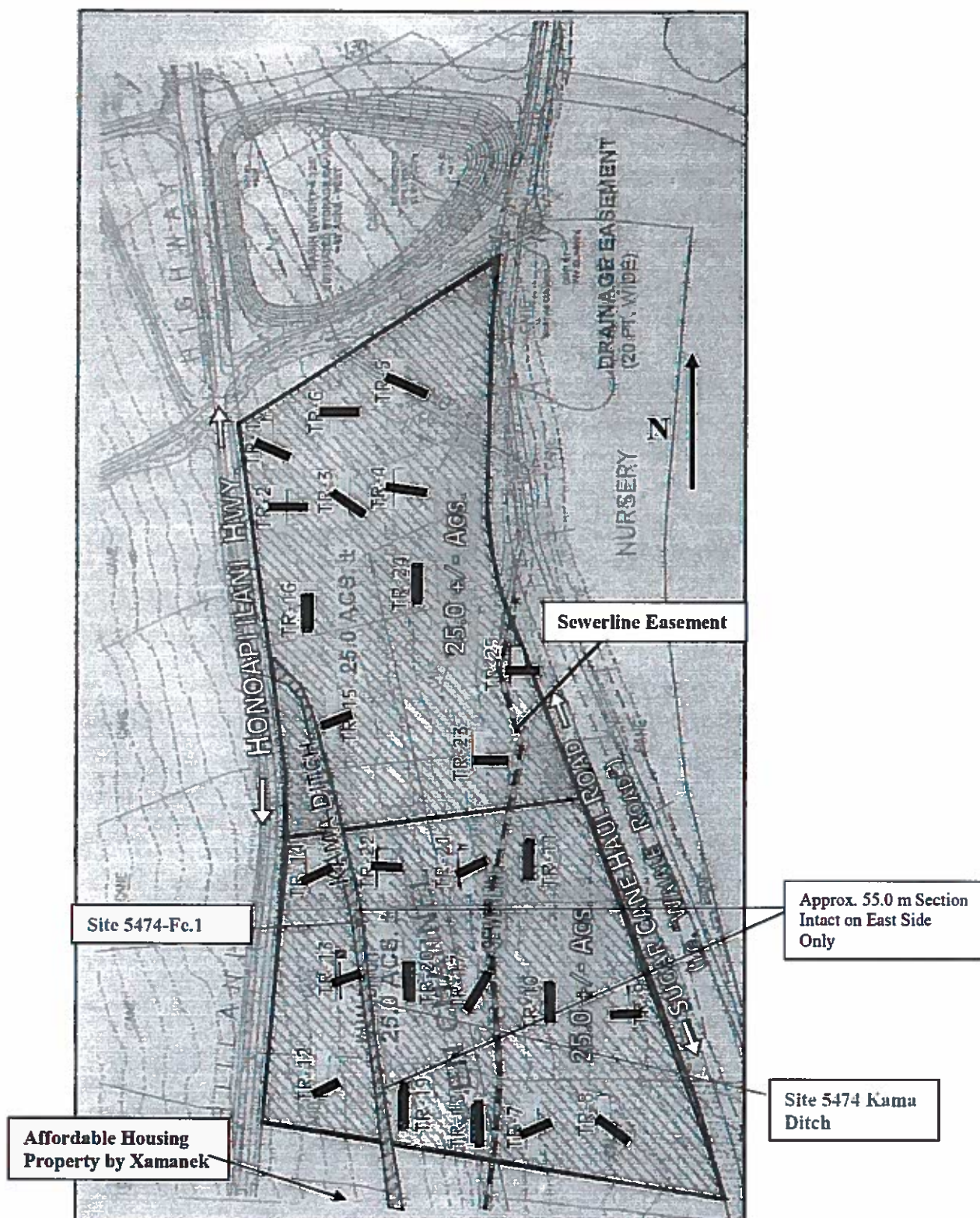


Figure 5. Topographic Map Showing TR's 1-25, Site 50-50-04-5474 and Waiale Housing to South

### **Backhoe Trench 1 and Backhoe Trench 2**

Backhoe Trench 1 (TR1) and Backhoe Trench 2 (TR2), were placed in the northwest portion of the project area, and placed east of Honoapi'ilani Highway (Fig. 5). Trench 1 measured 6.6 m long by .8 m wide and 1.5 m deep, and orientated east / west. Trench 2 was placed c. 100 m south of Trench 1, measured 7.0 m long by .8 m wide and 1.5 m deep, and orientated east / west. Layer I in both trenches contained the plow zone with evidence of past and recent agricultural disturbance. Three stratigraphic layers were revealed in TR1 and TR2 (Fig.7).

Layer I contained the plow zone, was a dark brown (10YR 3/3), fine silty loam, and contained a high content of rootlets. It ranged from 0/40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark grayish brown (10YR 3/2), very fine silt, with gravel inclusions. Layer II ranged from .4-.5 / 1.0-1.5 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark grayish brown (10YR 3/2), very fine silt, with colluvial deposited water affected pebbles, cobbles and small boulders; and was non-cultural. Layer III ranged from 1.0 / 1.5 mbs. BOE was terminated at eroding bedrock.

### **Backhoe Trench 3**

Backhoe Trench 3 (TR3), was placed centrally in the northwest portion of the project area, and placed c. 100 m east of Trench 2 and Honoapi'ilani Highway. Trench 3 measured 5.0 m long by .8 m wide and 1.4 m deep, and orientated east / west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance. Three stratigraphic layers were revealed in TR3 (Fig. 6).

Layer I contained the plow zone, was a dark brown (10YR 3/3), fine silty loam, and contained a high content of rootlets. It ranged from 0/40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

Layer II was a dark grayish brown (10YR 3/2), very fine silt. Layer II ranged from .4-.5 / 1.3 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a dark grayish brown (10YR 3/2), very fine gravelly silt; and was non-cultural. Layer III ranged from 1.0 / 1.4 mbs. BOE was terminated at eroding bedrock.



**Figure 6. Overview of Trench 3, View to West**

#### **Backhoe Trench 4**

Backhoe Trench 4 (TR4), was placed in the northwest portion of the project area along the lower slope, and placed c. 100 m east of Trench 3. Trench 4 measured 6.2 m long by .8 m wide and 1.3 – 1.6 m deep, and orientated east / west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance. Two stratigraphic layers were revealed in TR4 (Fig. 7).

**Layer I** contained the plow zone, was a dark brown to dark yellowish brown (10YR 3/3-3/4), fine silty loam with sand inclusions, contained a high content of rootlets and scattered pieces of cement. It ranged from 0/-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

**Layer II** was a dark brown (10YR 3/2), homogenous fine silt. Layer II ranged from .5 / 1.6 mbs and was non-cultural. BOE was terminated in sterile subsoil.

#### **Backhoe Trench 5**

Backhoe Trench 5 (TR5), was placed in the northeast portion of the project area along the lower slope, and placed c. 100 m east of Trench 4. Trench 5 measured 6.2 m long by .8 m wide and 1.5 deep, and orientated east/west on a slight slope towards the east. Layer I contained the plow zone with evidence of past and recent agricultural disturbance, fallow vegetables and fruit were noted in the area. Two stratigraphic layers were revealed in TR5 same as Trench 4 (Fig. 8).



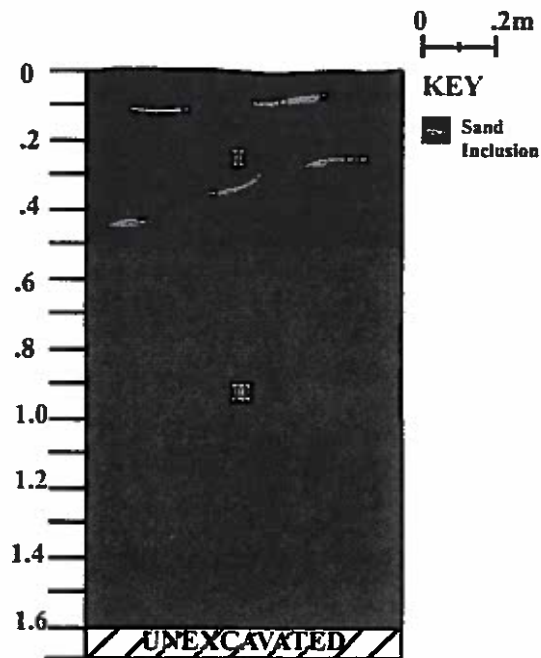
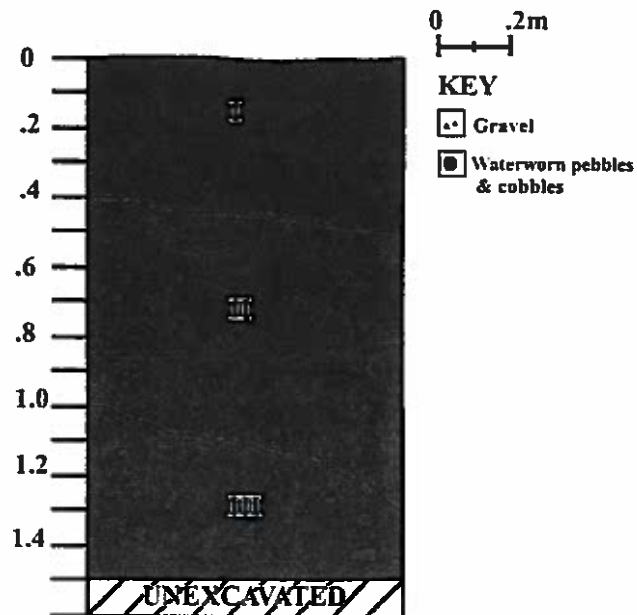


Figure 7. Representative Stratigraphic Profiles for Trenches 1-5, (top) TR2 North Wall (bottom) TR4 South Wall



**Figure 8. Trench 5, View to North**

#### **Backhoe Trench 6**

Backhoe Trench 6 (TR6), was placed along the northern boundary of the project area, situated centrally along a slight slope to the east, and placed c. 100 m east of Trench 1 and c. 100 m north of Trench 3. Trench 6 measured 4.8 m long by .8 m wide and 1.6 deep, and orientated east / west. Layer I contained the plow zone with evidence of past and recent agricultural disturbance, fallow vegetables and fruit were noted in the area. Three stratigraphic layers were revealed in TR6 same as Trench 3.

#### **Backhoe Trench 7**

Backhoe Trench 7 (TR7), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement in an area previously sand mined. Trench 7 measured 5.5 m long by .8 m wide and 1.4 deep, and orientated east / west. Surface area was relatively flat with scattered modern historic debris. Three stratigraphic layers were revealed in TR7, and a concentration of riverbed pebbles and cobbles were noted in the north face (Fig. 11).

**Layer I** was a dark brown to dark yellowish brown (10YR 3/4), silt with sand inclusions, and contained a high content of rootlets. It ranged from 0/45 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

**Layer II** was a dark brown (10YR 3/3), fine silt, with sand and gravel inclusions Layer II ranged from .45 / 1.25 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

**Layer III** was a dark brown to dark yellowish brown (10YR 3/3-3/4), homogenous fine silt; and was non-cultural. Layer III ranged from 1.25 / 1.4 mbs. BOE was terminated in sterile subsoil.



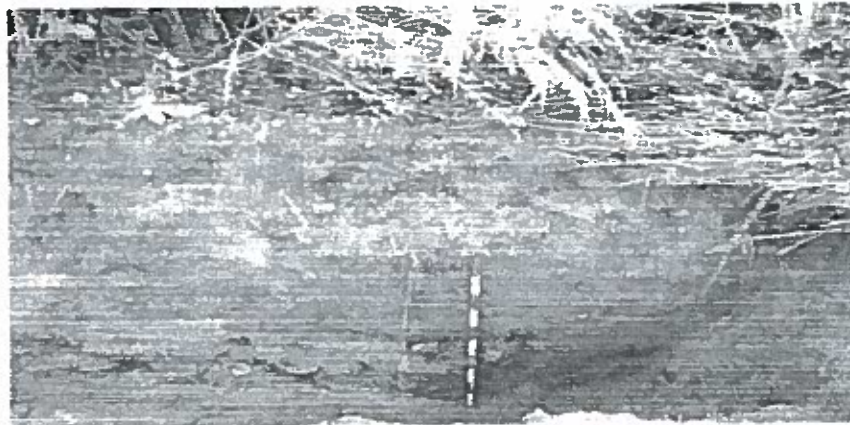
#### **Backhoe Trench 8**

Backhoe Trench 8 (TR8), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and east of TR7, in an area previously sand mined. Trench 8 measured 5.5 m long by .8 m wide and 1.5 m deep, and orientated east / west. Surface area was relatively flat with scattered modern historic debris. Three stratigraphic layers were revealed in TR8 (Fig. 9).

**Layer I** was a dark brown to dark yellowish brown (10YR 3/4), mottled silty sand with sand inclusions, and contained a high content of rootlets. It ranged from 0 / 50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

**Layer II** was a dark brown (10YR 3/3), fine silt, Layer II ranged from .50 / 1.0 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

**Layer III** was a dark brown (10YR 3/3), fine silt; with subangular and water affected cobbles and was non-cultural. Layer III ranged from 1.0 / 1.5 mbs. BOE was terminated in sterile subsoil.



**Figure 9. Trench 8, View to North**

#### **Backhoe Trench 9**

Backhoe Trench 9 (TR9), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and north of TR8 and the cane road (Waiale Road), in an area previously used for sweet potato cultivation. Trench 9 measured 6 m long by .8 m wide and 1.5 m deep, and orientated east / west. Surface area was relatively flat with fallow sweet potato vines. Four stratigraphic layers were revealed in TR9 (Fig. 10 and 11).

Layer I was a brown (7.5YR 3/2), mottled silty sand with sand inclusions, and contained a high content of sweet potato rootlets. It ranged from 0 / 40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had a wavy, smooth lower boundary.

Layer II was a pale brown, brown (10YR 6/3-5/3), sand, Layer II ranged from .40-.50 / .70 cmbs, was found directly overlying Layer III and had a wavy, smooth lower boundary.

Layer III was a dark brown (10YR 3/3), fine silt; cultural. Layer III ranged from .40 / 1.5 mbs. BOE was terminated in Layer IV lithified sand.



Figure 10. Trench 9, View to South

#### **Backhoe Trench 10**

Backhoe Trench 10 (TR10), was placed in the southeast portion of the project area, along the southern boundary, east of the existing sewerline easement, and west of Trench 9 and the cane road (Waiale Road), in an area previously used for sweet potato cultivation.

Trench 10 measured 6 m long by .8 m wide and 1.5 m deep, and orientated north / south.

Surface area was relatively flat with fallow sweet potato vines. Five stratigraphic layers were revealed in TR10.

Layer I was a very dark grayish brown (10YR 3/2), mottled silty sand with charcoal flecks, irrigation driplines and contained a high content of sweet potato rootlets. It ranged from 0 / 50-80 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had a wavy, smooth lower boundary.

Layer II was a brown to dark brown (10YR 5/3-4/3), sandy silt, Layer II ranged from .50-.80 / 1.0 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

Layer III was a pale brown, (10YR 6/3), fine grain sand; and was non-cultural. Layer III ranged from 1.0 / 1.2mbs and had an abrupt, smooth lower boundary.

**Layer IV was a very dark grayish brown, (10YR 3/2), silt; and was non-cultural. Layer IV ranged from 1.2 / 1.3 mbs. Abrupt, smooth boundary.**

**Layer V was a light brown grey, (10YR 6/2), coarse lithified sand; non-cultural. Layer V from 1.3 / 1.5 mbs. BOE was terminated lithified sand.**

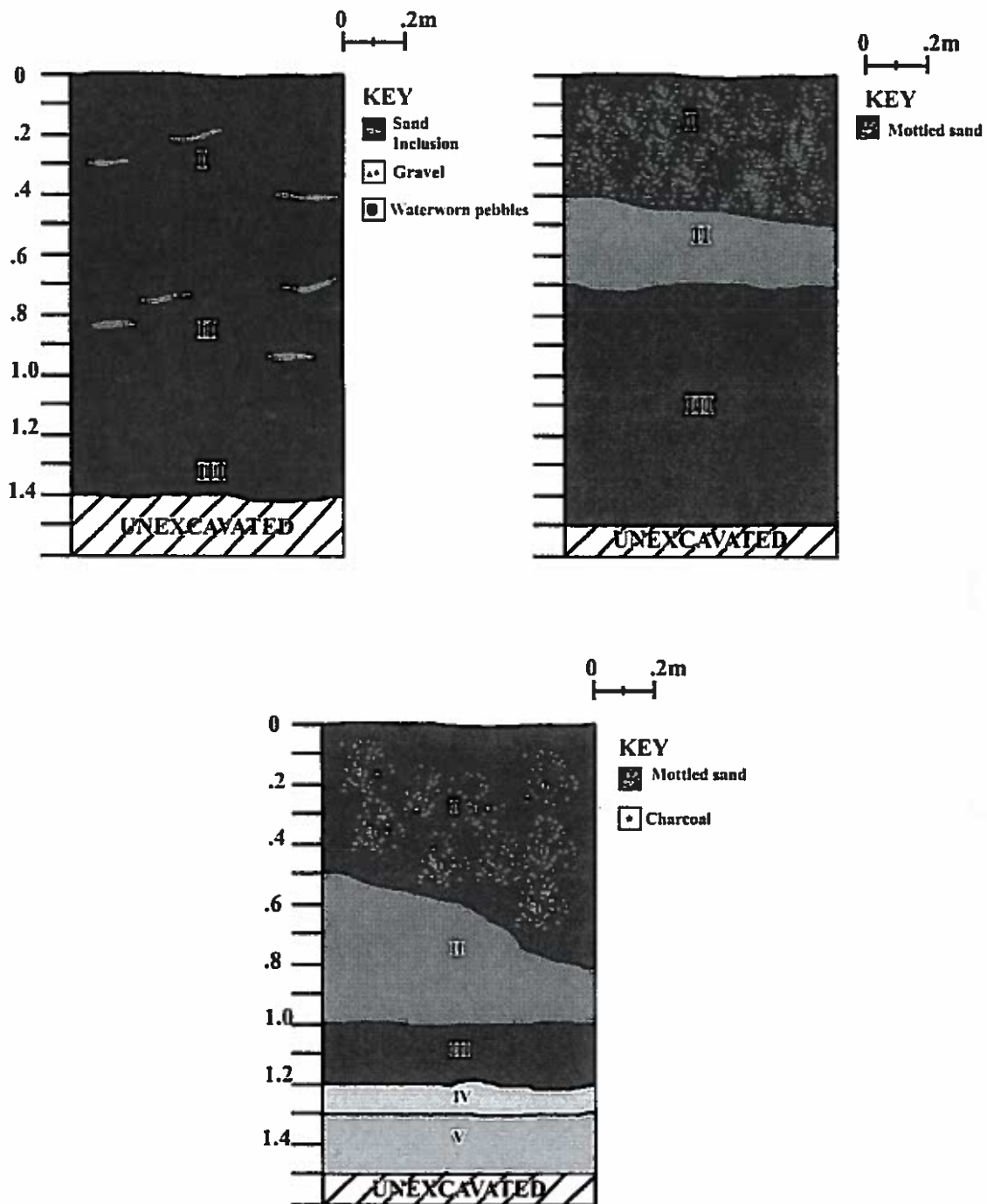


Figure 11. Representative Stratigraphic Profiles for Trenches 6 through 10, (top left) TR7 South Wall, (top right) TR9 South Wall and (bottom) TR10 West Wall

#### **Backhoe Trench 11**

Backhoe Trench 11 (TR11), was placed in the southeast portion of the project area, along the southern boundary, east of; adjacent to, the existing sewerline easement, and north of Trench 10 and south of a farming access road, in an area previously used for sweet potato cultivation. Trench 11 measured 6 m long by .8 m wide and 1.5 m deep, and orientated north / south. Surface area was relatively flat with fallow sweet potato vines. Three stratigraphic layers were revealed in TR11 (Figs. 11 and 13).

**Layer I** was a very dark grayish brown (10YR 3/2), silty loam, and contained a high content of sweet potato rootlets. It ranged from 0 / 40 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

**Layer II** was a dark brown (10YR 5/3-4/3), silt, Layer II ranged from .40 / 1.2 mbs directly overlying Layer III and had an abrupt, smooth lower boundary.

**Layer III** was a dark brown, (10YR 3/3), silt; and was non-cultural. Layer IV ranged from 1.2 / 1.5 mbs. BOE was terminated in sterile subsoil.

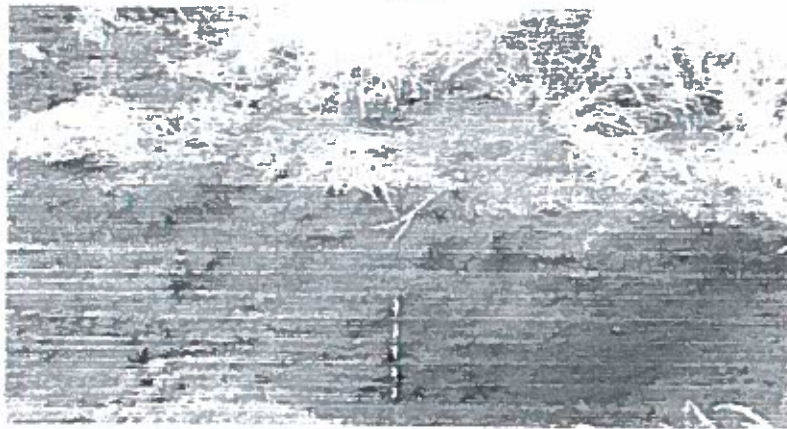
#### **Backhoe Trenches 12 through 14**

These three trenches were placed west of the Kama Ditch (Site5474), in the southwestern portion of the project area, east of Honoapi'ilani Highway, and excavated in the abandoned pineapple fields. All three trenches contained the plow zone – Layer I and all revealed a three layer substratum (Figs. 12 and 13).

**Layer I** was a very dark grayish brown (10YR 3/2), silt; with scattered subangular cobbles. It ranged from 0 / 80 cmbs directly overlying Layer II and had an abrupt lower boundary.

**Layer II** was a dark brown (10YR 3/3), silt. It ranged from .80 / 1.5 directly overlying Layer III and had an abrupt lower boundary

**Layer III** was a dark brown (10YR 3/3), silt with many water affected cobbles and pebbles. 1.50 to 1.80 mbs. BOE was terminated in sterile subsoil.



**Figure 12. Trench 14, View to North**

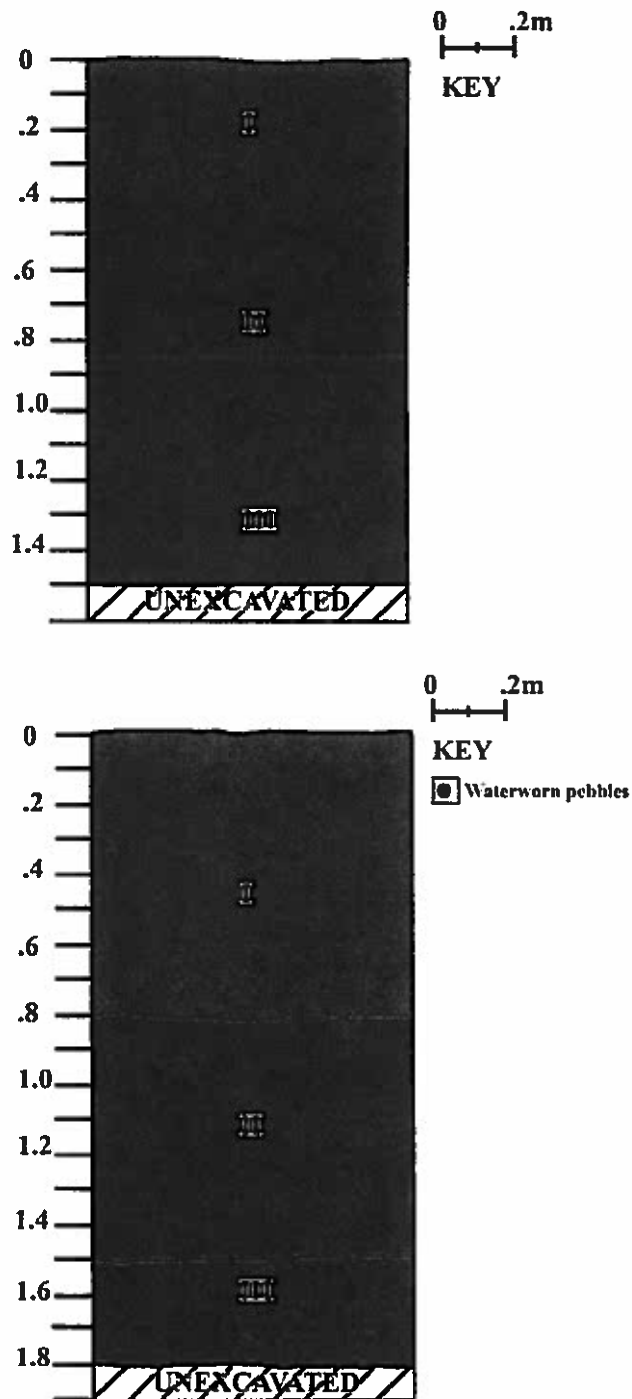


Figure 13. Representative Stratigraphic Profiles for Trenches 11-15 (top) TR11 South Wall and (bottom) TR12 North Wall



### **Backhoe Trenches 15 and 16**

These two trenches were placed east of the Kama Ditch (Site 5474), in the western portion of the project area, east of Honoapi'ilani Highway, and excavated in the abandoned pineapple fields.

Both of these trenches contained the plow zone – Layer I, and all revealed a three layer substratum such as identified in Trenches 12 through 14.

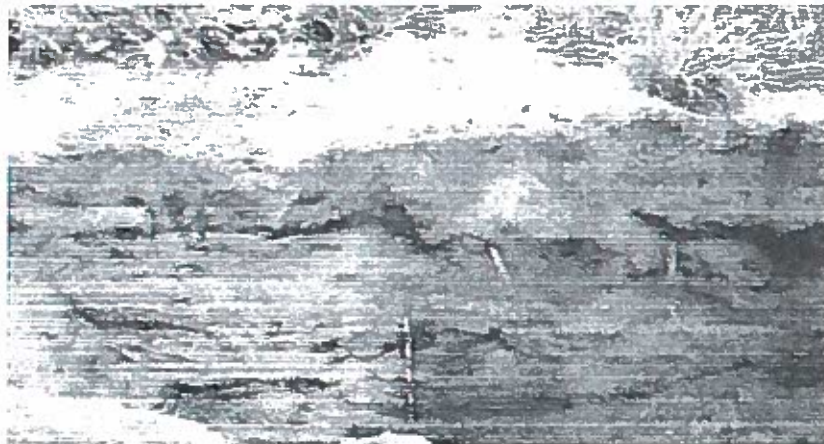
### **Backhoe Trench 17**

Backhoe Trench 17 (TR17), was placed centrally in the south portion of the project area, along the southern boundary, west of, adjacent to, the existing sewerline easement, and east of the Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 17 measured 6 m long by .8 m wide and 1.65 m deep, and was orientated north / south. Surface area was on a slight slope towards the east. Three stratigraphic layers were revealed in TR17 (Figs. 14 and 16).

**Layer I** was a grayish brown (10YR 3/4), mottled silty sand with sand inclusions, and contained a high content of sweet potato rootlets. It ranged from 0 / 40-50 cmbs, and was non-cultural. Layer I was found directly overlying Layer II, and had an abrupt, smooth lower boundary.

**Layer II** was a yellowish brown, (10YR 5/6), Aeolian sand, Layer II ranged from .40-50 / 1.0 mbs, was non-cultural. Layer II was found directly overlying Layer III and had an abrupt, smooth lower boundary.

**Layer III** was a very dark brown (10YR 2/2), silt; was non-cultural. Layer III ranged from 1.0 / 1.65 mbs. BOE was terminated in Layer IV lithified sand.



**Figure 14. Trench 17, View to East**

### **Backhoe Trench 18**

Backhoe Trench 18 (TR18), was placed centrally in the south portion of the project area, along the southern boundary, west of, adjacent to, the existing sewerline easement, and east of the

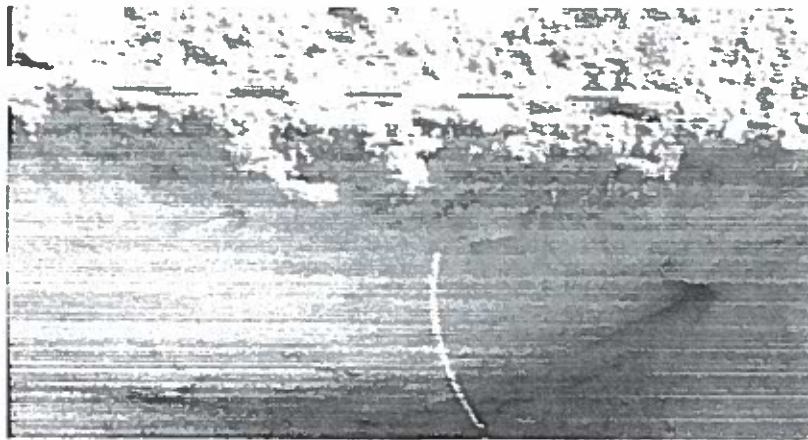
Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 18 measured 5 m long by .8 m wide and 1.8 m deep, and was orientated north / south. Surface area was on a slight slope towards the east. Three stratigraphic layers were revealed similar to TR's 17, 19-22 with the exception of a disturbed sand layer with lithified dune inclusions located below Layer I and above the original dune layer of layer III (Fig. 16).

#### **Backhoe Trench 19**

Backhoe Trench 19 (TR19), was placed along the southern boundary of the project area, west of the existing sewerline easement, and east of, adjacent to, the Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. Trench 19 measured 5 m long by .8 m wide and 2.2 m deep, and was orientated north / south. Surface area was on a level roadbed. Three stratigraphic layers were revealed in TR19 similar to TR17 through TR 22.

#### **Backhoe Trench 20**

Backhoe Trench 20 (TR20), was placed in the southern portion of the project area, approximately 50 m north of TR19, west of the existing sewerline easement, and adjacent, east to Kama Ditch (Site 5474), along a farming access road, in an area used for active sweet potato cultivation. TR20 measured 5.5 m long (N/S) by .8m wide by 2.8m deep. Surface area was on a level roadbed. Three stratigraphic layers similar to TR's 17 through 22 were documented and culturally sterile (Fig. 15).



**Figure 15. Trench 20, View to West**



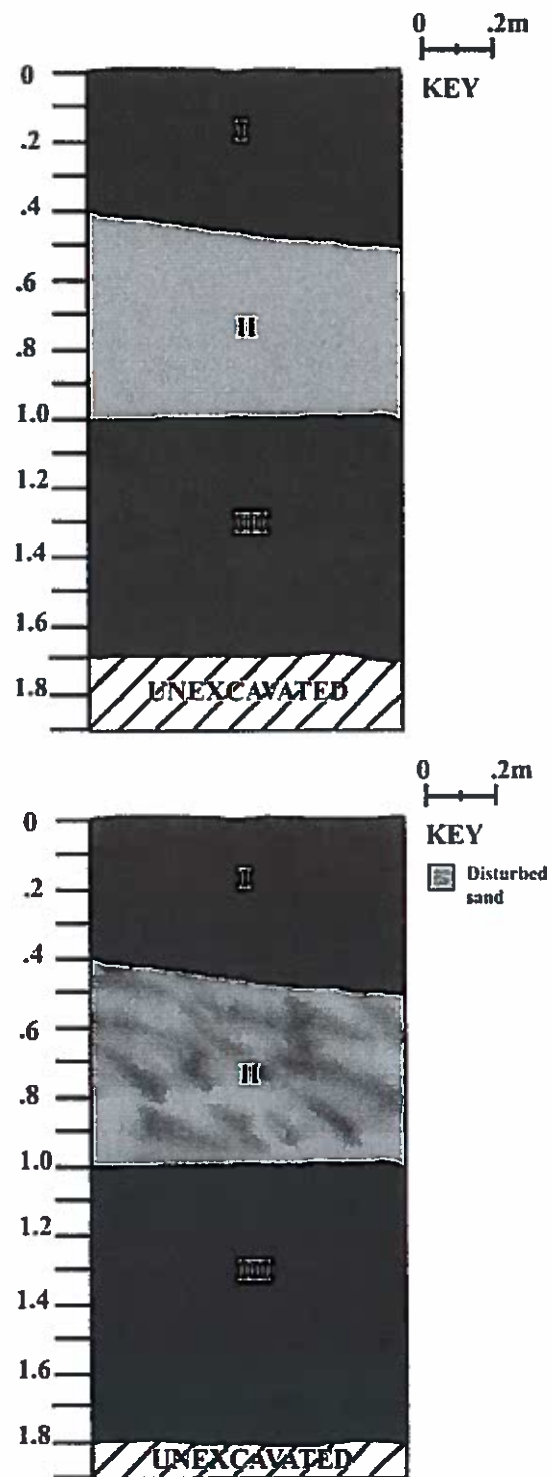


Figure 16. Representative Stratigraphic Profiles for Trenches 16 through 20, (top) TR17 East Wall, (bottom) TR18 East Wall

#### **Backhoe Trench 21**

Backhoe Trench 21 (TR21), was placed in the southern portion of the project area, approximately 100m west of TR19, west of the existing sewerline easement, east of Kama Ditch (Site 5474), along an access road, mid-slope in an area of active sweet potato at the base of a lithified dune. TR21 measured 6 m long by .8 m wide by 2.5 m deep, oriented north/south. The surface area was on a slight slope towards the east. Three stratigraphic layers similar to TR's 17-20 and 22 were documented and negative for cultural remains (Fig. 17).



**Figure 17. Trench 21, View to North**

#### **Backhoe Trench 22**

Backhoe Trench 22 (TR22), was situated in the southern portion, approximately 50 m west of TR21, west of the existing sewerline easement, and adjacent and east of Kama Ditch (Site 5474), along the access road and in the active sweet potato area. Trench 22 measured 5 m long by .8 m wide and 2.5 m deep, and oriented north/south. Surface area was a level road bed. Three stratigraphic layers similar to TR's 17-21 were documented.

#### **Backhoe Trench 23**

Backhoe Trench 23 (TR23) was placed along the same elevation contour as Trenches 17, 18, and 21, in the central portion of the project area, located west of the existing sewer easement. Backhoe Trench 23 (TR23), measured 6.5 m long by .8 m wide and 2.5 deep. A two stratigraphic sequence was revealed in Trench 23, the same Layer I and Layer II as found in TR's 17 through 22 (Figs. 18 and 19). BOE was terminated in sterile substratum Layer II (Aeolian dune).

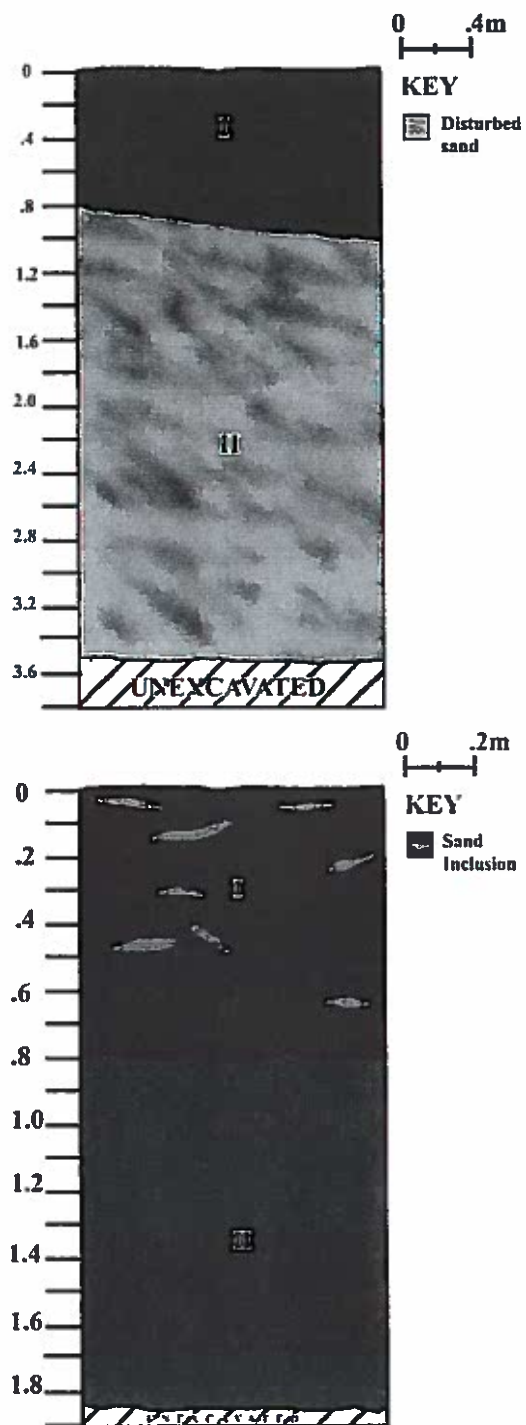


Figure 18. Representative Stratigraphic Profiles for Trenches 21-25 (top) TR23 East Wall (bottom)  
TR25 North Wall



**Figure 19. Trench 23, View to East**

**Backhoe Trench 24**

Backhoe Trench 24 (TR24) was placed along the same elevation contour as Trenches 4, and 5, in the central portion of the project area, in an open, recently tilled, unplanted agricultural field, located west of the existing sewer easement. Backhoe Trench 24 (TR24), measured 4 m long by .8 m wide and 2 m deep. The same three stratigraphic sequence was revealed in Trench 24, as those found in Trenches 4 and 5. BOE was terminated in sterile substratum.

**Backhoe Trench 25**

Backhoe Trench 25 (TR25) was placed in the central portion of the project area, in an open, fallow sweet potato agricultural field, located east of, adjacent to, the existing sewer easement. Backhoe Trench 25 (TR25), measured 4.6 m long by 1.2 m wide and 1.9 m deep. The same three stratigraphic sequence was revealed in Trench 24, as those found in Trench 9 (Fig. 20). BOE was terminated in sterile substratum.

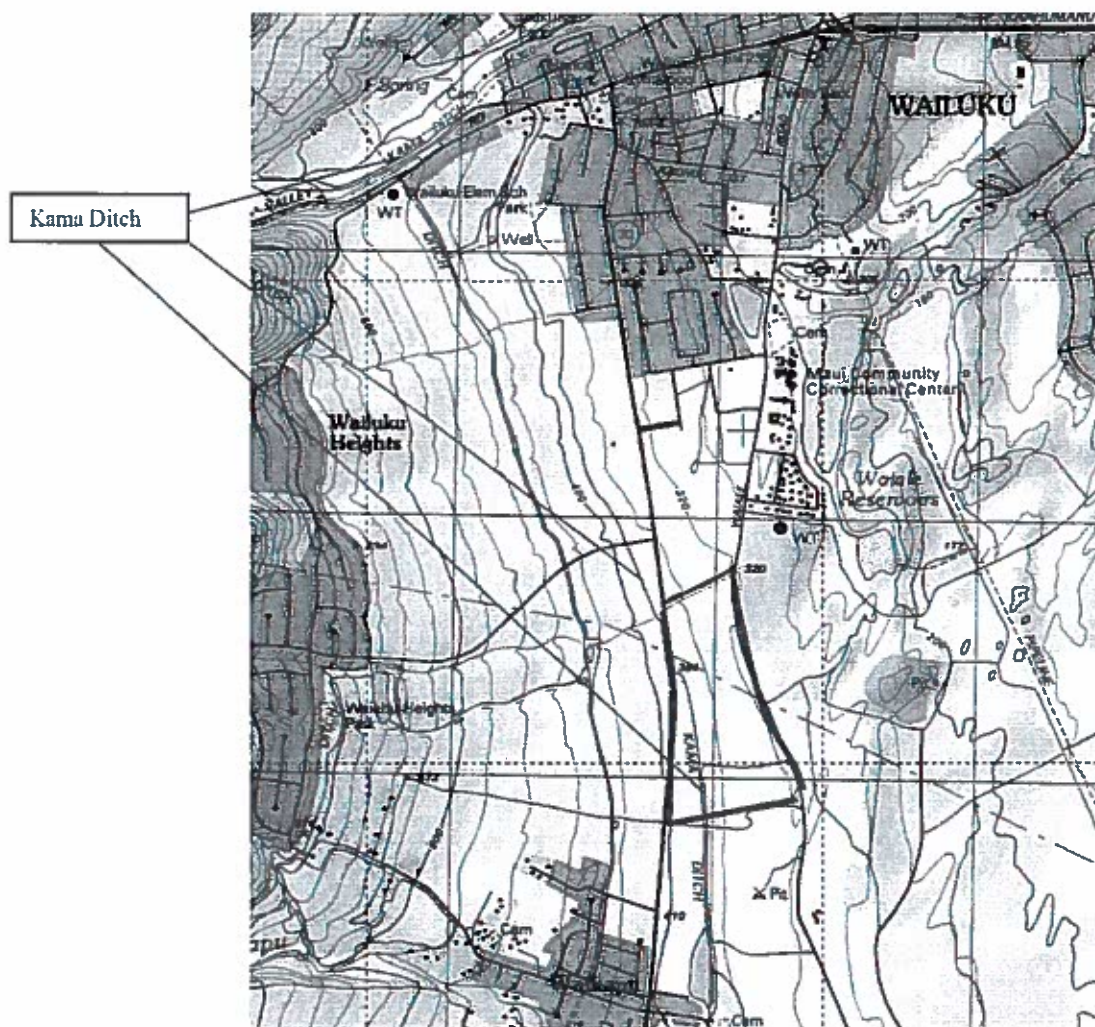


**Figure 20. Trench 25, View to East**



**SITE 50-50-04-5474**

Results of the current investigation identified a segment of historic property State Site 50-50-04-5474, the Kama Ditch, as well as an associated metal sluice gate designated Feature 1 (see Figs 1 and 21). As exhibited below, the current configuration of Kama Ditch commences along the south side of Iao Stream and follows the stream east where it eventually turns southward flowing along the approximate 380 ft. elevation line, through the project area terminating at the Reservoir by Waikapū.



**Figure 21. Enlarged USGS Map Showing Kama Ditch from South side of Iao Stream to its Terminus at Reservoir by Waikapū**

Originally, the *Kama auwai* or *Kamaauwai* (Kama Ditch) served mostly *kuleana* lands (Wilcox, 1996, p.125 in Fredericksen, 2004:13), and due to this original intent, *Kamaauwai* along with *Kalaniauwai* (on the north side of Iao Stream) became a controversial water rights issue in 1867. In the Peck vs. Bailey case, the complainants alleged that the extension of *Kamaauwai* “beyond its original and true terminus,” to feed his (Bailey’s) *kula* land called *Kaluapuhi* and *Kekipi* was illegal; as the original intent of *Kamaauwai* was to convey water to the defendant’s (Bailey) 12-acres of *kalo* land called *Ka pohakuokauhi* and the excess always spilled over the road (High St./Honoapi’ilani Hwy) to their adjacent lands in *Kalua`ili* (Sterling 1998: 85) (Figure 22).

During the aforementioned court case, there was no date mentioned for when *Kamaauwai* and *Kalaniauwai* were constructed; however per Sterling “these two *auwai* have existed immemorially and were constructed for the purposes of irrigating *kalo* (Sterling 1998: 86). According to Fredericksen (2004), “this system was probably rebuilt by the Wailuku Sugar Company, following their takeover of Waikapū Sugar Company in 1894, and followed an ancient route called *Kamaauwai*.”

Several historic maps were reviewed in an attempt to identify the construction of Site 5474 and to ascertain its’ original extent; however most maps, if available were either illegible or contained inconsistent information. For example, Figure 22 is from the year 1882 and shows Mission Ditch which appears to follow the current route of Site 5474 (Kama Ditch), yet there is no mention of Kama Ditch. As exemplified on Figure 23, Kama Ditch commences along the south side of Iao Stream and continues to the east where it eventually curves to the south and quickly terminates, instead of continuing south towards Waikapū. Perhaps this map exemplified the original extent of *Kamaauwai* discussed in the above court case. Unfortunately, there was no date available for this map. Also noted on the aforementioned map is Old Mill Ditch, which after the Kama Ditch curves south, the Old Mill Ditch continues to the east and crosses over/under High Street, terminating before Market Street. Another historic map from 1907 obtained from the Bailey House Museum shows *Kama auwai* along the south side of Wailuku Stream (instead of Iao Stream) and Baileys Ditch parallel and further south, along the south side of Iao Valley Road (Figures 25-27). Interestingly, Old Mill Ditch or Mission Ditch are not identified and this is the first indication of a separate ditch for Bailey. Unfortunately, this map was only created along the Stream, thus the configuration of *Kama auwai* apart from the stream (i.e. south) is not known.

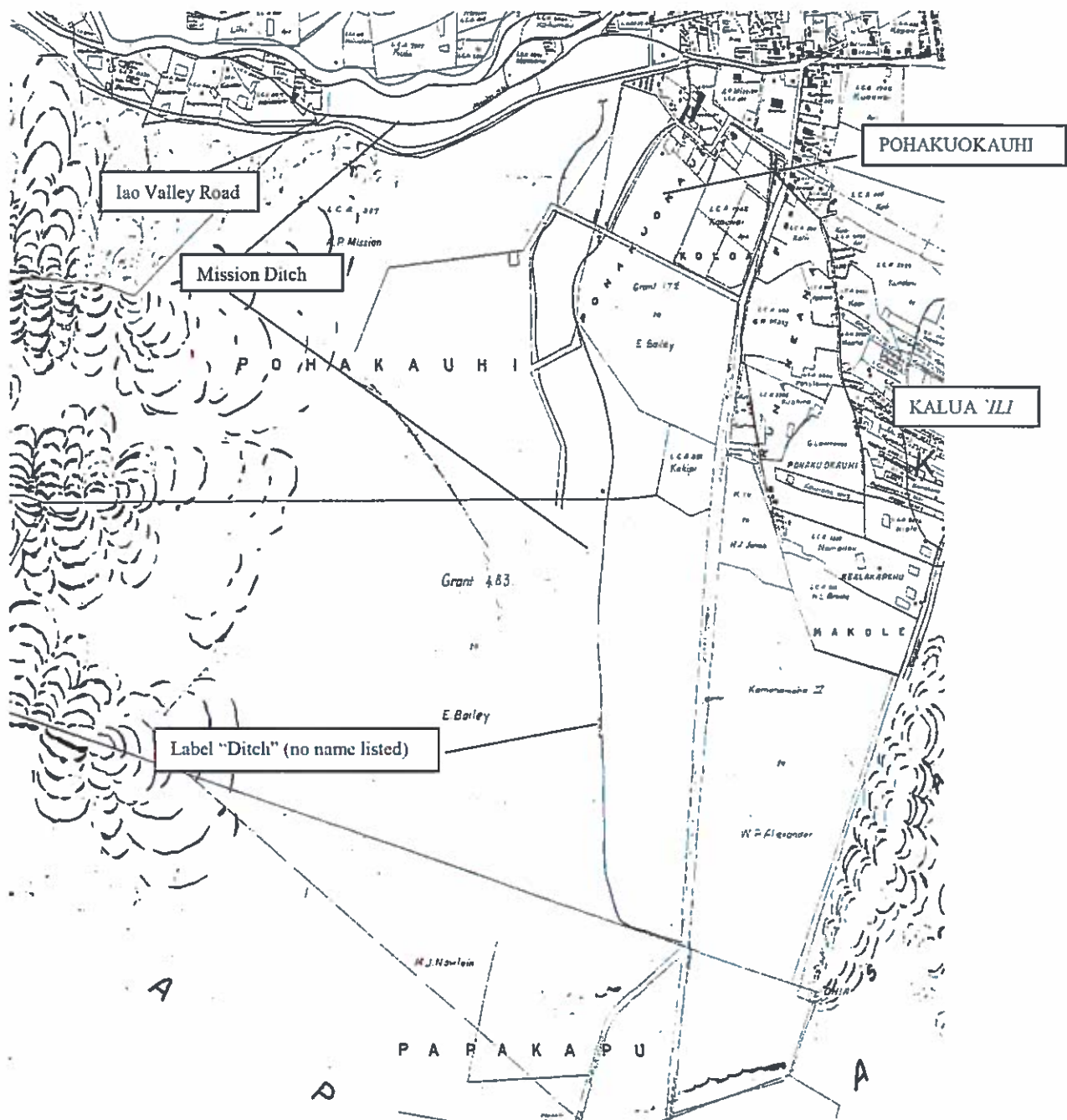
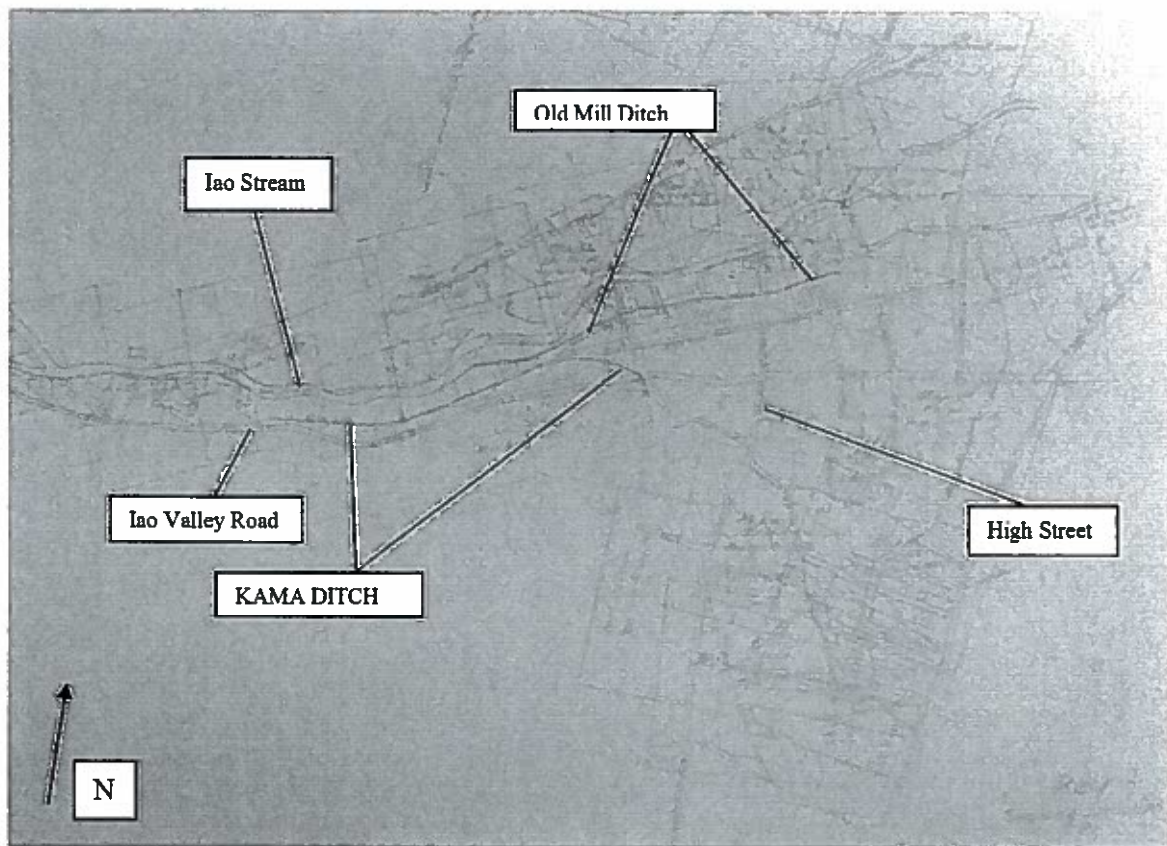
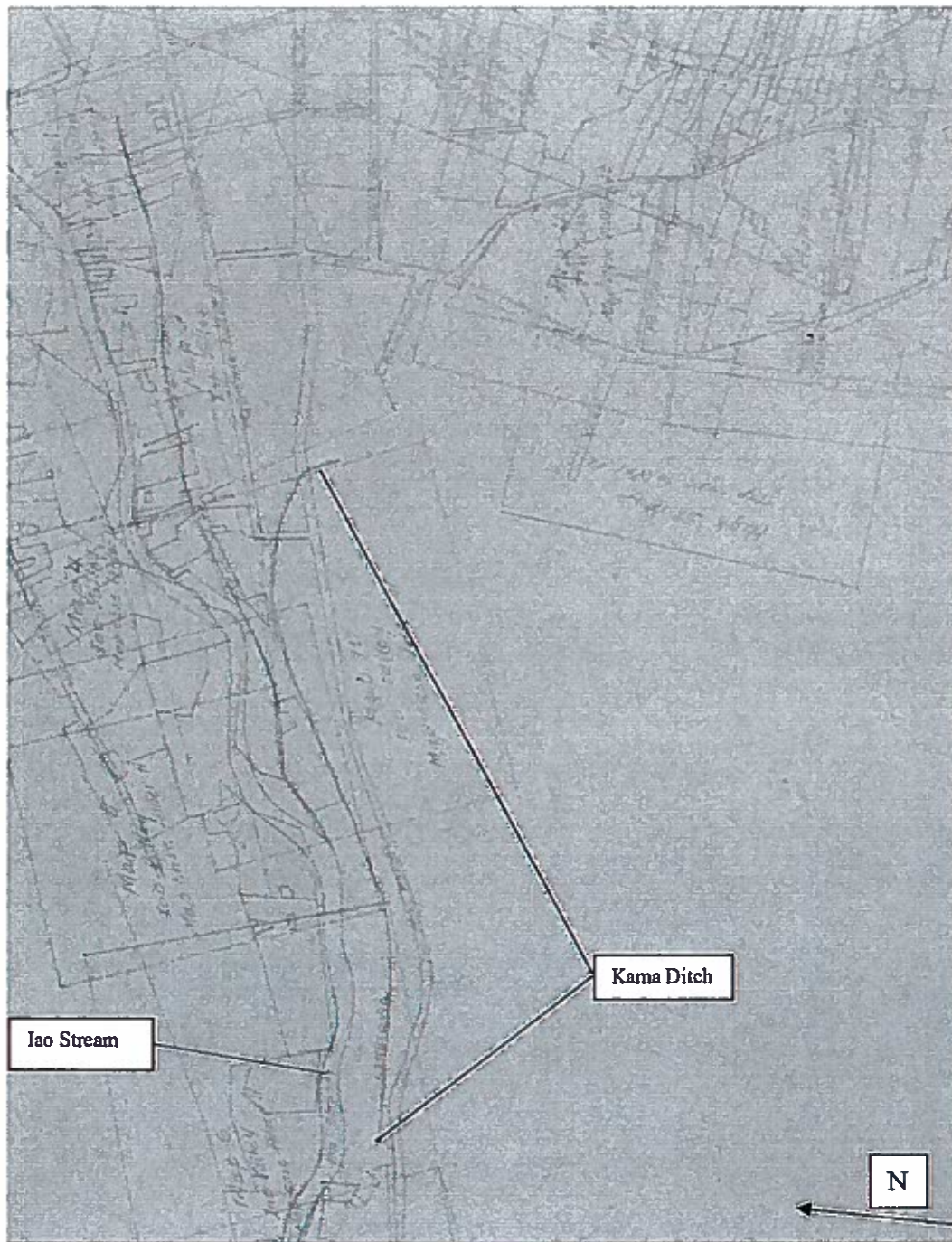


Figure 22. Registered Map 1261 by Monsarratt 1882 Showing a Portion of Wailuku

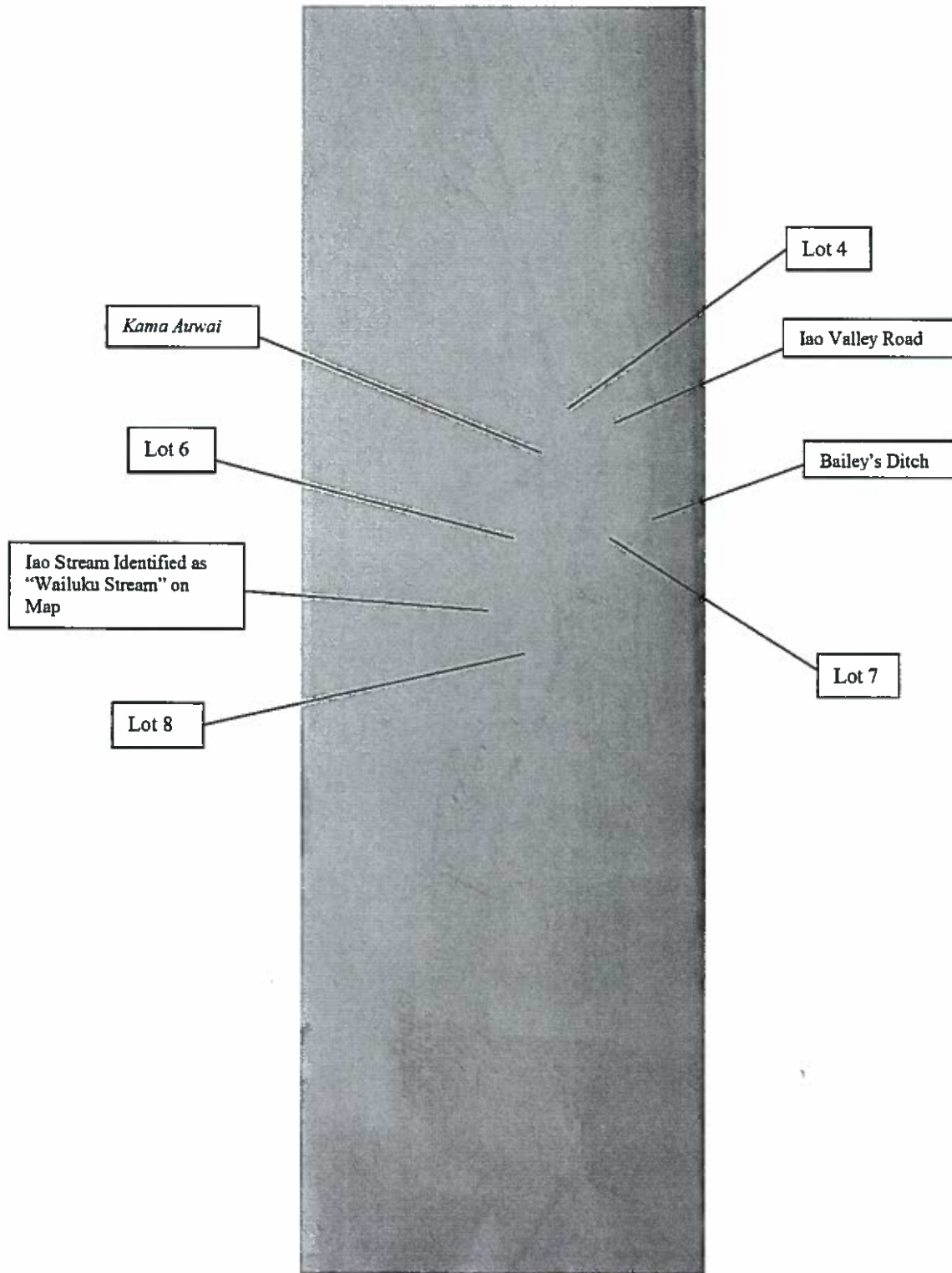




**Figure 23. Photo Copy of Map Key for Wailuku from Bailey House Museum Archives likely from Late 1800's early 1900's (original map is no longer available. Photo copy contains no date or drafter's name)**

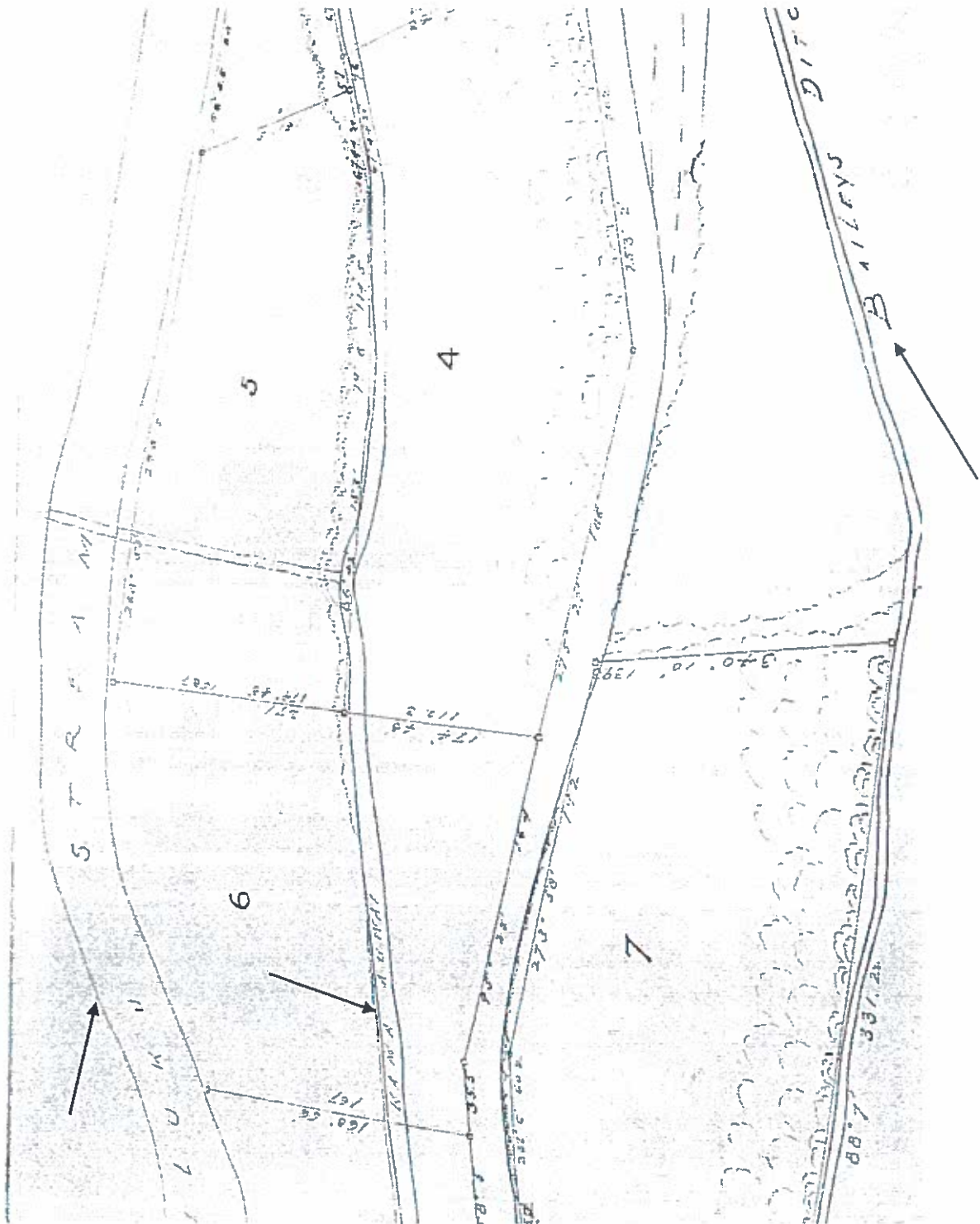


**Figure 24. Enlarged Key Map of Wailuku (Fig. 23) Showing Iao Stream, Kama Ditch-Site 5474 and Old Mill Ditch**



**Figure 25. Photograph of Illegible Photo Copy of Map for Wailuku Sugar Co. in Iao Valley from Bailey House Archives (By J.K. Kahookele 1907) (photo copy included here as reference for Figs. 26 and 27 as original map no longer available)**





**Figure 26. Enlarged Central Section of Wailuku Sugar Co. Map from 1907 (Fig.25) Showing Kama Auwai and Bailey's Ditch (note map designates Iao Stream as Wailuku Stream). Photo Copy courtesy of Baily House Museum as Original Map is no Longer Available**

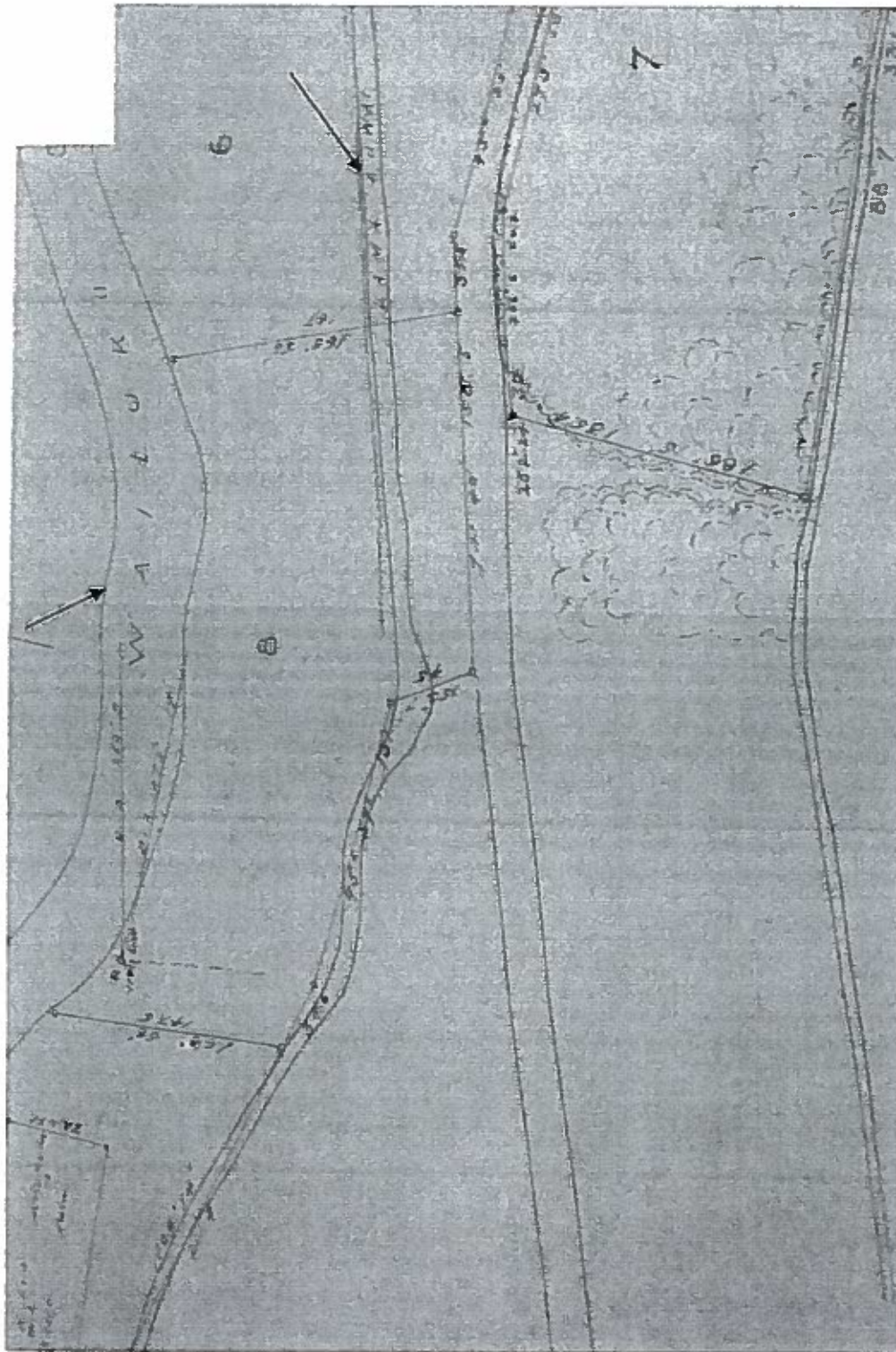


Figure 27. Enlarged Western Section of Wailuku Sugar Company Map from 1907 Showing Kama Auwai and Bailey's Ditch (note map designates Iao Stream as Wailuku Stream)

During the current course of work, the condition of Site 5474 ranged from poor to good with the overall condition as fair. The Kama Ditch was either dirt lined or concrete lined; however the majority, particularly on the northern end and western (*mauka*) side is either pushed up or removed by prior grading with the central portions infilled with vegetation and or soil (Figs. 28-31). The concrete lined portion when extant is along the east side intermittently for approximately 55.0 m. It averages 2.80 m wide by 0.60 m (top of silt) to 1.5 m deep. A metal sluice gate, designated Feature 1 was noted along the eastern side of the ditch approximately 60 m north of the southern boundary. The sluice gate is constructed of sheet metal and measures 0.43 m to 1.0 m long by 0.58 m wide by 0.04 m thick, and when operational, would release water to irrigate the fields below or *makai*. Unfortunately, Site 5474 has been severely damaged through prior grubbing and grading activities, abandonment and natural erosional forces. Site 5474 has been adequately documented at the inventory level and requires no further work beyond construction monitoring during removal.



Figure 28. Aerial Photograph of Southwestern Quadrant of Project Area Showing





**Figure 29. Photograph of Site 5474 Kama Ditch (View to North)**



**Figure 30. Overview Photograph of Project Area and Site 5474 (Kama Ditch) Feature 1 (Sluice Gate) along Southwest Side (View to South)**





**Figure 31. Photograph of Site 5474 Feature 1 Metal Sluice Gate of Kama Ditch-Note infill of Silt  
(View to East)**

### **INITIAL SIGNIFICANCE EVALUATION**

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of a location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

**Criterion "a":** Be associated with events that have made an important contribution to the broad patterns of our history;

**Criterion "b":** Be associated with the lives of persons important in our past;

**Criterion "c":** Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

**Criterion "d":** Have yielded, or is likely to yield, important information for research on prehistory or history;

**Criterion "e":** Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts.

State Site 50-50-04-5474 is considered to be significant under Criterion "a" and Criterion "d" of the Hawaii Register of Historic Places. Criterion "a" has been assigned based on its association with the Sugar Plantation and the Landmark Court Case. The sugar industry had significant impacts and contributions to the island for over a century. Criterion "d" is based on the fact that the ditch has yielded important information to the understanding of the pre-history and history of the Wailuku and Waikapū *ahupua`a*.

## DISCUSSION

Archaeological Inventory Survey (AIS) procedures comprised of a pedestrian survey and subsurface testing through mechanical excavations was undertaken within the approximate 50-acre project area. A total of 25 backhoe trenches, negative for buried cultural remains, were executed during the current AIS procedures. During the pedestrian survey, a disturbed segment of the Kama Ditch (Site 50-50-04-5474) and an associated sluice gate, Feature 1, was documented in fair to poor within the southwestern portion of the project area and evaluated as significant under Criteria a and d. Site 5474, along with numerous ditches, reservoirs and Mills were constructed or improved during the initial Plantation Era and have subsequently altered and shaped (both negatively and positively) the life styles of the historic period. Site 5474 continues to the north and south outside the subject parcel. However to the south, a 1000 ft. section of the Kama Ditch was approved for removal to develop the affordable subdivision by Spencer Homes at TMK's 3-5-002:001 and 3-8-007: 101 both portions (Fredericksen and Fredericksen 2004). During the review process for the southern subdivision, the SHPD Architecture Branch determined that sufficient information was collected at Site 5474 and the proposed demolition was approved. Similar to the above situation, the section of Site 5474 within the current project area shall be removed during proposed development.

No other significant surface or subsurface cultural remains were encountered during the inventory survey. The project area has undergone extensive compounded disturbances from sugar cane cultivation, past sand mining activities, a sewer line easement and individual farming plots. The backhoe testing and pedestrian survey exemplified that the entire surface consisted of the agricultural till zone designated as Layer I. The south, central section, primarily between the sewer line easement and Site 5474 (Kama Ditch), contains disturbed and un-disturbed sand within TR's 10, 17 through 23. TR's 1, 2, 7, 8 and 12-16 contained episodes of alluvium and possible colluvium comprised of rounded cobbles and boulders, silt and gravel with sub-angular cobbles noted in TR's 7 and 8. TR's 7 and 8 were located on the southeastern boundary, and the remaining trenches were confined to the western boundary adjacent to Honoapi'ilani Highway.

The results of the current investigations produced no evidence for sedentary cultural activities during the prehistoric and early historic periods in the subject area. These negative results are likely due to the prior disturbances across the parcel and the inherent bias in random sampling. Regardless of the negative results, previous archaeological investigations and archival research have documented traditional and historic burials in the vicinity of the subject parcel. Furthermore, based on the number of LCA's and Grants in the vicinity, together with the historical background research, Waikapū and Wailuku would have supported substantial populations.

### **RECOMMENDATIONS**

Based on the negative results of fieldwork, no further inventory level work is recommended prior to commencing construction activities. However, due to the presence of sand dune remnants in the project area, as well as the proximity of archaeological sites and Native Hawaiian burials in neighboring parcels, archaeological monitoring is recommended during all ground-altering activities such as base yards, dust and silt fences, grubbing, grading and etc. Unfortunately, the Kama Ditch, Site 5474 has been severely impacted and retains little if any integrity; thus the site is not recommended for preservation. However, Site 5474 shall be closely monitored to assess and document subsurface construction if applicable.

Prior to the commencement of construction, and Archaeological Monitoring Plan (AMP) will be prepared and submitted for review and approval by the SHPD.

## REFERENCES

- Adler, Jacob  
1966 *Claus Spreckels: The Sugar King in Hawaii*. Mutual Publishing, Honolulu.
- Armstrong  
1973 *Atlas of Hawaii*. Department of Geography, University of Hawaii. University Press of Hawaii, Honolulu.
- Bates, G.W.  
1854 *Sandwich Island Notes*. Harper and Brothers, New York.
- Beckwith, Martha  
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.
- Brisbin, J., A.E. Haun, and P. Jensen  
1991 *Archaeological Data Recovery Excavations Waikapū Mauka Partners Golf Resort Project Area*. Ms. on File, State Historic Preservation Division, DLNR, Honolulu.
- Creed, Victoria S.  
1993 *Settlement Pattern for Waikapū, Wailuku District, Maui, Hawaii, Vols. I and II*, Cultural Surveys Hawaii.
- Donham, T.  
1991 *Field Inspection of the Water Pipeline Easement Across Waikapū Stream, Waikapū, Maui Island (TMK3-5-4:14, 3-6-04:2)*. State Historic Preservation Division, Dept. of Land and Natural Resources, Honolulu.
- 1995 *Field Inspection of the Richardson Family Cemetery (Site 50-50-04-4001), Kukuialamaka, Waikapū, Wailuku District, Maui*. State Historic Preservation Division, Dept. of Land and Natural Resources, Honolulu.
- Farber, Joseph M.  
1997 *Ancient Hawaiian Fishponds: Can Restoration Succeed on Moloka'i?* Neptune House Publications, Encinitas, CA.
- Foote, Donald E., E. L. Hill, S. Nakamura, and F. Stephens  
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lana, State of Hawaii*. U.S.D.A. Soil Conservation Service, U.S. Government Printing Office, Washington, D.C.
- Fornander, A.  
1969 *Account of the Polynesian Race: Its Origins and Migrations. Volumes I-III*, Charles E. Tuttle, Co., Tokyo.



Foreign Testimony

- 1849      *Foreign Testimony to the Board of Commissioners to Quiet Land Titles.*  
Translation in the Hawai'i State Archives. Honolulu, HI.
- Fredericksen, Walter and Demaris
- 1996      *Report on the Waikapū Human Remains Recovery Project, Waikapū, Maui, Hawaii (Borrow Site 50-50-04-3525) TMK 3-8-07:104.* Prepared for SHPD, by Xamanek Researches, Pukalani, HI.
- 2004      *Archaeological Inventory Survey for Waikapū Affordable Housing Subdivision, Waikapū Ahupua'a, Wailuku District, Island of Maui (TMK: 3-5-02: por. 01 and 3-8-07: 101).* Prepared for Mr. Jesse Spencer, Xamanek Researches, Pukalani, HI.
- Guerriero, D., L. Rotunno-Hazuka, and J. Pantaleo
- 2004      *Archaeological Inventory Survey Report at TMK:3-8-07:121, Por. 136 & 137, Wailuku Ahupua'a; Wailuku District; Island of Maui.* Prepared for New Sandhills, LLC. Archaeological Services Hawaii, LLC, Wailuku, Hawaii.
- Guerriero, D., L. Rotunno-Hazuka, and J. Pantaleo
- 2004      *Archaeological Interim Monitoring Report for Ameron Sand Mining Operations at TMK:3-8-07:131, Wailuku Ahupua'a and District; Island of Maui.* Prepared for Maui Lani 100 LLC. Archaeological Services Hawaii, LLC.
- Handy, E.S.C.
- 1940      *The Hawaiian Planter, B.P. Bishop Museum Bulletin 116,* Bishop Museum Press, Honolulu.
- Handy, E.S. Craighill and E.G. Handy
- 1972      *Native Planters in Old Hawaii, their Life, Lore and Environment.* Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu.
- Hawai'i State Archives
- N.D.      *Native and Foreign Testimonies for Land Commission Awards.* Interior Department Files.
- Kalakaua, David.
- 1990      *The Legends and Myths of Hawai'i.* Mutual Publishing, Honolulu.
- Kamakau, Samuel, M.
- 1992      *Ruling Chiefs of Hawaii.* Revised Edition, Kamehameha Schools Press. Honolulu.
- Kamakau, Samuel, M., Pukui, and Barrere
- 1991      *Tales and Traditions of the People of Old: Na Mo'olelo a ka Po'e Kahiko.* B.P. Bishop Museum Press. Honolulu.

- Kame'eleihiwa, L.  
1992 *Native Land and Foreign Desires – Pehea La E Pono Ai?* Bishop Museum Press, Honolulu.
- Kennedy, Joseph  
1988 *Preliminary Archaeological Survey of Phase 1A of the Waikapū Master Plan (TMK 3-5-04: Por. Of 25).* Archaeological Consultants of Hawaii, Inc., Haleiwa.
- 1989 *Subsurface Testing Results for the Proposed Waikapū Grading Project, TMK 3-5-02:1, Waikapū, Maui.* Prepared for C. Brewer Properties. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- 1990 *Archaeological Inventory Report for the proposed Waikapū Maui Water Tank and Access Road Located at Waikapū, Island of Maui, TMK: 3-6-03: por. 2 and TMK: 3-6-02: por. 2.* Archaeological consultants of Hawaii, Inc., Haleiwa.
- 1994 *An Archaeological Inventory Survey with Subsurface Testing Report for the Proposed Maui Ocean Center Located at TMK: 3-6-01:1 & 19, in Waikapū Ahupua'a, Wailuku District, Island of Maui.* Prepared for Mr. Michael Spalding. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- Kennedy, Joseph, and Moore  
1999 *An Archaeological Inventory with Subsurface Testing at TMK:3-8-07:101 pors., Wailuku Ahupua'a; Wailuku District; Island of Maui.* Prepared for Mr. Bill Hornerman. Archaeological Consultants of Hawaii, Inc., Haleiwa.
- Neal, Marie C.  
1965 *In Gardens of Hawaii.* Bishop Museum Special Publication No. 50. Bishop Museum Press. Honolulu.
- McDonald, Gordon A., and Agatin T. Abbott  
1970 *Volcanoes in the Sea.* University Press of Hawaii, Honolulu.
- Munsell Color  
1975 *Munsell Soil Color Charts.* MacBeth Division, Kollmorgan Corporation, Baltimore.
- Native Testimony  
1849 *Native Testimony to the Board of Commissioners to Quiet Land Titles.* Translation in the Hawai'i State Archives.
- Pantaleo, Jeffrey  
2003 *Archaeological Inventory Survey for the Proposed Waikapū Mauka Subdivision Waikapū Ahupua'a, Wailuku District, Maui Island (TMK 3-4-4:25, por.).* Prepared for Munekyo & Hiraga, Inc. Archaeological Services Hawaii, LLC of Wailuku.



- Pickett, Jenny L.  
2003 *Cultural Resource Impact Statement, Paukukalo, Wailuku Ahupua`a and District, Maui Island, Hawai`i (TMK: (2)-3-3-01:1)*. Prepared for North Shore Wai`ehu LLC of Wailuku. Archaeological Services Hawaii, Wailuku.
- Pukui, Mary Kawena, and Caroline Curtis  
1974 *The Water of Kane and Other Legends of the Hawaiian Islands*. The Kamehameha Schools Press, Honolulu.
- Pukui, Mary Kawena, Samuel Elbert, and Esther Mookini  
1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.
- Pukui, Mary Kawena and Samuel H. Elbert  
1986 *Hawaiian Dictionary*. University of Hawai`i Press. Honolulu.
- Rotunno-Hazuka, Lisa and Jeffrey Pantaleo  
2004 *Archaeological Interim Monitoring Report for Hawaiian Cement Sand Mining Operations at TMK: 3-8-07:101 pors., Wailuku Ahupua`a; Wailuku District; Island of Maui*. Prepared for Mr. Bill Horneman. Archaeological Services Hawaii, LLC.
- Sinoto, Aki, L. Rotunno-Hazuka and Jeffrey Pantaleo  
2000 *Supplementary Archaeological Sampling: Proposed Light Industrial Park, Maui Lani Development Area, Wailuku, Maui Island (TMK 3-07: Por 131)*. For Maui Lani Partners, Ltd. Aki Sinoto Consulting, Honolulu.
- Sinoto, Aki, D. Guerriero, L. Rotunno-Hazuka and J. Pantaleo  
2001 *An Archaeological Inventory Survey of The Proposed 62 Market Street Project, Wailuku Ahupua`a, Wailuku, Maui (TMK 3-4-12:22 & por 23)*. Prepared for the Office of Economic Development, County of Maui, Wailuku. Aki Sinoto Consulting, Honolulu.
- State of Hawai`i  
1997 *Hawaii Administrative Rules, Title 11, Department of Health, Chapter 200, Environmental Impact Statements, (Unofficial version)*
- 1997 *Guidelines for Assessing Cultural Impacts*. Adopted by the Environmental Council, State of Hawai`i.
- Sterling, Elspeth P.  
1998 *Sites of Maui*. Bernice P. Bishop Museum, Honolulu.
- Thrum, T.G.  
1909 *Hawaiian Annual and Almanac*. Honolulu.
- Titchenal, P.  
1996 *Archaeological Inventory Survey of the Proposed Retention Basin and Adjoining Lands, Waikapū and Wailuku Ahupua`a, Wailuku District, Maui Island (TMK 3-5-02:01, por.: 3-5-01:17, por.)*. Prepared for C. Brewer Homes Inc., Wailuku by Aki Sinoto Consulting, Honolulu.

- Walker, W.  
1931 *Archaeology of Maui*. Ms. dept. Anthropology, B.P. Bishop Museum.
- Westervelt, William D.  
1977 *Hawaiian Historical Legends*. Chas. E. Tuttle Co., Inc., Tokyo.
- Wilcox, Carol  
1996 *Sugar Water: Hawaii's Plantation Ditches*, University of Hawai'i Press  
Honolulu, HI.

## ***Appendix D***

***SHPD Acceptance***

***Letter of AIS***



DAVID Y. IGE  
GOVERNOR OF HAWAII



SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA  
FIRST DEPUTY

JEFFREY T. PEARSON  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT

FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAI FOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

**STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION  
KAKUHIHEWA BUILDING  
601 KAMOKILA BLVD, STE 555  
KAPOLEI, HAWAII 96707

July 1, 2016

Vince Bagoyo  
Emmanuel Lutheran Church and Valley Isle Fellowship  
[Vbagoyo-devgroup@hawaii.rr.com](mailto:Vbagoyo-devgroup@hawaii.rr.com)

LOG NO: 2016.01495  
DOC NO: 1607MN01  
Archaeology

Dear Mr. Bagoyo:

**SUBJECT: Chapter 6E-42 Historic Preservation Review  
Revised Archaeological Inventory Survey Report of a 50 acre Parcel of Land  
Waikapu and Wailuku Ahupua'as, Wailuku District, Island of Maui  
TMK: (2) 3-5-002:001**

Thank you for requesting our review of the revised draft report titled "*Archaeological Inventory Survey of a 50-Acre Parcel of Land, Waikapu and Wailuku Ahupua'as, Wailuku District, Island of Maui, Hawai'i TMK (2)3-5-002:por 001*". D. Guerriero, L. Rotunno-Hazuka, and J. Pantaleo, June 2016. We received the report in our Kapolei office on February 11, 2016, and reviewed it in a letter dated April 11, 2016 (2016.00321, Doc No. 1604MN02). We received the revised version in our Kaua'i section on May 17, 2016. We received the third draft electronically on July 1, 2016.

At the request of the Emmanuel Lutheran Church and Valley Isle Fellowship, Archaeological Services Hawaii, LLC. (ASH) conducted a 100% pedestrian archaeological inventory survey (AIS) of 50 acres owned by Emmanuel Lutheran Church. The survey, which included subsurface testing, was completed between May 4-7, 2004. One historic property was identified, State Inventory of Historic Places (SIHP) Site 50-50-04-5474, Kama Ditch, and is assessed as significant under criteria a and d in accordance with Hawaii Administrative Rule (HAR) §13-284-6. The authors state that the site is significant under criteria a, for its association with the plantation era, and under criteria d for data potential. No further inventory work is recommended prior to construction, but the authors recommend archaeological monitoring due to the presence of numerous historic properties, including burials, on adjacent properties. The State Historic Preservation Division (SHPD) concurs with this recommendation.

The latest draft of the report contains the information requested regarding Site 5474, including historic maps. The AIS is accepted, in accordance with HAR§13-276. Please provide one hard copy of the report, clearly marked FINAL, along with a text-searchable CD to our Kapolei section. Please send one hard copy to the Maui section. Please contact Kaua'i Lead Archaeologist Mary Jane Naone at (808) 271-4940 or [Maryjane.Naone@hawaii.gov](mailto:Maryjane.Naone@hawaii.gov) if you have questions regarding this letter. Mahalo for your assistance in preserving significant historic and cultural properties.

Aloha,

*Mary Jane Naone*

Mary Jane Naone, Kaua'i Lead Archaeologist

cc. Jenny Pickett Maui Archaeologist [Jenny.L.Pickett@hawaii.gov](mailto:Jenny.L.Pickett@hawaii.gov)  
Lisa Rotunno-Hazuka, Archaeological Services Hawaii, LLC. [lisa@ashmaui.com](mailto:lisa@ashmaui.com)  
County of Maui, Department of Planning [Planning@co.maui.hi.us](mailto:Planning@co.maui.hi.us)  
County of Maui Department of Public Works - DSA [Renee.Segundo@co.maui.hi.us](mailto:Renee.Segundo@co.maui.hi.us)  
County of Maui Cultural Resources Commission [Annalise.Kehler@co.maui.hi.us](mailto:Annalise.Kehler@co.maui.hi.us)



***Appendix E***

***Archaeological***

***Monitoring Plan (AMP)***





**DRAFT ARCHAEOLOGICAL MONITORING PLAN  
FOR WAIKAPŪ DEVELOPMENT VENTURE  
AFFORDABLE HOUSING PROJECT  
WAIKAPŪ AHUPUA'A, WAILUKU DISTRICT,  
PŪ ALI KOMOHANA MOKU  
ISLAND OF MAUI  
TMK (2) 3-5-002:011 por.  
(FORMERLY TMK (2) 3-5-002:001 pors.)**

**FOR: Waikapū Development Ventures, LLC. [bill@mauiframpton.com](mailto:bill@mauiframpton.com)**

**BY: Ms. Lisa J. Rotunno-Hazuka (B.A.), Mr. Jeffrey Pantaleo (M.A.)  
and Mr. Nico Fuentes (M.A.)**

**MAY 2018**



***ARCHAEOLOGICAL SERVICES HAWAII, LLC.***

**POB 1015, PU'UNĒNĒ, HI 96784**

**In Association With**

**ATLAS ARCHAEOLOGY**

***"Protecting, Preserving, Interpreting the Past, While Planning the Future"***

## INTRODUCTION

At the request of Waikapū Development Ventures LLC., located at 56 Paliuli Place, Kula, HI 96790, and pursuant to recommendations by the State Historic Preservation Division –SHPD (Log. No. 2016.01495 and Doc. No. 1607MN01), Archaeological Services Hawaii, LLC (ASH) of Pu'unēnē in association with Atlas Archaeology of Wailuku, prepared this archaeological monitoring plan (AMP) according to the requirements set forth in the Hawaii Administrative Rules (HAR) §13-279-4. Archaeological monitoring will be performed during all ground-disturbing activities associated with the proposed development of an affordable residential subdivision located between Waiale Road and Honoapi'ilani Highway, Waikapū and Wailuku *ahupua'a*, Wailuku District, Pū'ali Komohana *Moku*; Island of Maui, TMK (2) 3-5-002:011 por. (formerly TMK (2) 3-5-002:001 por.) (Figures 1-4).

The proposed development is an affordable housing project submitted for the 201H process. The construction activities comprise grading across the entire project parcel (approximately 2.0 to 4.0 ft. below surface-bs), and the installation of infrastructure including sewer, drain, water and electrical lines within utility corridors (approximately 1.5 ft. to 10.0 ft. bs). The location of utility corridors is in the early design stages; however, the majority of utilities will be situated within the proposed roadways. The current subdivision layout is presented on Figure 3.

## PROJECT AREA DESCRIPTION

The project area, comprised of 12.5 acres, is a portion of a 25.0- acre parcel located in Central Maui, along the western perimeter of the isthmus and base of West Maui Mountains. It is juxtaposed by Waiale Road to the east and Honoapi'ilani Highway to the west, undeveloped portion of Parcel 11 for Valley Isle Fellowship to the north, undeveloped parcel to the southwest for Emmanuel Lutheran Church, and Waiale Elua affordable subdivision currently under construction to the southeast (Parcel 12). The Lower Main/Waiale Road corridor is a culturally and archaeologically sensitive corridor that contains numerous historic properties, including burial sites.

Geographically, the subject parcel is situated within an environmental zone containing three depositional systems comprised of colluvial (gravity transported or slope wash), alluvial (water transported) and aeolian (wind). Colluvium (soils, various sizes of angular to sub-angular rock), and alluvium (silts, clays various sizes of rounded rock) deposits transported from West Maui

Mountains would likely occur along the western perimeter, and Aeolian (sand dune) deposits within the central and eastern sections.

The project area has undergone compounded disturbances from past agricultural activities (sugar cane and pineapple cultivation and individual farm plots) spanning the entire parcel, construction of historic Kama Ditch (Site 50-50-04-5747) formerly in the southwest, installation of County sewer line to the southeast and prior sand mining operations. These disturbances have altered the entire parcel a minimum of 0.60 mbs (2.0 ft.), and from 1.53 mbs (5.0 ft.) along the western perimeter to 3.0 mbs (9.5 ft.) in the southeast portion.

### **BACKGROUND INFORMATION**

The project area is located within the central portion of a larger AIS study area conducted in 2004 by ASH. An AIS, for subdivision purposes, was conducted of a 50-acre parcel located in a portion of TMK: (2) 3-5-002:001 por. (Guerriero et. al. 2016). The AIS consisted of a pedestrian survey and mechanical subsurface testing comprised of 25 mechanical trenches (Figure 4). The parcel was subdivided into two, 25.0-acre parcels for Emmanuel Lutheran Church to the north (now designated as TMK: (2) 3-5-002:012), and Valley Isle Fellowship to the south, TMK: (2) 3-5-002:011 (see Figures 1 and 2). During the pedestrian survey, one historic property, consisting of a portion of Kama Ditch (Site 50-50-04-5474) and an associated metal sluice gate designated Feature 1 was recorded along the western perimeter of the property. Also noted was compounded disturbances from agricultural activities (sugar cane, pineapple and independent farming), the construction of Kama Ditch, the installation of a County sewer line and prior sand mining activities.

The subsurface testing program, comprised 25 trenches (TR's 1-25) executed across the parcel to obtain a sampling of the subsurface conditions. The results of testing were negative for buried cultural remains, and the trench profiles exhibited various disturbances and soil deposition. Distinct riverbed (rounded cobbles, pebbles and silts) deposits, indicative of a former active channel were recorded on the western and southern portions in TR's 1, 2, 7, 8 and 12-16. Seven trenches, TR's 1, 2 and 12-16 were located along the western perimeter and comprised both alluvial and colluvial deposits (silts, clays, angular and rounded rock). In the eastern section, the remaining 18 trenches, TR's 3-11, 17-25 were executed. Nine trenches (TR's 9, 10 and 17-23) contained remnant sand dune deposits, some of which were in a disturbed context, and/or comprised a thin deposit. The notable absence of sand in half of the eastern trenches; coupled

with the presence of disturbed sand dune matrices in the central and east portions indicated extensive prior sand mining activities.

In 1996, Aki Sinoto Consulting conducted an archaeological assessment (AIS with negative results), for the proposed retention basin and drainage channel along Waiale Road, which encompassed portions of the project area (Titchenal 1996). The project area extended south from the Waiko Road intersection, north to the Kuihelani Drive intersection, along the *mauka* (west) and *makai* (east) sides of Waiale Road. A total of 13 trenches were conducted, one which occurred within the current project parcel, TR11. TR11 was executed on the eastern side of the existing County sewer line and excavated to 3.3 mbs. TR11 contained two strata comprised of a thick, 2.8 m of silty loam with rounded cobbles, overlying an intact sand dune deposit.

The proposed retention basin and drainage channel project were monitored by Scientific Consultant Services (SCS) and ASH in 2005 (Morawski, Shefcheck, and Dega 2006). Five sites were recorded and consisted of a historic road bed (50-50-04-5963), a sugarcane flume (50-50-04-5964), an *in situ* burial (50-50-04-5680), and two areas of isolated human remains (50-50-04-5965 and -5966) (see Figure 1). The isolated finds were encountered in a previously disturbed context, most likely associated with the initial construction of the Waiale Road.

Additional Native Hawaiian burials were encountered along Kuikahi Avenue extension (Site 50-50-04-6261) and adjacent Walgreens (Site 50-50-04-6573) just north of the project (O'Claray-Nu et al. 2018) (see Figure 1).

*Pursuant to HAR §13-279-4(1) What kinds of archaeological remains or historic properties are anticipated or require protection and (2) Where in the project area are these properties known to be located or anticipated?*

#### **EXPECTABILITY OF SUBSURFACE SITES**

Based on the foregoing information, the subject parcel is located within a culturally significant area containing historic sites, and traditional burial sites. However due to the compounded disturbances incurred at the project area that impacted the parcel from 0.60 mbs to 3.0 mbs (2.0 ft. to 9.5 ft.); the likelihood of encountering primary/*in situ* burial features is low along the western perimeter, and medium to the east. Alternatively, since un-monitored sand mining activities were conducted in the parcel, there is a high likelihood scattered skeletal elements, dispersed cultural materials, and remnant burial features may be extant. Thus all ground-disturbing activities related to construction will be monitored.



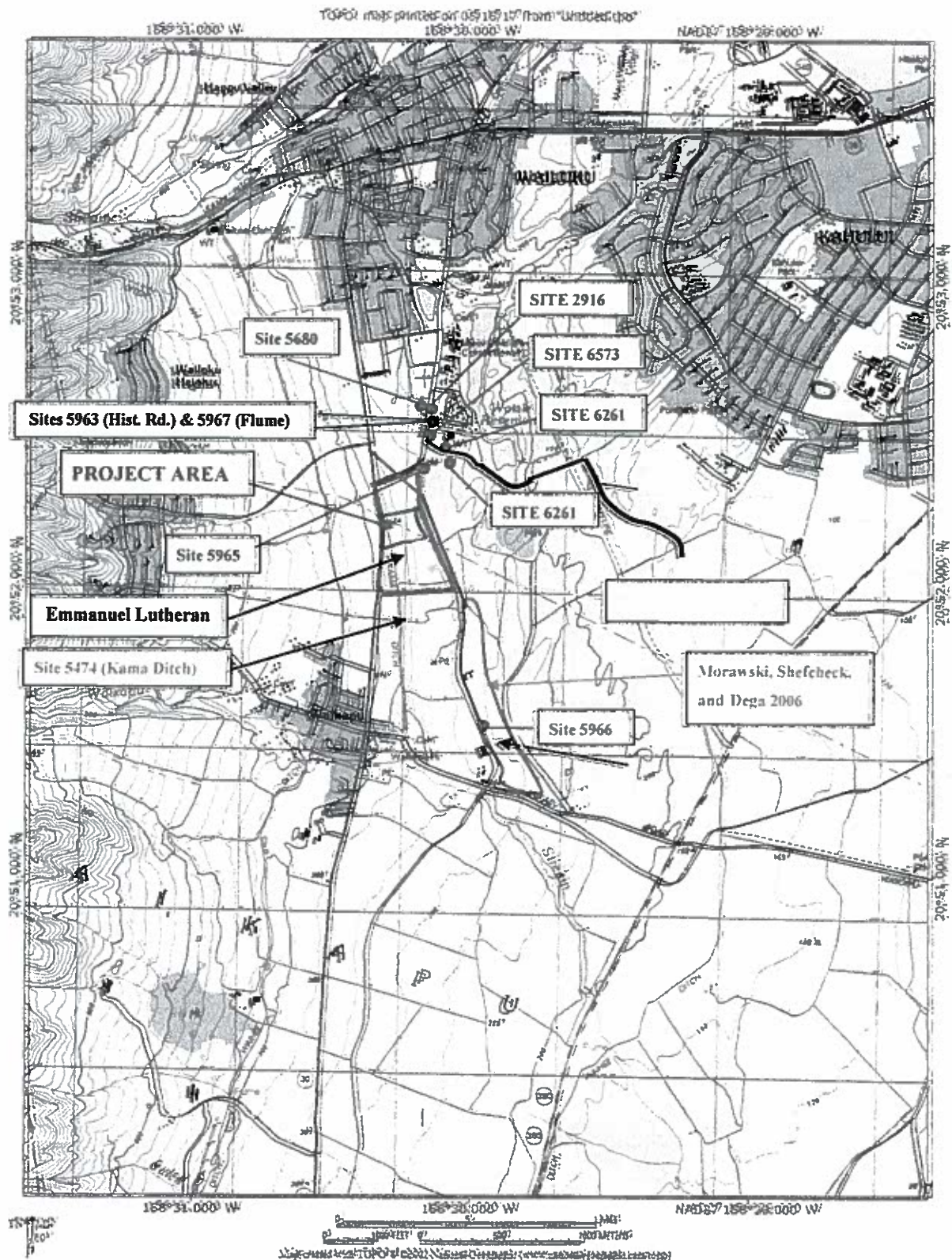
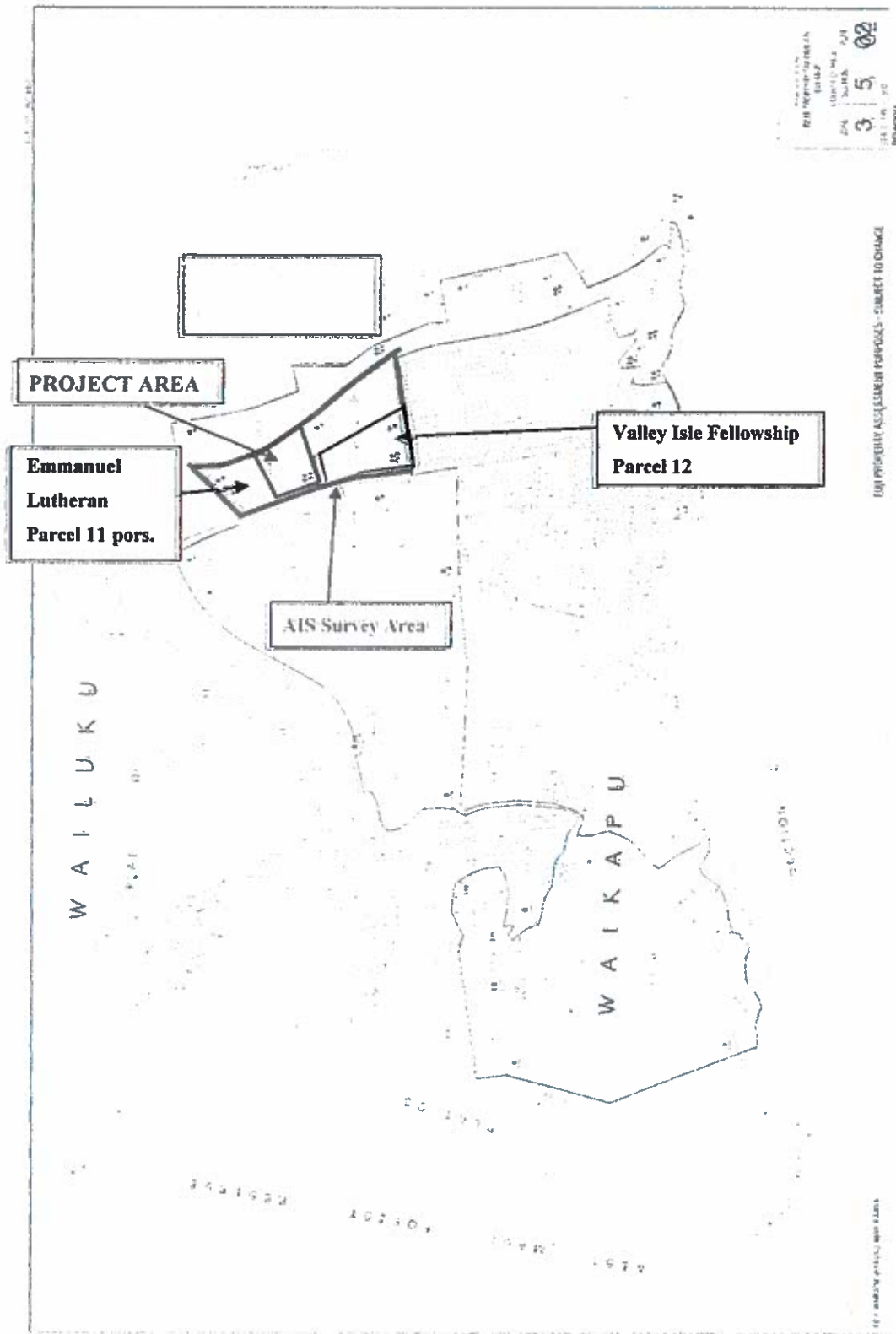
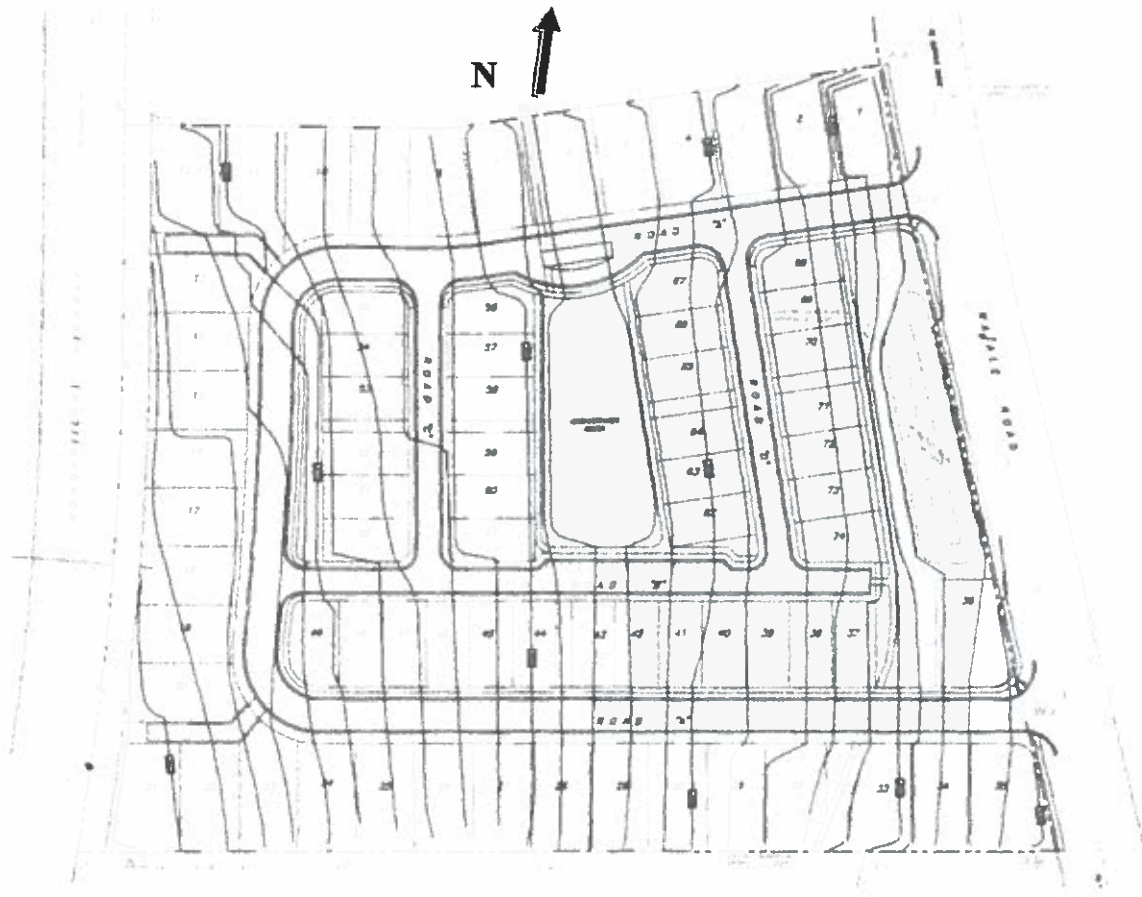


Figure 1. USGS Wailuku Quad (2002) Showing Project Area (red) & Nearby Historic Properties



**Figure 2. Location of Project Area (red) within Parcel 12 on TMK Map 3-5-002**





**Figure 3. Proposed Waiale Affordable Residential Subdivision Lots 1-71**

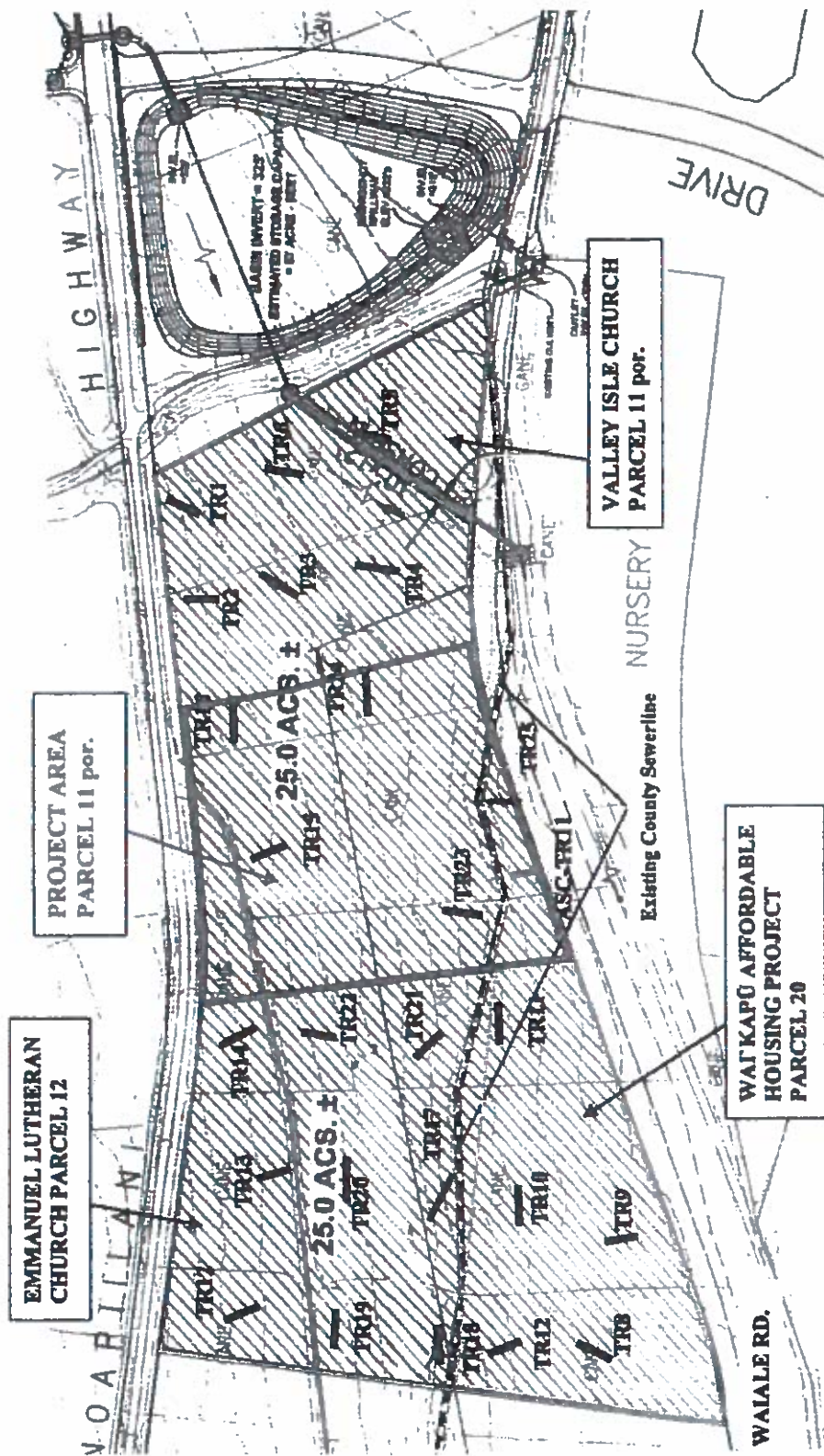


Figure 4. Topo Map Showing Project Area (red), AIS Study Area (green), TR's 1-25, and Site 50-50-04-5474 and Easements

## MONITORING PLAN

The construction plans call for excavations ranging from 2.0 to 10.0 ft. deep. Full-time monitoring will be the protocol for this project, with one archaeological monitor per piece of ground-disturbing equipment at all times and in all locations while the equipment is in operation. The purpose of the monitoring program is to identify, protect, document, and assess any inadvertently exposed primary burials and/or scattered human skeletal remains, as well as any pre-Contact and/or post-Contact historic properties such as non-burial features (e.g., cultural layers, trash pits, buried architectural remains). SHPD Archaeology Branch will be notified of the onset and completion of the proposed project. Additionally, no changes may be made to the monitoring provisions without written approval by SHPD.

*Pursuant to HAR §13-279-4(4) ....the archaeologist conducting the monitoring has been given the authority to halt ground disturbing activities in the immediate area of a find.... and (5) a coordination meeting with any construction team and the archaeologist, so the construction team is aware of the plan;*

Prior to the commencement of construction, a coordination meeting will be held with all pertinent parties including but not limited to construction and archaeological personnel. The purpose of the pre-construction meeting is to inform all personnel of the monitoring procedures as stipulated in the AMP, as well as the monitor's authority to halt work in the vicinity of a find. All stop work in the area of a find is necessary to protect and document any encountered historic property; however construction activities may shift to other localities of the project area.

*Pursuant to HAR §13-279-4(3) needed fieldwork to protect or document known or anticipated historic properties ....*

If subsurface (non-burial) historic properties are exposed during construction, the procedures for the inadvertent discovery of historic properties pursuant to HAR §13-279-5(5) will be instituted. These procedures include but are not limited to the following steps:

1. Temporarily halt ground-disturbing activities in the immediate area of the find and once the archaeologist makes an assessment of the historic property and condition, consultation with SHPD Archaeology Branch will be undertaken to determine the appropriate mitigation measures for the find.
2. The area around the historic property shall be protected by erecting orange fencing or yellow caution tape.

3. The historic property will be located utilizing GPS points (Garmin Montana 615t) and recorded utilizing all standard archaeological methods and procedures; such as plan view maps (to scale with north arrow) of all historic properties, stratigraphic profiles of the subsurface cultural features and natural soil deposition, photographs will be taken; and soil samples will be collected not only from the subsurface site, but from selected locations within the project area.
4. If large historic trash pits are encountered, SHPD will be consulted regarding appropriate field documentation (i.e. maps, photographs, quantification and description of artifacts) and collection of a representative sample.
5. All historic bottles are to be collected and analyzed by the archaeologist.
6. During nighttime work, the archaeological monitor has sole discretion to determine if lighting is adequate to perform visual inspections of the soil.

In the event that human remains are inadvertently exposed during this project, the monitor will implement the procedures for the inadvertent discovery of human skeletal remains stipulated in Chapter 6E 43.6 and HAR §13-300-40 and in accordance with SHPD History and Culture Branch directives. These procedures include, but are not limited to the following:

1. Upon the identification of human remains, the archaeological monitor will halt all construction activities in the immediate area of the find and secure the area.
2. The monitor will immediately notify the SHPD History and Culture Branch-Burial Sites Specialist and the SHPD Archaeology Branch. SHPD will contact the geographic representative of the Maui Lana`i Islands Burial Council. If warranted, the police and medical examiner will also be notified.
3. The monitor will establish a protective perimeter buffer zone using yellow caution tape or orange construction fencing and the exposed human remains will be secured and protected with sand, cloth, tarp and/or plywood to protect them from the elements.
4. In consultation with SHPD, the burial feature location will be recorded by a licensed surveyor and or by archaeological personnel using a hand-held GPS unit.

*Pursuant to HAR §13-279-4 (6) any laboratory work expected to be done;*

If cultural materials (midden and artifacts) are identified during the course of field work, all collected materials will be labeled with provenience information, sorted, counted and/or weighed, measured (if artifacts) and tabulated for the archaeological monitoring report (AMR). Soil samples collected from cultural and natural soil sequences will be recorded using USDA soil terminology and soil colors using the Munsell color charts. Charcoal samples collected from *in situ* features, as well as intact cultural and or natural layers may be submitted for identification to taxon. After identification, charcoal samples representing short-lived native or Polynesian introduced taxa may be submitted for radiocarbon dating analysis.

*Pursuant to HAR §13-279-4(7) Report preparation and (8) Archiving of any collection;*

Analyses of cultural materials, charcoal samples and etc. will be synthesized into a draft AMR. Upon acceptance of a Final AMR, hard and electronic copies of the report will be submitted to SHPD Maui and O'ahu libraries, and to the client. All notes, photographs and artifacts will be archived at the consulting archaeologists' office. After the analyses are complete, the final archiving location of all artifactual material will be decided in consultation with the landowner and SHPD.



## REFERENCES

Guerriero, Diane, Lisa Rotunno-Hazuka, and Jeffrey Pantaleo

- 2016 *Archaeological Inventory Survey of a 50 Acre Parcel of Land of Waikapu and Wailuku Ahupua'a, Wailuku District Maui Island TMK: (2) 3-5-002:011 and 012 (formerly 3-5-002:001 pors.)* Prepared for Valley Isle Fellowship and The Emmanuel Lutheran Church. Archaeological Services Hawaii, LLC., Wailuku, Hi.

<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

<http://www.nationalgeographic.com/topo>

<http://www.co.maui.hi.us/757/Tax-Map-Information>

Morawski, Lauren. Donna Shefcheck and Michael Dega

- 2006 *An Archaeological Monitoring Report for Kehalani Subdivision and Offsite Improvements, Wailuku and Waikapu Ahupua'a; Wailuku District; Island of Maui, Hawaii TMK: 3-5-002:01 por. and TMK: 3-5-001:017 por.* Prepared for Stanford Carr, LLC. Scientific Consultant Services, Inc. Honolulu, Hi.

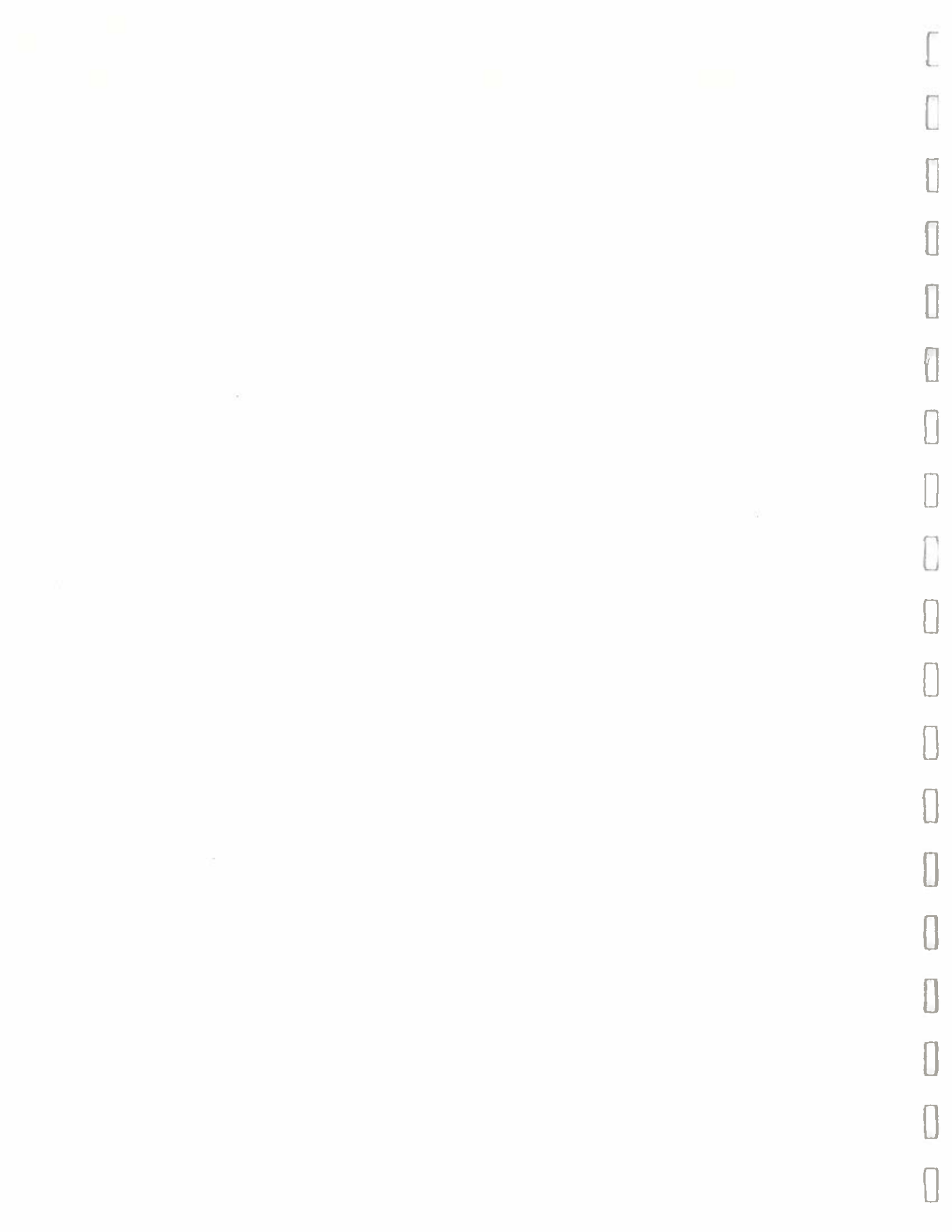
O'Claray-Nu, Jenny, Lisa Rotunno-Hazuka, and Jeffrey Pantaleo

- 2018 *Archaeological Assessment of a 15-Acre Parcel Located along Waiale Road in Wailuku Ahupua'a and District, Island of Maui, Pū'ali Komohana Moku, Island of Maui TMK: (2) 3-5-002:064.* Prepared for Pier Mgmt.-Hawaii, LLC., Archaeological Services Hawaii, LLC., Wailuku, Hi.

***Appendix F***

***Preliminary Engineering  
Report***





**PRELIMINARY ENGINEERING REPORT**

**FOR**

**WAIKAPU DEVELOPMENT VENTURE  
AFFORDABLE HOUSING PROJECT  
Wailuku, Maui, Hawaii**

**T.M.K.: (2) 3-5-002: por. of 011**

**Prepared for:**

**Waikapu Development Venture, LLC  
56 Paliuli Place  
Kula, Maui, Hawaii 96790**



*Mark M. Matsuda*

**Prepared by:**



**CONSULTING CIVIL ENGINEERS  
305 SOUTH HIGH STREET, SUITE 102  
WAILUKU, MAUI, HAWAII 96793  
PHONE: (808) 242-0032**

**July 2017  
Revised June 2018**

## **TABLE OF CONTENTS**

### **1.0 INTRODUCTION**

### **2.0 EXISTING INFRASTRUCTURE**

2.1 ROADWAYS

2.2 DRAINAGE

2.3 SEWER

2.4 WATER

2.5 ELECTRIC, TELEPHONE & CABLE TV

### **3.0 ANTICIPATED INFRASTRUCTURE IMPROVEMENTS**

3.1 ROADWAYS

3.2 DRAINAGE

3.3 SEWER

3.4 WATER

3.5 ELECTRIC, TELEPHONE & CABLE TV

### **APPENDICES**

A HYDROLOGIC CALCULATIONS

B WASTEWATER CALCULATIONS

C WATER DEMAND CALCULATIONS

### **EXHIBITS**

1 LOCATION MAP

2 VICINITY MAP

3 SOIL SURVEY MAP

4 FLOOD INSURANCE RATE MAP

5 PRELIMINARY SITE PLAN

6 PRELIMINARY GRADING PLAN

### **REFERENCES**

**PRELIMINARY ENGINEERING REPORT  
FOR  
WAIKAPU DEVELOPMENT VENTURE  
AFFORDABLE HOUSING PROJECT  
T.M.K.: (2) 3-5-002: por. of 011**

**1.0 INTRODUCTION**

The purpose of this report is to provide information on the existing infrastructure which will be servicing the proposed project. It will also evaluate the adequacy of the existing infrastructure and anticipated improvements which may be required for the proposed project.

The subject parcel is identified as T.M.K.: (2) 3-5-002: 011. It is also known as Lot A of the Waikapu East (Large Lot) Subdivision. The proposed project will encompass the southern 12.5 acres of the 25.263 acre parcel. The remaining northern portion of the property is owned and utilized by Emmanuel Lutheran Church. The property is bordered by the undeveloped Lot J of the Waikapu East (Large Lot) Subdivision to the north, Waiale Road to the east; Honoapiilani Highway to the west, and the Valley Isle Fellowship Church and Waiale Elua Subdivision to the south.

The proposed project consists of developing a 74 lot subdivision with 6 of the lots consisting of a duplex unit for a total of 80 units. The project will have lot sizes ranging from approximately 3,000 square feet to 6,500 square feet. Proposed improvements include paved roadways; concrete curbs, gutters and sidewalks; landscaping; underground water, sewer, drainage, electrical, cable, and telephone systems; and a neighborhood green.

**2.0 EXISTING INFRASTRUCTURE**

**2.1 ROADWAYS**

Honoapiilani Highway is located west of the project site. It is a two lane undivided State Highway which runs in the north-south direction into Wailuku town. The speed limit ranges between 30 and 45 miles per hour (mph) in the vicinity of Waikapu. There are traffic signals at the intersection with Waiko Road to the south of the project site and with Kuikahi Drive to the north of the project site with existing left turn pockets for southbound traffic to head east towards Waiale Road. There is no direct access from Honoapiilani Highway into the subject property.

Kuihelani Highway is located approximately 4,500 feet east of the project site. It is a two way, four-lane State arterial highway which also runs in the north-south direction. The posted speed limit on Kuihelani Highway varies between 30 and 55 mph. Traffic signals are installed at the Kuihelani Highway-Waiko Road intersection.

The southern terminus of Kuihelani Highway is its intersection with Honoapiilani Highway.

Kuikahi Drive is a two-lane collector roadway that connects Honoapiilani Highway and Waiale Road. The posted speed limit on Kuikahi Drive range between 25 mph and 35 mph. Kuikahi Drive begins west of Honoapiilani Highway within the Wailuku Heights Subdivision and continues east past Waiale Road, terminating near the Church of Jesus Christ of Latter Day Saints where it bends and becomes Maui Lani Parkway.

Waiko Road is a two-lane collector roadway that connects Honoapiilani Highway and Kuihelani Highway. The posted speed limit on Waiko Road is 20 mph. Immediately east of Honoapiilani Highway, where Waiko Road provides access to a residential community. Further east, Waiko Road provides access to industrial and livestock land uses.

Waiale Road is a two-lane collector roadway running north from Waiko Road. It turns into Lower Main Street near Kaahumanu Avenue. The section of Waiale Road from Waiko Road to Kuikahi Drive was improved with 36' of pavement as part of the Waikapu Gardens Subdivision (Subdivision File No. 3.2129). Waiale Road is proposed to be extended from the intersection with Waiko Road southward to intersect with Honoapiilani Highway in the vicinity of the Maui Tropical Plantation.

## 2.2 DRAINAGE

The existing ground slopes in a west to east direction from elevation 355 feet above mean sea level at mauka portion of the property (western boundary) to elevation 324 feet along Waiale Road (eastern boundary), with an average slope of approximately 4.8%. The project site is currently vacant and was previously used for pineapple cultivation.

According to the Soil Survey Geographic Database for Island of Maui, State of Hawaii (September 2014) prepared by the United States Department of Agriculture Natural Conservation Service, the soils within the project site are classified as Puuone sand (PZUE) and lao silty clay (laA). Puuone sand is characterized as having rapid permeability near the surface, slow runoff, and a moderate to severe wind erosion hazard. lao silty clay is characterized as having slow runoff and an erosion hazard of no more than slight.

According to Panel Number 150003 0391 E of the Flood Insurance Rate Map, Sept. 29, 2009, prepared by the United States Federal Emergency Management Agency, the project site is situated in Flood Zone X. Flood Zone X represents areas outside the 0.2% annual chance floodplain.

There are no drainage improvements within the project site for onsite runoff. The onsite runoff presently sheet flows across the project site in a west to east direction towards Waiale Road. Along Waiale Road there is a grassed shoulder which conveys some of the runoff to the existing drainage systems in the surrounding area.

It is estimated that the present onsite runoff for a 50-year, 1-hour design storm from the entire project site is 13.0 cfs and approximately 15,625 cubic feet of runoff volume. Outside of the project area, but within the portion of the property to be retained by the Emmanuel Lutheran Church, there is an existing drainage channel which conveys storm runoff from the Kehalani Community to the north to an existing retention basin further south of the property and on the makai side of Waiale Road. Storm runoff from the project site does not enter this drainage channel.

### **2.3 SEWER**

There is a 12-inch gravity sewer lines traversing through a portion of the property entering along the southern boundary and continues north exiting the property and enters the Waiale Road right-of-way. Wastewater collected from the Waikapu area is transported to the Kahului Wastewater Treatment Plant in Naska.

### **2.4 WATER**

Domestic water and fire flow for the Waikapu area are serviced from the 300,000 gallon Waikapu Tank and 1.5 million gallon Kehalani mid-level tank. A series of 8-inch and 12-inch waterlines traverse along West Waiko Road from the Waikapu Tank to Honoapiilani Highway. As part of the Waikapu Gardens Subdivision, a 12-inch waterline was installed from Waiko Road, through the center of the subdivision and reduced to 8-inch waterlines to provide distribution throughout the subdivision. A 12" waterline was connected to the existing waterlines in the Waikapu Gardens Subdivision and installed along the southern boundary line of the Valley Isle Fellowship. Separately to the north of the project site, there is an existing 12" waterline along Kuikahi Drive that services the surrounding properties and continues east at the intersection with Waiale Road. The source for this water system is the Moku hau wells located in Happy Valley.

### **2.5 ELECTRIC, TELEPHONE & CABLE TV**

There is an existing electrical transmission system traversing along Waiale Road fronting the project site. The existing system currently provides service to the adjacent properties and surrounding area.

## **3.0 ANTICIPATED INFRASTRUCTURE IMPROVEMENTS**

### **3.1 ROADWAYS**

The subdivision roadway will access onto Waiale Road at two locations along the frontage the property. There will be no direct access from the individual lots onto Waiale Road or Honoapiilani Highway. From Waiale Road, vehicles can continue

north to access Kuikahi Drive and eventually onto Lower Main Street. Vehicles can turn south to the Waiko Road intersection and head west to access Honoapiilani Highway or east to access Kuihelani Highway. Based on the Traffic Impact Analysis Report, left turn storage lanes along Waiale Road are recommended at the two proposed intersections into the project.

The interior subdivision roads are intended to be dedicated to the County. Road "A" will have a 48 foot minimum right-of-way, concrete curbs, gutters and sidewalk on both sides. Road "B" will have a 44 right of way with curbs and gutters, and a sidewalk on one side. The other two interior roadways "C" and "D" will have 36 foot right-of-ways with 20 feet of pavement, concrete curbs, and gutters. The narrower pavement widths are to minimize pavement area which help to surface runoff and address traffic calming by encouraging lower vehicle speeds. Concrete wheel chair ramps will be constructed at appropriate locations to comply with ADA standards. Appropriate striping and signage will be installed in accordance with the Department of Public Works standards. Sidewalks and pedestrian lanes will be constructed to provide access throughout the property such as to the neighborhood green.

### 3.2 DRAINAGE

It is estimated that the post development runoff from the project site for a 50 year – 1 hour design storm will be 36.8 cfs generating 28,670 cf of runoff volume, which equates to a net increase of 23.8 cfs of runoff and 13,045 cf of runoff volume. Onsite runoff from the project site will be collected by curb-inlet catch basins located at appropriate intervals along the subdivision roadways and convey the runoff to a retention basin at the eastern end of the property along Waiale Road. The retention basin will have a capacity of approximately 33,250 cf which will accommodate the entire post development runoff volume of the design storm from the project site. Other features such as the grassed shoulders, vegetated strips and the neighborhood green will provide additional areas for runoff to infiltrate into the ground. There will be no increase in runoff sheet flowing from the project site after construction of the development. This is in accordance with Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui.

The design intent of the project will be to limit the need for extensive grading as much as possible. Development of the project will also include implementation of site specific best management practices (BMP's) during construction to provide erosion control and minimize impacts to downstream properties. BMP's which may be implemented would include, but is not limited to:

1. Prevention of cement products, oil, fuel, and other toxic substances from falling or leaching into the water.
2. Prompt and proper disposal of all loosened and excavated soil and debris material from drainage structure work.



3. Retention of ground cover until the last possible date.
4. Stabilization of denuded areas by sodding or planting as soon as possible.
5. Early construction of drainage features.
6. Minimize time of construction.

Design of the construction BMP's will be initiated at the time of construction to ensure the adequacy and applicability of the proposed features. County and State regulations also require ongoing inspections and maintenance during construction to ensure proper functionality and protection of downstream properties. Incorporating BMP's such during construction along with post construction measures to be installed will meet the requirements of Chapter 111, Rules for the Design of Stormwater Treatment Best Management Practices.

### 3.3 SEWER

The proposed project will generate approximately 28,000 gallons per day of wastewater based on the 80 residential units. Wastewater from the project will be collected by an onsite gravity sewer system and conveyed to the existing sewer system along the eastern boundary of the project site which continues in the northerly direction towards Lower Main Street. The existing system will continue to convey wastewater to the Kahului Wastewater Treatment Plant.

### 3.4 WATER

The domestic water demand for the project is anticipated to be approximately 50,295 gallons per day. Waterlines will be extended from the existing 12" waterline near the Kuikahi Drive and Waiale Road intersection to provide domestic and fire protection throughout the project site and service each proposed lot. In accordance with DWS standards, the fire flow demand for a single family residential development is 1,000 gallons per minute for a 2-hour duration and 1,250 gallons per minute for duplex units. Fire hydrants will be installed at the appropriately spaced intervals along the subdivision roadways.

### 3.5 ELECTRIC, TELEPHONE & CABLE TV

The proposed electrical, telephone, and cable TV distribution systems will be serviced from the existing facilities along Waiale Road. Within the subdivision, all distributions systems will be installed underground and service laterals will be provided to each lot. Street lights will be installed along the subdivision streets at intervals to be determined by the electrical engineer.

**APPENDIX A**  
**HYDROLOGIC CALCULATIONS**

## HYDROLOGIC CALCULATIONS

Purpose: Determine the increase in onsite surface runoff from the development of the proposed project based on a 50-year storm.

A. Determine the Runoff Coefficient (C):

EXISTING CONDITIONS:

Infiltration (Medium)	= 0.07
Relief (Rolling)	= 0.03
Vegetal Cover (High)	= 0.00
Development Type (Open)	= <u>0.15</u>
C	= 0.25

DEVELOPED CONDITIONS:

Infiltration (Slow)	= 0.14
Relief (Rolling)	= 0.03
Vegetal Cover (Good)	= 0.03
Development Type (Residential)	= <u>0.40</u>
C	= 0.60

B. Determine the 50-year 1-hour rainfall:

$$i_{50} = 2.5 \text{ inches}$$

Adjust for time of concentration to compute Rainfall Intensity (I):

Existing Condition:

$$\begin{aligned} T_c &= 20 \text{ minutes} \\ I &= 4.17 \text{ inches/hour} \end{aligned}$$

Developed Condition:

$$\begin{aligned} T_c &= 13 \text{ minutes} \\ I &= 4.90 \text{ inches/hour} \end{aligned}$$

C. Drainage Area (A) = 12.5.Acres

D. Compute the 50-year storm runoff volume (Q):

$$Q = CIA$$

Existing Conditions:

$$\begin{aligned} Q &= (0.25)(4.17)(12.5) \\ &= 13.0 \text{ cfs} \end{aligned}$$

Developed Conditions:

$$\begin{aligned} Q &= (0.60)(4.90)(12.5) \\ &= 36.8 \text{ cfs} \end{aligned}$$

The increase in runoff due to the proposed development is  $36.8 - 13.0 = 23.8$  cfs.

# Hydrograph Report

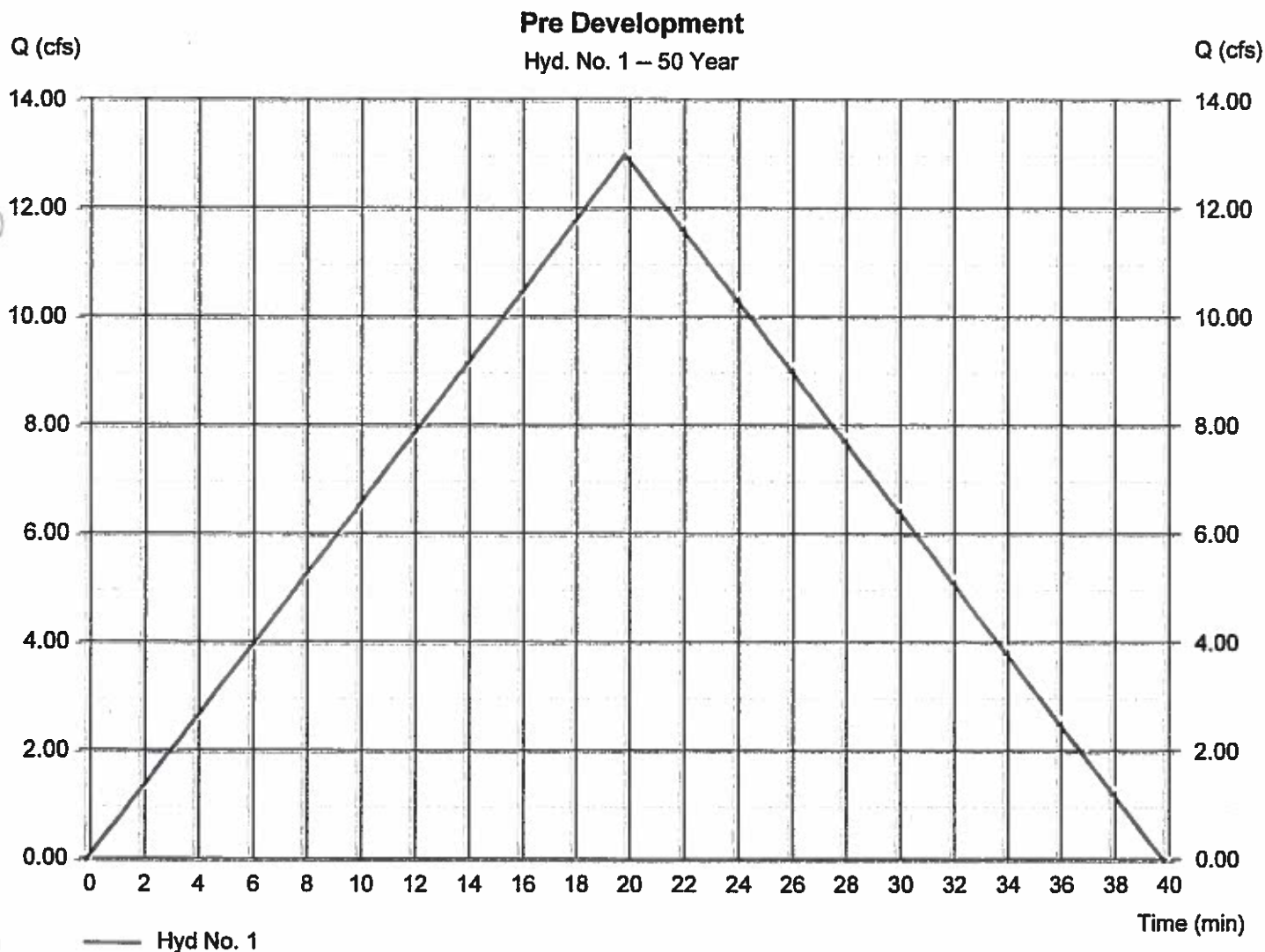
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

Friday, 06 / 30 / 2017

## Hyd. No. 1

### Pre Development

Hydrograph type	= Rational	Peak discharge	= 13.02 cfs
Storm frequency	= 50 yrs	Time to peak	= 20 min
Time interval	= 1 min	Hyd. volume	= 15,625 cuft
Drainage area	= 12.500 ac	Runoff coeff.	= 0.25
Intensity	= 4.167 in/hr	Tc by User	= 20.00 min
IDF Curve	= 2-5.IDF	Asc/Rec limb fact	= 1/1



# Hydrograph Report

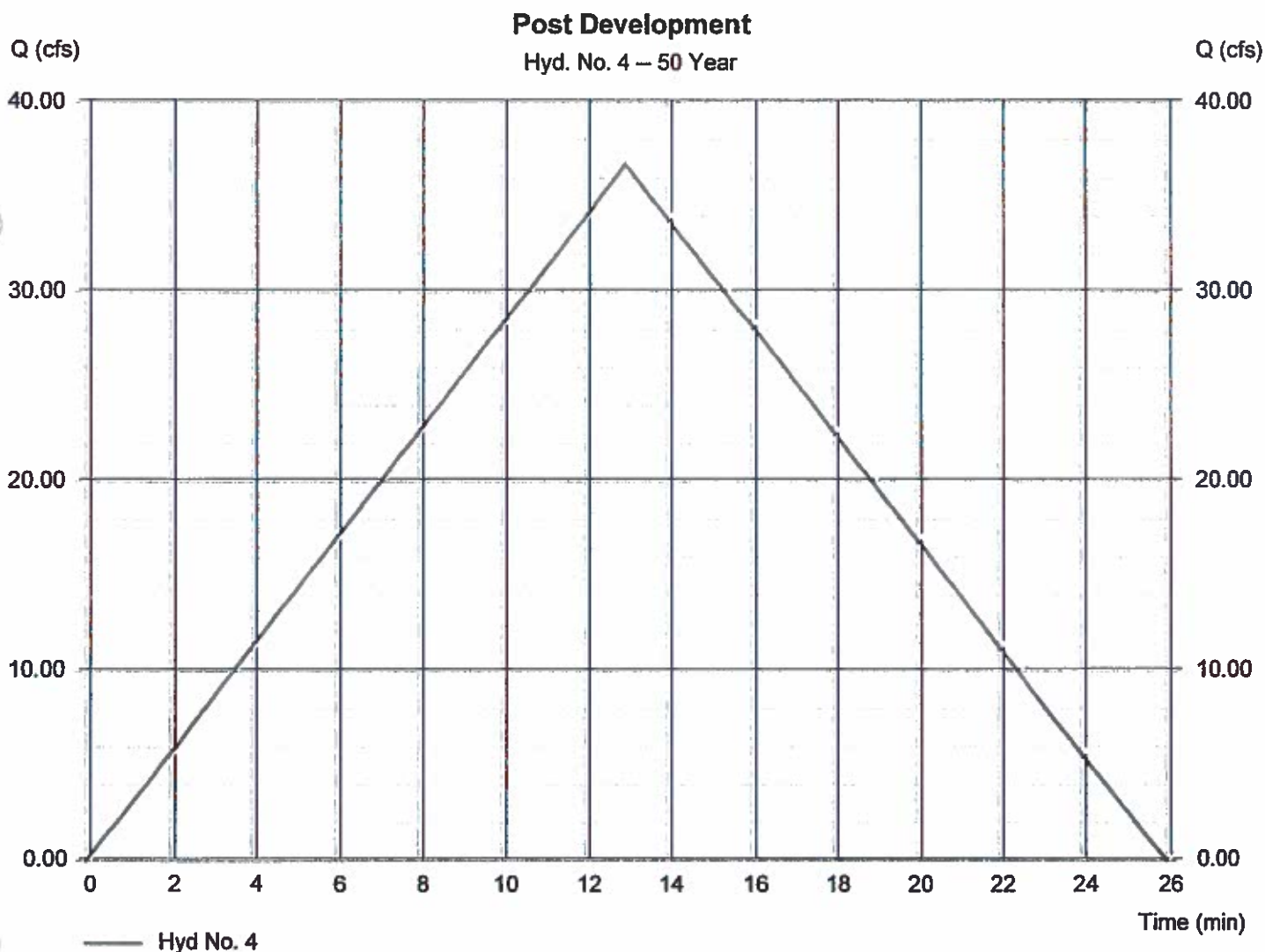
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v11

Friday, 06 / 30 / 2017

## Hyd. No. 4

### Post Development

Hydrograph type	= Rational	Peak discharge	= 36.76 cfs
Storm frequency	= 50 yrs	Time to peak	= 13 min
Time interval	= 1 min	Hyd. volume	= 28,669 cuft
Drainage area	= 12.500 ac	Runoff coeff.	= 0.6
Intensity	= 4.901 in/hr	Tc by User	= 13.00 min
IDF Curve	= 2-5.IDF	Asc/Rec limb fact	= 1/1



## Wednesday, 07 / 12 / 2017

**Contours** -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 326.00 ft

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	326.00	3,000	0	0
2.00	328.00	5,818	8,818	8,818
4.00	330.00	8,900	14,718	23,536
5.00	331.00	10,525	9,713	33,249
6.00	332.00	12,208	11,367	44,615

## Weir Structures

	[A]	[B]	[C]	[PrfRsr]		[A]	[B]	[C]	[D]
Rise (in)	= 0.00	0.00	0.00	0.00	Crest Len (ft)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00	Crest EL (ft)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0	Weir Coeff.	= 0.00	0.00	0.00	0.00
Invert El. (ft)	= 0.00	0.00	0.00	0.00	Weir Type	= —	—	—	—
Length (ft)	= 0.00	0.00	0.00	0.00	Multi-Stage	= No	No	No	No
Slope (%)	= 0.00	0.00	0.00	n/a					
N-Value	= .000	.000	.000	n/a					
Orifice Coeff.	= 0.00	0.00	0.00	0.00	Exfil.(in/hr)	= 0.000 (by Wet area)			
Multi-Stage	= n/a	No	No	No	TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

[illegible]



**APPENDIX B**  
**WASTEWATER CALCULATIONS**

## WASTEWATER CALCULATIONS

### Project Data:

74 Lot Residential Subdivision

68 single family units

12 duplex units

### Per the 2000 Wastewater Flow Standards:

Residential = 350 gallons/day/unit

Occupancy = 4 persons unit

### Wastewater Contribution:

Residential = 350 x 80 units = 28,000 gpd

**APPENDIX C**  
**WATER DEMAND CALCULATIONS**

## WATER DEMAND CALCULATIONS

### Project Data:

80 Single Family and Duplex Residential Units (12.5 acres)

26,400 sf Neighborhood Green

32,400 sf Open Space/Retention Basin

### Per 2002 Water System Standards:

#### Consumption Guidelines (Average Daily Demand):

Single Family Residential = 600 gallons/unit or 3,000 gallons/acre

Neighborhood Green/Retention Basin = 1,700 gallons/acre

#### Average Daily Demand (ADD)

Single Family Residential = 600 x 80 units = 48,000 gallons

or

= 3,000 x 12.5 acres = 37,500 gallons

Neighborhood Green = 1,700 x 0.61 acres = 1,037 gallons

Open Space/Retention Basin = 1,700 x 0.74 acres = 1,258 gallons

---

Total Average Daily Demand = 50,295 gpd

Max. Daily Demand (1.5 x ADD) = 1.5 x 50,295 = 75,443 gpd

Max. Fire Flow = 1,000 gpm (Single Family Residential)

= 1,250 gpm (Duplex)

### **EXHIBITS**

- 1      Location Map**
- 2      Vicinity Map**
- 3      Soil Survey Map**
- 4      Flood Insurance Rate Map**
- 5      Preliminary Site Plan**
- 6      Preliminary Grading Plan**

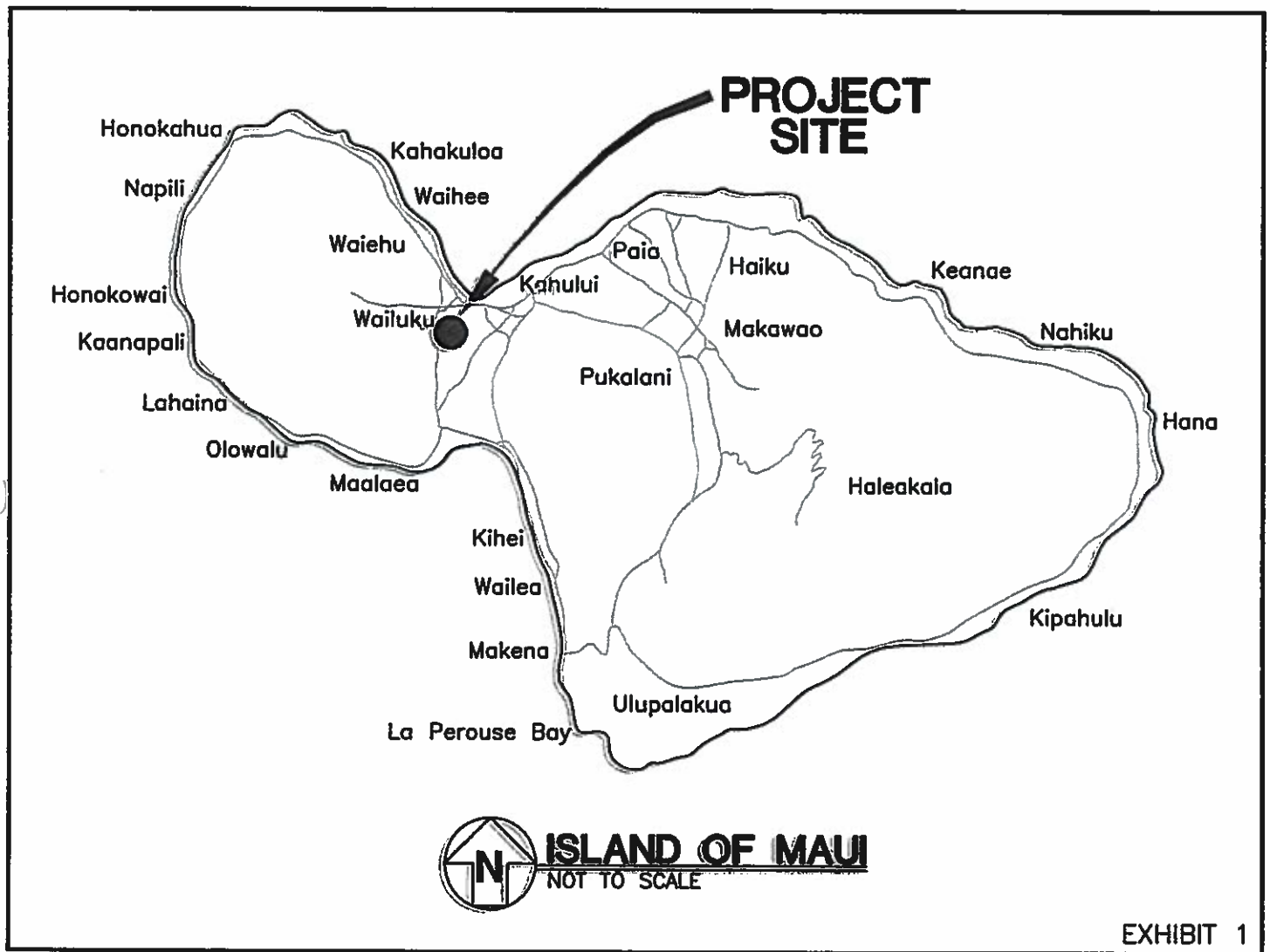


EXHIBIT 1

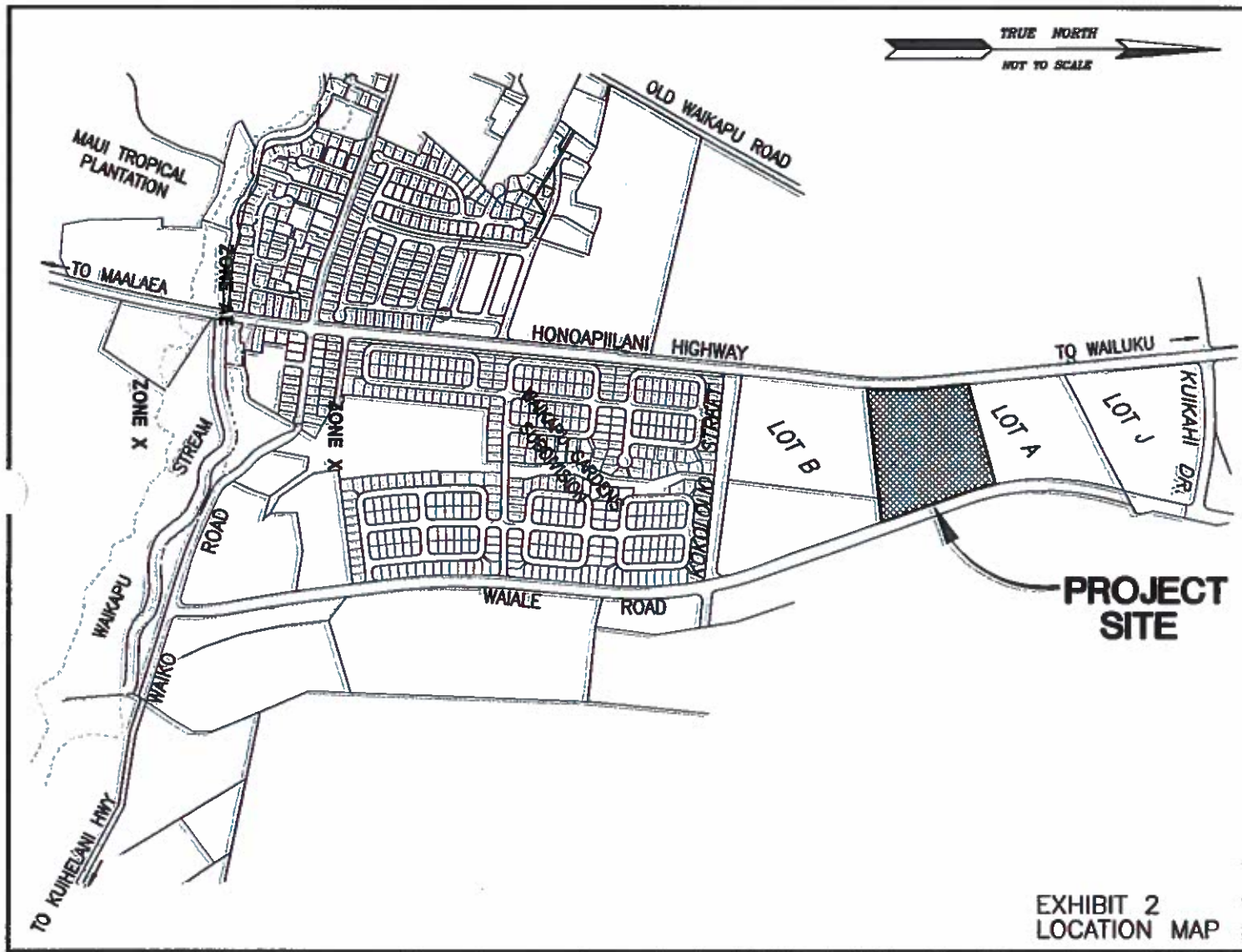
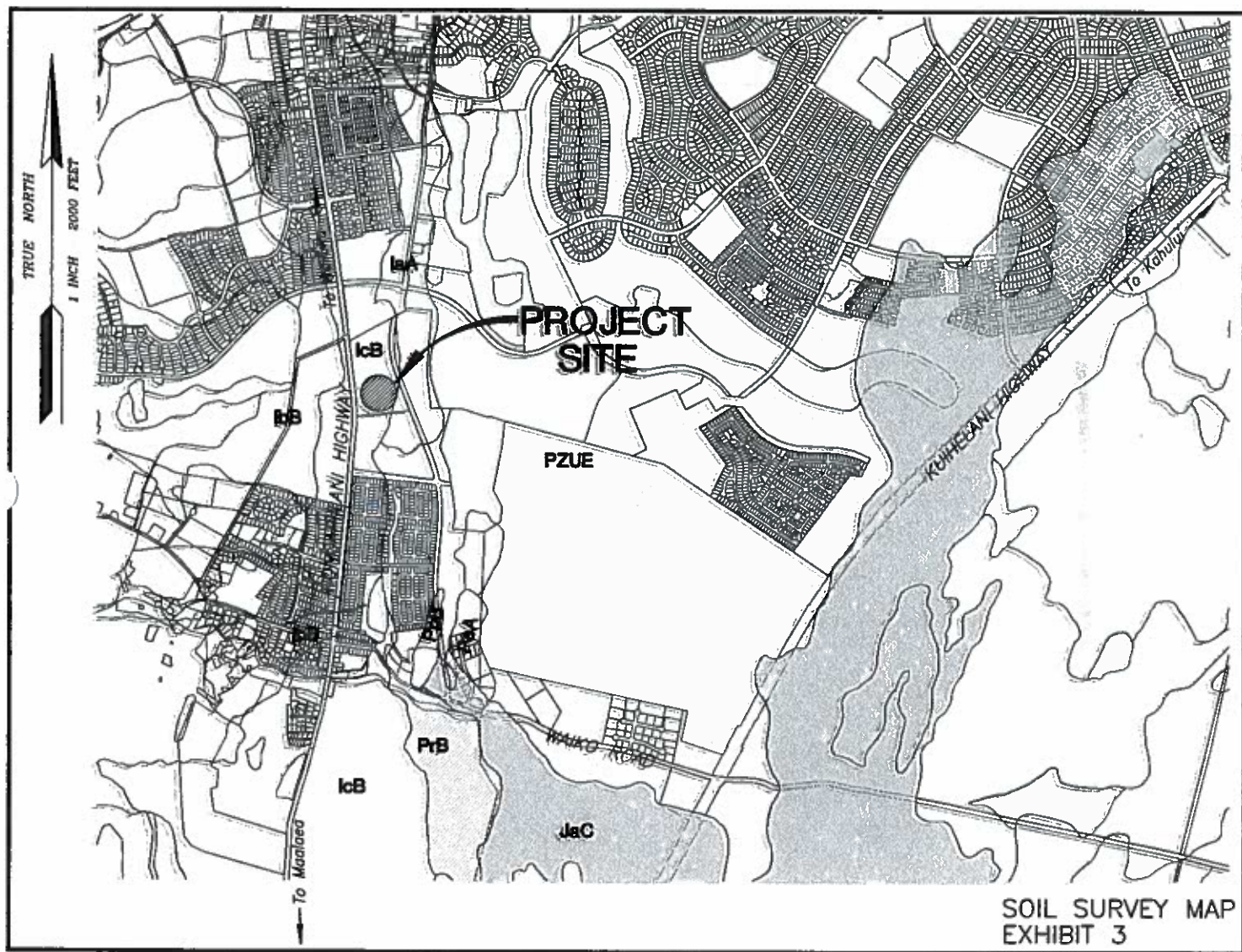



EXHIBIT 2  
LOCATION MAP







Insurance Program #11-800-633-4420

  
**MAP SCALE 1" = 500'**  
 50 0 500 1000  
 FEET METERS

---


**NFIP** **PANEL 0391E**

**FIRM**  
 FLOOD INSURANCE RATE MAP  
 MAUI COUNTY,  
 HAWAII

**(PANEL 0391 OF 825)**  
 (SUBMITTAL NUMBER FOR FIRM REVIEW ONLY)

**DATE:** **REVISION:** **REVISION:**  
 MAUI COUNTY 11/22/01 2101 1

Disclaimer: This map is not a warranty, representation, or guarantee of any kind. It is provided for informational purposes only. The user assumes all liability for any use of this map. The user agrees to hold the Federal Government harmless for any use of this map.

  
**MAP NUMBER**  
 11500030391E  
**MAP REVISED**  
 SEPTEMBER 25, 2009  
 Federal Emergency Management Agency

This map is a copy of the original map of the United States and is not to be used for any other purpose. The user assumes all liability for any use of this map. The user agrees to hold the Federal Government harmless for any use of this map.





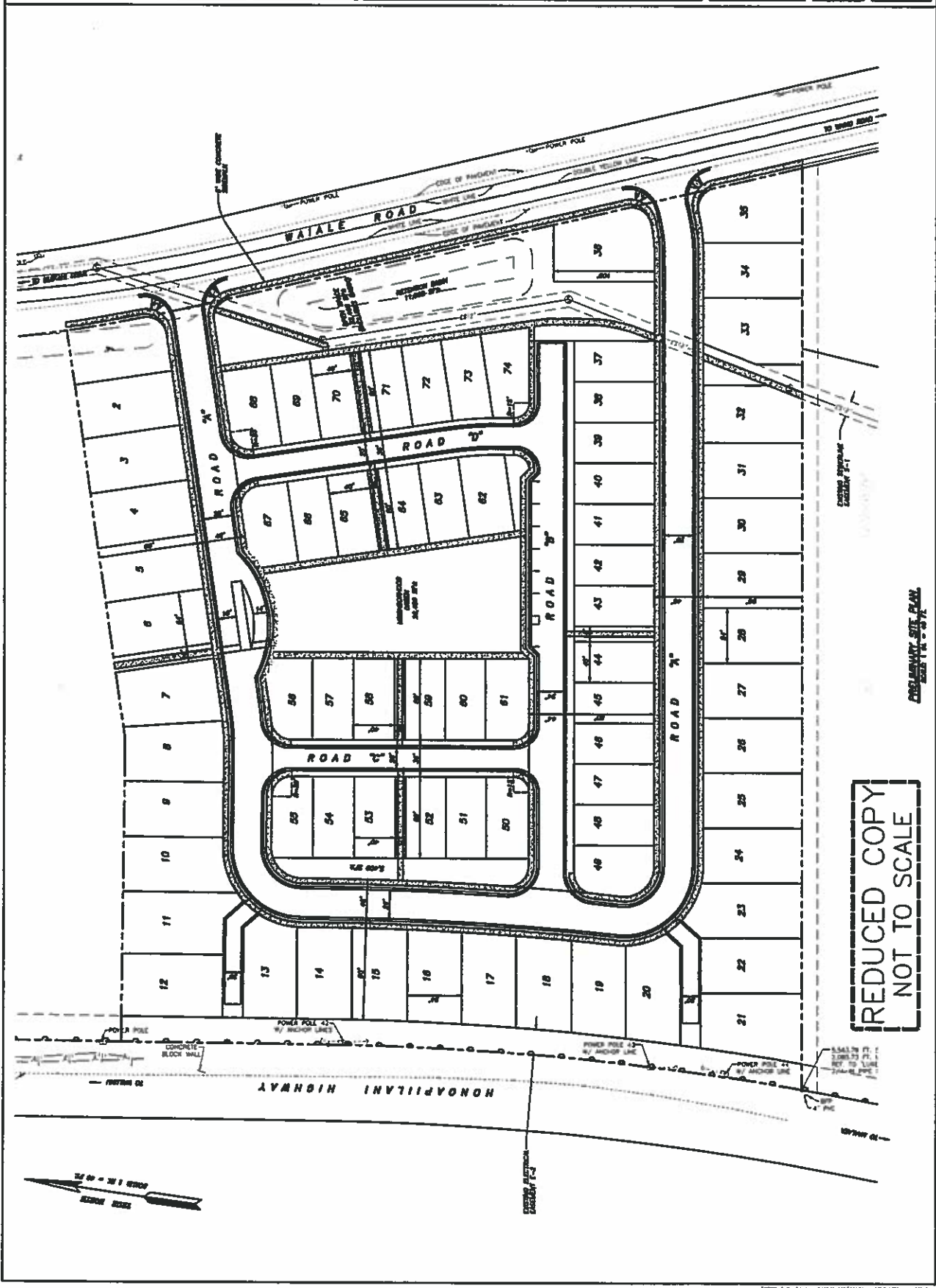
APPROVED FOR  
SUBMITTAL TO THE  
STATE OF HAWAII  
DATE: 10/10/18  
BY: [Signature]

WAIKAPU DEVELOPMENT VENTURE  
PRELIMINARY SITE PLAN  
T.M.K.: (2) 3-5-002: 011  
WAIKAPU, WAILUKU, MAUI, HAWAII

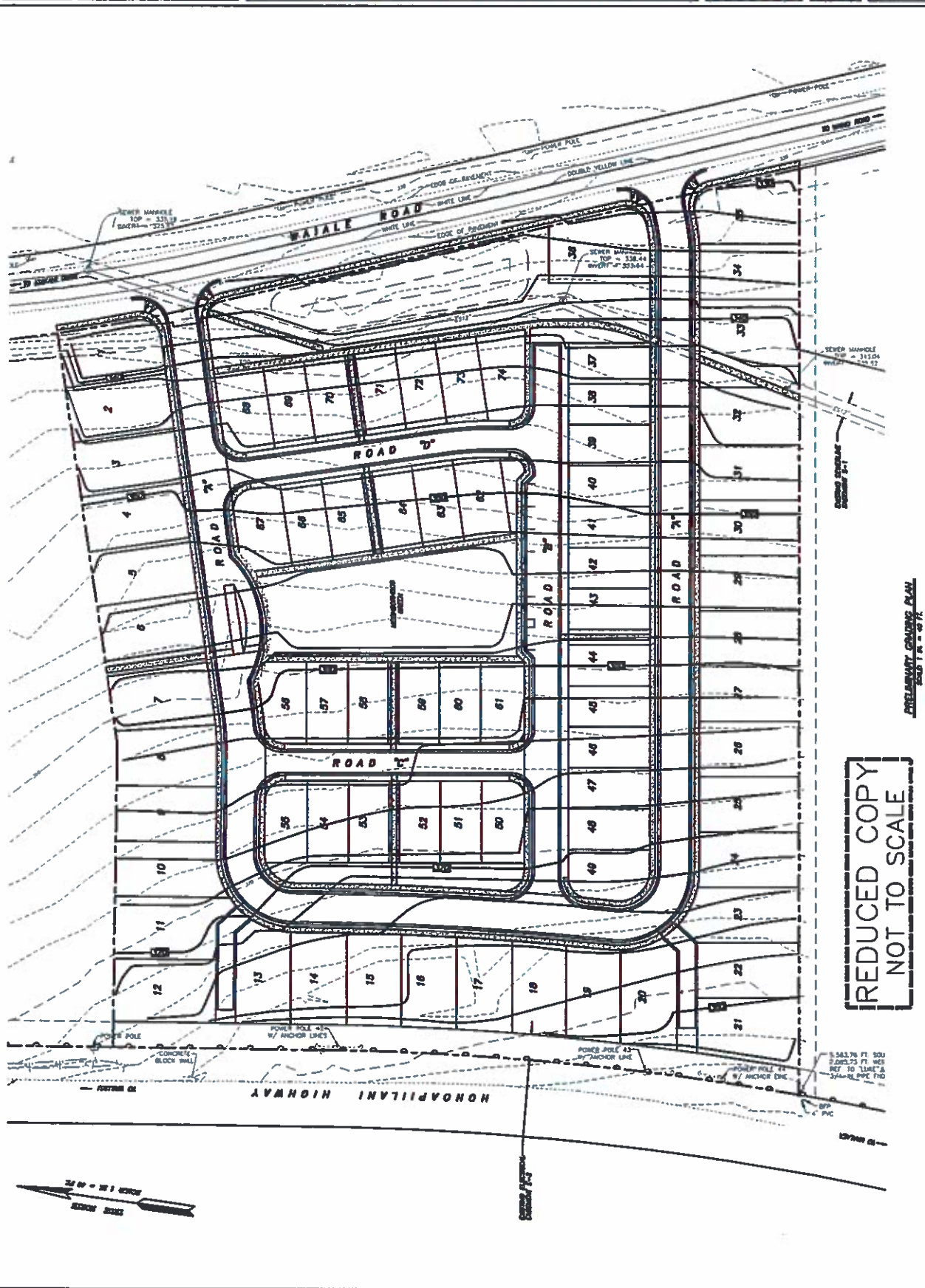
NO.	DATE	REVISION
1	10/10/18	ISSUED FOR PERMIT

DESIGNED BY: [Firm Name]  
DRAWN BY: [Firm Name]  
CHECKED BY: [Firm Name]  
DATE: 10/10/18

SHEET NO. 5  
OF 5



REDUCED COPY  
NOT TO SCALE



## REFERENCES

- A. Soil Survey Geographic (SSURGO) Database of Island of Maui, State of Hawaii, prepared by U.S. Department of Agriculture, Natural Resources Conservation Service, September, 2014.
- B. Erosion and Sediment Control Guide for Hawaii, prepared by U.S. Department of Agriculture, Soil Conservation Service, March 1981.
- C. Rainfall-Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43, U.S. Department of Commerce, Weather Bureau, 1962.
- D. Flood Insurance Rate Maps of the County of Maui, September 2009.
- E. Chapter 4, Rules for the Design of Storm Drainage Facilities in the County of Maui, prepared by the Department of Public Works and Waste Management, County of Maui, 1995.
- F. Chapter 111, Rules for the Design of Storm Water Treatment Best Management Practices, prepared by the Department of Public Works, County of Maui, 2012.
- G. Water System Standards, Department of Water Supply, County of Maui, 2002.
- H. Traffic Impact Analysis Report, Waikapu 201-H Affordable Housing Project, prepared by Austin Tsutsumi & Associates, Inc., June 2017



***Appendix G***

***Traffic Impact Analysis  
Report***





---

# **TRAFFIC IMPACT ANALYSIS REPORT WAIKAPU 201-H AFFORDABLE HOUSING PROJECT WAIKAPU, MAUI, HAWAII**

## **FINAL DRAFT**

April 30, 2018

Prepared for:

Waikapu Development Venture, LLC  
56 Paliuli Place  
Kula, Hawaii 96790



*Austin, Tsutsumi & Associates, Inc.*

Civil Engineers • Surveyors

501 Sumner Street, Suite 521

Honolulu, Hawaii 96817-5031

Telephone: (808) 533-3646

Facsimile: (808) 526-1267

E-mail: [atahnl@atahawaii.com](mailto:atahnl@atahawaii.com)

Honolulu • Wailuku • Hilo, Hawaii

---

**TRAFFIC IMPACT ANALYSIS REPORT**  
**WAIKAPU 201-H AFFORDABLE**  
**HOUSING PROJECT**

Waikapu, Maui, Hawaii

**FINAL DRAFT**

Prepared for  
**Waikapu Development Venture, LLC**

Prepared by  
**Austin, Tsutsumi & Associates, Inc.**  
Civil Engineers • Surveyors  
Honolulu • Wailuku • Hilo, Hawaii

April 30, 2018

## TABLE OF CONTENTS

		<u>Page</u>
1.	INTRODUCTION.....	1-4
1.1	Location.....	1
1.2	Project Description .....	1
1.3	Study Methodology.....	2
1.4	Intersection Methodology .....	2
2.	EXISTING TRAFFIC CONDITIONS.....	5-12
2.1	Roadway Network .....	5
2.2	Existing Traffic Volumes .....	6
2.3	Existing Traffic Conditions Analysis and Observations .....	6
3.	BASE YEAR 2020 TRAFFIC CONDITIONS .....	13-21
3.1	Defacto Growth Rate .....	13
3.2	Traffic Forecasts for Known Developments.....	13
3.3	Planned Roadway Projects .....	17
3.4	Base Year 2020 Analysis .....	17
4.	FUTURE YEAR 2020 TRAFFIC CONDITIONS .....	23-30
4.1	Background .....	23
4.2	Travel Demand Estimations .....	23
4.2.1	Transportation Demand Management Assumptions .....	23
4.2.2	Trip Generation.....	23
4.2.3	Trip Distribution.....	24
4.3	Future Year 2020 Analysis .....	25
5.	CONCLUSIONS.....	33
6.	RECOMMENDATIONS .....	34

**TABLE OF CONTENTS**  
**Cont'd**

<b>7.</b>	<b>REFERENCES.....</b>	<b>35</b>
-----------	------------------------	-----------

## TABLE OF CONTENTS

### Cont'd

#### TABLES

2.1	EXISTING 2017 LOS SUMMARY .....	11-12
3.1	TOTOAL TRIPS GENERATED BY KNOWN DEVELOPMENTS IN PROJECT VICINITY .....	15
3.2	EXISTING AND BASE YEAR 2020 LOS SUMMARY .....	20-22
4.1	PROJECT TRIP GENERATION RATES.....	24
4.2	NEW PROJECT-GENERATED TRIPS .....	24
4.3	EXISTING, BASE YEAR 2020 AND YEAR 2020 WITH PROJECT LOS SUMMARY .....	30-32

#### FIGURES

1.1	LOCATION MAP .....	3
1.2	PROJECT SITE PLAN .....	4
2.1	EXISTING LANEAGE, TRAFFIC VOLUMES, AND LOS .....	9-10
3.1	BACKGROUND DEVELOPMENTS IN PROJECT VICINITY.....	16
3.2	BASE YEAR 2020 LANEAGE, VOLUMES, AND LOS.....	18-19
4.1	PROJECT TRIPS .....	26-27
4.2	FUTURE YEAR 2020 LANEAGE, VOLUMES, AND LOS.....	28-29

**TABLE OF CONTENTS**  
**Cont'd**

**APPENDICES**

- A. TRAFFIC COUNT DATA
- B. LEVEL OF SERVICE CRITERIA
- C. LEVEL OF SERVICE CALCULATIONS
- D. BACKGROUND PROJECT TRIPS
- E. ADDITIONAL FORECAST SCENARIOS





AUSTIN, TSUTSUMI & ASSOCIATES, INC.

CIVIL ENGINEERS • SURVEYORS

CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

TERRANCE S. ARASHIRO, P.E.

ADRIENNE W.L.H. WONG, P.E., LEED AP

DEANNA M.R. HAYASHI, P.E.

PAUL K. ARITA, P.E.

ERIK S. KANESHIRO, L.P.L.S., LEED AP

MATT K. NAKAMOTO, P.E.

GARRETT K. TOKUOKA, P.E.

## WAIKAPU 201-H AFFORDABLE HOUSING TRAFFIC IMPACT ANALYSIS REPORT

### Wailuku, Maui, Hawaii

## 1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi & Associates, Inc. (ATA) to evaluate the potential traffic impacts resulting from the proposed Waikapu 201-H Affordable Housing (hereinafter referred to as the "Project") located in Wailuku, Maui, Hawaii.

### 1.1 Location

The Project is located in Wailuku on the island of Maui on the parcel of land more specifically identified as TMK: (2) 3-5-002-011. The Project will be bounded by Honoapiilani Highway to the west, Waiale Road to the east and the New Valley Isle Fellowship Church to the south. See Figure 1.1 for Project location.

### 1.2 Project Description

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road. The Project is anticipated to be completed by the Year 2020. See Figure 1.2 for Project Site Plan.



### 1.3 Study Methodology

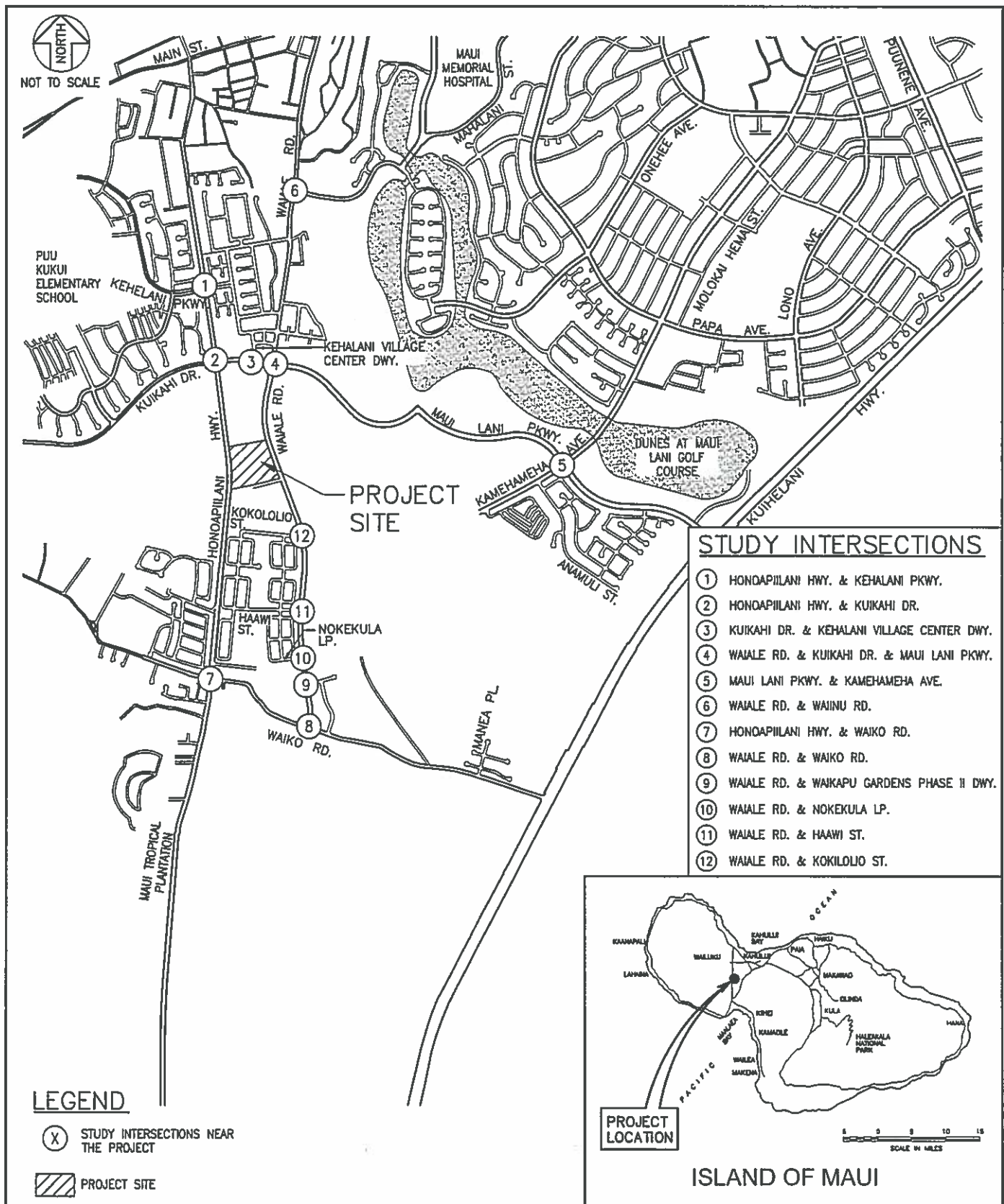
This study will address the following:

- Assess existing traffic operating conditions during the weekday AM and PM peak hours of traffic within the study area.
- Traffic Projections for Base Year 2020 (without the Project).
- Estimate the vehicular trips that will be generated by the Project.
- Traffic projections for the Project for Future Year 2020 (with Project).
- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the Project.

### 1.4 Intersection Methodology

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), 6<sup>th</sup> Edition, includes methods for calculating volume to capacity ratios, delays, and corresponding Levels of Service that were utilized in this study. See Appendix B for Level of Service Criteria.

Analyses for the study intersections were performed using the traffic analysis software Synchro, which is able to prepare reports based on the methodologies described in the HCM. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results, as confirmed or refined by field observations, constitute the technical analysis that will form the basis of the recommendations outlined in this report.



WAIKAPU 201-H  
AFFORDABLE HOUSING



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS

HONOLULU, HAWAII

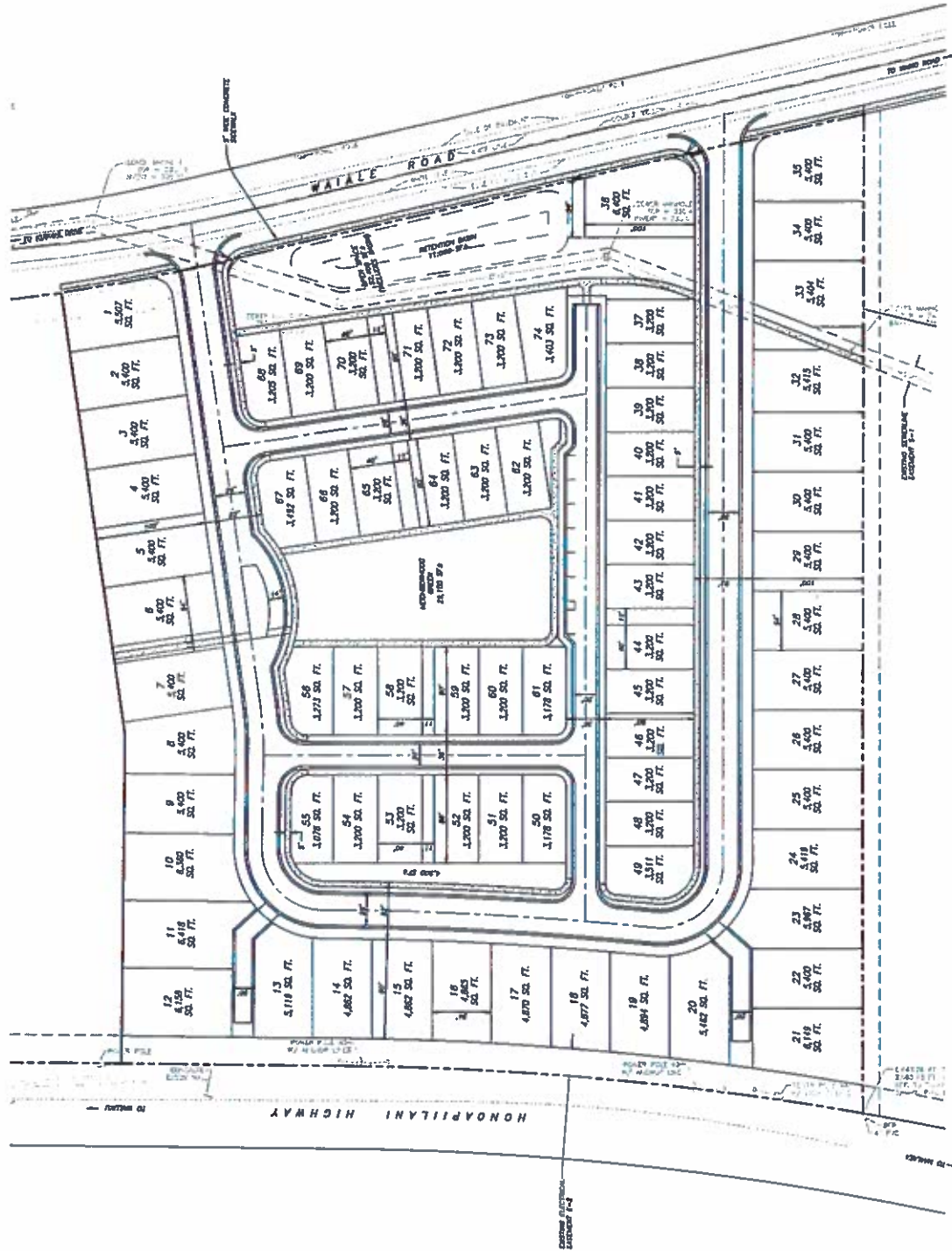
LOCATION MAP

FIGURE

1.1



NOT TO SCALE



FIGURE

1.2

**ATA** AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

WAIKAPU 201-H  
AFFORDABLE HOUSING

PROJECT SITE LOCATION



## 2. EXISTING TRAFFIC CONDITIONS

### 2.1 Roadway Network

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Honoapiilani Highway is a north-south, two-way, two-lane, undivided arterial highway with posted speed limits ranging between 30 miles per hour (mph) and 45 mph. Honoapiilani Highway begins as the continuation of South High Street near Kahookele Street and continues southward through Waikapu, Maalaea, and wraps around the "Pali" to West Maui. Right turn channelization is provided at all of its major intersections within the study area.

Kuikahi Drive is an east-west, two-way, two-lane, undivided collector roadway with posted speed limits ranging between 25 mph and 30 mph. Kuikahi Drive begins approximately 1.2 miles west of Honoapiilani Highway within the Wailuku Heights development and extends eastward past Honoapiilani Highway, terminating near The Church of Jesus Christ of Latter Day Saints, where Kuikahi Drive becomes Maui Lani Parkway.

Maui Lani Parkway is a mostly east-west, two-way, one-lane, collector roadway with a posted speed limit of 20 mph. It begins to the west at the Kuikahi Drive/Waiale Road intersection and extends eastward until connecting to the Kuihelani Highway.

Waiale Road is a north-south, two-way, two-lane, undivided collector roadway with a posted speed limit of 20 mph in the Project study area. To the north, Waiale Road serves as the southern connection to Lower Main Street and extends past the Maui Community Correctional Center, Kehalani Village Center and various residential subdivisions, eventually terminating at a T-intersection with East Waiko Road.

East Waiko Road is an east-west, two-way, two-lane, undivided collector roadway with a posted speed limit of 20 mph in the Project study area. East Waiko Road extends westward from Kuihelani Highway to Honoapiilani Highway where it continues as West Waiko Road within the Waikapu residential neighborhood.

Kehalani Parkway is an east-west, two-way, four-lane, divided collector roadway with posted speed limits ranging between 20 mph and 30 mph on either side of Honoapiilani Highway. Kehalani Parkway extends east of Honoapiilani Highway from the lower Kehalani residential subdivision at Kamole Street and continues in the mauka direction, curving north past Puu Kukui Elementary School in the upper Kehalani residential subdivisions.

Nokekula Loop, Haawi Street & Kokololio Street are east-west, two-way, two lane, undivided local roadway to the west of Waiale Road with a posted speed limit of 20 mph. These three roads service the Waikapu Gardens Phase I residential neighborhood

Ohana Hana Loop is an east-west, two-way, two lane, undivided local roadway to the west of Waiale Road with a posted speed limit of 20 mph. Ohana Hana Loop extends from Waiale Road and services the Waikapu Gardens Phase II residential neighborhood.

Waiinu Road is mostly an east-west, two-way, one-lane, undivided local roadway with a posted speed limit of 25 mph. Waiinu Road starts at the west at the Waiale Road intersection servicing





a couple of neighborhoods until terminating at the Maui Lani Parkway/Puumele Street intersection.

Kamehameha Avenue is a north-south, two-way, two-lane, undivided County collector roadway that extends to the south from Hana Highway in Kahului to Pomaikai Elementary School. This roadway has a posted speed limit of 30 mph within the vicinity of the Project.

## 2.2 Existing Traffic Volumes

Intersection analysis within the study area was performed on the following intersections due to their proximity to the Project. The existing traffic volumes data utilized in this report were collected on Wednesday, March 15, 2017 and Thursday, March 16, 2017 with the exception of the Waikapu Gardens Phase 1 accesses along Waiale Road, which were counted in October 2015. Since the development is fully built out, turning movements at these intersections are anticipated to remain the same.

- Honoapiilani Highway/Waiko Road (Signalized)
- Honoapiilani Highway/Kuikahi Drive (Signalized)
- Kuikahi Drive/Kehalani Village Center Driveway (Unsignalized)
- Honoapiilani Highway/Kehalani Parkway (Signalized)
- Waiale Road/Waiko Road (Unsignalized)
- Waiale Road/Nokekula Loop (Unsignalized)
- Waiale Road/Haawi Street (Unsignalized)
- Waiale Road/Kokololio Street (Unsignalized)
- Waiale Road/Ohana Hana Loop (Unsignalized)
- Waiale Road/Kuikahi Drive (Signalized)
- Waiale Road/Waiinu Road (Unsignalized)
- Maui Lani Parkway/Kamehameha Avenue (Unsignalized)

Based on the traffic count data, the weekday AM peak hour of traffic was determined to occur between 7:00 AM and 8:00 AM, while the weekday PM peak hour of traffic was determined to occur between 4:15 PM and 5:15 PM. The traffic count data is provided in Appendix A for the existing intersections studied.

## 2.3 Existing Traffic Conditions Analysis and Observations

Honoapiilani Highway/Kehalani Parkway is a signalized intersection with exclusive left-turn and right-turn lanes on all approaches. The channelized northbound and southbound right-turn movements also include exclusive eastbound and westbound receiving lanes, respectively. All movements at this intersection currently operate at LOS D or better during the AM and PM peak hours of traffic, except for the eastbound left-turn movement which operates at LOS E during the AM peak hour. For a portion of the AM peak hour, the eastbound left-turn movement operates with queues that extend to or beyond the existing left-turn storage lane and some vehicles may require two cycle lengths to clear the intersection. Heavy traffic during a short period of time is reflective of typical school traffic conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour, generally between 7:15-7:45 AM and primarily stem from traffic generated by the Puu Kukui Elementary School.



In addition, northbound traffic queues along Honoapiilani Highway were observed to primarily stem from Wailuku Elementary School. At Aupuni Street, northbound traffic queued back to Kehalani Parkway for about 5-10 minutes during the AM peak hour due to a police officer directing traffic at Aupuni Street to service Wailuku Elementary School traffic in the morning. The police officer is observed to stop mainline northbound and southbound traffic for as much as 30-40 seconds at a time, creating lengthy mainline queues. This impacted the vehicular progression through the Honoapiilani Highway/Kehalani Parkway intersection.

Honoapiilani Highway/Kuikahi Drive is a signalized intersection with exclusive left-turn and right-turn lanes on all approaches. The channelized northbound right-turn movement also includes an exclusive eastbound acceleration lane. All movements at this intersection currently operate at LOS D or better with no significant queueing observed during the AM and PM peak hours of traffic.

Waiale Road/Kuikahi Drive is a signalized intersection with exclusive left-turn lanes on all approaches and an exclusive right-turn lane on the westbound approach. All movements at this intersection currently operate at LOS C or better during the AM and PM peak hours of traffic. However, for about 20-30 minutes during the AM peak hour, vehicles were observed to queue beyond the length of the eastbound left-turn storage lane to the Kehalani Village Drive or as far as Honoapiilani Highway. These queues occur at variable lengths and are dependent on existing northbound queues that spill back from Waiale Road into the Waiale Road/Kuikahi Drive intersection, which limits full progression for eastbound left-turning vehicles.

Kamehameha Avenue/Maui Lani Parkway is a four-way stop controlled intersection with exclusive left-turn lanes on both approaches on Kamehameha Avenue and is located 700 feet northeast of Pomaikai Elementary School. Each approach includes flashing beacons with stop signs, and marked crosswalks are provided on the southwest leg of Kamehameha Avenue and the northwest leg of Maui Lani Parkway.

The northbound through/right-turn movement, southbound through/right-turn movement, eastbound approach, and westbound approach operate at LOS F with some overcapacity conditions during the AM and PM peak hours of traffic. This is primarily due to regional traffic between the Waikapu-Wailuku-Kahului regions. Queues were inconsistent and varied in length throughout the peak hours, with a short period of extensive southbound queuing during the AM peak hour and periodic eastbound queuing during the AM and PM peak hours of traffic.

Waiale Road/Waiinu Road is an unsignalized T-intersection the minor westbound approach of Waiinu Road stop-controlled. In both the AM and PM peak hours the westbound shared left-turn/through lane operates at LOS F and overcapacity conditions due to lengthy delays.

Traffic was generally observed to progress unimpeded along Waiale Road during the AM peak hour, except between 7:30-7:50 AM, where northbound traffic on Waiale Road was observed to slowly progress through the intersection in part due to northbound spillbacks from the Waiale Road/Kaohu Street 4-way stop controlled intersection and reduced northbound speeds generated by frequent northbound right-turning vehicles at the Waiale Road/Waiinu Road intersection. Some northbound vehicles along Waiale Road also stopped within the through travel lane to allow side street vehicles (ranging from 1-6 vehicles at a time) to turn onto or off of Waiale Road, which formed lengthy platoons. Congestion and queuing along Waiale Road generally dissipated around 7:50-7:55 AM.





During the PM peak hour, traffic along Waiale Road operated smoothly, but queues continued to be observed along the westbound leg of Waiinu Road. Queues along the westbound approach also varies throughout the peak period, depending on gaps in traffic and the occurrence of throughput vehicles stopping within the through lane to allow westbound vehicles to turn onto Waiale Road.

Honoapiilani Highway/Waiko Road is a signalized intersection with exclusive left-turn lanes on the northbound and southbound approaches, and exclusive right-turn lanes on the eastbound and southbound approaches. All movements at this intersection currently operate at LOS C or better with no significant delays or queuing during the AM and PM peak hours of traffic.

Waiale Road/Waiko Road is an unsignalized T-intersection with shared lanes on all approaches and the southbound approach stop-controlled. All movements at this intersection currently operate at LOS B or better with no significant delays or queues during the peak hours of traffic.

Waiale Road at Ohana Hana Loop, Nokekula Loop, Haawi Street & Kokololio Street are unsignalized T-intersections servicing the Waikapu Gardens Phase I and II developments. All movements at these intersections currently operate at LOS B or better with no significant delays during the AM and PM peak hours of traffic.

Figure 2.1 illustrates the existing lane configuration, existing traffic volumes, and LOS for each study intersection. Table 2.1 summarizes the existing LOS at the study intersections. LOS worksheets are provided in Appendix C.

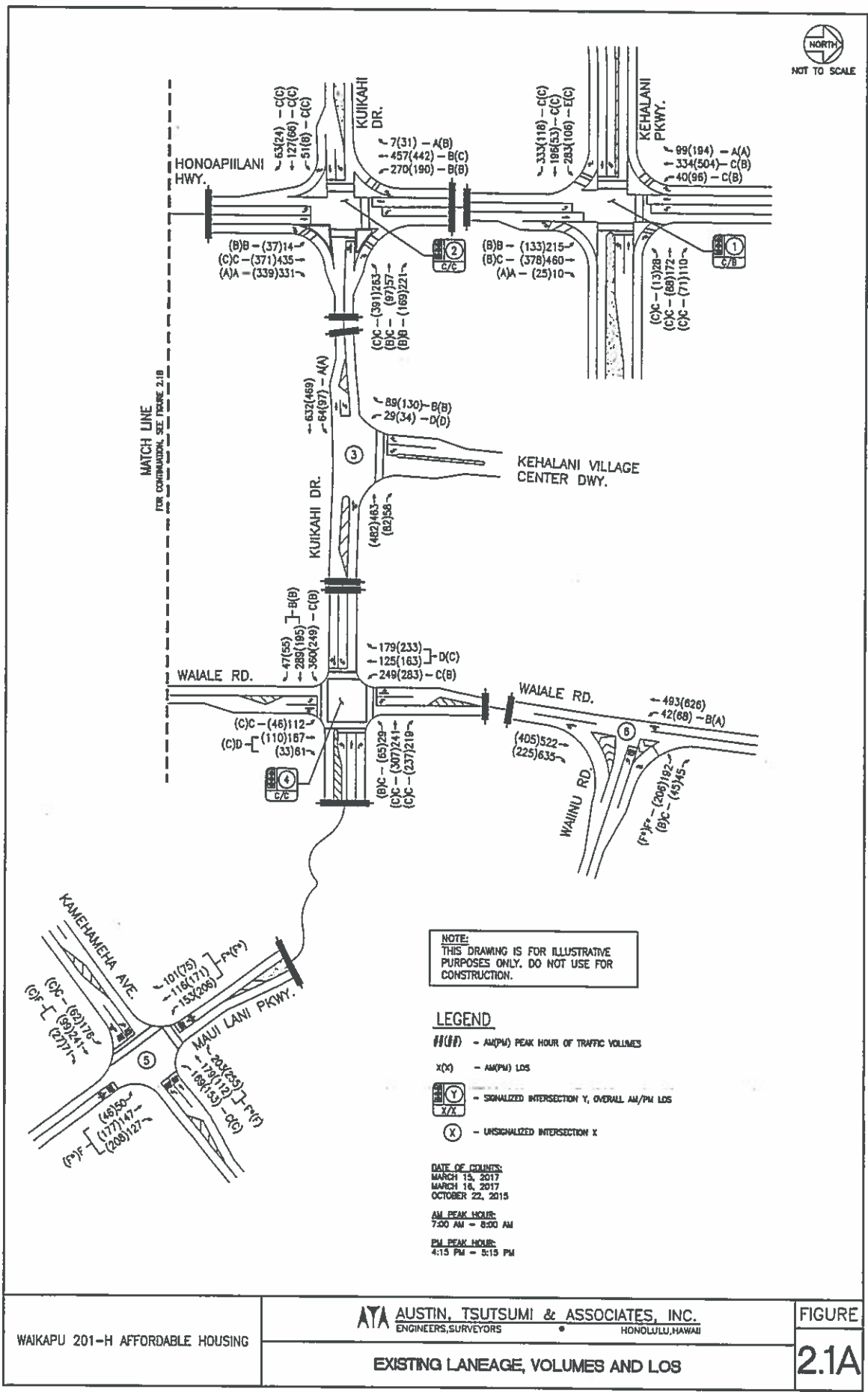




Table 2.1: Existing 2017 Level of Service Summary

Intersection	Existing Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>1: Honoapiilani Hwy &amp; Kehalani Pkwy</b>						
NB LT	17.9	0.59	B	11.9	0.39	B
NB TH	26.6	0.77	C	15.3	0.55	B
NB RT	0.0	0.00	A	0.0	0.00	A
EB LT	59.2	0.97	E	22.1	0.37	C
EB TH	21.6	0.38	C	22.6	0.21	C
EB RT	30.6	0.77	C	24.3	0.54	C
WB LT	27.4	0.12	C	24.2	0.05	C
WB TH	33.8	0.75	C	27.5	0.57	C
WB RT	32.2	0.57	C	27.4	0.54	C
SB LT	20.0	0.17	C	10.3	0.22	B
SB TH	29.7	0.72	C	19.1	0.75	B
SB RT	0.0	0.00	A	0.0	0.00	A
<i>Overall</i>	32.5	-	C	18.6	-	B
<b>2: Honoapiilani Highway &amp; Kuikahi Drive</b>						
NB LT	16.1	0.04	B	17.6	0.14	B
NB TH	26.8	0.78	C	27.0	0.75	C
NB RT	0.0	0.00	A	0.0	0.00	A
EB LT	27.7	0.19	C	28.3	0.04	C
EB TH	33.7	0.70	C	30.3	0.40	C
EB RT	29.9	0.37	C	27.7	0.13	C
WB LT	23.6	0.65	C	23.7	0.72	C
WB TH	22.0	0.15	C	17.4	0.18	B
WB RT	17.4	0.42	B	13.4	0.28	B
SB LT	17.8	0.70	B	15.8	0.55	B
SB TH	16.4	0.60	B	21.4	0.70	C
SB RT	9.6	0.01	A	13.8	0.06	B
<i>Overall</i>	21.9	-	C	21.7	-	C
<b>3: Kuikahi Dr &amp; Kehalani Village Center Dr</b>						
EB LT	8.8	0.1	A	9.2	0.1	A
SB LT	34.8	0.2	D	33.9	0.2	D
SB RT	13.0	0.2	B	14.4	0.3	B
<b>4: Waiale Rd &amp; Kuikahi Dr/Maui Lani Pkwy</b>						
NB LT	24.9	0.43	C	23.2	0.23	C
NB TH/RT	35.4	0.80	D	27.3	0.53	C
EB LT	22.8	0.82	C	17.6	0.65	B
EB TH/RT	18.0	0.50	B	18.3	0.46	B
WB LT	24.1	0.10	C	18.7	0.17	B
WB TH	32.1	0.73	C	27.5	0.77	C
WB RT	33.9	0.78	C	26.4	0.71	C
SB LT	26.1	0.69	C	19.7	0.61	B
SB TH/RT	35.4	0.82	D	34.2	0.87	C
<i>Overall</i>	27.9	-	C	24.8	-	C
<b>5: Kamehameha Ave &amp; Maui Lani Pkwy</b>						
NB LT	24.5	0.55	C	15.9	0.20	C
NB TH/RT	53.9	0.90	F	18.2	0.38	C
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*
WB LT/TH/RT	57.4	0.93	F	76.9	1.05	F*
SB LT	23.0	0.52	C	19.1	0.44	C
SB TH/RT	88.0	1.06	F*	51.9	0.93	F

\* Denotes overcapacity condition, v/c ≥ 1.

Table 2.1: Existing 2017 Level of Service Summary Cont'd

Intersection	Existing Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>6: Waiale Rd &amp; Waiinu Rd</b>						
WB LT	485.7	1.86	F*	378.8	1.65	F*
WB RT	17.7	0.15	C	12.5	0.09	B
SB LT	12.1	0.08	B	9.3	0.08	A
<b>7: Honoapiilani Hwy &amp; W Waiko Rd/E Waiko Rd</b>						
NB LT	10.4	0.01	B	10.9	0.02	B
NB TH/RT	20.2	0.72	C	21.8	0.83	C
EB LT/TH	28.2	0.12	C	24.4	0.06	C
EB RT	27.6	0.03	C	24.2	0.03	C
WB LT/TH/RT	30.1	0.34	C	26.4	0.34	C
SB LT	11.3	0.33	B	12.6	0.16	B
SB TH	12.5	0.60	B	13.8	0.69	B
SB RT	6.4	0.01	A	7.1	0.04	A
<i>Overall</i>	17.2	-	B	18.3	-	B
<b>8: E Waiko Rd &amp; Waiale Rd</b>						
EB LT	7.6	0.0	A	7.8	0.0	A
SB TH/RT	14.2	0.4	B	12.1	0.2	B
<b>9: Waiale Rd &amp; Ohana Hana Loop</b>						
NB LT	7.7	0.01	A	7.6	0.01	A
EB LT	10.9	0.03	B	11.1	0.03	B
EB RT	9.6	0.03	A	9.1	0.01	A
<b>10: Waiale Rd &amp; Nokekula Lp</b>						
NB LT	7.7	0.00	A	7.6	0.02	A
EB LT/RT	10.4	0.07	B	10.0	0.03	B
<b>11: Waiale Rd &amp; Haawi St</b>						
NB LT	7.6	0.01	A	7.7	0.03	A
EB LT/RT	11.0	0.22	B	11.0	0.14	B
<b>12: Waiale Rd &amp; Kokololio St</b>						
NB LT	7.6	0.00	A	7.9	0.01	A
EB LT	12.2	0.18	B	12.2	0.11	B
EB RT	9.2	0.03	A	9.6	0.01	A

\* Denotes overcapacity condition, v/c ≥ 1.

### 3. BASE YEAR 2020 TRAFFIC CONDITIONS

#### 3.1 Defacto Growth Rate

Projections for Base Year 2020 traffic were based upon existing traffic counts performed by ATA, the Maui Regional Travel Demand Model (MRTDM) growth for forecast years of 2020 and 2035, and nearby developments in the immediate vicinity of the Project. The resulting growth rate along study roadways was approximately 1.9 percent per year.

#### 3.2 Traffic Forecasts for Known Developments

By year 2020, the following developments shown in Figure 3.1 and Table 3.1 may be constructed. Appendix D shows the general trip distribution/assignment percentages associated with each development either based on existing traffic patterns or their respective Project TIAR's. Appendix E shows the volumes of traffic contributed to each studied intersection. The Kehalani Village Center and Maui Lani Village Center are currently occupied and ongoing developments with associated growth assumptions described in Table 3.1 below.

Trips generated by the master planned communities for the Kehalani and Maui Lani residential developments are accounted for in the MRTDM growth.

- **Waikapu Light Industrial Project** - Proposed 8.5-acre industrial development along Waiko Road. Forecast traffic growth generated by this development was obtained from the Project's TIAR dated April 2013 and was added to the roadway network.
- **Waiko Baseyard Light Industrial Development** - Proposed industrial development along Waiko Road that will include 102,414 SF of commercial space and 215,195 SF of light industrial space.
- **Central Maui Regional Sports Complex (CMRSC)** – Proposed regional park development, located south of the Maui Lani Parkway and Kamehameha Avenue intersection. Forecast traffic growth generated by this development was obtained from the Project's TIAR dated May 2014 and was added to the roadway network.
- **Kehalani Village Center** – Existing retail center in the Kehalani subdivision. Currently occupied by Longs Drugs, Foodland, Foodland Gas, American Savings Bank, Coffee Bean Tea & Leaf and McDonalds. The forecast AM and PM peak hour trips for the remaining development was obtained from the Project's TIAR dated 2012 and was added to the roadway network.
- **Maui Lani Village Center** – Existing retail center in the Maui Lani subdivision. Currently occupied by Walgreen and a mix of various commercial, office and warehouse land uses. Based on the latest projections, approximately 20,000 SF of commercial, 20,000 SF of office and 107,000 SF of warehouse space may be completed by year 2020. The forecast AM and PM peak hour trips were generated based on the cumulative ITE Trip generation and added to the roadway network.
- **Waiale Affordable Housing** – Proposed 70-unit single-family residential subdivision and a neighborhood park. It will be located adjacent to the Valley Isle Fellowship Church



along Waiale Road. An existing gated access to the project is located along Waiale Road and was assumed to be the primary access to the subdivision. The forecast AM and PM peak hour trips were obtained from the Project's TIAR dated 2015 and was added to the roadway network.

- **Kehalani Mauka** – Existing residential subdivision located north of Kuikahi Drive and west of Honoapiilani Highway. Currently partially developed with residential homes and the Puu Kukui Elementary School. Based on the latest projections, approximately 246 single-family homes and 138 duplex units may be completed by year 2020. The Kehalani Mauka Parkway Loop is also anticipated to be completed by year 2020 and was assumed in the analysis.
- **Wailuku Apartments** – Proposed 324 multi-family dwelling units. Vehicular traffic will be provided by two (2) new accesses; one along Kuikahi Drive directly across the Kehalani Village Center Driveway and another along Waiale Road towards the south frontage of the site.
- **Waikapu Country Town** – This future development is currently going through the entitlement process to obtain permits for construction. For purposes of this TIAR, it's assumed that permit approval and infrastructure construction will be complete by Year 2020 and the initial phase that includes 150 single-family residential units (identified in the Project's EIS) will be constructed and occupied.



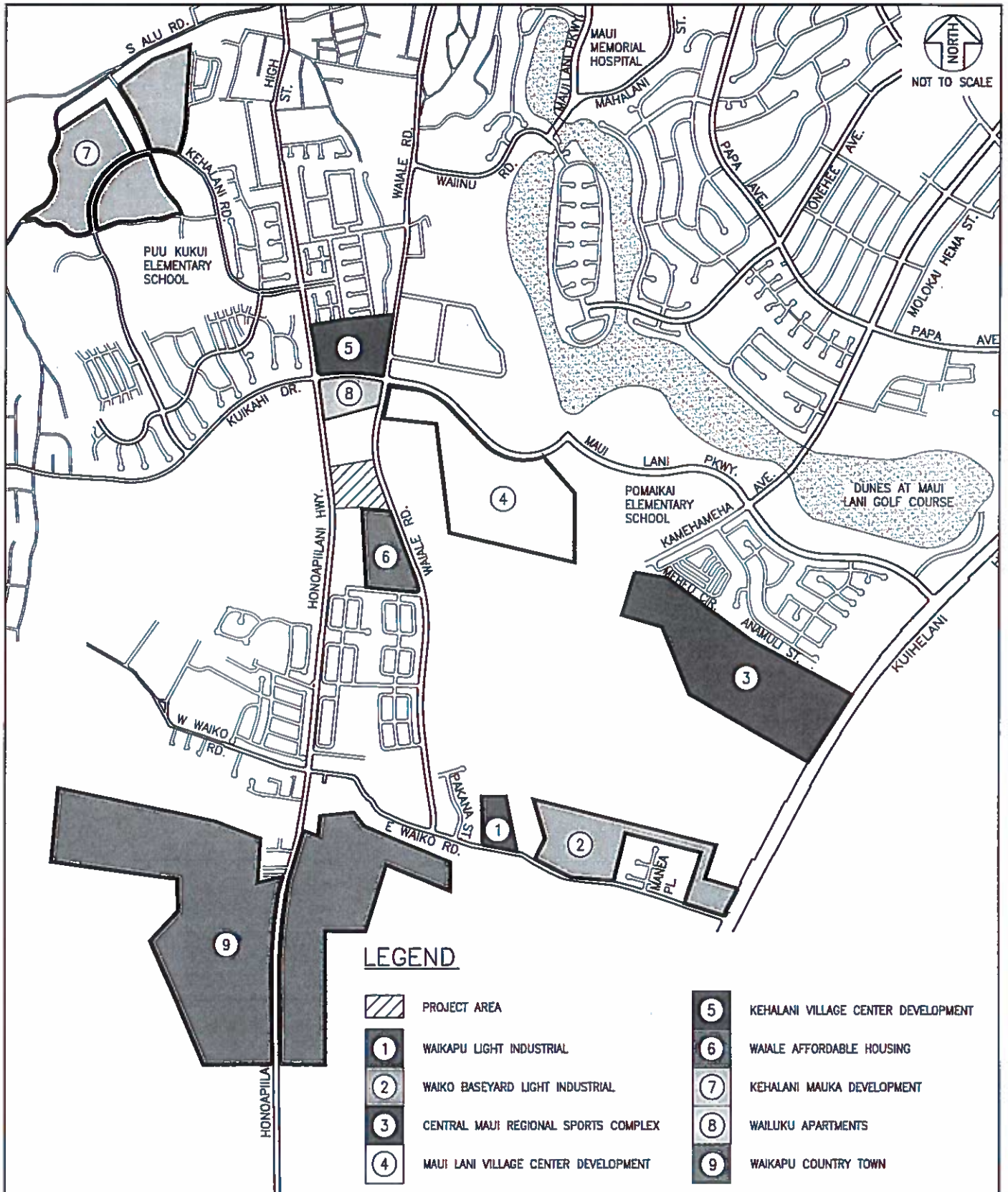


Table 3.1: Total Trips Generated by Known Developments in Project Vicinity <sup>1</sup>

Known Development	Land Use	Units	AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Waikapu Light Industrial Project	Industrial Park	8.5 Acres	74	15	89	21	79	100
Waiko Baseyard Light Industrial Development	Light Industrial/ Retail	215,195 SF/ 100,000 SF	187	79	266	183	253	436
Central Maui Regional Sports Complex	County Park, Soccer Complex	13 Acres, 12 Fields	9	6	15	144	71	215
Kehalani Village Center <sup>2</sup>	Commercial	72,000 SF 56 MF	55	39	94	181	194	375
Maui Lani Village Center (formerly VMX) <sup>3</sup>	Commercial, Office, Warehouse	165,000 SF	123	26	149	65	142	207
Waiale Affordable Housing	Single-Family Residential	70 Units	15	44	59	49	28	77
Kehalani Mauka <sup>4</sup>	Single-Family, Multi-Family Residential	246 SF 138 MF	57	192	249	202	114	316
Wailuku Apartments	Residential Condo/ Townhouse	324 Units	23	110	133	106	52	158
Waikapu Country Town <sup>5</sup>	Single-Family Residential	150 SF	28	84	112	95	56	150

**Note:**

1. Table 3.1 shows trips generated by known developments in the vicinity of the Project. Not all traffic generated by these developments travel through the study area of this TIAR, since some traffic will be routed to various roadways and intersections that were not included in this TIAR. See Appendix D for more detailed assessment of trip distribution/assignment patterns.
2. Kehalani Village Center partially completed with Longs Drugs, Foodland, Foodland Gas and McDonalds. Trips shown, accounts for assumed 30% remaining commercial development and residential unit and is based on Kehalani Village Center TIAR dated 2012.
3. Maui Lani Village Center projections based on latest assumptions for growth. Majority of expansion (147,000 SF) attributed to lower trip generating office and warehouse land uses.
4. Kehalani Mauka projections based on latest assumptions for growth.
5. Initial residential phase as identified in the Waikapu Country Town Final EIS dated December 2016, assumed to be completed by Year 2020.



WAIKAPU 201-H  
AFFORDABLE HOUSING



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS

HONOLULU, HAWAII

## BACKGROUND DEVELOPMENTS IN PROJECT VICINITY

FIGURE

3.1

### 3.3 Planned Roadway Projects

The Waiale Road Extension and Waiko Road Improvements are planned roadway improvements to be constructed in the future. However, since they are unlikely to be built by Year 2020 given their current status, these roadway improvements were not included in this TIAR. In addition, at the Waiale Road/Waiinu Road intersection, a traffic signal and widening improvements are listed in the Statewide Transportation Improvement Program (STIP). However, it's unknown if this development will be constructed by Year 2020 and was therefore not included in this TIAR. At the Maui Lani Parkway/Kamehameha Avenue intersection, a single-lane roundabout is planned to be constructed and was included in this TIAR.

### 3.4 Base Year 2020 Analysis

At the Honoapiilani Highway/Kehalani Parkway intersection, the eastbound left-turn and right-turn movements will operate at over-capacity and LOS F conditions during the AM peak hour. As noted in Section 2.3, heavy traffic during a short period of time is reflective of typical school traffic conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour and primarily stem from traffic generated by the Puu Kukui Elementary School. There are currently no identified or planned roadway improvements likely to occur at this intersection. Signal timing may be adjusted, but northbound congestion along Honoapiilani Highway will continue to occur during the AM peak hour.

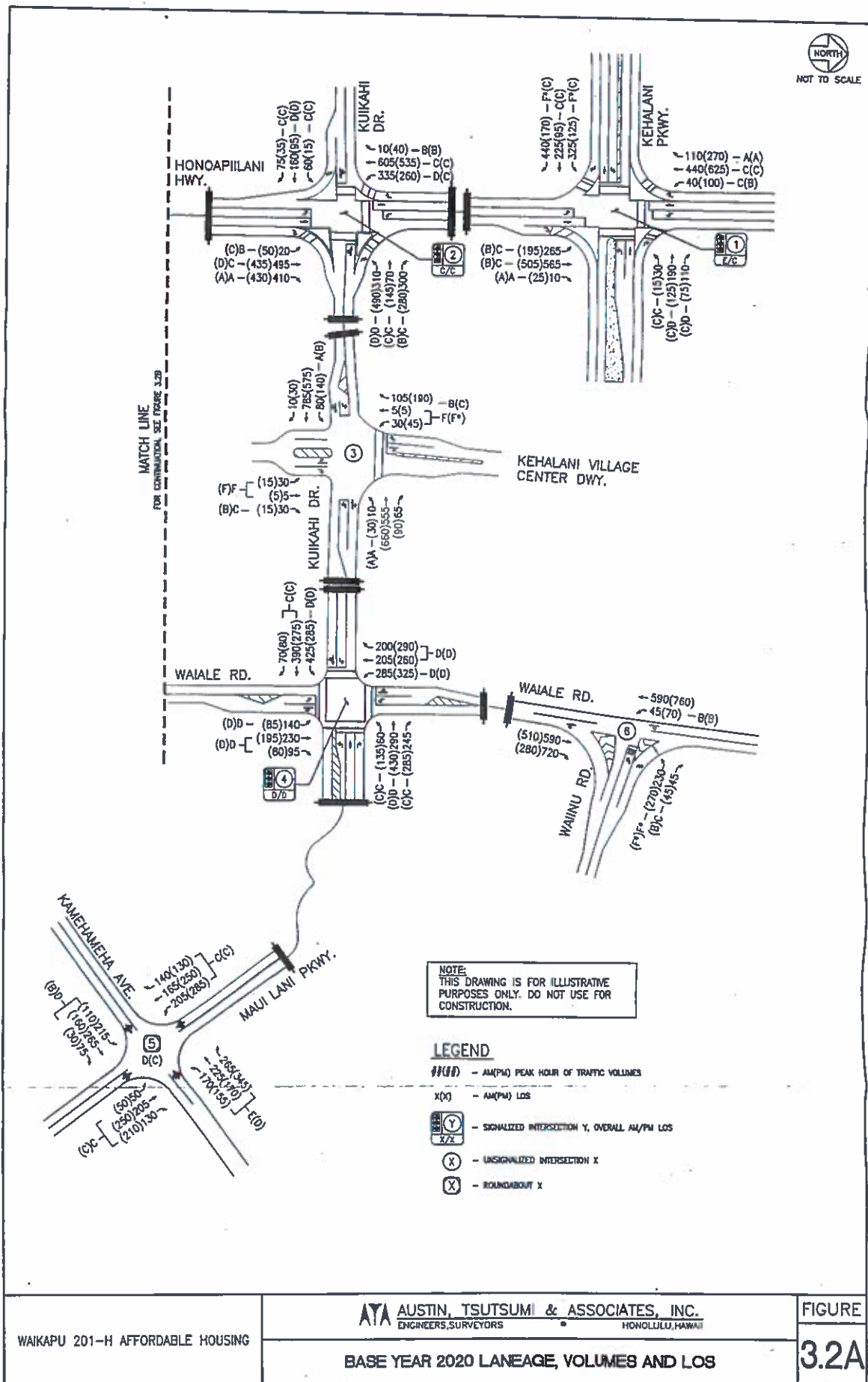
The southbound left-turn movement at the Kuikahi Drive/Kehalani Village Center Driveway will worsen to operate at LOS F during the AM and PM peak hours of traffic, however will continue to operate with relatively low volume at 30(45) vehicles in the AM(PM) peak hours of traffic.

All movements at the Kamehameha Avenue/Maui Lani Parkway roundabout will operate at LOS D or better during both peak hours, with the exception of the southbound Kamehameha Avenue approach, which is forecast to operate at LOS E during the AM peak hour.

Since no roadway improvements were assumed at the Waiale Road/Waiinu Road intersection, the westbound left-turn movement will continue operating at LOS F and overcapacity conditions during the AM/PM peak hours. Northbound through traffic on Waiale Road will continue to spill back in the AM peak hour. For future planning purposes along Waiale Road, traffic control treatment at Waiale Road/Kaohu Street intersection, intersection improvements at the Waiale Road/Waiinu Road intersection (as identified on the STIP) and median refuge lanes along Waiale Road could be considered to help mitigate Waiale Road northbound flows in the AM peak hour of traffic.

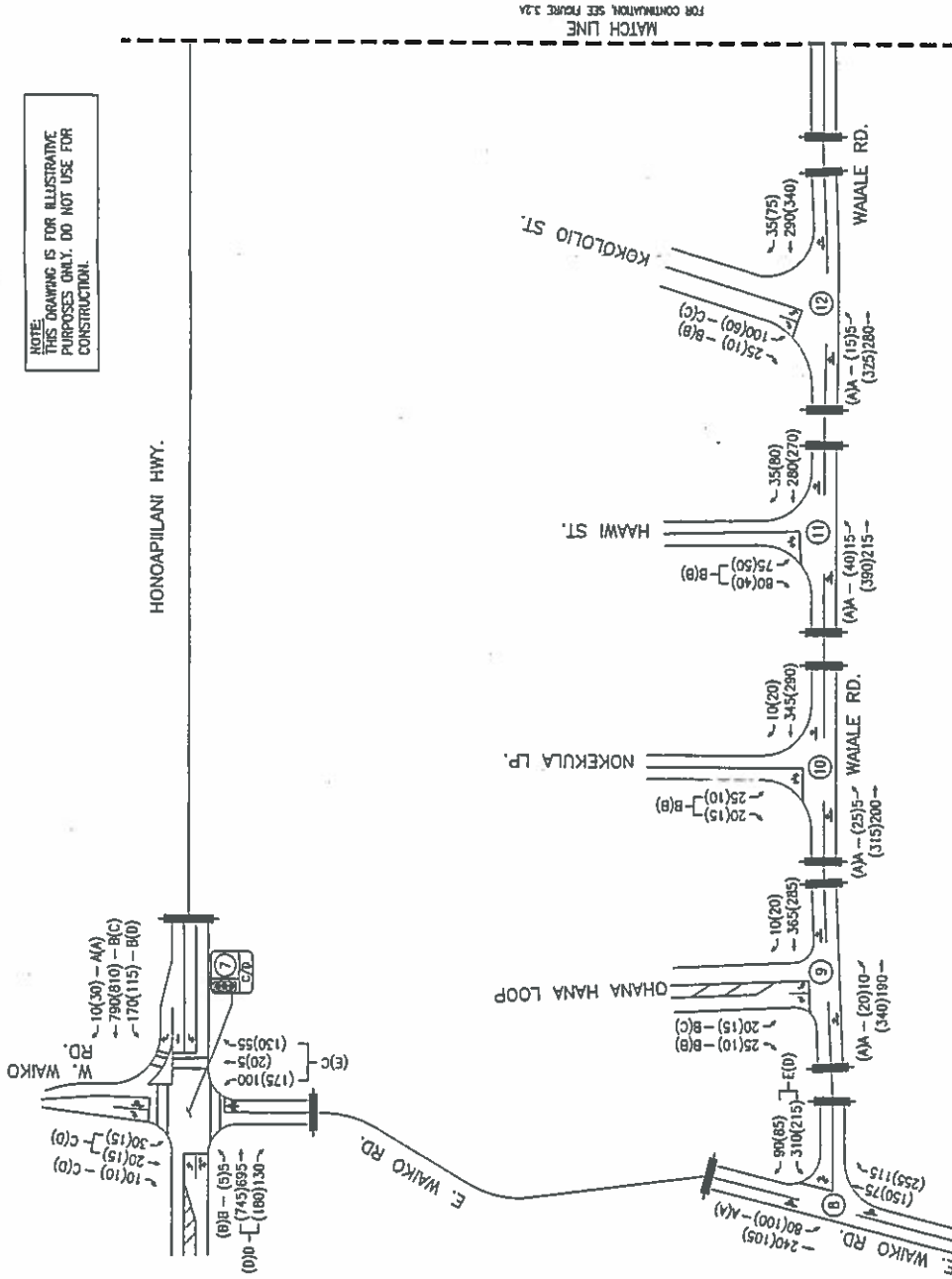
At the Waiko Road/Waiale Road intersection, the southbound approach will operate at LOS E during the AM peak hour of traffic.

Figure 3.2 illustrates the Base Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 3.2 summarizes the Base Year 2020 LOS at the study intersections compared to existing conditions. LOS worksheets are provided in Appendix C.





NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



### LEGEND

- HHV - AADT PEAK HOUR OF TRAFFIC VOLUMES
- X(1) - AADT LOS
- 37X - SCHEDULED INTERSECTION Y, OVERALL AADT LOS
- X - UNSIGNALIZED INTERSECTION X

FIGURE

3.2B

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS/SURVEYORS  
HONOLULU, HAWAII

BASE YEAR 2020 LANEAGE, VOLUMES AND LOS

WAIKAPU 201-H AFFORDABLE HOUSING



Table 3.2: Existing and Base Year 2020 Level of Service Summary

Intersection	Existing Conditions						Base Year 2020					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>1: Honoapiilani Hwy &amp; Kehalani Pkwy</b>												
NB LT	17.9	0.59	B	11.9	0.39	B	20.6	0.74	C	16.2	0.63	B
NB TH	26.6	0.77	C	15.3	0.55	B	28.1	0.80	C	17.6	0.64	B
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	59.2	0.97	E	22.1	0.37	C	181.0	1.29	F*	26.2	0.47	C
EB TH	21.6	0.38	C	22.6	0.21	C	27.3	0.48	C	27.9	0.32	C
EB RT	30.6	0.77	C	24.3	0.54	C	104.2	1.10	F*	30.7	0.68	C
WBLT	27.4	0.12	C	24.2	0.05	C	31.5	0.14	C	29.7	0.07	C
WB TH	33.8	0.75	C	27.5	0.57	C	39.5	0.80	D	34.8	0.70	C
WB RT	32.2	0.57	C	27.4	0.54	C	36.7	0.55	D	33.2	0.50	C
SB LT	20.0	0.17	C	10.3	0.22	B	20.9	0.18	C	12.4	0.27	B
SB TH	29.7	0.72	C	19.1	0.75	B	33.0	0.80	C	27.4	0.85	C
SB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
Overall	32.5	-	C	18.6	-	B	65.3	-	E	24.1	-	C
<b>2: Honoapiilani Highway &amp; Kuikahi Drive</b>												
NB LT	16.1	0.04	B	17.6	0.14	B	18.5	0.09	B	21.2	0.23	C
NB TH	26.8	0.78	C	27.0	0.75	C	34.1	0.85	C	40.8	0.87	D
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	27.7	0.19	C	28.3	0.04	C	30.9	0.23	C	35.0	0.08	C
EB TH	33.7	0.70	C	30.3	0.40	C	43.3	0.77	D	39.5	0.67	D
EB RT	29.9	0.37	C	27.7	0.13	C	33.4	0.38	C	34.1	0.20	C
WBLT	23.6	0.65	C	23.7	0.72	C	35.1	0.80	D	42.0	0.90	D
WB TH	22.0	0.15	C	17.4	0.18	B	24.7	0.17	C	20.9	0.26	C
WB RT	17.4	0.42	B	13.4	0.28	B	20.6	0.55	C	15.6	0.42	B
SB LT	17.8	0.70	B	15.8	0.55	C	45.5	0.93	D	27.9	0.78	C
SB TH	16.4	0.60	B	21.4	0.70	C	23.0	0.76	C	29.6	0.80	C
SB RT	9.6	0.01	A	13.8	0.06	B	10.2	0.01	B	15.3	0.07	B
Overall	21.9	-	C	21.7	-	C	31.4	-	C	31.9	-	C
<b>3: Kuikahi Dr &amp; Kehalani Village Center Dr</b>												
NB LT/TH	-	-	-	-	-	-	211.2	0.8	F	358.8	0.9	F
NB RT	-	-	-	-	-	-	16.1	0.1	C	12.9	0.0	B
EB LT	8.8	0.07	A	9.2	0.11	A	9.3	0.1	A	10.5	0.2	B
WBLT	-	-	-	-	-	-	9.7	0.0	A	9.0	0.0	A
SB LT	34.8	0.21	D	33.9	0.23	D	-	-	-	-	-	-
SB LT/TH	-	-	-	-	-	-	141.3	0.6	F	307.5	1.1	F*
SB RT	13.0	0.18	B	14.4	0.27	B	14.9	0.2	B	23.0	0.5	C

Table 3.2: Existing and Base Year 2020 Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>4: Waiale Rd &amp; Kuikahi Dr/Maui Lani Pkwy</b>												
NB LT	24.9	0.43	C	23.2	0.23	C	40.2	0.63	D	35.2	0.53	D
NB TH/RT	35.4	0.80	D	27.3	0.53	C	47.3	0.86	D	36.9	0.61	D
EB LT	22.8	0.82	C	17.6	0.65	B	47.1	0.94	D	42.6	0.88	D
EB TH/RT	18.0	0.50	B	18.3	0.46	B	26.3	0.66	C	31.1	0.61	C
WB LT	24.1	0.10	C	18.7	0.17	B	31.6	0.21	C	26.5	0.40	C
WB TH	32.1	0.73	C	27.5	0.77	C	47.5	0.85	D	51.5	0.90	D
WB RT	33.9	0.78	C	26.4	0.71	C	34.5	0.13	C	30.1	0.14	C
SB LT	26.1	0.69	C	19.7	0.61	B	51.5	0.89	D	36.2	0.80	D
SB TH/RT	35.4	0.82	D	34.2	0.87	C	36.4	0.78	D	44.1	0.90	D
<b>Overall</b>	<b>27.9</b>	<b>-</b>	<b>C</b>	<b>24.8</b>	<b>-</b>	<b>C</b>	<b>41.2</b>	<b>-</b>	<b>D</b>	<b>39.9</b>	<b>-</b>	<b>D</b>
<b>5: Kamehameha Ave &amp; Maui Lani Pkwy</b>												
NB LT	24.5	0.55	C	15.9	0.20	C	-	-	-	-	-	-
NB TH/RT	53.9	0.90	F	18.2	0.38	C	-	-	-	-	-	-
NB LT/TH/RT	-	-	-	-	-	-	27.6	0.82	D	14.7	0.53	B
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*	16.5	0.68	C	23.3	0.82	C
WB LT/TH/RT	57.4	0.93	F	76.9	1.05	F*	20.1	0.67	C	23.2	0.77	C
SB LT	23.0	0.52	C	19.1	0.44	C	-	-	-	-	-	-
SB TH/RT	88.0	1.06	F*	51.9	0.93	F	-	-	-	-	-	-
SB LT/TH/RT	-	-	-	-	-	-	35.5	0.90	E	27.7	0.85	D
<b>6: Waiale Rd &amp; Wainu Rd</b>												
WB LT	485.7	1.86	F*	378.8	1.65	F*	1126.4	3.25	F*	1227.2	3.5	F*
WB RT	17.7	0.15	C	12.5	0.09	B	20.4	0.17	C	14.3	0.1	B
SB LT	12.1	0.08	B	9.3	0.08	A	13.4	0.10	B	10.1	0.1	B
<b>7: Honoapiilani Hwy &amp; W Waiko Rd/E Waiko Rd</b>												
NB LT	10.4	0.01	B	10.9	0.02	B	12.2	0.02	B	16.8	0.02	B
NB TH/RT	20.2	0.72	C	21.8	0.83	C	38.5	0.95	D	53.8	0.99	D
EB LT/TH	28.2	0.12	C	24.4	0.06	C	28.2	0.15	C	35.9	0.08	D
EB RT	27.6	0.03	C	24.2	0.03	C	27.5	0.03	C	35.6	0.03	D
WB LT/TH/RT	30.1	0.34	C	26.4	0.34	C	32.0	0.51	C	70.1	0.90	E
SB LT	11.3	0.33	B	12.6	0.16	B	19.4	0.65	B	44.2	0.71	D
SB TH	12.5	0.60	B	13.8	0.69	B	16.7	0.75	B	20.6	0.76	C
SB RT	6.4	0.01	A	7.1	0.04	A	6.6	0.01	A	9.2	0.03	A
<b>Overall</b>	<b>17.2</b>	<b>-</b>	<b>B</b>	<b>18.3</b>	<b>-</b>	<b>B</b>	<b>27.3</b>	<b>-</b>	<b>C</b>	<b>42.7</b>	<b>-</b>	<b>D</b>
<b>8: E Waiko Rd &amp; Waiale Rd</b>												
EB LT	7.6	0.04	A	7.8	0.05	A	7.8	0.1	A	8.6	0.1	A
SB LT/RT	14.2	0.4	B	12.1	0.2	B	44.1	0.9	E	30.2	0.7	D



Table 3.2: Existing and Base Year 2020 Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>9: Waiale Rd &amp; Ohana Hana Loop</b>												
NB LT	7.7	0.01	A	7.6	0.01	A	8.2	0.01	A	8.0	0.02	A
EB LT	10.9	0.03	B	11.1	0.03	B	13.6	0.05	B	15.0	0.04	C
EB RT	9.6	0.03	A	9.1	0.01	A	10.8	0.04	B	10.1	0.02	B
<b>10: Waiale Rd &amp; Nokekula Lp</b>												
NB LT	7.7	0.00	A	7.6	0.02	A	8.1	0.01	A	8.0	0.02	A
EB LT/RT	10.4	0.1	B	10.0	0.0	B	12.5	0.09	B	12.1	0.05	B
<b>11: Waiale Rd &amp; Haawi St</b>												
NB LT	7.6	0.01	A	7.7	0.03	A	8.0	0.01	A	8.2	0.04	A
EB LT/RT	11.0	0.2	B	11.0	0.1	B	14.0	0.30	B	14.7	0.21	B
<b>12: Waiale Rd &amp; Kokololio St</b>												
NB LT	7.6	0.00	A	7.9	0.01	A	8.0	0.01	A	8.3	0.02	A
EB LT	12.2	0.18	B	12.2	0.11	B	16.1	0.25	C	17.6	0.19	C
EB RT	9.2	0.03	A	9.6	0.01	A	10.3	0.04	B	10.7	0.02	B

\* Denotes overcapacity condition,  $v/c \geq 1$ .



## 4. FUTURE YEAR 2020 TRAFFIC CONDITIONS

The Future Year 2020 scenario represents the traffic conditions within the Project study area with the full build-out of the Project.

### 4.1 Background

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road.

### 4.2 Travel Demand Estimations

#### 4.2.1 Transportation Demand Management (TDM) Assumptions

The State of Hawaii Department of Transportation (HDOT) and Maui County provide various TDM programs that promote the use of transit, walking, biking and alternative modes of transportation, to reduce the use of single-occupant vehicles on roadways. TDM measures discussed in this section have only been identified, but conservatively assumed to yield no vehicular reductions for Project generated traffic.

Maui County, in partnership with Roberts Hawaii provides bus service to the major areas in Maui. In the vicinity of the Project, the Maui Bus currently provides two (2) bus stops near the Project site. The first is part of the Wailuku Loop route that stops along Waiale Road in front of the Ka Hale A Ke Ola Resource Center, about 0.3 miles north of the Kuikahi Drive/Waiale Road/Maui Lani Parkway intersection. A marked crosswalk and rectangular rapid flash beacon (RRFB) is provided at the bus stop to provide for pedestrian crossings. The second bus stop is part of the Lahaina-Wailuku route that stops at the Honoapiilani Highway/Wilikona Place intersection, about 450 feet south of the Honoapiilani Highway/East Waiko Road intersection. The nearest park and ride lots are currently located to the northeast of the Project, on the southwest corner of the Puunene Avenue/Kuihelani Highway/Dairy Road intersection and to the south of the Project, at the Honoapiilani Highway/North Kihei Road intersection.

HDOT currently provides the Bike Plan Hawaii Master Plan, which identifies proposed bicycle routes that could potentially be implemented in the future. In the vicinity of the study area, Honoapiilani Highway is proposed to be a "signed shared roadway", which is a roadway shared by both vehicles and bicycles, which accommodate bicycles through wider vehicular travel lanes or paved shoulders. Along Waiale Road between Waiko Road and Kuikahi Drive, paved shoulders are currently provided for pedestrian and bike use. In the Central Maui Pedestrian & Bicycle Master Plan for 2030, dated March 2012, the County has identified the potential implementation of bike paths or bike lanes along this stretch for future consideration.

#### 4.2.2 Trip Generation

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9<sup>th</sup> Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. The independent variable can range from Dwelling Units (DU) for single-family attached homes to Gross Floor Area (GFA) for commercial and office



development. See Tables 4.1 and 4.2 for Trip Generation formulae and projections for the Project.

Table 4.1: Project Trip Generation Rates

Land Use Type	Independent Variable	AM Peak Hour		PM Peak Hour	
		Rate	% Enter	Rate	% Enter
Single-Family Detached Housing (ITE 210)	Dwelling Units (DU)	[a]	25%	[b]	75%
Residential Apartment/Townhouse (ITE 230 )	Dwelling Units (DU)	[c]	17%	[d]	83%

Notes:

[a]  $T = 0.70 \cdot X + 9.74$

[b]  $\ln(T) = 0.90 \cdot \ln(X) + 0.51$

[c]  $\ln(T) = 0.80 \cdot \ln(X) + 0.26$

[d]  $\ln(T) = 0.82 \cdot \ln(X) + 0.32$

Table 4.2: New Project-Generated Trips

Land Use Type	Quantity	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Single-Family Detached Housing (ITE 210)	68 DU	15	43	58	47	28	75
Residential Apartment/Townhouse (ITE 230 )	12 DU	2	8	10	7	4	11
TOTAL	80 DU	17	51	68	54	32	86

#### 4.2.3 Trip Distribution

Trips generated by the Project were assigned throughout the study area generally based upon existing travel patterns in the study area. The traffic generated by the Project was added to the forecast Base Year 2020 traffic volumes within the vicinity of the Project to constitute the traffic volumes for the Future Year 2020 traffic conditions. Figure 4.1 illustrates the Project-generated trip volumes.



### 4.3 Future Year 2020 Analysis

Upon completion of the Project, all study intersections are forecast to operate with LOS similar to Base Year 2020 conditions. The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection is forecast to continue operating at over-capacity and LOS F conditions in the AM peak hour, similar to Base Year 2020 conditions. As noted in Section 2.3, heavy traffic during a short period of time is reflective of typical school conditions, as these queuing conditions were observed to last about 30 minutes during the AM peak hour and likely primarily stem from traffic generated by the Puu Kukui Elementary School. However, the Project is only anticipated to increase traffic at the Honoapiilani Highway/Kehalani Parkway intersection by approximately 0.5%, with individual movement increases generally ranging from 1-7 vehicles. At the Waiko Road/Waiale Road intersection, the southbound approach will continue to operate at LOS E conditions during the AM peak hour of traffic.

At the Kamehameha Avenue/Maui Lani Parkway roundabout intersection, all approaches will operate similar to Base Year 2020 conditions, with LOS D or better conditions during peak hours, with the exception of the southbound Kamehameha Avenue approach, which is forecast to operate at LOS E during the AM peak hour. The westbound left-turn movement at the Waiale Road/Waiinu Road intersection will continue operating at LOS F and overcapacity conditions during the AM and PM peak hours.

As mentioned in Section 2.3, northbound through traffic on Waiale Road will continue to spill back to the Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.8%. During the more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection.

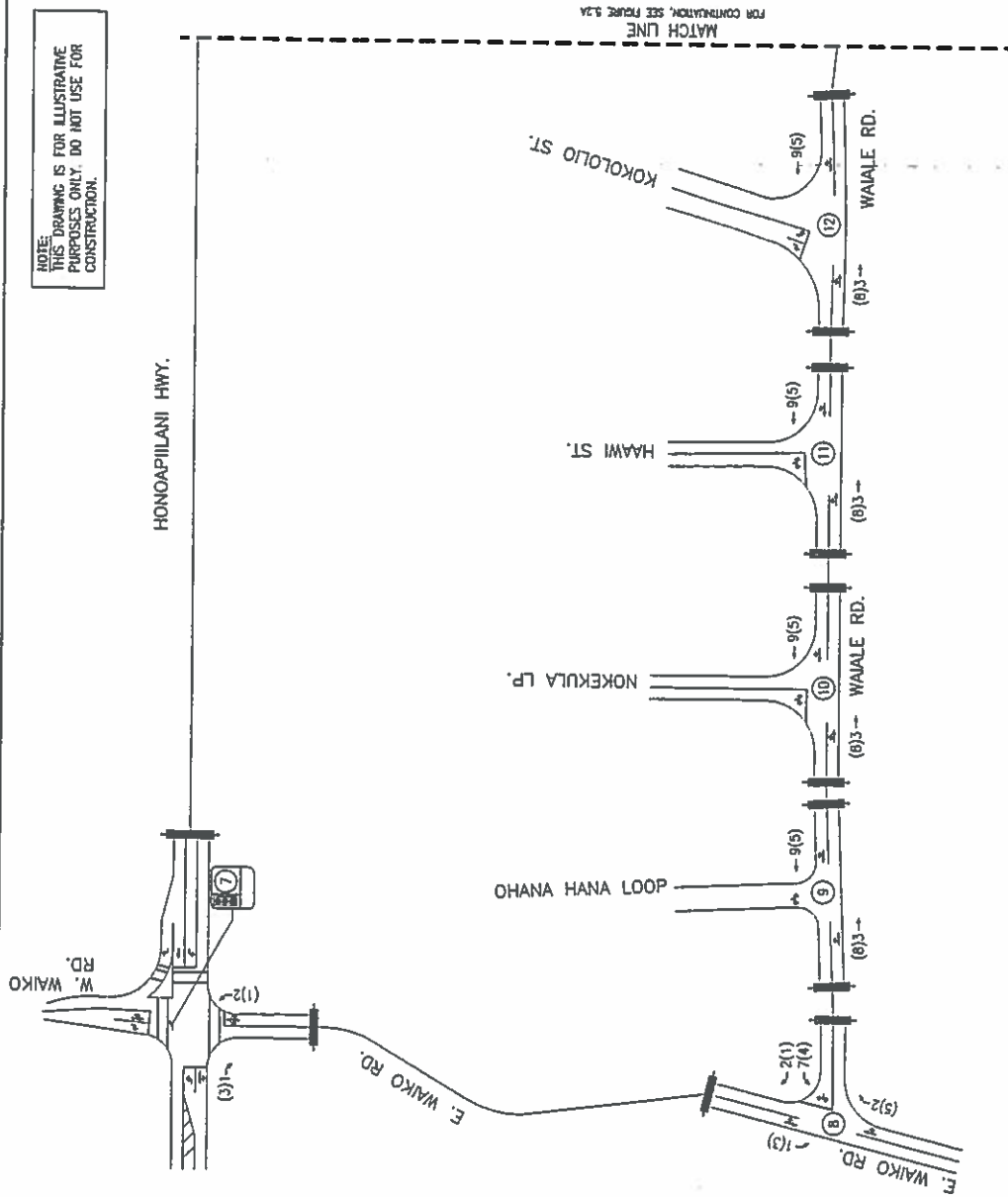
Based on MUTCD signal warrants, a signal will likely not be met at both Project accesses along Waiale Road. Two northbound left-turn storage lanes along Waiale Road are recommended for entrance into the two proposed Project accesses, to remove left-turn vehicles from mainline through traffic. Left-turn storage lanes should accommodate a minimum 50 feet of storage length.

Figure 4.2 illustrates the Future Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 4.3 summarizes the Future Year 2020 LOS at the study intersections compared to Base Year 2020 conditions. LOS worksheets are provided in Appendix C.





NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



**LEGEND**

#(X)Y - AMPMJ PEAK HOUR OF TRAFFIC VOLUMES



- SIGNALIZED INTERSECTION Y



- UNSIGNALIZED INTERSECTION X

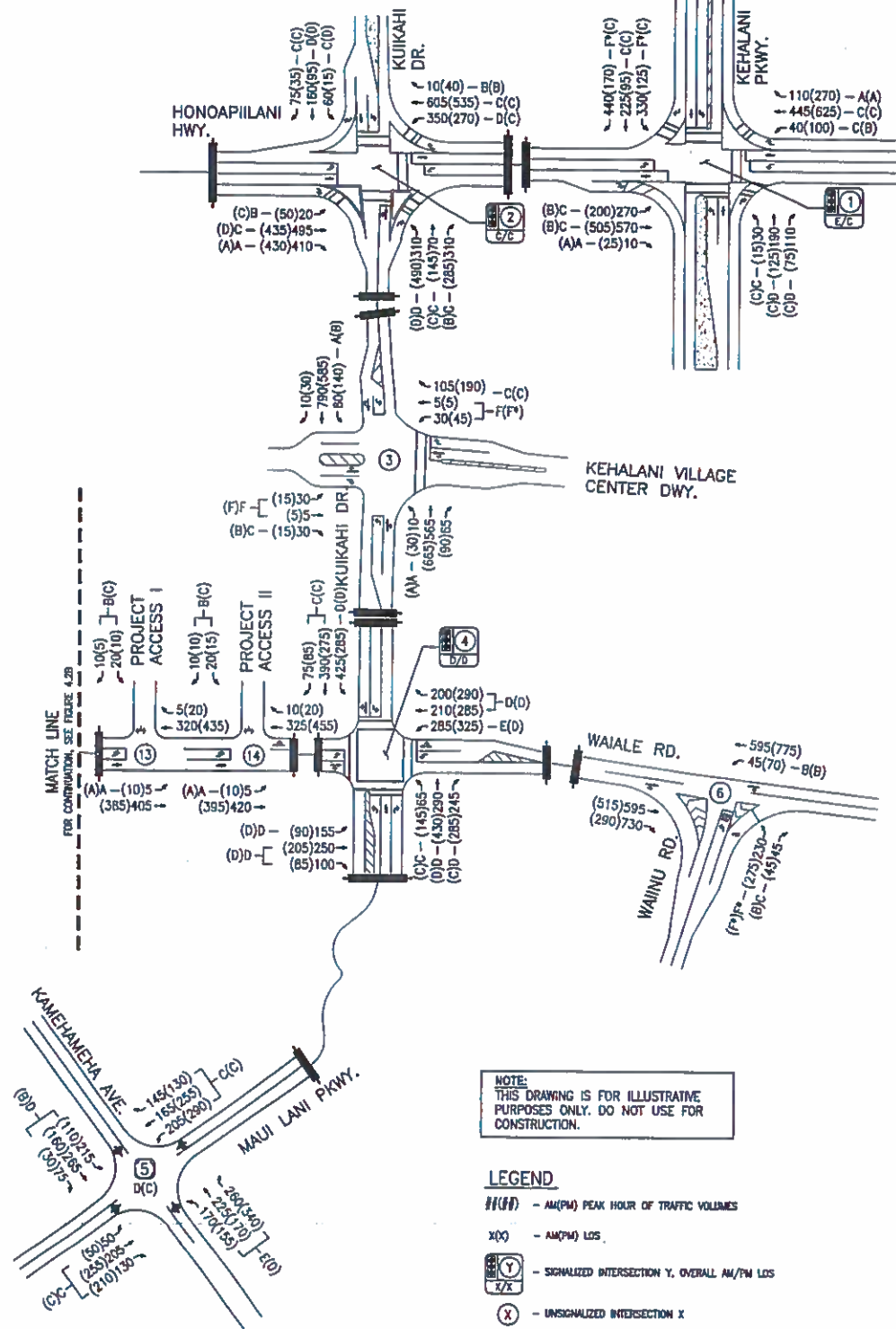
FIGURE

4.1B

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS • HONOLULU, HAWAII

WAIKAPU 201-H AFFORDABLE HOUSING

PROJECT TRIPS



NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.

- LEGEND**
- (H)(H) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
  - X(X) - AM(PM) LOS
  - Y - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
  - X - UNSIGNALIZED INTERSECTION X
  - R - ROUNDABOUT X

WAIKAPU 201-H AFFORDABLE HOUSING

**ATA** AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS  
HONOLULU, HAWAII

**FUTURE YEAR 2020 LANEAGE, VOLUMES AND LOS**

**FIGURE**  
**4.2A**





Table 4.3: Existing, Base Year 2020 and Year 2020 with Project Level of Service Summary

Intersection	Existing Conditions										Base Year 2020										Future Year 2020												
	AM					PM					AM					PM					AM					PM							
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS			
1: Honokahuli Hwy & Kehala Drive																																	
NB LT	17.9	0.59	B	11.9	0.39	B	20.6	0.74	C	16.2	0.63	B	21.2	0.75	C	16.3	0.64	B	21.2	0.75	C	16.3	0.64	B	21.2	0.75	C	16.3	0.64	B	21.2	0.75	C
NB TH	26.6	0.77	C	15.3	0.55	B	28.1	0.80	C	17.6	0.64	B	28.1	0.80	C	17.6	0.64	B	28.1	0.80	C	17.6	0.64	B	28.1	0.80	C	17.6	0.64	B	28.1	0.80	C
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	59.2	0.97	E	22.1	0.37	C	181.0	1.29	F*	26.2	0.47	C	184.5	1.33	F*	26.3	0.47	C	184.5	1.33	F*	26.3	0.47	C	184.5	1.33	F*	26.3	0.47	C	184.5	1.33	F*
EB TH	21.6	0.38	C	22.6	0.21	C	27.3	0.48	C	27.3	0.48	C	27.7	0.48	C	27.7	0.48	C	27.7	0.48	C	27.7	0.48	C	27.7	0.48	C	27.7	0.48	C	27.7	0.48	C
EB RT	30.6	0.77	C	24.3	0.54	C	104.2	1.10	F*	30.7	0.68	C	107.0	1.10	F*	30.8	0.68	C	107.0	1.10	F*	30.8	0.68	C	107.0	1.10	F*	30.8	0.68	C	107.0	1.10	F*
WB LT	27.4	0.12	C	24.2	0.05	C	31.5	0.14	C	29.7	0.07	C	31.8	0.14	C	29.7	0.07	C	31.8	0.14	C	29.7	0.07	C	31.8	0.14	C	29.7	0.07	C	31.8	0.14	C
WB TH	33.8	0.75	C	27.5	0.57	C	39.5	0.80	D	34.8	0.70	C	39.9	0.80	D	34.8	0.70	C	39.9	0.80	D	34.8	0.70	C	39.9	0.80	D	34.8	0.70	C	39.9	0.80	D
WB RT	32.2	0.57	C	27.4	0.54	C	36.7	0.55	D	33.2	0.50	C	37.0	0.55	D	33.3	0.50	C	37.0	0.55	D	33.3	0.50	C	37.0	0.55	D	33.3	0.50	C	37.0	0.55	D
SB LT	20.0	0.17	C	10.3	0.22	B	20.9	0.18	C	12.4	0.27	B	21.0	0.18	C	12.4	0.27	B	21.0	0.18	C	12.4	0.27	B	21.0	0.18	C	12.4	0.27	B	21.0	0.18	C
SB TH	29.7	0.72	C	19.1	0.75	B	33.0	0.80	C	27.4	0.85	C	33.2	0.80	C	27.6	0.85	C	33.2	0.80	C	27.6	0.85	C	33.2	0.80	C	27.6	0.85	C	33.2	0.80	C
SB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
Overall	32.5	-	C	19.6	-	B	65.3	-	E	24.1	-	C	68.1	-	E	24.1	-	C	68.1	-	E	24.1	-	C	68.1	-	E	24.1	-	C	68.1	-	C
2: Honokahuli Highway & Kula Drive																																	
NB LT	16.1	0.04	B	17.6	0.14	B	18.5	0.09	B	21.2	0.23	C	18.5	0.09	B	21.2	0.23	C	18.5	0.09	B	21.2	0.23	C	18.5	0.09	B	21.2	0.23	C	18.5	0.09	B
NB TH	26.8	0.78	C	27.0	0.75	C	34.1	0.85	C	40.8	0.87	D	34.1	0.85	C	41.1	0.87	D	34.1	0.85	C	41.1	0.87	D	34.1	0.85	C	41.1	0.87	D	34.1	0.85	C
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	27.7	0.19	C	28.3	0.04	C	30.9	0.23	C	35.0	0.08	C	30.9	0.23	C	35.1	0.08	C	30.9	0.23	C	35.1	0.08	C	30.9	0.23	C	35.1	0.08	C	30.9	0.23	C
EB TH	33.7	0.70	C	30.3	0.40	C	43.3	0.77	D	39.5	0.67	D	43.3	0.77	D	39.8	0.68	D	43.3	0.77	D	39.8	0.68	D	43.3	0.77	D	39.8	0.68	D	43.3	0.77	D
EB RT	29.9	0.37	C	27.7	0.13	C	33.4	0.38	C	34.1	0.20	C	33.4	0.38	C	34.3	0.20	C	33.4	0.38	C	34.3	0.20	C	33.4	0.38	C	34.3	0.20	C	33.4	0.38	C
WB LT	23.6	0.65	C	23.7	0.72	C	35.1	0.80	D	42.0	0.90	D	35.1	0.80	D	42.9	0.91	D	35.1	0.80	D	42.9	0.91	D	35.1	0.80	D	42.9	0.91	D	35.1	0.80	D
WB TH	22.0	0.15	C	17.4	0.18	B	24.7	0.17	C	20.9	0.26	C	24.7	0.17	C	21.0	0.26	C	24.7	0.17	C	21.0	0.26	C	24.7	0.17	C	21.0	0.26	C	24.7	0.17	C
WB RT	17.4	0.42	B	13.4	0.28	B	20.6	0.55	C	15.6	0.42	B	21.0	0.57	C	15.6	0.42	B	21.0	0.57	C	15.6	0.42	B	21.0	0.57	C	15.6	0.42	B	21.0	0.57	C
SB LT	17.8	0.70	B	15.8	0.55	B	45.5	0.93	D	27.9	0.78	C	48.6	0.94	D	29.7	0.80	C	48.6	0.94	D	29.7	0.80	C	48.6	0.94	D	29.7	0.80	C	48.6	0.94	D
SB TH	16.4	0.60	B	21.4	0.70	C	23.0	0.75	C	29.6	0.80	C	23.0	0.75	C	29.4	0.80	C	23.0	0.75	C	29.4	0.80	C	23.0	0.75	C	29.4	0.80	C	23.0	0.75	C
SB RT	9.6	0.01	A	13.8	0.06	B	10.2	0.01	B	15.3	0.07	B	10.2	0.01	B	15.2	0.07	B	10.2	0.01	B	15.2	0.07	B	10.2	0.01	B	15.2	0.07	B	10.2	0.01	B
Overall	21.9	-	C	21.7	-	C	31.4	-	C	31.9	-	C	31.9	-	C	32.3	-	C	31.9	-	C	32.3	-	C	31.9	-	C	32.3	-	C	31.9	-	C
3: Kula Dr & Kehala Village Dr																																	
NB LT/TH	-	-	-	-	-	-	211.2	0.81	F	358.8	0.87	F	219.4	0.83	F	382.0	0.91	F	219.4	0.83	F	382.0	0.91	F	219.4	0.83	F	382.0	0.91	F	219.4	0.83	F
NB RT	-	-	-	-	-	-	16.1	0.09	C	12.9	0.03	B	16.2	0.09	C	13.0	0.04	B	16.2	0.09	C	13.0	0.04	B	16.2	0.09	C	13.0	0.04	B	16.2	0.09	C
EB LT	8.8	0.07	A	9.2	0.11	A	9.3	0.10	A	10.5	0.19	B	9.4	0.10	A	10.5	0.19	B	9.4	0.10	A	10.5	0.19	B	9.4	0.10	A	10.5	0.19	B	9.4	0.10	A
WB LT	-	-	-	-	-	-	9.7	0.01	A	9.0	0.04	A	9.7	0.01	A	9.1	0.04	A	9.7	0.01	A	9.1	0.04	A	9.7	0.01	A	9.1	0.04	A	9.7	0.01	A
SB LT	34.8	0.21	D	33.9	0.23	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SB LT/TH	-	-	-	-	-	-	141.3	0.65	F	307.5	1.13	F*	150.1	0.67	F	319.5	1.16	F*	150.1	0.67	F	319.5	1.16	F*	150.1	0.67	F	319.5	1.16	F*	150.1	0.67	F
SB RT	13.0	0.18	B	14.4	0.27	B	14.9	0.24	B	23.0	0.51	C	15.1	0.24	C	23.2	0.52	C	15.1	0.24	C	23.2	0.52	C	15.1	0.24	C	23.2	0.52	C	15.1	0.24	C

\* Denotes overcapacity condition, v/c ≥ 1.

Table 4.3: Existing, Base Year 2020 and Year 2020 with Project Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020						Future Year 2020					
	AM			PM			AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>4: Waiale Rd &amp; Kukuihi Dr/Maui Land Pkwy</b>																		
NB LT	24.9	0.43	C	23.2	0.23	C	40.2	0.63	D	35.2	0.53	D	39.5	0.65	D	41.7	0.59	D
NB THRT	35.4	0.80	D	27.3	0.53	C	47.3	0.86	D	38.9	0.81	D	54.3	0.89	D	38.3	0.85	D
EB LT	22.8	0.82	C	17.6	0.65	B	47.1	0.94	D	42.6	0.88	D	52.1	0.95	D	49.2	0.90	D
EB THRT	18.0	0.50	B	18.3	0.46	B	26.3	0.86	C	31.1	0.61	C	29.0	0.68	C	33.3	0.63	C
WB LT	24.1	0.10	C	18.7	0.17	B	31.8	0.21	C	26.5	0.40	C	33.8	0.23	C	27.8	0.43	C
WB TH	32.1	0.73	C	27.5	0.77	C	47.5	0.85	D	51.5	0.90	D	53.3	0.88	D	54.0	0.90	D
WB RT	33.9	0.78	C	26.4	0.71	C	34.5	0.13	C	30.1	0.14	C	37.1	0.13	D	31.4	0.14	C
SB LT	26.1	0.69	C	18.7	0.61	B	51.5	0.89	D	36.2	0.80	D	56.7	0.91	E	35.4	0.79	D
SB THRT	35.4	0.82	D	34.2	0.87	C	36.4	0.78	D	44.1	0.90	D	40.5	0.76	D	47.4	0.91	D
Overall	27.9	-	C	24.8	-	C	41.2	-	D	39.9	-	D	45.5	-	D	42.6	-	D
<b>5: Kanehameha Ave &amp; Maui Land Pkwy</b>																		
NB LT	24.5	0.55	C	15.9	0.20	C	-	-	-	-	-	-	-	-	-	-	-	-
NB THRT	53.9	0.90	F	18.2	0.38	C	-	-	-	-	-	-	-	-	-	-	-	-
EB LT/THRT	-	-	-	-	-	-	27.6	0.82	D	14.7	0.53	B	27.6	0.82	D	15.0	0.53	B
WB LT/THRT	82.3	1.03	F*	109.2	1.11	F*	16.5	0.68	C	23.3	0.82	C	16.8	0.89	C	24.4	0.83	C
SB LT	57.4	0.93	F	78.9	1.05	F*	20.1	0.67	C	23.2	0.77	C	20.1	0.67	C	-	-	-
SB TH	23.0	0.52	C	19.1	0.44	C	-	-	-	-	-	-	-	-	-	-	-	-
SB THRT	88.0	1.06	F*	51.9	0.93	F	-	-	-	-	-	-	-	-	-	-	-	-
Overall	-	-	-	-	-	-	35.5	0.9	E	27.7	0.8	D	35.5	0.90	E	28.4	0.86	D
<b>6: Waiale Rd &amp; Walinu Rd</b>																		
WB LT	485.7	1.86	F*	378.8	1.65	F*	1128.4	3.25	F*	1227.2	3.49	F*	1167.6	3.33	F*	1297.0	3.85	F*
WB RT	17.7	0.15	C	12.5	0.09	B	20.4	0.17	C	14.3	0.11	B	20.7	0.18	C	14.5	0.11	B
SB LT	12.1	0.08	B	8.3	0.08	A	13.4	0.10	B	10.1	0.10	B	13.5	0.10	B	10.2	0.10	B
<b>7: Honolulu Hwy &amp; W Waiale Rd</b>																		
NB LT	10.4	0.01	B	10.9	0.02	B	12.2	0.02	B	16.8	0.02	B	12.2	0.02	B	16.8	0.02	B
NB THRT	20.2	0.72	C	21.8	0.83	C	38.5	0.95	D	53.8	0.99	D	38.5	0.95	D	53.8	0.99	D
EB LT/TH	28.2	0.12	C	24.4	0.06	C	28.2	0.15	C	35.9	0.08	D	28.2	0.15	C	35.9	0.08	D
EB RT	27.6	0.03	C	24.2	0.03	C	27.5	0.03	C	35.6	0.03	D	27.5	0.03	C	35.6	0.03	D
WB LT/THRT	30.1	0.34	C	26.4	0.34	C	32.0	0.51	C	70.1	0.90	E	32.0	0.51	C	70.1	0.90	E
SB LT	11.3	0.33	B	12.6	0.16	B	19.4	0.65	B	44.2	0.71	D	19.4	0.65	B	44.2	0.71	D
SB TH	12.5	0.60	B	13.8	0.69	B	16.7	0.75	A	20.6	0.76	C	16.7	0.75	A	20.6	0.76	C
SB RT	6.4	0.01	A	7.1	0.04	A	6.8	0.01	A	9.2	0.03	A	6.8	0.01	A	9.2	0.03	A
Overall	17.2	-	B	18.3	-	B	27.3	-	C	42.7	-	D	27.3	-	C	42.7	-	D
<b>8: E Waiale Rd &amp; Waiale Rd</b>																		
EB LT	7.6	0.04	A	7.8	0.05	A	7.8	0.06	A	8.6	0.10	A	7.8	0.07	A	8.6	0.10	A
SB LT/RT	14.2	0.40	B	12.1	0.25	B	44.1	0.87	E	30.2	0.71	D	48.6	0.80	E	31.0	0.73	D

\* Denotes overcapacity condition, v/c ≥ 1.

Table 4.3: Existing, Base Year 2020 and Year 2020 with Project Level of Service Summary Cont'd

Intersection	Existing Conditions						Base Year 2020						Future Year 2020					
	AM			PM			AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
9: Waiale Rd & Ohana Hana Loop	7.7	0.01	A	7.6	0.01	A	8.2	0.01	A	8.0	0.02	A	8.2	0.01	A	8.0	0.02	A
	10.9	0.03	B	11.1	0.03	B	13.6	0.05	B	15.0	0.04	C	13.8	0.05	B	15.1	0.04	C
	9.6	0.03	A	9.1	0.01	A	10.8	0.04	B	10.1	0.02	B	10.9	0.04	B	10.1	0.02	B
10: Waiale Rd & Nohokula Lp	7.7	0.00	A	7.6	0.02	A	8.1	0.01	A	8.0	0.02	A	8.1	0.01	A	8.0	0.02	A
	10.4	0.07	B	10.0	0.03	B	12.5	0.1	B	12.1	0.1	B	12.6	0.09	B	12.3	0.05	B
11: Waiale Rd & Haawi St	7.6	0.01	A	7.7	0.03	A	8.0	0.01	A	8.2	0.04	A	8.0	0.01	A	8.2	0.04	A
	11.0	0.22	B	11.0	0.14	B	14.0	0.3	B	14.7	0.2	B	14.1	0.30	B	14.9	0.21	B
12: Waiale Rd & Kokololo St	7.6	0.00	A	7.9	0.01	A	8.0	0.01	A	8.3	0.02	A	8.0	0.01	A	8.3	0.02	A
	12.2	0.18	B	12.2	0.11	B	16.1	0.25	C	17.6	0.19	C	16.4	0.26	C	17.9	0.19	C
	9.2	0.03	A	8.6	0.01	A	10.3	0.04	B	10.7	0.02	B	10.4	0.04	B	10.8	0.02	B
13: Waiale Rd & Project Access II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14: Waiale Rd & Project Access I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15: Waiale Rd & Project Access I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Denotes overcapacity condition,  $v/c \geq 1$ .



## 5. CONCLUSIONS

The Project proposes to develop approximately 12.5-acres of vacant land to provide a residential subdivision with 68 single-family units and 12 multi-family units. Vehicular traffic to the Project will be provided by two (2) new Project access along Waiale Road. The Project is anticipated to be completed by the Year 2020.

The Project is anticipated to generate approximately 68 AM peak hour trips and 86 PM peak hour trips. Upon completion of the Project, all study intersections are forecast to operate with LOS similar to Base Year 2020 conditions. The eastbound left-turn movement at the Honoapiilani Highway/Kehalani Parkway intersection is forecast to continue operating at over-capacity and LOS F conditions in the AM peak hour, similar to Base Year 2020 conditions. The Project is only anticipated to increase traffic at the Honoapiilani Highway/Kehalani Parkway intersection by approximately 0.5%, with individual movement increases generally ranging from 1-7 vehicles. There are currently no identified or planned roadway improvements likely to occur at this intersection.

As mentioned in Section 2.3, northbound through traffic on Waiale Road will continue to spill back to the Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.8%. During the more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection. Based on MUTCD signal warrants, a signal will likely not be met at both Project accesses along Waiale Road.



## 6. RECOMMENDATIONS

The following Base Year 2020 recommendations are roadway improvements that can be considered without the Project:

### Waiale Road Corridor

- For future planning purposes along Waiale Road, traffic control treatment at Waiale Road/Kaohu Street intersection, intersection improvements at the Waiale Road/Waiinu Road intersection (as identified on the STIP) and median refuge lanes along Waiale Road could be considered to help mitigate Waiale Road northbound flows in the AM peak hour of traffic.

The following Future Year 2020 recommendations are proposed to be implemented by the Applicant:

### Waiale Road/Project Access I & Project Access II

- Construct one northbound left-turn storage lane along Waiale Road at each of the two (2) Project accesses. Left-turn storage lanes should accommodate a minimum 50 feet of storage length.

### Waiale Road/Kuikahi Drive

- Optimize the Waiale Road/Kuikahi Drive signalized intersection signal timing after completion and occupancy of the Project.



## 7. REFERENCES

- Austin, Tsutsumi & Associates, Central Maui Regional Sports Complex TIAR, 2014.
- Austin, Tsutsumi & Associates, Waiale Affordable Housing TIAR, 2016.
- Austin, Tsutsumi & Associates, Waikapu Light Industrial Project TIAR, 2013.
- Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009.
- Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.
- Phillip Rowell & Associates, Waiko Road Light Industrial Park TIAR, 2011.
- Transportation Research Board, Highway Capacity Manual, 2010.





AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
CIVIL ENGINEERS • SURVEYORS

---

# APPENDICES

---



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
CIVIL ENGINEERS • SURVEYORS

---

## APPENDIX A

### TRAFFIC COUNT DATA

---

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

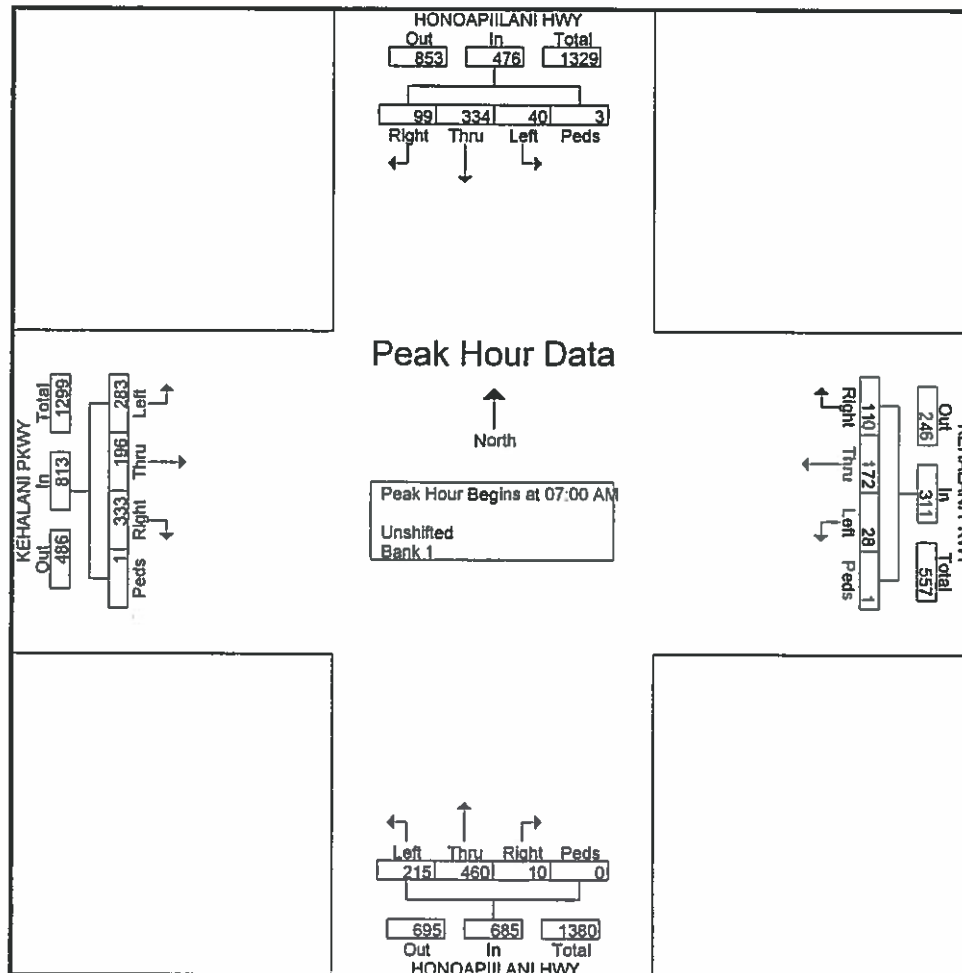
File Name : AM\_Honoapiilani Hwy - Kehalani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KEHALANI PKWY Westbound					HONOAPIILANI HWY Northbound					KEHALANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	6	95	30	0	131	5	35	21	0	61	41	106	0	0	147	77	20	67	0	164	503
07:15 AM	11	71	33	2	117	8	51	38	0	97	73	116	2	0	191	92	49	90	1	232	637
07:30 AM	12	79	21	1	113	6	63	38	1	108	75	121	7	0	203	59	78	112	0	249	673
07:45 AM	11	89	15	0	115	9	23	13	0	45	26	117	1	0	144	55	49	64	0	168	472
Total Volume	40	334	99	3	476	28	172	110	1	311	215	460	10	0	685	283	196	333	1	813	2285
% App. Total	8.4	70.2	20.8	0.6		9	55.3	35.4	0.3		31.4	67.2	1.5	0		34.8	24.1	41	0.1		
PHF	.833	.879	.750	.375	.908	.778	.683	.724	.250	.720	.717	.950	.357	.000	.844	.769	.628	.743	.250	.816	.849



501 Sumner Street, Suite 521  
Honolulu, HI 96817  
Phone: (808) 533-3646 Fax: (808) 526-1267

Page No : 1

	HONOAPIILANI HWY Southbound					KEHALANI PKWY Westbound					HONOAPIILANI HWY Northbound					KEHALANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds		Left	Thru	Right	Peds		Left	Thru	Right	Peds		Left	Thru	Right	Peds	Int. Total	
03:30 PM	8	112	33	0		2	26	15	0		26	108	2	0		36	27	50	0	445	
03:45 PM	13	99	29	0		3	12	16	0		23	128	2	0		32	13	28	0	398	
Total	21	211	62	0		5	38	31	0		49	236	4	0		68	40	78	0	843	
04:00 PM	12	97	25	1		0	14	25	0		31	127	3	0		28	18	18	1	400	
04:15 PM	17	130	48	0		2	20	16	0		30	95	8	0		28	11	33	0	438	
04:30 PM	30	133	47	0		5	23	21	0		36	103	6	0		30	15	31	0	460	
04:45 PM	28	126	50	1		1	19	14	1		29	87	5	0		26	15	31	1	435	
Total	87	486	170	2		8	76	76	1		125	412	22	0		114	59	113	2	1753	
05:00 PM	21	115	49	1		5	28	20	1		39	93	6	0		20	12	23	0	431	
05:15 PM	18	116	38	2		3	32	17	0		36	94	5	0		37	17	23	2	438	
Grand Total	147	928	317	5		21	172	144	2		249	835	37	0		239	128	237	4	3465	
Approch %	10.5	68.4	22.7	0.4		6.2	50.7	42.5	0.6		22.2	74.5	3.3	0		39.3	21.1	39	0.7		
Total %	4.2	26.8	9.1	0.1		0.8	5	4.2	0.1		7.2	24.1	1.1	0		6.9	3.7	6.8	0.1		
Unshifted	147	928	317	5		21	172	144	2		249	835	37	0		239	128	237	4	3465	
% Unshifted	100	100	100	100		100	100	100	100		100	100	100	0		100	100	100	100	100	
Bank 1	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	0	
% Bank 1	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	0	

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

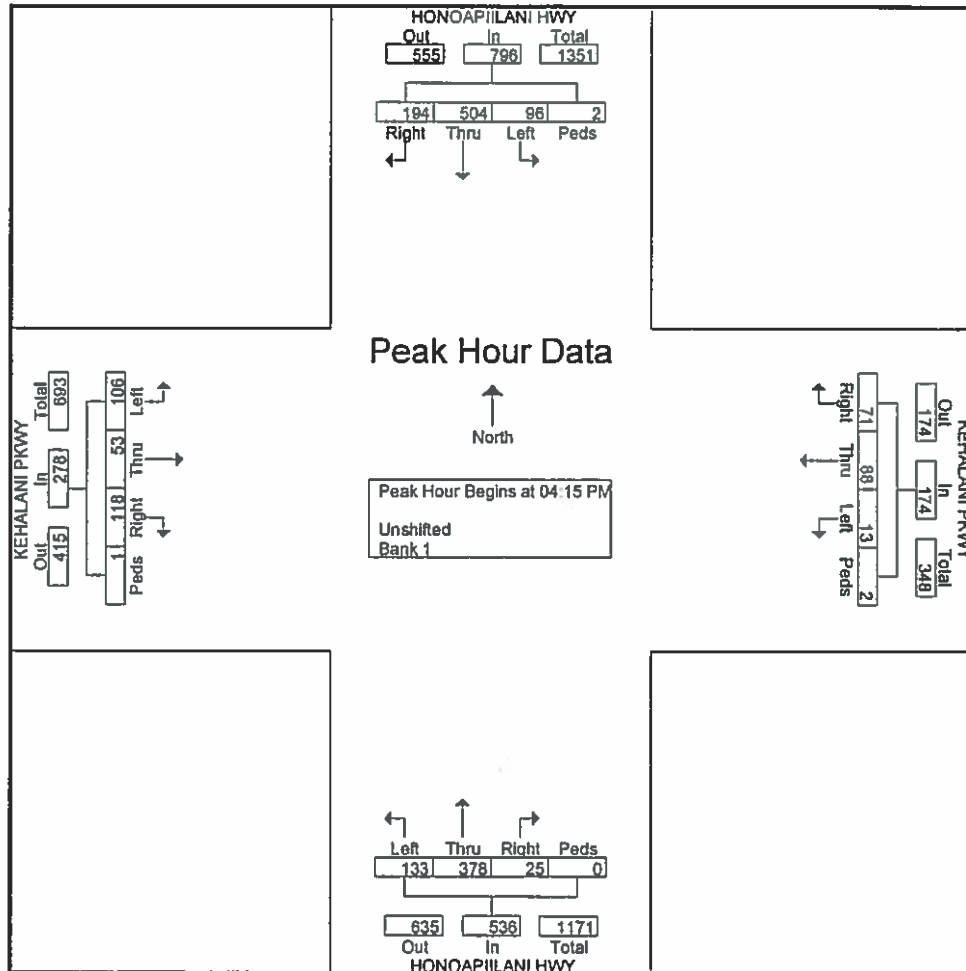
File Name : PM\_Honoapiilani Hwy - Kehalani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KEHALANI PKWY Westbound					HONOAPIILANI HWY Northbound					KEHALANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	17	130	48	0	195	2	20	16	0	38	30	95	8	0	133	28	11	33	0	72	438
04:30 PM	30	133	47	0	210	5	23	21	0	49	36	103	8	0	145	30	15	31	0	78	480
04:45 PM	28	128	50	1	205	1	19	14	1	35	28	87	5	0	120	28	15	31	1	75	435
05:00 PM	21	115	49	1	186	5	28	20	1	52	38	93	8	0	138	20	12	23	0	55	431
Total Volume	98	504	164	2	798	13	88	71	2	174	133	378	25	0	536	108	53	118	1	278	1784
% App. Total	12.1	63.3	24.4	0.3		7.5	50.8	40.8	1.1		24.8	70.5	4.7	0		38.1	19.1	42.4	0.4		
PHF	.800	.947	.970	.500	.948	.650	.848	.845	.500	.837	.853	.917	.781	.000	.924	.883	.883	.894	.250	.914	.929



[illegible]



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

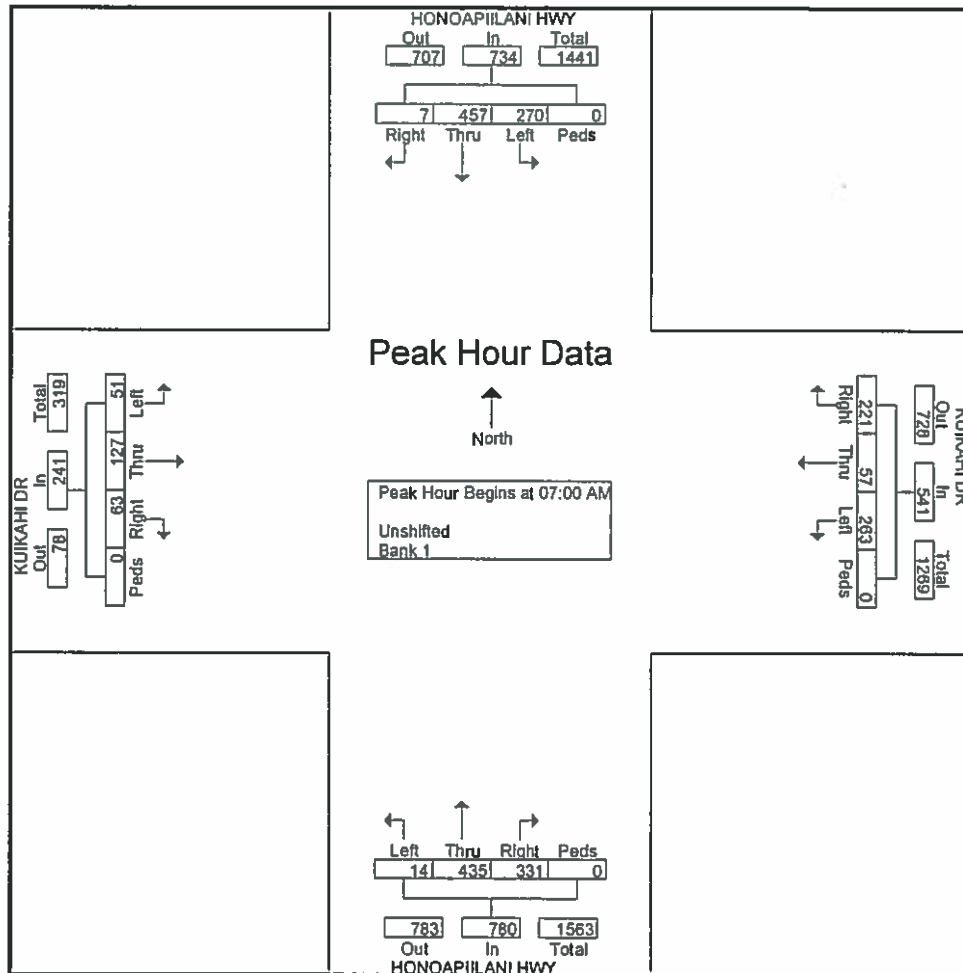
File Name : AM\_Honoapiilani Hwy - Kuikahi Dr\_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KUIKAHI DR Westbound					HONOAPIILANI HWY Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:45 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	57	126	1	0	184	63	13	60	0	136	0	95	79	0	174	8	29	15	0	52	546
07:15 AM	61	96	1	0	158	55	14	70	0	139	3	112	86	0	201	20	48	9	0	77	575
07:30 AM	79	132	2	0	213	71	8	57	0	136	6	136	88	0	235	16	25	29	0	72	658
07:45 AM	73	103	3	0	179	74	22	34	0	130	3	89	78	0	170	5	25	10	0	40	519
Total Volume	270	457	7	0	734	263	57	221	0	541	14	435	331	0	780	51	127	63	0	241	2298
% App. Total	36.8	62.3	1	0		48.6	10.5	40.9	0		1.8	55.8	42.4	0		21.2	52.7	26.1	0		
PHF	.854	.866	.583	.000	.862	.889	.648	.789	.000	.973	.438	.782	.940	.000	.830	.638	.661	.543	.000	.782	.875



501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031  
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Honoapiilani Hwy - Kuikahi Dr\_Maui Lani Pkwy

Site Code : 00000000

**Start Date : 3/15/2017**

Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

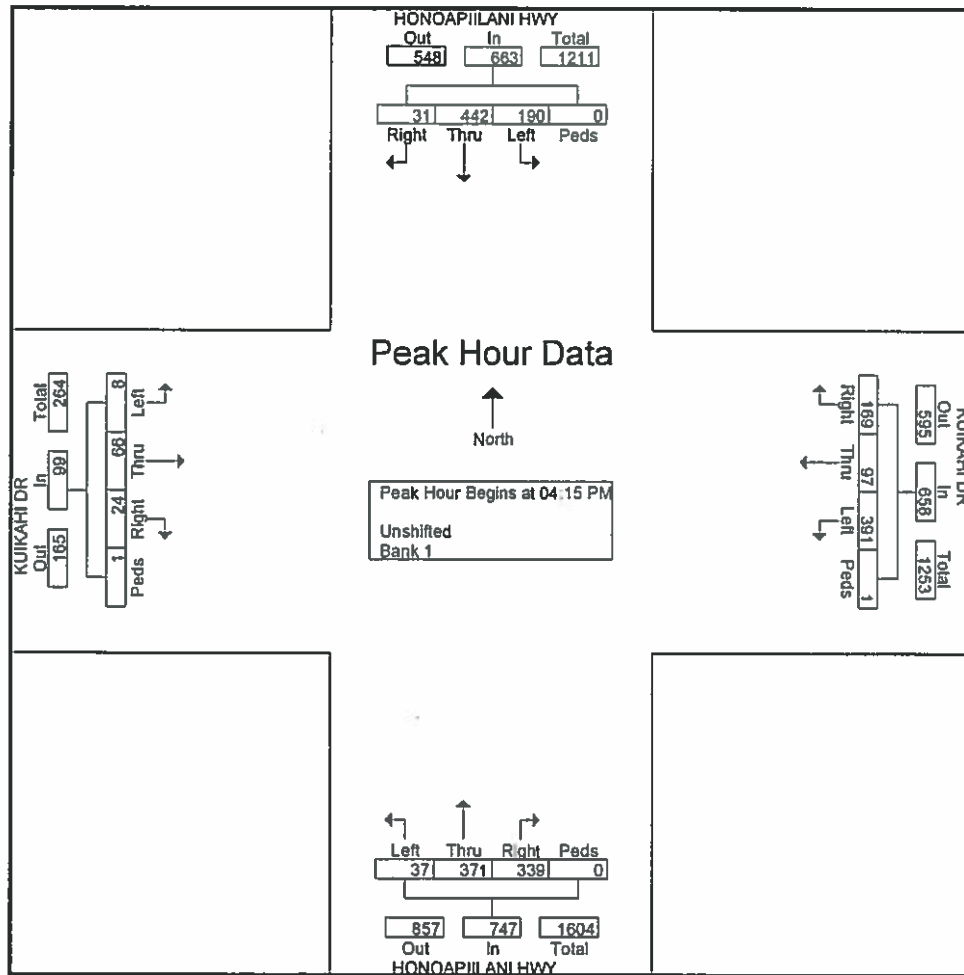
File Name : PM\_Honoapiilani Hwy - Kuikahi Dr\_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					KUIKAHI DR Westbound					HONOAPIILANI HWY Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	60	100	8	0	168	92	29	42	0	163	6	107	98	0	211	1	15	7	0	23	565
04:30 PM	47	134	8	0	189	97	29	41	0	167	7	100	88	0	195	2	17	8	1	28	579
04:45 PM	48	105	11	0	164	103	17	41	1	162	14	79	73	0	166	2	15	2	0	19	511
05:00 PM	35	103	4	0	142	99	22	45	0	166	10	85	80	0	175	3	19	7	0	29	512
Total Volume	190	442	31	0	663	391	97	169	1	658	37	371	339	0	747	8	66	24	1	99	2167
% App. Total	28.7	66.7	4.7	0		59.4	14.7	25.7	0.2		5	49.7	45.4	0		8.1	66.7	24.2	1		
PHF	.792	.825	.705	.000	.877	.949	.836	.939	.250	.985	.661	.867	.865	.000	.885	.667	.868	.750	.250	.853	.936



501 Sumner Street, Suite 521  
Honolulu, HI 96817  
Phone: (808) 533-3646 Fax: (808) 526-1267

Page No : 1

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

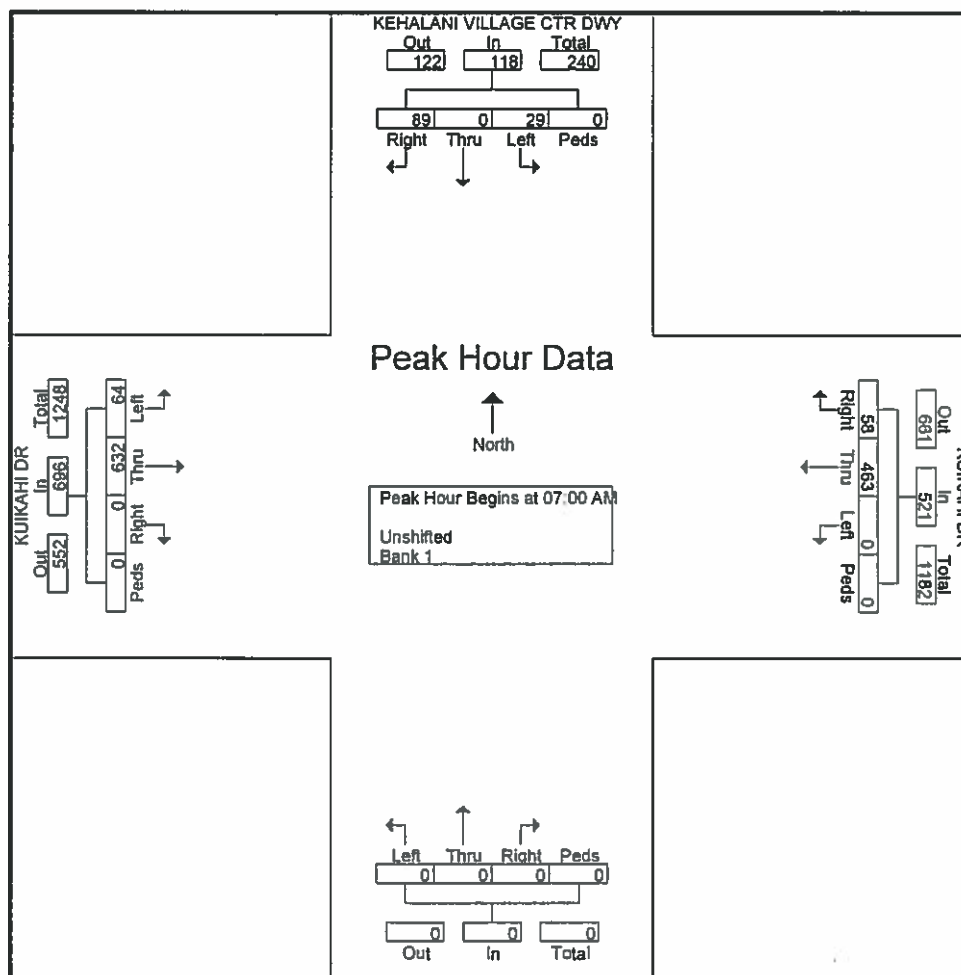
File Name : AM\_Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	KEHALANI VILLAGE CTR DWY Southbound					KUIKAHI DR Westbound					Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	6	0	18	0	24	0	119	18	0	135	0	0	0	0	0	13	164	0	0	177	338
07:15 AM	5	0	21	0	26	0	127	13	0	140	0	0	0	0	0	16	188	0	0	184	350
07:30 AM	6	0	27	0	33	0	120	13	0	133	0	0	0	0	0	22	148	0	0	168	334
07:45 AM	12	0	23	0	35	0	97	18	0	113	0	0	0	0	0	13	154	0	0	167	315
Total Volume	29	0	89	0	118	0	463	58	0	521	0	0	0	0	0	64	632	0	0	696	1335
% App. Total	24.6	0	75.4	0		0	89.9	11.1	0		0	0	0	0	0	9.2	90.8	0	0		
PHF	.604	.000	.824	.000	.843	.000	.911	.008	.000	.930	.000	.000	.000	.000	.000	.727	.940	.000	.000	.946	.954



	KAMEHAMEHA AVE Southbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				MAUI LANI PKWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
09:00 AM	6	0	11	0	0	94	9	0	0	0	0	0	12	93	0	0	225
09:15 AM	6	0	13	0	0	71	7	0	0	0	0	0	13	84	0	0	194
09:30 AM	4	0	5	0	0	25	6	0	0	0	0	0	11	45	0	0	96
09:45 AM	6	0	14	0	0	59	5	0	0	0	0	0	10	69	0	0	163
Total	22	0	43	0	0	249	27	0	0	0	0	0	46	291	0	0	678
10:00 AM	9	0	18	0	0	93	15	0	0	0	0	0	11	133	0	0	279
10:15 AM	8	0	13	0	0	72	23	0	0	0	0	0	12	100	0	0	228
10:30 AM	14	0	17	0	0	69	16	0	0	0	0	0	16	80	0	0	212
10:45 AM	8	0	22	0	0	59	13	0	0	0	0	0	10	85	0	0	197
Total	39	0	70	0	0	293	67	0	0	0	0	0	49	398	0	0	916
11:00 AM	8	0	16	0	0	68	9	0	0	0	0	0	19	77	0	0	197
11:15 AM	10	0	18	0	0	74	7	0	0	0	0	0	25	84	0	0	218
11:30 AM	11	0	24	0	0	82	7	0	0	0	0	0	20	74	0	0	218
11:45 AM	13	0	17	0	0	94	13	0	0	0	0	0	20	97	0	0	254
Total	42	0	75	0	0	318	36	0	0	0	0	0	84	332	0	0	887
12:00 PM	13	0	21	0	0	84	16	0	0	0	0	0	16	89	0	0	239
12:15 PM	4	0	19	0	0	73	9	0	0	0	0	0	13	67	0	0	185
12:30 PM	6	0	26	0	0	76	20	0	0	0	0	0	17	78	0	0	223
12:45 PM	5	0	14	1	0	84	15	0	0	0	0	0	17	80	0	0	216
Total	28	0	80	1	0	317	60	0	0	0	0	0	63	314	0	0	863
01:00 PM	4	0	20	0	0	79	16	0	0	0	0	0	13	81	0	0	213
01:15 PM	4	0	25	0	0	81	6	0	0	0	0	0	15	110	0	0	241
01:30 PM	5	0	30	0	0	80	7	0	0	0	0	0	12	106	0	0	240
01:45 PM	6	0	13	0	0	88	15	0	0	0	0	0	24	89	0	0	235
Total	19	0	88	0	0	328	44	0	0	0	0	0	64	386	0	0	929
02:00 PM	3	0	8	0	0	50	5	0	0	0	0	0	13	55	0	0	134
02:15 PM	11	0	20	0	0	105	16	0	0	0	0	0	19	129	0	0	300
Grand Total	164	0	384	1	0	1660	255	0	0	0	0	0	338	1905	0	0	4707
Apprch %	29.9	0	69.9	0.2	0	86.7	13.3	0	0	0	0	0	15.1	84.9	0	0	
Total %	3.5	0	8.2	0	0	35.3	5.4	0	0	0	0	0	7.2	40.5	0	0	
Unshifted	164	0	384	1	0	1660	255	0	0	0	0	0	338	1905	0	0	4707
% Unshifted	100	0	100	100	0	100	100	0	0	0	0	0	100	100	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

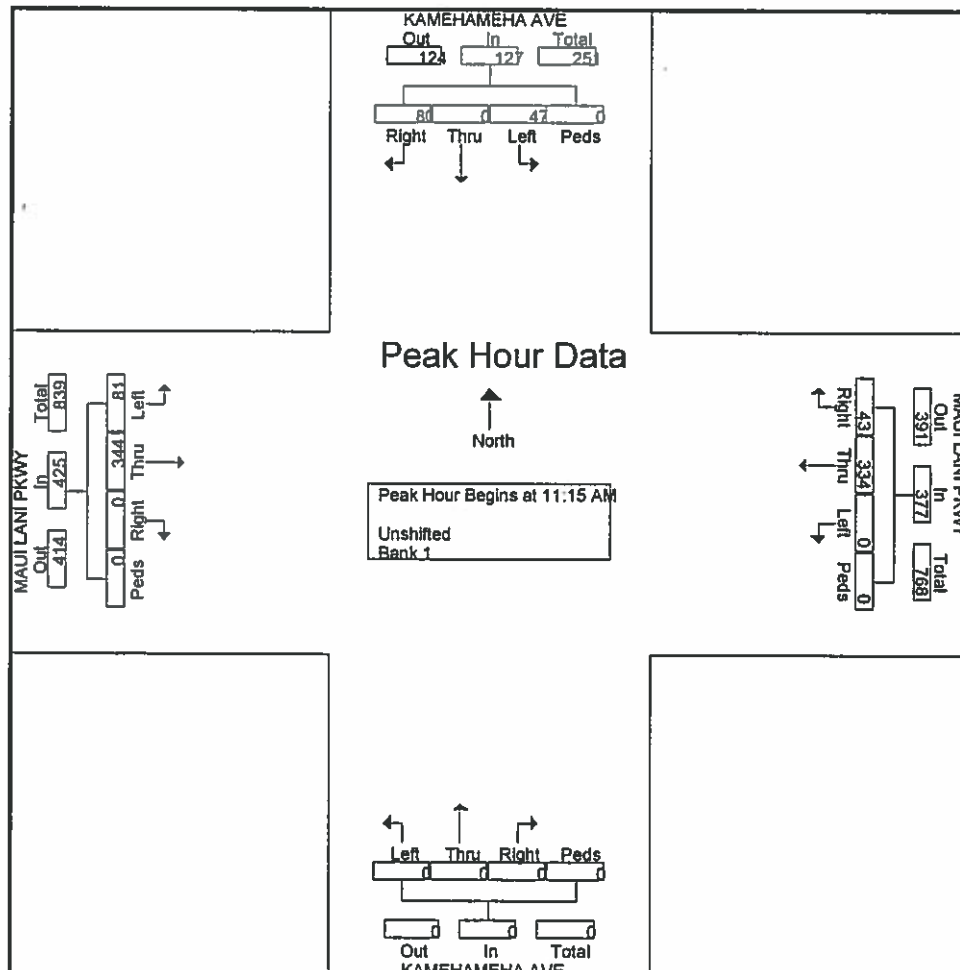
File Name : MD\_Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/16/2017

Page No : 2

	KAMEHAMEHA AVE Southbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					MAUI LANI PKWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 09:00 AM to 02:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	10	0	18	0	28	0	74	7	0	81	0	0	0	0	0	25	84	0	0	109	218
11:30 AM	11	0	24	0	35	0	82	7	0	89	0	0	0	0	0	20	74	0	0	94	218
11:45 AM	13	0	17	0	30	0	94	13	0	107	0	0	0	0	0	20	97	0	0	117	254
12:00 PM	13	0	21	0	34	0	84	16	0	100	0	0	0	0	0	16	89	0	0	105	239
Total Volume	47	0	80	0	127	0	334	43	0	377	0	0	0	0	0	81	344	0	0	425	929
% App. Total	37	0	63	0		0	88.6	11.4	0		0	0	0	0		19.1	80.9	0	0		
PHF	.904	.000	.833	.000	.907	.000	.888	.672	.000	.881	.000	.000	.000	.000	.000	.810	.887	.000	.000	.908	.914





[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

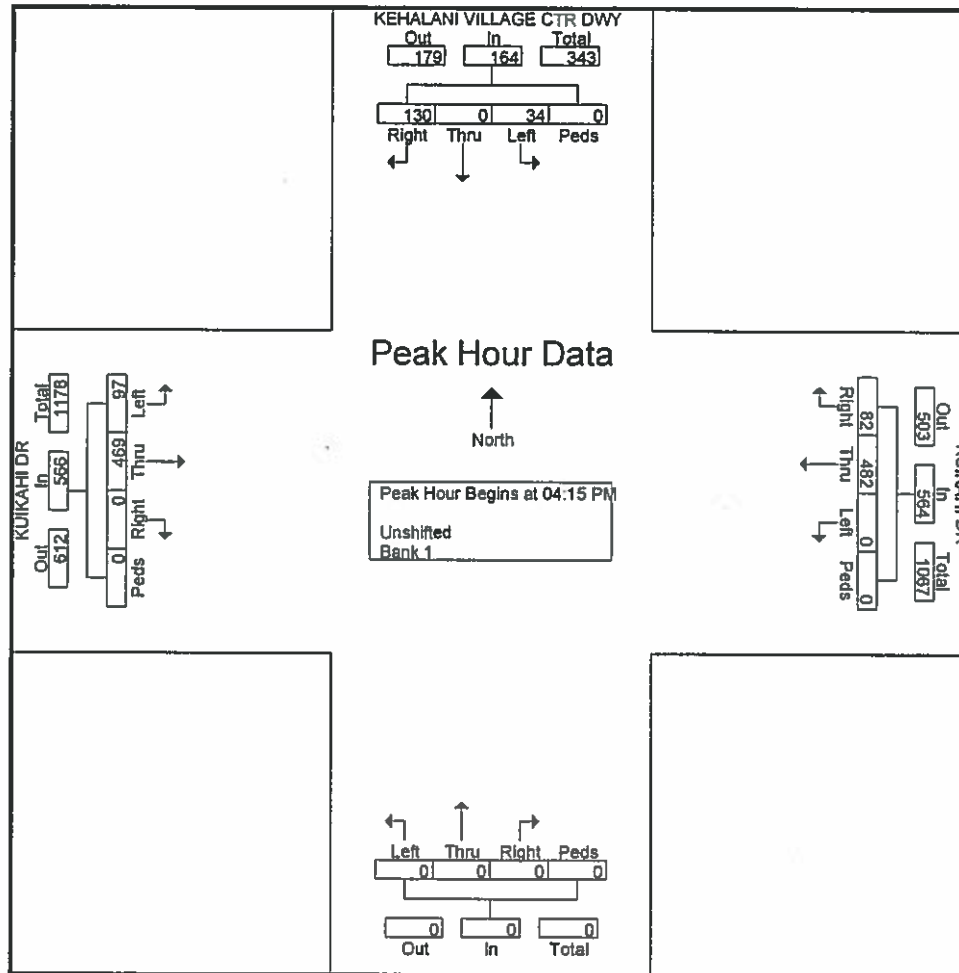
File Name : PM\_Kehalani Village Ctr Dwy - Kuikahi Dr

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	KEHALANI VILLAGE CTR DWY Southbound					KUIKAHI DR Westbound					Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	4	0	30	0	34	0	122	20	0	142	0	0	0	0	0	21	148	0	0	167	343
04:30 PM	7	0	33	0	40	0	115	22	0	137	0	0	0	0	0	30	113	0	0	143	320
04:45 PM	12	0	28	0	40	0	125	22	0	147	0	0	0	0	0	21	109	0	0	130	317
05:00 PM	11	0	30	0	50	0	120	18	0	138	0	0	0	0	0	25	101	0	0	126	314
Total Volume	34	0	130	0	164	0	482	82	0	564	0	0	0	0	0	97	469	0	0	566	1294
% App. Total	20.7	0	79.3	0		0	85.5	14.5	0		0	0	0	0	0	17.1	82.9	0	0		
PHF	.708	.000	.833	.000	.820	.000	.964	.932	.000	.959	.000	.000	.000	.000	.000	.808	.803	.000	.000	.847	.943



## Page No : 1

[illegible]

# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: 533-3646 Fax: 526-1267

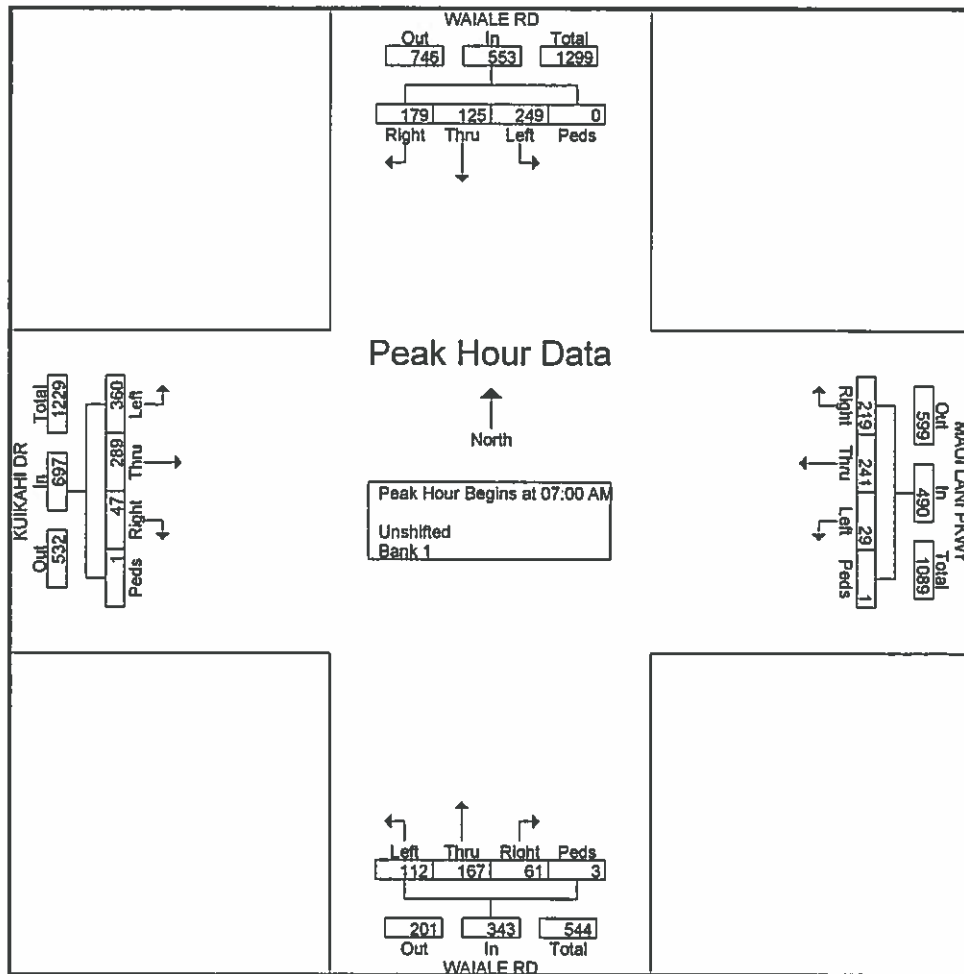
File Name : AM\_Waiale Rd - Kuikahi Dr\_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					MAUI LANI PKWY Westbound					WAIALE RD Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	52	27	51	0	130	6	68	50	0	124	24	31	13	1	69	88	57	8	1	155	478
07:15 AM	85	35									40	81	20		121	93	83	11	0	187	540
07:30 AM	80	33	42	0	155	7	60	58	0	125	37	44	18	2	99	88	88	15	0	189	548
07:45 AM	72	30	60	0	162	8	58	68	1	127	11	31	12	0	54	90	83	13	0	186	519
Total Volume	249	125	179	0	553	29	241	219	1	490	112	167	61	3	343	380	289	47	1	697	2083
% App. Total	45	22.6	32.4	0		5.9	49.2	44.7	0.2		32.7	48.7	17.8	0.9		51.6	41.5	6.7	0.1		
PHF	.865	.893	.877	.000	.910	.808	.886	.928	.250	.965	.700	.884	.783	.375	.709	.968	.840	.783	.250	.822	.954



	<b>WAIALE RD Southbound</b>				<b>MAUI LANI PKWY Westbound</b>					<b>WAIALE RD Northbound</b>					<b>KUIKAHI DR Eastbound</b>				
<b>Start Time</b>	<b>Left</b>	<b>Thru</b>	<b>Right</b>	<b>Peds</b>	<b>Left</b>	<b>Thru</b>	<b>Right</b>	<b>Peds</b>		<b>Left</b>	<b>Thru</b>	<b>Right</b>	<b>Peds</b>		<b>Left</b>	<b>Thru</b>	<b>Right</b>	<b>Peds</b>	<b>Int. Total</b>
03:30 PM	71	35	48	0	18	86	58	1		5	51	24	0		61	73	10	0	535
03:45 PM	75	40	52	0	8	77	57	0		12	33	7	0		84	44	12	0	481
Total	146	75	98	0	24	163	113	1		17	84	31	0		125	117	22	0	1016
04:00 PM	73	40	57	0	17	75	77	0		10	40	8	0		57	40	7	0	501
04:15 PM	64	35	44	0	20	81	48	0		10	29	10	0		67	60	9	0	477
04:30 PM	73	48	67	0	15	78	71	4		10	30	6	0		72	44	13	0	527
04:45 PM	68	45	81	0	15	82	62	1		13	28	10	0		59	53	18	0	515
Total	278	168	229	0	67	314	258	5		43	127	34	0		255	167	47	0	2020
05:00 PM	78	37	81	0	15	68	58	0		13	23	7	0		51	38	15	2	464
05:15 PM	55	32	35	0	10	62	55	0		8	28	13	0		64	35	11	2	408
Grand Total	557	310	423	0	116	607	482	6		79	282	85	0		485	387	95	4	3908
Approch %	43.2	24	32.8	0	9.6	50.1	39.8	0.5		18.5	61.5	20	0		50.5	39.4	9.7	0.4	
Total %	14.3	7.9	10.8	0	3	15.5	12.3	0.2		2	8.7	2.2	0		12.7	9.9	2.4	0.1	
Unshifted	557	310	423	0	118	607	482	6		79	282	85	0		485	387	95	4	3908
% Unshifted	100	100	100	0	100	100	100	100		100	100	100	0		100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0		0	0	0	0		0	0	0	0	0

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

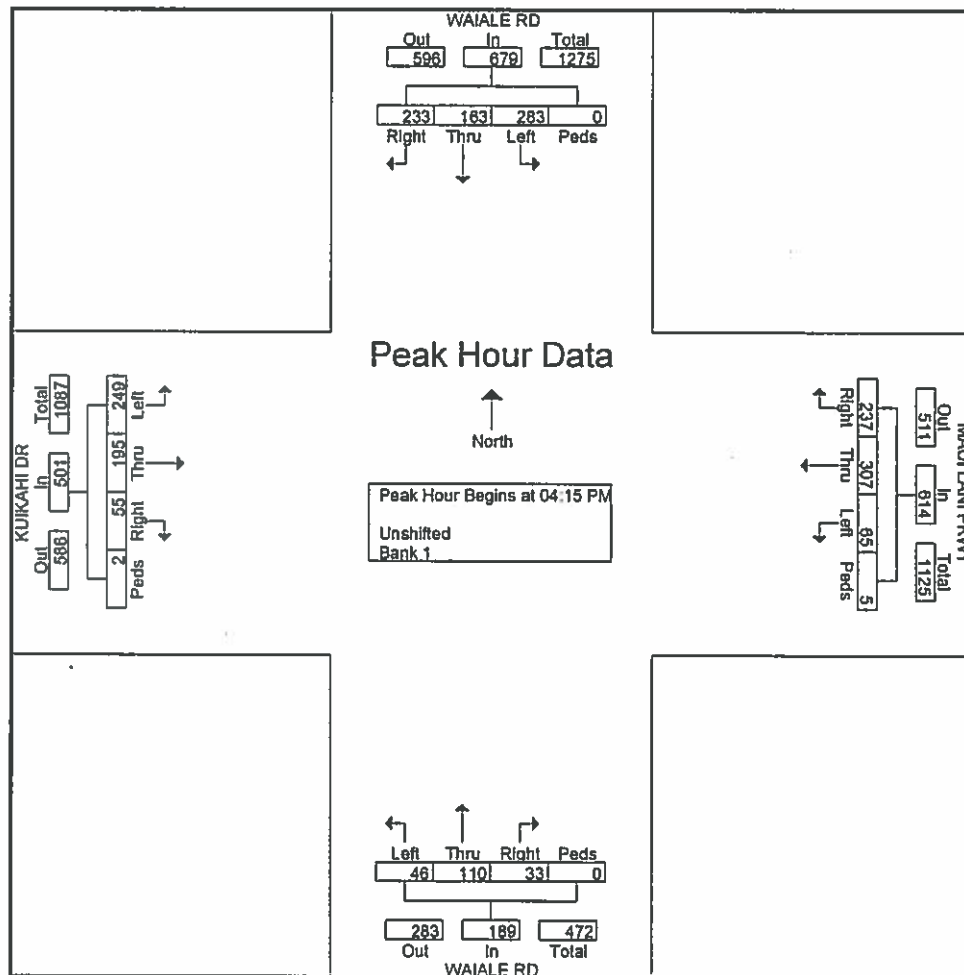
File Name : PM\_Waiale Rd - Kuikahi Dr\_Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					MAUI LANI PKWY Westbound					WAIALE RD Northbound					KUIKAHI DR Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	64	35	44	0	143	20	61	48	0	149	10	29	10	0	49	67	80	9	0	156	477
04:30 PM	73	48	67	0	188	15	76	71	4	166	10	30	6	0	46	72	44	13	0	129	527
04:45 PM	68	45	61	0	174	15	82	62	1	160	13	28	10	0	51	59	53	18	0	130	515
05:00 PM	78	37	61	0	176	15	68	56	0	139	13	23	7	0	43	51	38	15	2	108	464
Total Volume	283	163	233	0	679	65	307	237	5	614	46	110	33	0	189	249	195	55	2	501	1983
% App. Total	41.7	24	34.3	0		10.6	50	38.6	0.8		24.3	58.2	17.5	0		49.7	38.9	11	0.4		
PHF	.907	.886	.869	.000	.913	.813	.936	.835	.313	.925	.885	.917	.825	.000	.926	.865	.813	.764	.250	.921	.941



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Kamehameha Ave – Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 1

## Groups Printed- Unshifted

Start Time	MAUI LANI PKWY Eastbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				KAMEHAMEHA AVE Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	39	52	4	1	4	38	21	0	16	17	9	0	71	5	54	0	331
06:45 AM	49	39	11	8	12	53	25	0	19	20	11	0	53	21	51	0	372
Total	88	91	15	9	16	91	46	0	35	37	20	0	124	26	105	0	703
07:00 AM	35	30	33	4	15	34	23	0	42	38	18	1	58	44	50	0	425
07:15 AM	32	23	32	15	14	38	44	0	65	78	16	0	17	47	40	0	461
07:30 AM	41	29	28	4	16	27	29	0	38	72	22	0	31	67	32	0	436
07:45 AM	45	34	8	2	5	48	31	0	31	53	15	4	63	21	81	0	441
Total	153	116	101	25	50	147	127	0	176	241	71	5	169	179	203	0	1763
08:00 AM	43	37	4	0	3	52	22	0	14	17	8	0	47	11	45	0	303
08:15 AM	40	56	12	2	6	42	34	0	10	13	7	1	37	7	49	0	316
Grand Total	324	300	132	36	75	332	229	0	235	308	106	6	377	223	402	0	3085
Apprch %	40.9	37.9	16.7	4.5	11.8	52.2	36	0	35.9	47	16.2	0.9	37.6	22.3	40.1	0	
Total %	10.5	9.7	4.3	1.2	2.4	10.8	7.4	0	7.6	10	3.4	0.2	12.2	7.2	13	0	



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

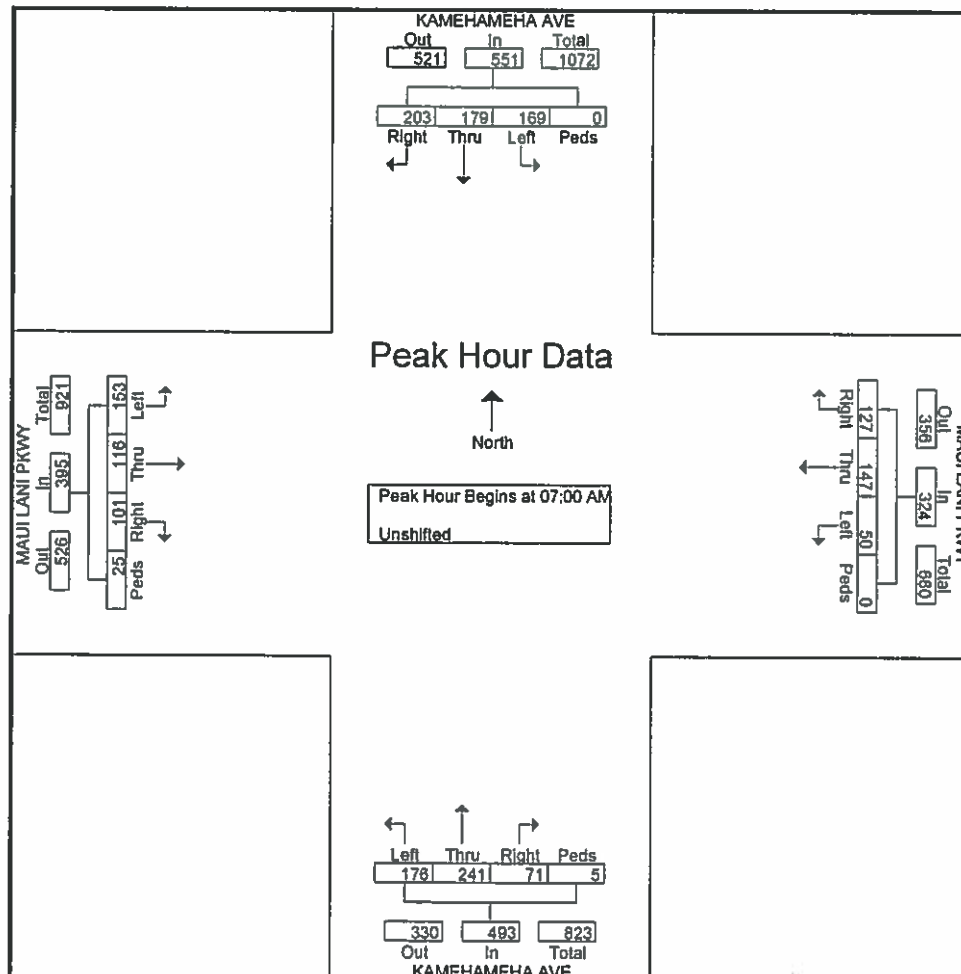
File Name : AM\_Kamehameha Ave – Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 2

	MAUI LANI PKWY Eastbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					KAMEHAMEHA AVE Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	35	30	33	4	102	15	34	23	0	72	42	38	18	1	99	58	44	50	0	152	425
07:15 AM	32	23	32	15	102	14	38	44	0	96	65	78	16	0	159	17	47	40	0	104	461
07:30 AM	41	29	28	4	102	16	27	29	0	72	38	72	22	0	132	31	67	32	0	130	436
07:45 AM	45	34	8	2	89	5	48	31	0	84	31	53	15	4	103	63	21	81	0	165	441
Total Volume	153	116	101	25	395	50	147	127	0	324	176	241	71	5	493	169	179	203	0	551	1763
% App. Total	38.7	29.4	25.6	6.3		15.4	45.4	39.2	0		35.7	48.9	14.4	1		30.7	32.5	36.8	0		
PHF	.850	.853	.765	.417	.968	.781	.766	.722	.000	.844	.677	.772	.807	.313	.775	.671	.668	.627	.000	.835	.956



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Kamehameha Ave - Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 1

Groups Printed- Unshifted

	MAUI LANI PKWY Eastbound				MAUI LANI PKWY Westbound				KAMEHAMEHA AVE Northbound				KAMEHAMEHA AVE Southbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:30 PM	47	44	13	1	6	59	40	0	23	21	10	0	40	32	58	0	394
03:45 PM	46	43	14	1	12	47	45	0	24	26	8	0	34	35	71	0	406
Total	93	87	27	2	18	106	85	0	47	47	18	0	74	67	129	0	800
04:00 PM	44	43	21	3	12	46	48	0	18	35	9	0	33	32	67	0	411
04:15 PM	51	39	26	1	10	52	55	0	15	24	13	0	27	29	60	0	402
04:30 PM	52	46	15	0	14	40	50	0	17	26	8	0	30	24	71	0	393
04:45 PM	43	44	18	0	15	37	50	0	17	22	4	0	59	32	70	0	411
Total	190	172	80	4	51	175	203	0	67	107	34	0	149	117	268	0	1617
05:00 PM	60	42	16	0	7	48	53	0	13	27	2	0	37	27	54	0	386
05:15 PM	41	52	17	1	15	51	42	0	16	13	5	1	42	24	53	0	373
Grand Total	384	353	140	7	91	380	383	0	143	194	59	1	302	235	504	0	3176
Apprch %	43.4	39.9	15.8	0.8	10.7	44.5	44.8	0	36	48.9	14.9	0.3	29	22.6	48.4	0	
Total %	12.1	11.1	4.4	0.2	2.9	12	12.1	0	4.5	6.1	1.9	0	9.5	7.4	15.9	0	

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

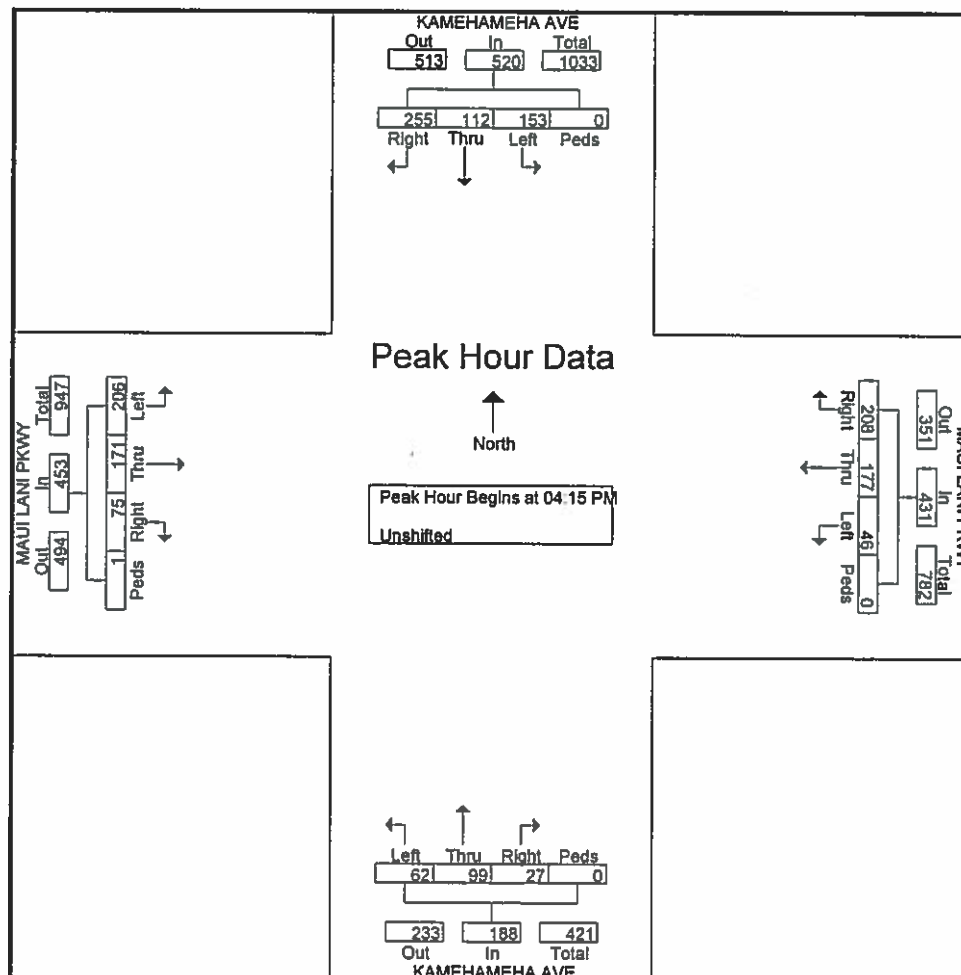
File Name : PM\_Kamehameha Ave - Maui Lani Pkwy

Site Code : 00000000

Start Date : 3/16/2017

Page No : 2

	MAUI LANI PKWY Eastbound					MAUI LANI PKWY Westbound					KAMEHAMEHA AVE Northbound					KAMEHAMEHA AVE Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	51	39	26	1	117	10	52	55	0	117	15	24	13	0	52	27	29	60	0	116	402
04:30 PM	52	46	15	0	113	14	40	50	0	104	17	26	8	0	51	30	24	71	0	125	393
04:45 PM	43	44	18	0	105	15	37	50	0	102	17	22	4	0	43	59	32	70	0	161	411
05:00 PM	60	42	16	0	118	7	48	53	0	108	13	27	2	0	42	37	27	54	0	118	386
Total Volume	206	171	75	1	453	46	177	208	0	431	62	99	27	0	188	153	112	255	0	520	1592
% App. Total	45.5	37.7	16.6	0.2		10.7	41.1	48.3	0		33	52.7	14.4	0		29.4	21.5	49	0		
PHF	.858	.929	.721	.250	.960	.767	.851	.945	.000	.921	.912	.917	.519	.000	.904	.648	.875	.898	.000	.807	.968



501 Sumner Street, Suite 521  
Honolulu, HI 96817  
Phone: (808) 533-3646 Fax: (808) 526-1267

Page No : 1

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

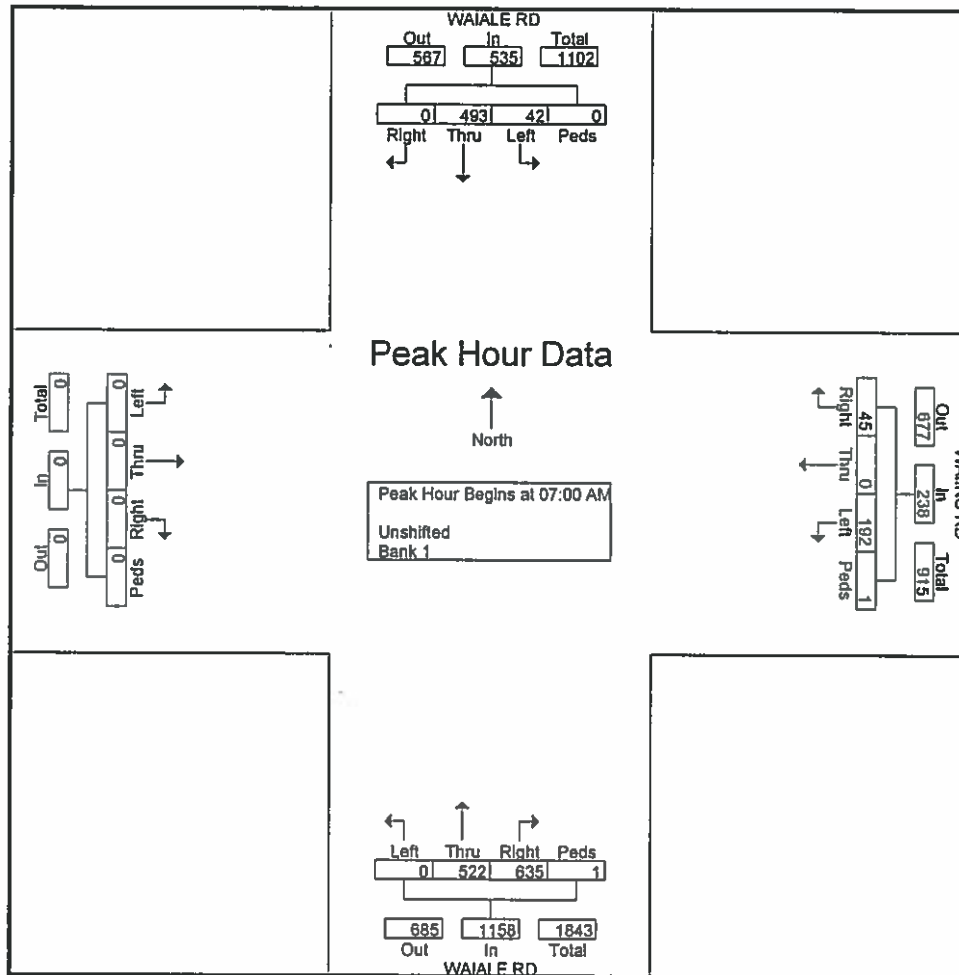
File Name : AM\_Waiale Rd - Waiinu Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIINU RD Westbound					WAIALE RD Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	14	100	0	0	114	50	0	7	0	57	0	117	123	0	240	0	0	0	0	0	411
07:15 AM	6	140	0	0	146	41	0	12	0	53	0	120	168	0	288	0	0	0	0	0	485
07:30 AM	13	122	0	0	135	53	0	19	1	73	0	148	182	0	331	0	0	0	0	0	536
07:45 AM	9	131	0	0	140	48	0	7	0	55	0	136	164	1	301	0	0	0	0	0	498
Total Volume	42	493	0	0	535	192	0	45	1	238	0	522	635	1	1158	0	0	0	0	0	1931
% App. Total	7.9	92.1	0	0		80.7	0	18.9	0.4		0	45.1	54.8	0.1		0	0	0	0	0	
PHF	.750	.880	.000	.000	.918	.908	.000	.592	.250	.815	.000	.878	.872	.250	.875	.000	.000	.000	.000	.000	.898



501 Sumner Street, Suite 521  
Honolulu, HI 96817  
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Waiale Rd - Waiinu Rd  
Site Code : 00000000  
Start Date : 3/15/2017  
Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

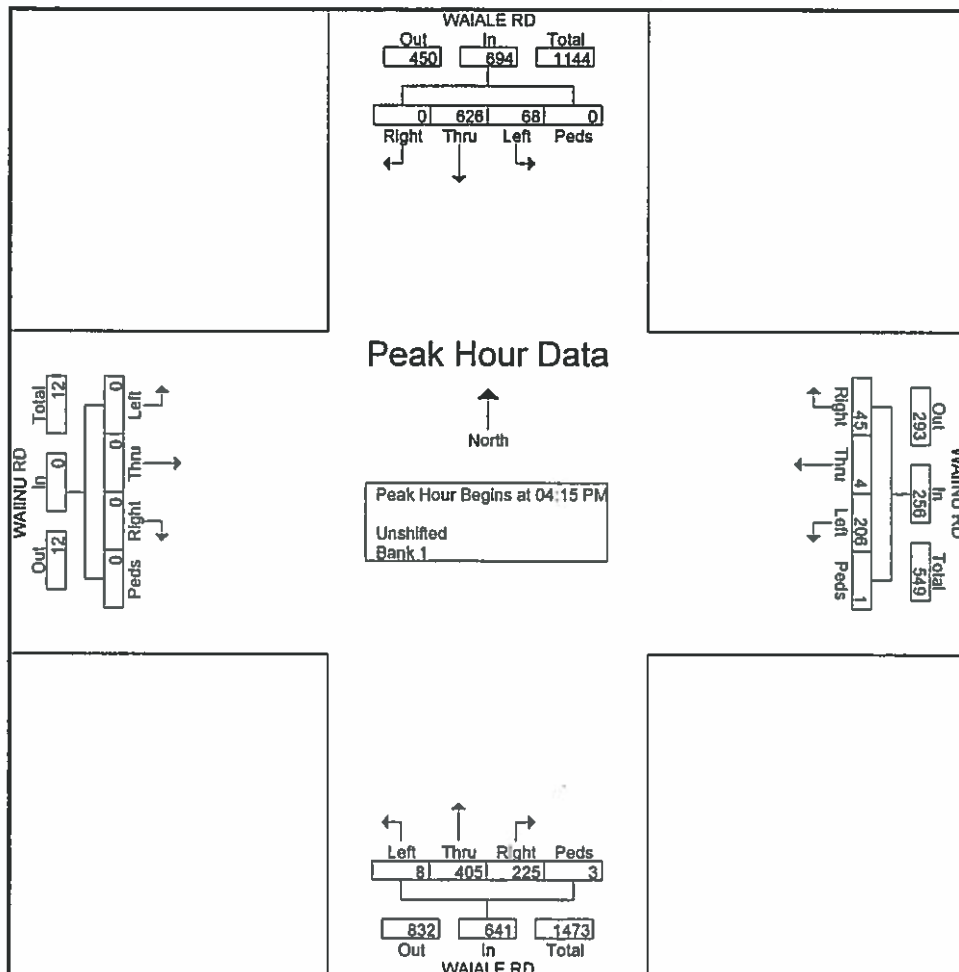
File Name : PM\_Waiale Rd - Waiinu Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIINU RD Westbound					WAIALE RD Northbound					WAIINU RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	13	137	0	0	150	54	1	14	0	69	8	115	51	0	172	0	0	0	0	0	391
04:30 PM	24	182	0	0	206	42	0	9	0	51	1	99	52	0	152	0	0	0	0	0	408
04:45 PM	17	143	0	0	160	48	2	7	1	58	0	109	59	0	168	0	0	0	0	0	388
05:00 PM	14	164	0	0	178	62	1	15	0	78	1	82	63	3	149	0	0	0	0	0	405
Total Volume	68	626	0	0	694	206	4	45	1	256	8	405	225	3	641	0	0	0	0	0	1591
% App. Total	9.8	90.2	0	0		80.5	1.6	17.6	0.4		1.2	63.2	35.1	0.5		0	0	0	0	0	
PHF	.708	.680	.000	.000	.842	.631	.500	.750	.250	.821	.333	.680	.893	.250	.932	.000	.000	.000	.000	.000	.972





[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

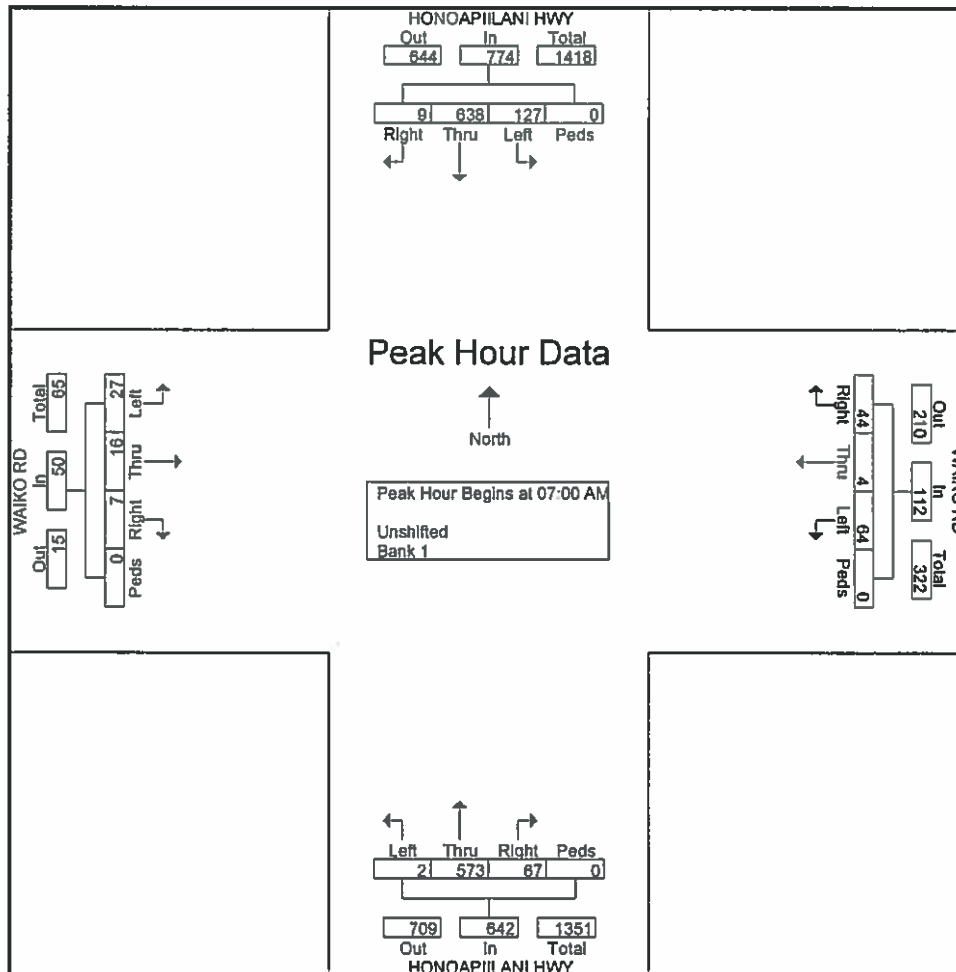
File Name : AM\_Honoapiilani Hwy - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					WAIKO RD Westbound					HONOAPIILANI HWY Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	18	162	1	0	181	19	0	5	0	24	0	130	11	0	141	6	7	0	0	13	359
07:15 AM	32	162	2	0	196	16	1	17	0	34	2	162	15	0	179	10	4	1	0	15	424
07:30 AM	48	153	2	0	204	17	2	13	0	32	0	162	21	0	183	6	4	4	0	14	433
07:45 AM	26	161	4	0	193	12	1	9	0	22	0	119	20	0	139	5	1	2	0	8	362
Total Volume	127	638	9	0	774	64	4	44	0	112	2	573	67	0	642	27	16	7	0	50	1578
% App. Total	16.4	82.4	1.2	0		57.1	3.6	39.3	0		0.3	89.3	10.4	0		54	32	14	0		
PHF	.848	.985	.583	.000	.949	.842	.500	.647	.000	.824	.250	.884	.798	.000	.877	.675	.571	.438	.000	.833	.911



[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

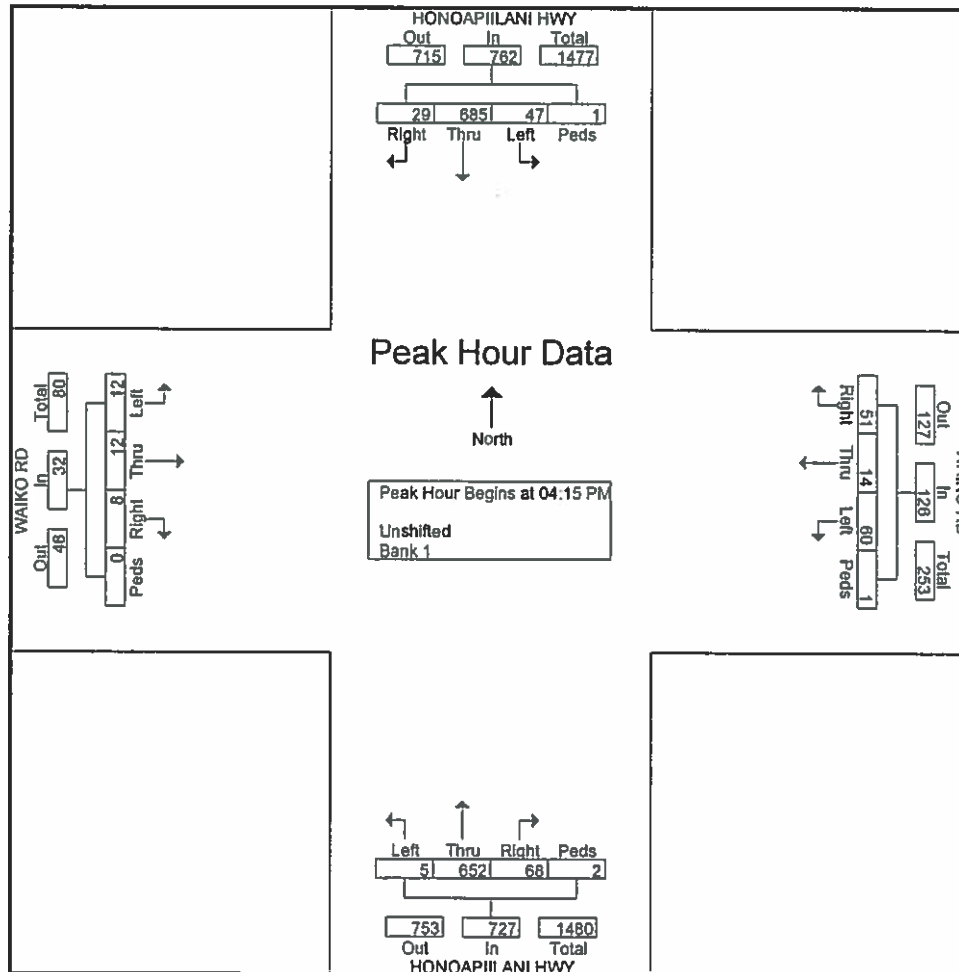
File Name : PM\_Honoapiilani Hwy - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	HONOAPIILANI HWY Southbound					WAIKO RD Westbound					HONOAPIILANI HWY Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	12	135	8	0	155	13	3	11	1	28	2	184	15	0	211	1	4	3	0	8	402
04:30 PM	9	198	8	1	215	7	4	14	0	25	0	182	17	0	179	3	3	4	0	10	429
04:45 PM	13	172	8	0	191	23	3	14	0	40	1	131	17	0	149	4	1	0	0	5	385
05:00 PM	13	182	8	0	201	17	4	12	0	33	2	165	19	2	186	4	4	1	0	9	431
Total Volume	47	685	29	1	762	60	14	51	1	126	5	652	68	2	727	12	12	8	0	32	1647
% App. Total	6.2	89.9	3.8	0.1		47.8	11.1	40.5	0.8		0.7	89.7	9.4	0.3		37.5	37.5	25	0		
PHF	.904	.874	.808	.250	.888	.852	.875	.911	.250	.788	.825	.840	.895	.250	.861	.750	.750	.500	.000	.800	.955



[illegible]

# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

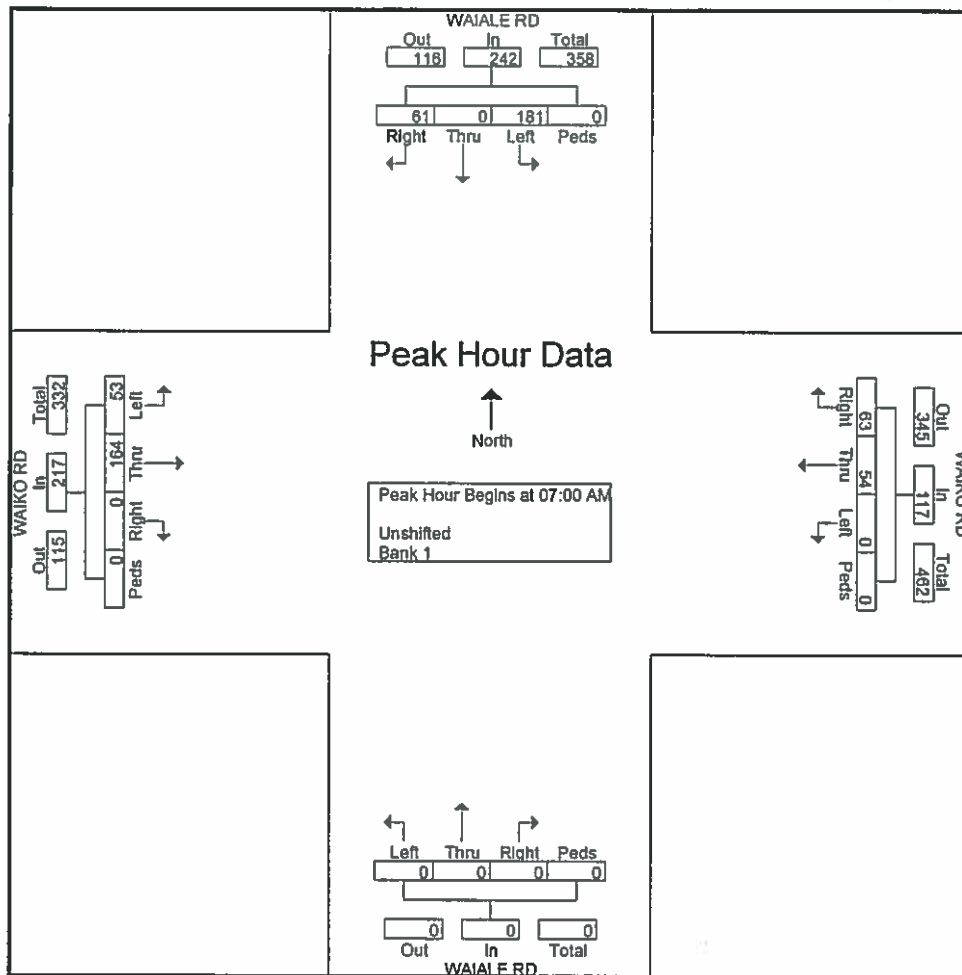
File Name : AM\_Waiale Rd - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIKOLE RD Southbound					WAIKOLE RD Westbound					WAIKOLE RD Northbound					WAIKOLE RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	37	0	19	0	56	0	8	17	0	25	0	0	0	0	0	8	23	0	0	29	108
07:15 AM	58	0	13	0	71	0	17	15	0	32	0	0	0	0	0	15	43	0	0	58	181
07:30 AM	43	0	14	0	57	0	14	17	0	31	0	0	0	0	0	16	57	0	0	73	181
07:45 AM	43	0	15	0	58	0	17	14	0	31	0	0	0	0	0	16	41	0	0	57	148
Total Volume	181	0	61	0	242	0	54	63	0	117	0	0	0	0	0	53	164	0	0	217	578
% App. Total	74.8	0	25.2	0		0	46.2	53.8	0		0	0	0	0	0	24.4	75.6	0	0		
PHF	.780	.000	.803	.000	.852	.000	.794	.928	.000	.914	.000	.000	.000	.000	.000	.828	.719	.000	.000	.743	.894



**AUSTIN TSUTSUMI & ASSOCIATES**

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Waiale Rd - Waiko Rd

Site Code : 00000000

**Start Date : 3/15/2017**

Page No : 1

**Groups Printed- Unshifted - Bank 1**

[illegible]



# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

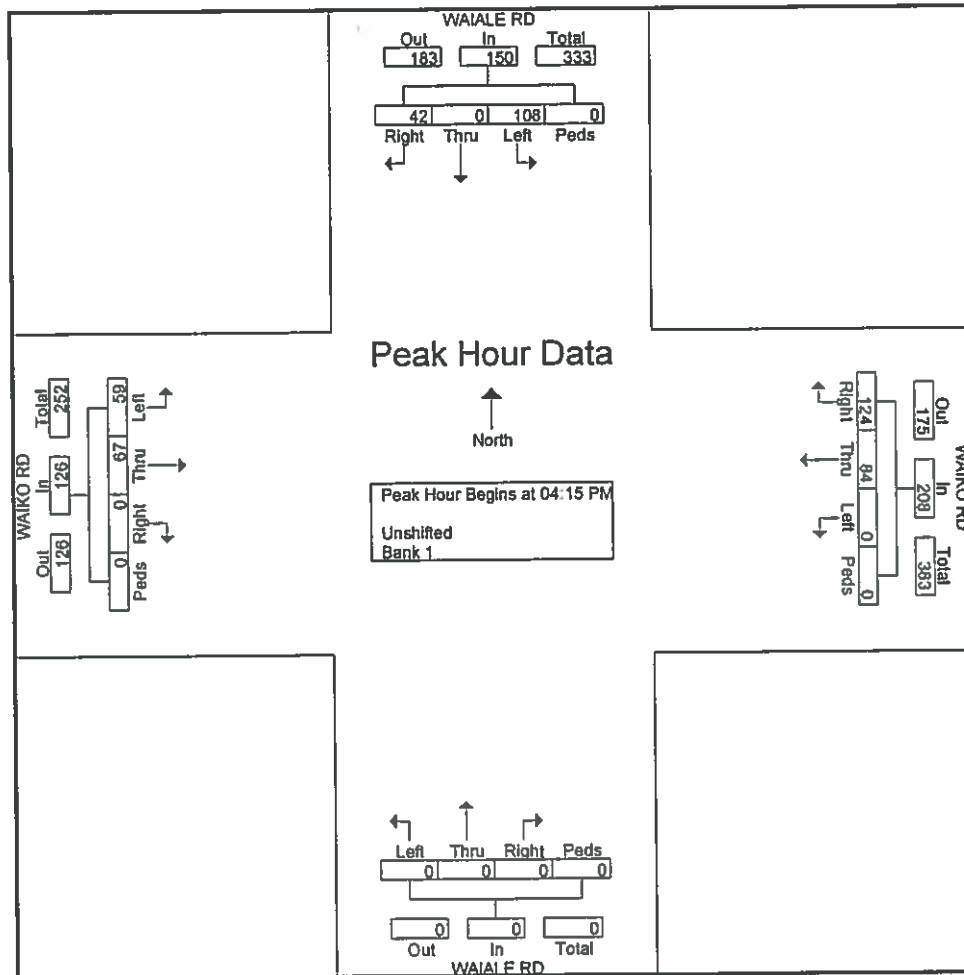
File Name : PM\_Waiale Rd - Waiko Rd

Site Code : 00000000

Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIKO RD Westbound					WAIALE RD Northbound					WAIKO RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	26	0	13	0	39	0	21	34	0	55	0	0	0	0	0	21	16	0	0	37	131
04:30 PM	36	0	5	0	41	0	15	35	0	50	0	0	0	0	0	12	14	0	0	26	117
04:45 PM	25	0	13	0	38	0	29	30	0	59	0	0	0	0	0	11	16	0	0	29	126
05:00 PM	21	0	11	0	32	0	19	25	0	44	0	0	0	0	0	15	19	0	0	34	110
Total Volume	108	0	42	0	150	0	84	124	0	208	0	0	0	0	0	59	67	0	0	126	484
% App. Total	72	0	28	0	100	0	40.4	59.6	0	100	0	0	0	0	0	46.8	53.2	0	0	100	100
PHF	.750	.000	.808	.000	.915	.000	.724	.886	.000	.881	.000	.000	.000	.000	.000	.702	.882	.000	.000	.851	.924





# AUSTIN TSUTSUMI & ASSOCIATES

501 Sumner Street, Suite 521

Honolulu, HI 96817

Phone: (808) 533-3646 Fax: (808) 526-1267

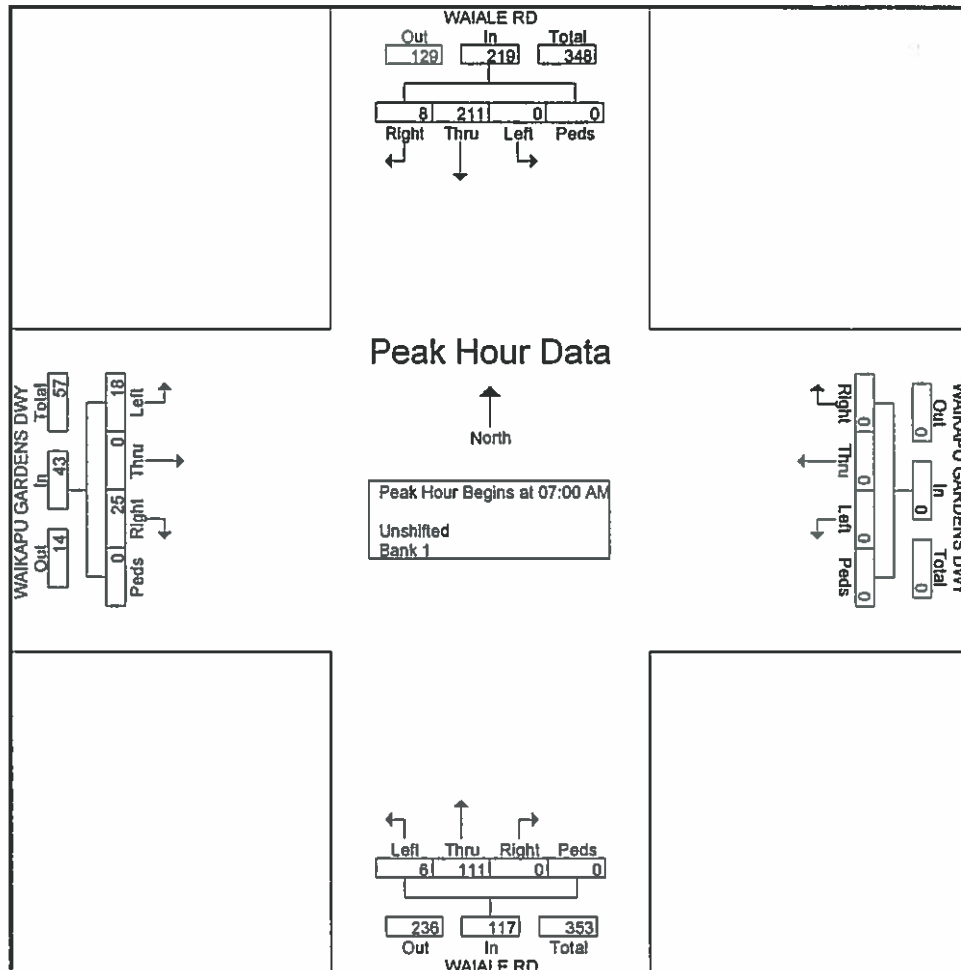
File Name : AM\_Waiale Rd - Waikapu Gardens Dwy

Site Code : 00000000

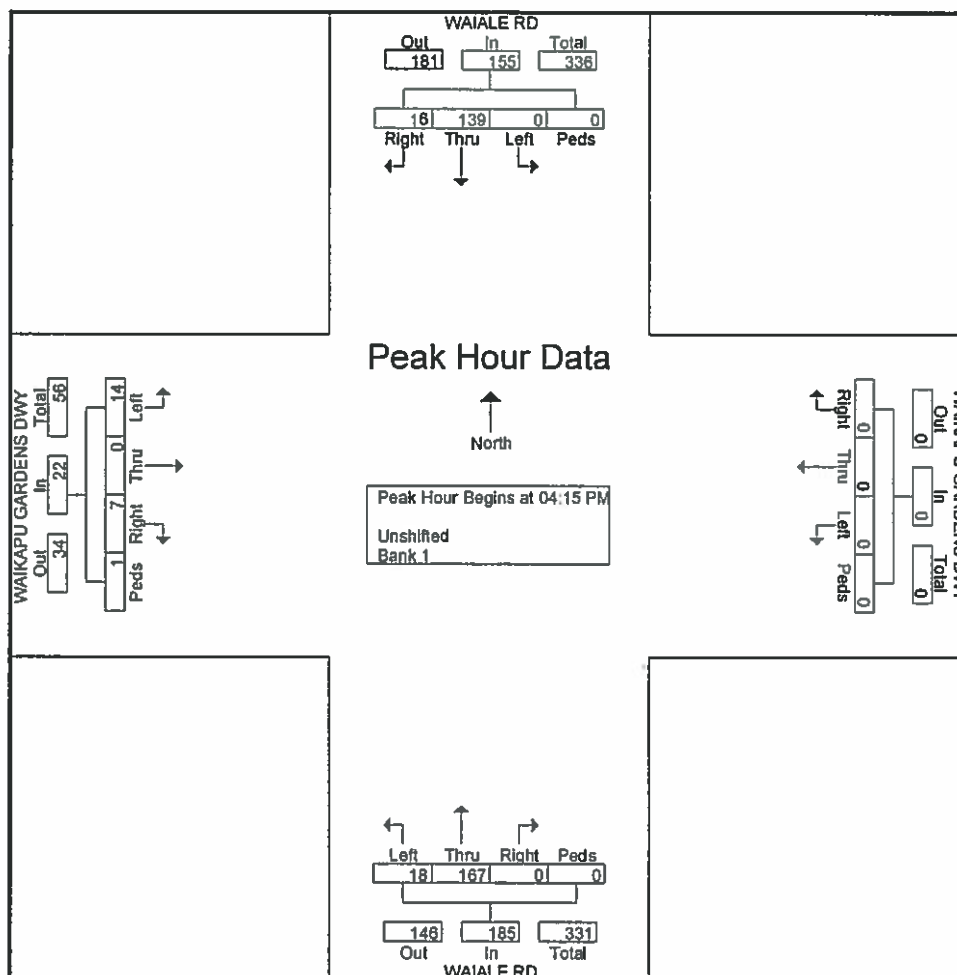
Start Date : 3/15/2017

Page No : 2

	WAIALE RD Southbound					WAIKAPU GARDENS DWY Westbound					WAIALE RD Northbound					WAIKAPU GARDENS DWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	46	2	0	48	0	0	0	0	0	0	24	0	0	24	4	0	10	0	14	86
07:15 AM	0	68	2	0	68	0	0	0	0	0	0	29	0	0	29	8	0	5	0	13	110
07:30 AM	0	50	2	0	52	0	0	0	0	0	2	31	0	0	33	3	0	3	0	6	91
07:45 AM	0	49	2	0	51	0	0	0	0	0	4	27	0	0	31	3	0	7	0	10	92
Total Volume	0	211	6	0	219	0	0	0	0	0	6	111	0	0	117	18	0	25	0	43	379
% App. Total	0	98.3	3.7	0		0	0	0	0		5.1	94.9	0	0		41.8	0	58.1	0		
PHF	.000	.799	1.00	.000	.805	.000	.000	.000	.000	.000	.375	.895	.000	.000	.886	.563	.000	.625	.000	.768	.881



[illegible]



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	NOKEKULA LP Eastbound				NOKEKULA LP Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	2	0	8	0	0	0	0	0	1	10	0	0	0	58	1	0	80
Total	2	0	8	0	0	0	0	0	1	10	0	0	0	58	1	0	80
07:00 AM	11	0	8	0	0	0	0	0	1	29	0	0	0	46	1	0	96
07:15 AM	6	0	2	0	0	0	0	0	1	25	0	0	0	48	0	0	82
07:30 AM	5	0	2	0	0	0	0	0	0	47	0	0	0	52	2	0	108
07:45 AM	2	0	7	0	0	0	0	0	1	21	0	0	0	48	5	0	84
Total	24	0	19	0	0	0	0	0	3	122	0	0	0	194	8	0	370
08:00 AM	3	0	1	0	0	0	0	0	1	19	0	0	0	25	3	0	52
08:15 AM	2	0	3	0	0	0	0	0	2	32	0	0	0	20	3	0	62
Grand Total	31	0	31	0	0	0	0	0	7	183	0	0	0	297	15	0	564
Apprch %	50	0	50	0	0	0	0	0	3.7	96.3	0	0	0	95.2	4.8	0	
Total %	5.5	0	5.5	0	0	0	0	0	1.2	32.4	0	0	0	52.7	2.7	0	

# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

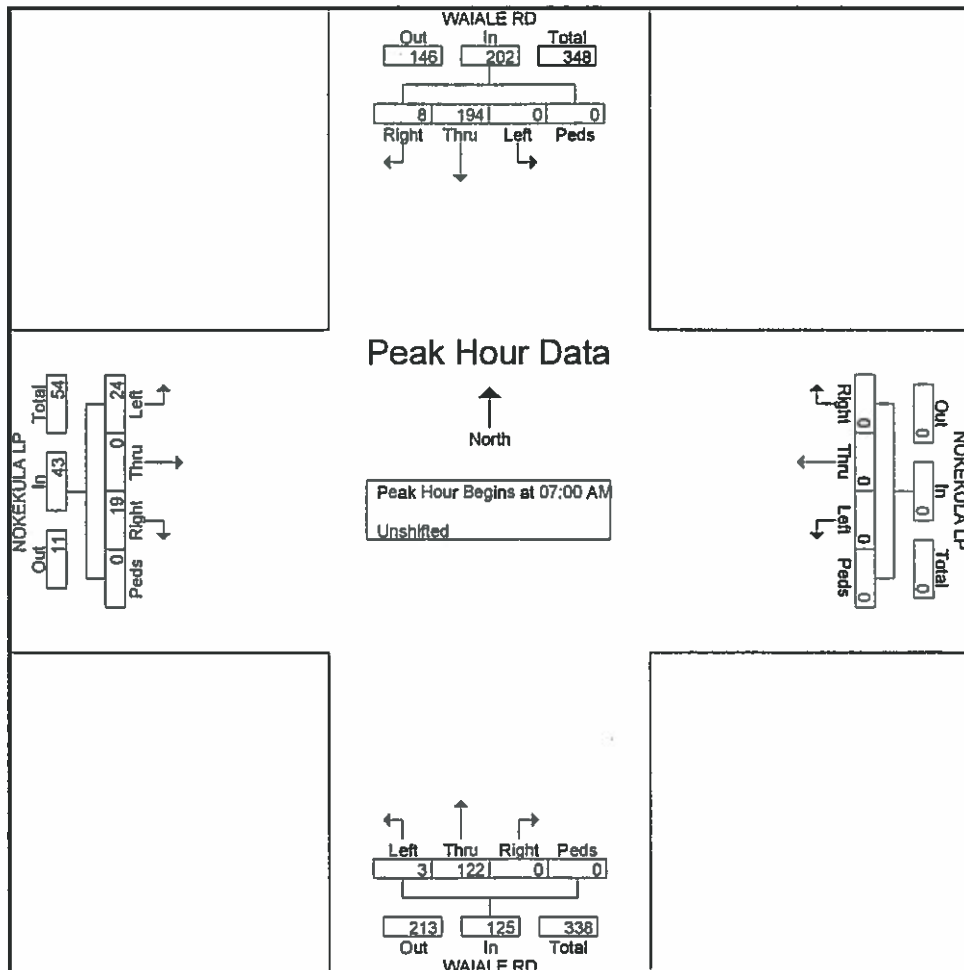
File Name : AM\_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	NOKEKULA LP Eastbound					NOKEKULA LP Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	11	0	8	0	19	0	0	0	0	0	1	29	0	0	30	0	46	1	0	47	96
07:15 AM	6	0	2	0	8	0	0	0	0	0	1	25	0	0	26	0	48	0	0	48	82
07:30 AM	5	0	2	0	7	0	0	0	0	0	0	47	0	0	47	0	52	2	0	54	108
07:45 AM	2	0	7	0	9	0	0	0	0	0	1	21	0	0	22	0	48	5	0	53	84
Total Volume	24	0	19	0	43	0	0	0	0	0	3	122	0	0	125	0	194	8	0	202	370
% App. Total	55.8	0	44.2	0		0	0	0	0		2.4	97.6	0	0		0	96	4	0		
PHF	.545	.000	.594	.000	.566	.000	.000	.000	.000	.000	.750	.649	.000	.000	.665	.000	.933	.400	.000	.935	.856





# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	NOKEKULA LP Eastbound				NOKEKULA LP Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	3	0	0	0	0	0	0	0	2	27	0	0	0	23	1	0	56
03:45 PM	0	0	1	0	0	0	0	0	4	49	0	0	0	27	2	0	83
Total	3	0	1	0	0	0	0	0	6	76	0	0	0	50	3	0	139
04:00 PM	0	0	4	0	0	0	0	0	2	34	0	0	0	29	5	0	74
04:15 PM	2	0	0	0	0	0	0	0	8	26	0	0	0	30	4	0	70
04:30 PM	2	0	4	0	0	0	0	0	7	34	0	0	0	37	4	0	88
04:45 PM	2	0	3	0	0	0	0	0	3	47	0	0	0	42	4	0	101
Total	6	0	11	0	0	0	0	0	20	141	0	0	0	138	17	0	333
05:00 PM	4	0	5	0	0	0	0	0	3	38	0	0	0	33	5	0	88
05:15 PM	3	0	2	0	0	0	0	0	2	38	0	0	0	34	2	0	81
Grand Total	16	0	19	0	0	0	0	0	31	293	0	0	0	255	27	0	641
Apprch %	45.7	0	54.3	0	0	0	0	0	9.6	90.4	0	0	0	90.4	9.6	0	
Total %	2.5	0	3	0	0	0	0	0	4.8	45.7	0	0	0	39.8	4.2	0	

# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

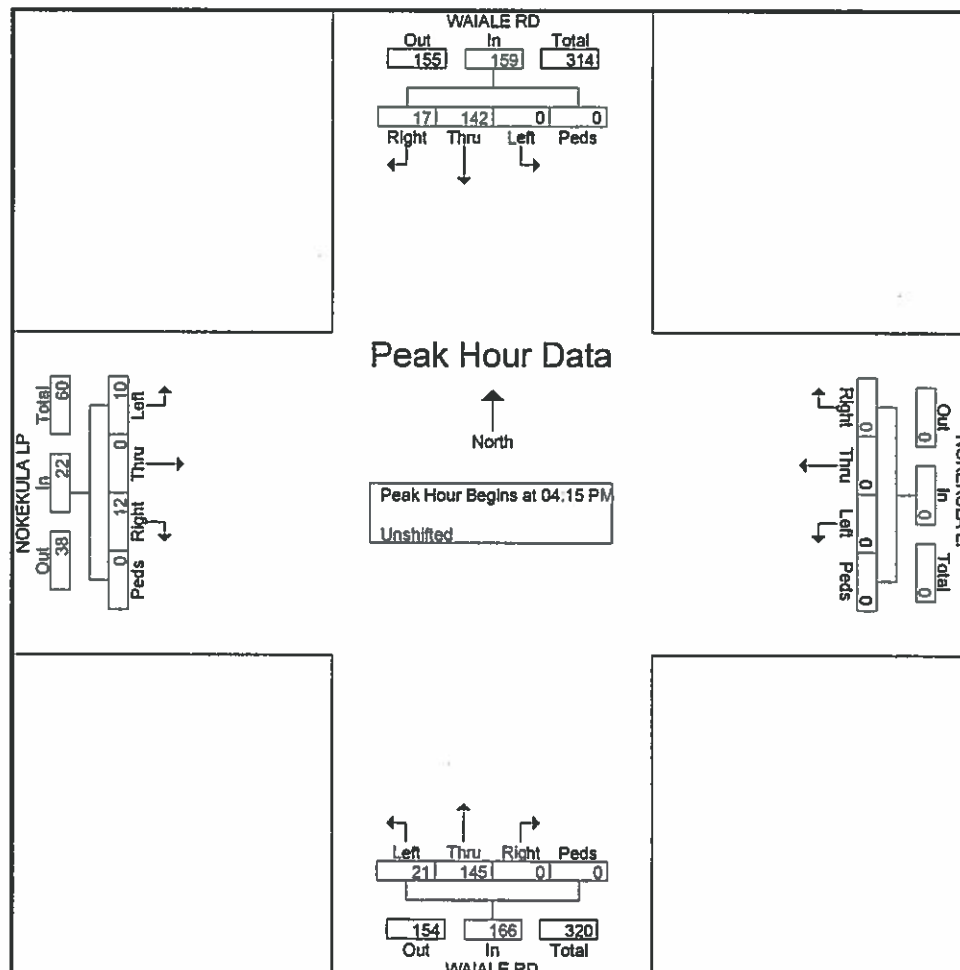
File Name : PM\_Waiale Rd - Nokekula Lp

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	NOKEKULA LP Eastbound					NOKEKULA LP Westbound					WAIKALE RD Northbound					WAIKALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	0	0	0	2	0	0	0	0	0	8	26	0	0	34	0	30	4	0	34	70
04:30 PM	2	0	4	0	6	0	0	0	0	0	7	34	0	0	41	0	37	4	0	41	88
04:45 PM	2	0	3	0	5	0	0	0	0	0	3	47	0	0	50	0	42	4	0	46	101
05:00 PM	4	0	5	0	9	0	0	0	0	0	3	38	0	0	41	0	33	5	0	38	88
Total Volume	10	0	12	0	22	0	0	0	0	0	21	145	0	0	166	0	142	17	0	159	347
% App. Total	45.5	0	54.5	0		0	0	0	0		12.7	87.3	0	0		0	89.3	10.7	0		
PHF	.625	.000	.600	.000	.611	.000	.000	.000	.000	.000	.656	.771	.000	.000	.830	.000	.845	.850	.000	.864	.859



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Waiale Rd - Haawi St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	HAAWI ST Eastbound				HAAWI ST Westbound				WIALE RD Northbound				WIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	21	0	19	0	0	0	0	0	3	9	0	0	0	40	3	0	95
Total	21	0	19	0	0	0	0	0	3	9	0	0	0	40	3	0	95
07:00 AM	22	0	21	0	0	0	0	0	2	38	0	0	0	26	6	0	115
07:15 AM	30	0	20	0	0	0	0	0	2	29	0	0	0	28	10	0	119
07:30 AM	15	0	21	0	0	0	0	0	4	48	0	0	0	33	8	0	129
07:45 AM	7	0	15	0	0	0	0	0	3	20	0	0	0	38	11	0	94
Total	74	0	77	0	0	0	0	0	11	135	0	0	0	125	35	0	457
08:00 AM	5	0	3	0	0	0	0	0	1	21	0	0	0	25	11	0	66
08:15 AM	8	0	9	0	0	0	0	0	7	27	0	0	0	14	6	0	71
Grand Total	108	0	108	0	0	0	0	0	22	192	0	0	0	204	55	0	689
Apprch %	50	0	50	0	0	0	0	0	10.3	89.7	0	0	0	78.8	21.2	0	
Total %	15.7	0	15.7	0	0	0	0	0	3.2	27.9	0	0	0	29.6	8	0	

# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

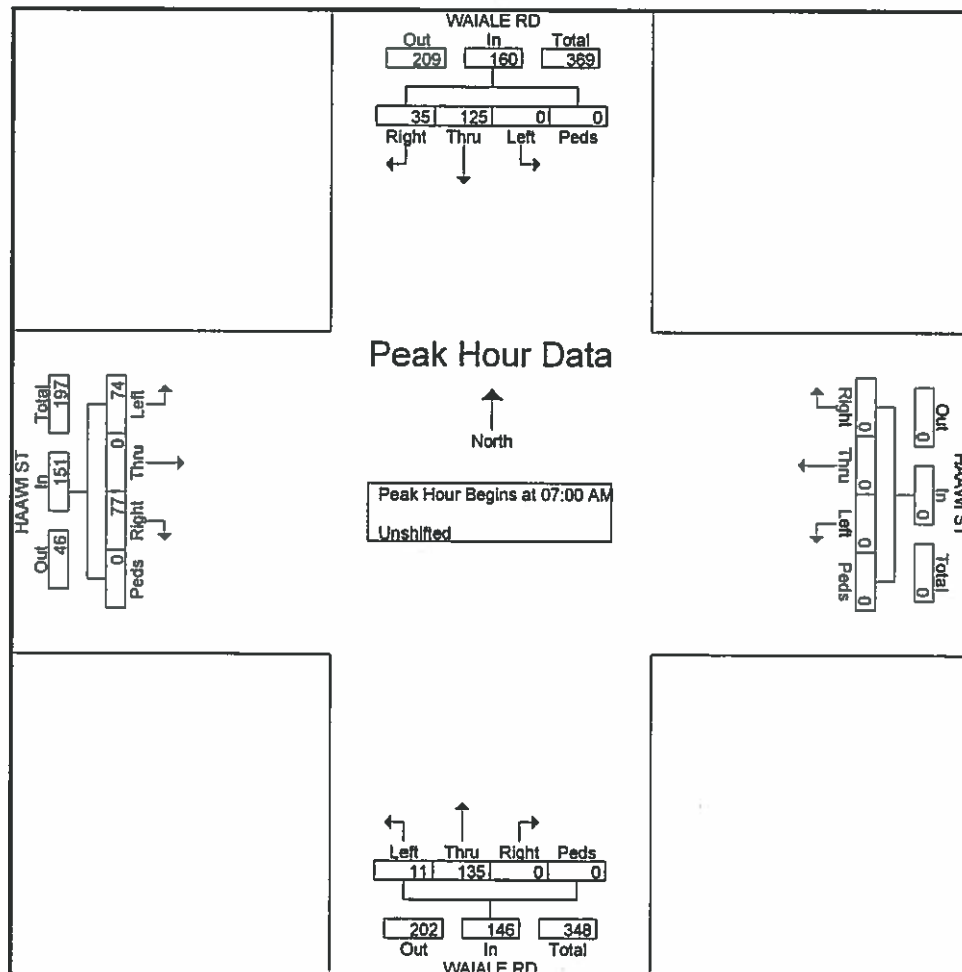
File Name : AM\_Waiale Rd - Haawi St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	HAAWI ST Eastbound					HAAWI ST Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	22	0	21	0	43	0	0	0	0	0	2	38	0	0	40	0	26	6	0	32	115
07:15 AM	30	0	20	0	50	0	0	0	0	0	2	29	0	0	31	0	28	10	0	38	119
07:30 AM	15	0	21	0	36	0	0	0	0	0	4	48	0	0	52	0	33	8	0	41	129
07:45 AM	7	0	15	0	22	0	0	0	0	0	3	20	0	0	23	0	38	11	0	49	94
Total Volume	74	0	77	0	151	0	0	0	0	0	11	135	0	0	146	0	125	35	0	160	457
% App. Total	49	0	51	0		0	0	0	0	0	7.5	92.5	0	0		0	78.1	21.9	0		
PHF	.617	.000	.917	.000	.755	.000	.000	.000	.000	.000	.688	.703	.000	.000	.702	.000	.822	.795	.000	.816	.886



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Waiale Rd - Haawi St

Site Code : 00000000

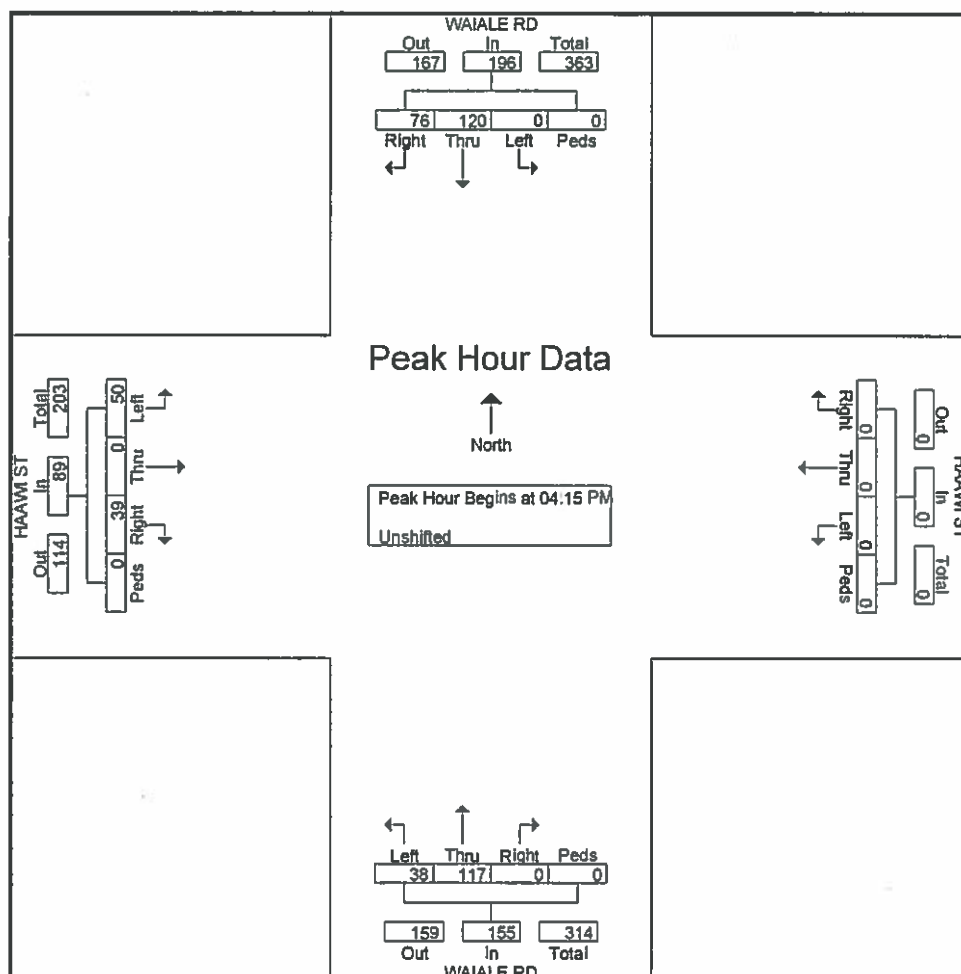
Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	HAAWI ST Eastbound				HAAWI ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	12	0	10	0	0	0	0	0	7	23	0	0	0	14	16	0	82
03:45 PM	10	0	3	0	0	0	0	0	9	40	0	0	0	26	10	0	98
Total	22	0	13	0	0	0	0	0	16	63	0	0	0	40	26	0	180
04:00 PM	14	0	3	0	0	0	0	0	15	19	0	0	0	31	13	0	95
04:15 PM	12	0	5	0	0	0	0	0	1	27	0	0	0	29	16	0	90
04:30 PM	14	0	12	0	0	0	0	0	16	20	0	0	0	29	18	0	109
04:45 PM	14	0	15	0	0	0	0	0	11	38	0	0	0	31	20	0	129
Total	54	0	35	0	0	0	0	0	43	104	0	0	0	120	67	0	423
05:00 PM	10	0	7	0	0	0	0	0	10	32	0	0	0	31	22	0	112
05:15 PM	7	0	4	0	0	0	0	0	17	24	0	0	0	32	15	0	99
Grand Total	93	0	59	0	0	0	0	0	86	223	0	0	0	223	130	0	814
Apprch %	61.2	0	38.8	0	0	0	0	0	27.8	72.2	0	0	0	63.2	36.8	0	
Total %	11.4	0	7.2	0	0	0	0	0	10.6	27.4	0	0	0	27.4	16	0	

## Page No : 2



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM\_Waiale Rd - Kokololio St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	KOKOLOLIO ST Eastbound				KOKOLOLIO ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	23	0	6	0	0	0	0	0	1	29	0	0	0	37	4	0	100
Total	23	0	6	0	0	0	0	0	1	29	0	0	0	37	4	0	100
07:00 AM	20	0	6	0	0	0	0	0	1	59	0	0	0	26	6	0	118
07:15 AM	36	0	7	0	0	0	0	0	1	58	0	0	0	31	9	0	142
07:30 AM	29	0	5	0	0	0	0	0	2	61	0	0	0	36	6	0	139
07:45 AM	12	0	3	0	0	0	0	0	1	26	0	0	0	46	12	0	100
Total	97	0	21	0	0	0	0	0	5	204	0	0	0	139	33	0	499
08:00 AM	10	0	1	0	0	0	0	0	0	26	0	0	0	35	8	0	80
08:15 AM	9	0	1	0	0	0	0	0	2	33	0	0	0	19	7	0	71
Grand Total	139	0	29	0	0	0	0	0	8	292	0	0	0	230	52	0	750
Apprch %	82.7	0	17.3	0	0	0	0	0	2.7	97.3	0	0	0	81.6	18.4	0	
Total %	18.5	0	3.9	0	0	0	0	0	1.1	38.9	0	0	0	30.7	6.9	0	



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

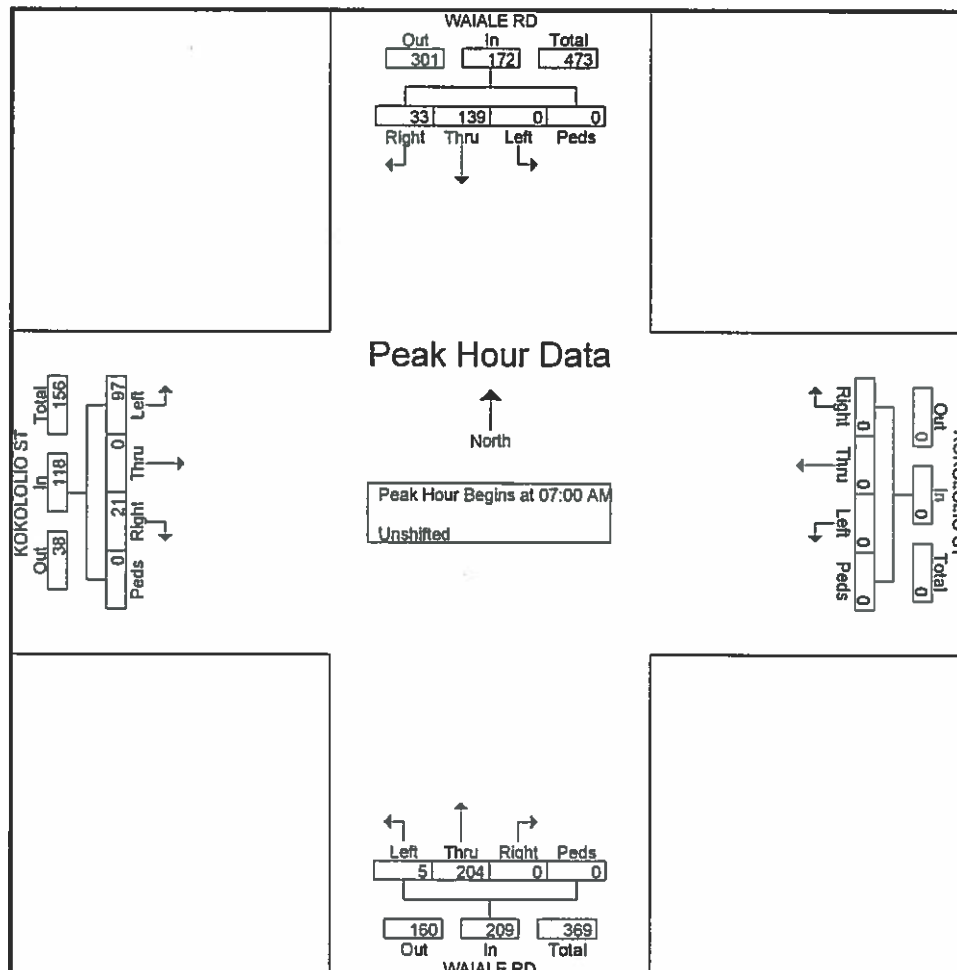
File Name : AM\_Waiale Rd - Kokololio St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	KOKOLOLIO ST Eastbound					KOKOLOLIO ST Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	20	0	6	0	26	0	0	0	0	0	1	59	0	0	60	0	26	6	0	32	118
07:15 AM	36	0	7	0	43	0	0	0	0	0	1	58	0	0	59	0	31	9	0	40	142
07:30 AM	29	0	5	0	34	0	0	0	0	0	2	61	0	0	63	0	36	6	0	42	139
07:45 AM	12	0	3	0	15	0	0	0	0	0	1	26	0	0	27	0	46	12	0	58	100
Total Volume	97	0	21	0	118	0	0	0	0	0	5	204	0	0	209	0	139	33	0	172	499
% App. Total	82.2	0	17.8	0		0	0	0	0	0	2.4	97.6	0	0		0	80.8	19.2	0		
PHF	.674	.000	.750	.000	.686	.000	.000	.000	.000	.000	.625	.836	.000	.000	.829	.000	.755	.688	.000	.741	.879



# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521  
Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM\_Waiale Rd - Kokololio St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 1

## Groups Printed- Unshifted

Start Time	KOKOLOLIO ST Eastbound				KOKOLOLIO ST Westbound				WAIALE RD Northbound				WAIALE RD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:30 PM	7	0	1	0	0	0	0	0	4	31	0	0	0	29	15	0	87
03:45 PM	17	0	4	0	0	0	0	0	4	46	0	0	0	32	15	0	118
Total	24	0	5	0	0	0	0	0	8	77	0	0	0	61	30	0	205
04:00 PM	17	0	6	0	0	0	0	0	4	29	0	0	0	38	13	0	107
04:15 PM	13	0	1	0	0	0	0	0	3	36	0	0	0	44	13	0	110
04:30 PM	17	0	2	0	0	0	0	0	3	31	0	0	0	45	22	0	120
04:45 PM	14	0	2	0	0	0	0	0	5	47	0	0	0	49	21	0	138
Total	61	0	11	0	0	0	0	0	15	143	0	0	0	176	69	0	475
05:00 PM	13	0	1	0	0	0	0	0	4	38	0	0	0	52	17	0	125
05:15 PM	12	0	6	0	0	0	0	0	9	22	0	0	0	41	16	0	106
Grand Total	110	0	23	0	0	0	0	0	36	280	0	0	0	330	132	0	911
Apprch %	82.7	0	17.3	0	0	0	0	0	11.4	88.6	0	0	0	71.4	28.6	0	
Total %	12.1	0	2.5	0	0	0	0	0	4	30.7	0	0	0	36.2	14.5	0	

# Austin Tsutsumi & Associates

501 Sumner Street, Suite 521

Honolulu, HI 96817-5031

Phone: (808) 533-3646 Fax: (808) 526-1267

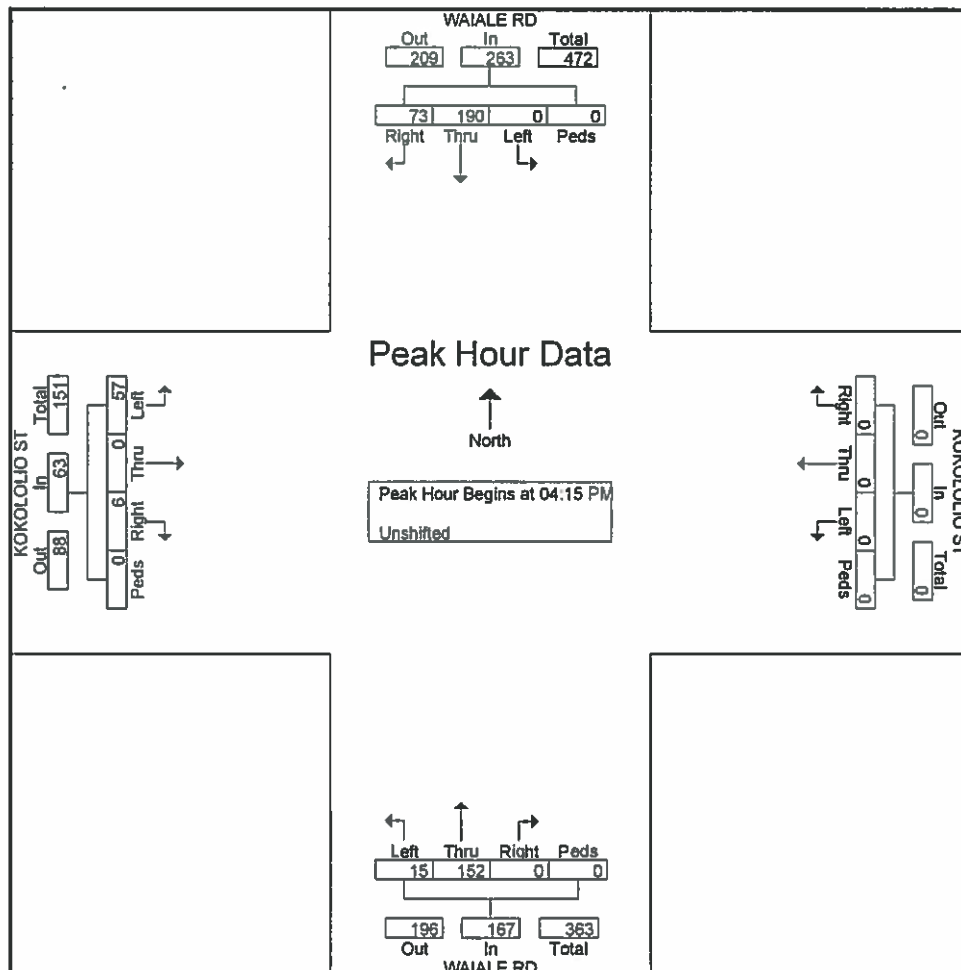
File Name : PM\_Waiale Rd - Kokololio St

Site Code : 00000000

Start Date : 10/22/2015

Page No : 2

	KOKOLOLIO ST Eastbound					KOKOLOLIO ST Westbound					WAIALE RD Northbound					WAIALE RD Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03 30 PM to 05 15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04 15 PM																					
04:15 PM	13	0	1	0	14	0	0	0	0	0	3	36	0	0	39	0	44	13	0	57	110
04:30 PM	17	0	2	0	19	0	0	0	0	0	3	31	0	0	34	0	45	22	0	67	120
04:45 PM	14	0	2	0	16	0	0	0	0	0	5	47	0	0	52	0	49	21	0	70	138
05:00 PM	13	0	1	0	14	0	0	0	0	0	4	38	0	0	42	0	52	17	0	69	125
Total Volume	57	0	6	0	63	0	0	0	0	0	15	152	0	0	167	0	190	73	0	263	493
% App. Total	90.5	0	9.5	0		0	0	0	0	0	9	91	0	0		0	72.2	27.8	0		
PHF	.838	.000	.750	.000	.829	.000	.000	.000	.000	.000	.750	.809	.000	.000	.803	.000	.913	.830	.000	.939	.893





---

## APPENDIX B

### LEVEL OF SERVICE CRITERIA

---

## APPENDIX B – LEVEL OF SERVICE (LOS) CRITERIA

### VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 6<sup>th</sup> EDITION)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	< 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

### VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6<sup>th</sup> EDITION)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
CIVIL ENGINEERS • SURVEYORS

---

---

## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

---

---



























## APPENDIX C LEVEL OF SERVICE CALCULATIONS

- Existing Conditions AM
-



# HCM 6th Signalized Intersection Summary 1: Honoapiilani Hwy & Kehalani Pkwy

04/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	196	333	28	172	110	215	460	10	40	334	99
Future Volume (veh/h)	283	196	333	28	172	110	215	460	10	40	334	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1567	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	404	213	362	30	187	120	234	500	0	43	363	0
Peak Hour Factor	0.70	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	418	556	471	260	248	210	397	648		260	502	
Arrive On Green	0.20	0.30	0.30	0.03	0.13	0.13	0.12	0.35	0.00	0.04	0.27	0.00
Sat Flow, veh/h	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	404	213	362	30	187	120	234	500	0	43	363	0
Grp Sat Flow(s),veh/h/ln	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	15.0	6.9	16.0	1.1	7.4	5.5	6.8	18.3	0.0	1.3	13.5	0.0
Cycle Q Clear(g_c), s	15.0	6.9	16.0	1.1	7.4	5.5	6.8	18.3	0.0	1.3	13.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	556	471	260	248	210	397	648		260	502	
V/C Ratio(X)	0.97	0.38	0.77	0.12	0.75	0.57	0.59	0.77		0.17	0.72	
Avail Cap(c_a), veh/h	418	584	495	553	584	495	651	1193		655	1193	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.1	21.4	24.6	27.3	32.1	31.3	17.3	22.4	0.0	19.9	25.5	0.0
Incr Delay (d2), s/veh	35.1	0.2	6.1	0.1	1.7	0.9	0.5	4.2	0.0	0.1	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	3.0	6.6	0.5	3.4	2.1	2.5	8.0	0.0	0.5	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	21.6	30.6	27.4	33.8	32.2	17.9	26.6	0.0	20.0	29.7	0.0
LnGrp LOS	E	C	C	C	C	C	B	C		C	C	
Approach Vol, veh/h		979			337			734	A		406	A
Approach Delay, s/veh		40.5			32.7			23.8			28.7	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	32.6	7.4	28.8	14.0	26.6	20.0	16.2				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	3.3	20.3	3.1	18.0	8.8	15.5	17.0	9.4				
Green Ext Time (p_c), s	0.0	6.3	0.0	0.9	0.2	4.4	0.0	0.8				

## Intersection Summary

HCM 6th Ctrl Delay 32.5  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

## HCM 6th Signalized Intersection Summary

### 2: Honoapiilani Highway & Kuikahi Drive

04/26/2018

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	51	127	63	263	57	221	14	435	331	270	457	7
Future Volume (veh/h)	51	127	63	263	57	221	14	435	331	270	457	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	138	68	286	62	240	15	473	0	293	497	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	288	196	185	437	423	566	337	604		421	829	761
Arrive On Green	0.04	0.10	0.10	0.17	0.23	0.23	0.01	0.32	0.00	0.13	0.44	0.44
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	55	138	68	286	62	240	15	473	0	293	497	8
Grp Sat Flow(s), veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	1.8	4.6	2.6	9.6	1.9	8.1	0.4	16.2	0.0	7.2	14.3	0.2
Cycle Q Clear(g_c), s	1.8	4.6	2.6	9.6	1.9	8.1	0.4	16.2	0.0	7.2	14.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	196	185	437	423	566	337	604		421	829	761
V/C Ratio(X)	0.19	0.70	0.37	0.65	0.15	0.42	0.04	0.78		0.70	0.60	0.01
Avail Cap(c_a), veh/h	326	263	242	540	555	679	469	899		465	1031	933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	31.0	29.4	21.5	21.9	17.2	16.1	21.7	0.0	14.7	14.9	9.6
Incr Delay (d2), s/veh	0.3	2.7	0.5	2.0	0.1	0.2	0.0	5.0	0.0	3.0	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.4	1.1	4.1	0.8	2.8	0.2	7.3	0.0	2.8	5.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	33.7	29.9	23.6	22.0	17.4	16.1	26.8	0.0	17.8	16.4	9.6
LnGrp LOS	C	C	C	C	C	B	B	C		B	B	A
Approach Vol, veh/h		261			588			488	A		798	
Approach Delay, s/veh		31.4			20.9			26.4			16.9	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.3	28.8	15.9	12.7	4.8	37.3	6.6	22.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	34.0	16.0	9.0	6.0	39.0	4.0	21.0				
Max Q Clear Time (g_c+1), s	18.2	18.2	11.6	6.6	2.4	16.3	3.8	10.1				
Green Ext Time (p_c), s	0.1	4.6	0.4	0.1	0.0	5.9	0.0	0.5				

#### Intersection Summary

HCM 6th Ctrl Delay 21.9  
 HCM 6th LOS C

#### Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th TWSC

## 3: Kuikahi Dr & Kehalani Village Center Dr

04/26/2018

### Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑	↵		↵	↵
Traffic Vol, veh/h	64	632	463	58	29	89
Future Vol, veh/h	64	632	463	58	29	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	145	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	687	503	63	32	97

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	566	0	0 1362 535
Stage 1	-	-	- 535 -
Stage 2	-	-	- 827 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1006	-	- 163 545
Stage 1	-	-	- 587 -
Stage 2	-	-	- 430 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1006	-	- 152 545
Mov Cap-2 Maneuver	-	-	- 152 -
Stage 1	-	-	- 546 -
Stage 2	-	-	- 430 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1006	-	-	-	152	545
HCM Lane V/C Ratio	0.069	-	-	-	0.207	0.178
HCM Control Delay (s)	8.8	-	-	-	34.8	13
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.6

Exist AM

Z:\2017\17-529 Waikapu 201-H Aff. Housing\Exist\Exist AM\17-529 Exist AM.syn

Synchro 9 Report

Page 3

# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/26/2018

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	GBR
Lane Configurations	↖	↗		↖	↑	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	360	289	47	29	241	219	112	167	61	249	125	179
Future Volume (veh/h)	360	289	47	29	241	219	112	167	61	249	125	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1821	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	450	314	51	32	262	238	122	182	66	271	136	195
Peak Hour Factor	0.80	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	550	627	102	335	361	306	287	228	83	392	166	239
Arrive On Green	0.23	0.40	0.40	0.03	0.19	0.19	0.08	0.17	0.17	0.14	0.24	0.24
Sat Flow, veh/h	1734	1570	255	1781	1870	1585	1781	1310	475	1781	695	996
Grp Volume(v), veh/h	450	0	365	32	262	238	122	0	248	271	0	331
Grp Sat Flow(s),veh/h/ln	1734	0	1824	1781	1870	1585	1781	0	1785	1781	0	1691
Q Serve(g_s), s	14.9	0.0	11.6	1.1	10.2	11.0	4.3	0.0	10.3	9.1	0.0	14.3
Cycle Q Clear(g_c), s	14.9	0.0	11.6	1.1	10.2	11.0	4.3	0.0	10.3	9.1	0.0	14.3
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.27	1.00		0.59
Lane Grp Cap(c), veh/h	550	0	729	335	361	306	287	0	310	392	0	405
V/C Ratio(X)	0.82	0.00	0.50	0.10	0.73	0.78	0.43	0.00	0.80	0.69	0.00	0.82
Avail Cap(c_a), veh/h	731	0	921	543	581	492	404	0	554	392	0	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	17.4	24.0	29.3	29.6	23.9	0.0	30.6	21.0	0.0	27.8
Incr Delay (d2), s/veh	5.5	0.0	0.5	0.1	2.8	4.3	1.0	0.0	4.8	5.1	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	4.8	0.5	4.7	4.5	1.8	0.0	4.8	4.2	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.0	18.0	24.1	32.1	33.9	24.9	0.0	35.4	26.1	0.0	35.4
LnGrp LOS	C	A	B	C	C	C	C	A	D	C	A	D
Approach Vol, veh/h		815			532			370			602	
Approach Delay, s/veh		20.6			32.4			31.9			31.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	19.4	6.0	36.9	9.9	24.5	21.9	20.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	11.0	24.0	11.0	39.0	11.0	24.0	26.0	24.0				
Max Q Clear Time (g_c+l1), s	11.1	12.3	3.1	13.6	6.3	16.3	16.9	13.0				
Green Ext Time (p_c), s	0.0	1.1	0.0	2.5	0.1	1.3	1.1	1.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			27.9									
HCM 6th LOS			C									



HCM 6th AWSC  
5: Kamehameha Ave & Maui Lani Pkwy

04/26/2018

Intersection

Intersection Delay, s/veh62.1

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↑	↑		↑	↑	
Traffic Vol, veh/h	153	116	101	50	147	127	176	241	71	169	179	203
Future Vol, veh/h	153	116	101	50	147	127	176	241	71	169	179	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	166	126	110	54	160	138	191	262	77	184	195	221
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	82.3	57.4	43.3	68.1
HCM LOS	F	F	E	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	41%	15%	100%	0%
Vol Thru, %	0%	77%	31%	45%	0%	47%
Vol Right, %	0%	23%	27%	39%	0%	53%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	176	312	370	324	169	382
LT Vol	176	0	153	50	169	0
Through Vol	0	241	116	147	0	179
RT Vol	0	71	101	127	0	203
Lane Flow Rate	191	339	402	352	184	415
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.536	0.885	1.018	0.906	0.507	1.041
Departure Headway (Hd)	10.41	9.715	9.42	9.587	10.253	9.334
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	348	376	390	380	355	390
Service Time	8.11	7.415	7.42	7.587	7.953	7.034
HCM Lane V/C Ratio	0.549	0.902	1.031	0.926	0.518	1.064
HCM Control Delay	24.5	53.9	82.3	57.4	23	88
HCM Lane LOS	C	F	F	F	C	F
HCM 95th-tile Q	3	8.7	12.5	9.3	2.7	13.3

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/26/2018

Intersection:

Int Delay, s/veh 49

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	1	1	1	1	1	1
Traffic Vol, veh/h	192	45	522	635	42	493
Future Vol, veh/h	192	45	522	635	42	493
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	209	49	567	690	46	536

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1540	912	0 0 1257 0
Stage 1	912	-	- - - -
Stage 2	628	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	~ 127	332	- - 553 -
Stage 1	392	-	- - - -
Stage 2	532	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	~ 112	332	- - 553 -
Mov Cap-2 Maneuver	~ 112	-	- - - -
Stage 1	346	-	- - - -
Stage 2	532	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	396.8	0	0.9
HCM LOS	F		




















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	112	332	553	-
HCM Lane V/C Ratio	-	-	1.863	0.147	0.083	-
HCM Control Delay (s)	-	-	\$ 485.7	17.7	12.1	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	16.8	0.5	0.3	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	16	7	64	4	44	2	573	67	127	638	9
Future Volume (veh/h)	27	16	7	64	4	44	2	573	67	127	638	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	17	8	70	4	48	2	623	73	138	693	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	248	131	312	215	27	114	375	862	101	421	1147	972
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	910	664	1585	753	137	578	1781	1643	193	1781	1870	1585
Grp Volume(v), veh/h	46	0	8	122	0	0	2	0	696	138	693	10
Grp Sat Flow(s),veh/h/ln	1575	0	1585	1468	0	0	1781	0	1836	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.3	4.4	0.0	0.0	0.0	0.0	24.7	2.6	19.3	0.2
Cycle Q Clear(g_c), s	1.8	0.0	0.3	6.2	0.0	0.0	0.0	0.0	24.7	2.6	19.3	0.2
Prop In Lane	0.63		1.00	0.57		0.39	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	379	0	312	356	0	0	375	0	963	421	1147	972
V/C Ratio(X)	0.12	0.00	0.03	0.34	0.00	0.00	0.01	0.00	0.72	0.33	0.60	0.01
Avail Cap(c_a), veh/h	508	0	448	481	0	0	707	0	963	595	1147	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	27.6	29.9	0.0	0.0	10.4	0.0	15.5	11.2	10.1	6.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	4.7	0.2	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.1	2.2	0.0	0.0	0.0	0.0	10.6	0.9	7.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	27.6	30.1	0.0	0.0	10.4	0.0	20.2	11.3	12.5	6.4
LnGrp LOS	C	A	C	C	A	A	B	A	C	B	B	A
Approach Vol, veh/h		54			122			698			841	
Approach Delay, s/veh		28.1			30.1			20.2			12.2	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	50.6		22.7	4.1	58.1		22.7				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	4.6	26.7		3.8	2.0	21.3		8.2				
Green Ext Time (p_c), s	0.1	1.5		0.1	0.0	4.3		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			17.2									
HCM 6th LOS			B									



HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/26/2018

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	53	164	54	63	181	61
Future Vol, veh/h	53	164	54	63	181	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	178	59	68	197	66

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	127	0	0	387	93
Stage 1	-	-	-	93	-
Stage 2	-	-	-	294	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1459	-	-	616	964
Stage 1	-	-	-	931	-
Stage 2	-	-	-	756	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1459	-	-	589	964
Mov Cap-2 Maneuver	-	-	-	589	-
Stage 1	-	-	-	890	-
Stage 2	-	-	-	756	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1459	-	-	-	653
HCM Lane V/C Ratio	0.039	-	-	-	0.403
HCM Control Delay (s)	7.6	0	-	-	14.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.9

HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/26/2018

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	18	25	6	111	211	8
Future Vol, veh/h	18	25	6	111	211	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	27	7	121	229	9

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	369	234	238
Stage 1	234	-	-
Stage 2	135	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	631	805	1329
Stage 1	805	-	-
Stage 2	891	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	627	805	1329
Mov Cap-2 Maneuver	627	-	-
Stage 1	800	-	-
Stage 2	891	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1329	-	627	805	-	-
HCM Lane V/C Ratio	0.005	-	0.031	0.034	-	-
HCM Control Delay (s)	7.7	0	10.9	9.6	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/26/2018

Intersection

Int Delay, s/veh 1.3

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			4	1	
Traffic Vol, veh/h	24	19	3	122	194	8
Future Vol, veh/h	24	19	3	122	194	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	21	3	133	211	9

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	355	216	220	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	139	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	643	824	1349	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	642	824	1349	-	-	-
Mov Cap-2 Maneuver	642	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	10.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1349	-	711	-	-
HCM Lane V/C Ratio	0.002	-	0.066	-	-
HCM Control Delay (s)	7.7	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/26/2018

Intersection

Int Delay, s/veh 3.8

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	74	77	11	135	125	35
Future Vol, veh/h	74	77	11	135	125	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	84	12	147	136	38

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	326	155	174	0	-	0
Stage 1	155	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	668	891	1403	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	662	891	1403	-	-	-
Mov Cap-2 Maneuver	662	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	859	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1403	-	762	-	-
HCM Lane V/C Ratio	0.009	-	0.215	-	-
HCM Control Delay (s)	7.6	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/26/2018

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	97	21	5	204	139	33
Future Vol, veh/h	97	21	5	204	139	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	23	5	222	151	36

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	401	169	187
Stage 1	169	-	-
Stage 2	232	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	605	875	1387
Stage 1	861	-	-
Stage 2	807	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	603	875	1387
Mov Cap-2 Maneuver	603	-	-
Stage 1	858	-	-
Stage 2	807	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1387	-	603	875	-	-
HCM Lane V/C Ratio	0.004	-	0.175	0.026	-	-
HCM Control Delay (s)	7.6	0	12.2	9.2	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	0.1	-	-



## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

- Existing Conditions PM
-



# HCM 6th Signalized Intersection Summary

## 1: Honoapiilani Hwy & Kehalani Pkwy

04/26/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	106	53	118	13	88	71	133	378	25	96	504	194
Future Volume (veh/h)	106	53	118	13	88	71	133	378	25	96	504	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	58	128	14	96	77	145	411	0	104	548	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	307	281	238	258	167	142	374	745		465	731	
Arrive On Green	0.08	0.15	0.15	0.02	0.09	0.09	0.08	0.40	0.00	0.07	0.39	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	115	58	128	14	96	77	145	411	0	104	548	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	3.4	1.6	4.5	0.4	3.0	2.8	2.8	10.2	0.0	2.0	15.2	0.0
Cycle Q Clear(g_c), s	3.4	1.6	4.5	0.4	3.0	2.8	2.8	10.2	0.0	2.0	15.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	307	281	238	258	167	142	374	745		465	731	
V/C Ratio(X)	0.37	0.21	0.54	0.05	0.57	0.54	0.39	0.55		0.22	0.75	
Avail Cap(c_a), veh/h	612	746	632	671	746	632	831	1213		935	1213	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.8	22.4	23.6	24.2	26.3	26.2	11.6	14.0	0.0	10.2	15.8	0.0
Incr Delay (d2), s/veh	0.3	0.1	0.7	0.0	1.2	1.2	0.2	1.4	0.0	0.1	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.7	1.7	0.2	1.3	1.1	0.9	3.8	0.0	0.6	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	22.6	24.3	24.2	27.5	27.4	11.9	15.3	0.0	10.3	19.1	0.0
LnGrp LOS	C	C	C	C	C	C	B	B		B	B	
Approach Vol, veh/h		301			187			556	A		652	A
Approach Delay, s/veh		23.1			27.2			14.4			17.7	
Approach LOS		C			C			B			B	
Timer - AssignedPlhs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	30.0	6.0	15.0	9.6	29.5	9.7	11.4				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	4.0	12.2	2.4	6.5	4.8	17.2	5.4	5.0				
Green Ext Time (p_c), s	0.1	4.8	0.0	0.4	0.1	6.3	0.1	0.4				

### Intersection Summary

HCM 6th Ctrl Delay 18.6  
 HCM 6th LOS B

### Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

04/26/2018

	↖	→	↗	↙	←	↖	↗	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	8	66	24	391	97	169	37	371	339	190	442	31
Future Volume (veh/h)	8	66	24	391	97	169	37	371	339	190	442	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	9	72	26	425	105	184	40	403	0	207	480	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	180	195	589	580	658	278	534		379	685	595
Arrive On Green	0.01	0.09	0.09	0.23	0.31	0.31	0.02	0.29	0.00	0.10	0.37	0.37
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	9	72	26	425	105	184	40	403	0	207	480	34
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.3	2.3	0.9	14.1	2.8	5.3	1.1	13.5	0.0	5.3	15.1	0.9
Cycle Q Clear(g_c), s	0.3	2.3	0.9	14.1	2.8	5.3	1.1	13.5	0.0	5.3	15.1	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	180	195	589	580	658	278	534		379	685	595
V/C Ratio(X)	0.04	0.40	0.13	0.72	0.18	0.28	0.14	0.75		0.55	0.70	0.06
Avail Cap(c_a), veh/h	324	270	271	589	580	658	390	923		477	1059	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	29.7	27.6	19.4	17.4	13.3	17.5	22.4	0.0	15.4	18.6	13.7
Incr Delay (d2), s/veh	0.1	0.5	0.1	4.3	0.1	0.1	0.1	4.6	0.0	0.5	2.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.1	0.4	6.2	1.2	1.8	0.4	6.1	0.0	1.9	6.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	30.3	27.7	23.7	17.4	13.4	17.6	27.0	0.0	15.8	21.4	13.8
LnGrp LOS	C	C	C	C	B	B	B	C		B	C	B
Approach Vol, veh/h		107			714			443	A		721	
Approach Delay, s/veh		29.5			20.1			26.2			19.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.2	25.7	20.0	12.0	5.7	31.2	4.6	27.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	3	34.0	16.0	9.0	6.0	39.0	4.0	21.0				
Max Q Clear Time (g_c+I1), s	3	15.5	16.1	4.3	3.1	17.1	2.3	7.3				
Green Ext Time (p_c), s	0.1	4.1	0.0	0.1	0.0	5.8	0.0	0.6				

## Intersection Summary

HCM 6th Ctrl Delay 21.7  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th TWSC

## 3: Kuikahi Dr & Kehalani Village Dr

04/26/2018

### Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑	↵		↵	↵
Traffic Vol, veh/h	97	469	482	82	34	130
Future Vol, veh/h	97	469	482	82	34	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	145	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	105	510	524	89	37	141
























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	613	0	0 1289 569
Stage 1	-	-	- 569 -
Stage 2	-	-	- 720 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	966	-	- 181 522
Stage 1	-	-	- 566 -
Stage 2	-	-	- 482 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	966	-	- 161 522
Mov Cap-2 Maneuver	-	-	- 161 -
Stage 1	-	-	- 504 -
Stage 2	-	-	- 482 -

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	966	-	-	-	161	522
HCM Lane V/C Ratio	0.109	-	-	-	0.23	0.271
HCM Control Delay (s)	9.2	-	-	-	33.9	14.4
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8	1.1

# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	195	55	65	307	237	46	110	33	283	163	233
Future Volume (veh/h)	249	195	55	65	307	237	46	110	33	283	163	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	271	212	60	71	334	258	50	120	36	308	177	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	419	466	132	422	432	366	219	228	69	501	203	290
Arrive On Green	0.15	0.33	0.33	0.04	0.23	0.23	0.04	0.17	0.17	0.16	0.29	0.29
Sat Flow, veh/h	1781	1402	397	1781	1870	1585	1781	1381	414	1781	696	995
Grp Volume(v), veh/h	271	0	272	71	334	258	50	0	156	308	0	430
Grp Sat Flow(s),veh/h/ln	1781	0	1799	1781	1870	1585	1781	0	1796	1781	0	1691
Q Serve(g_s), s	7.2	0.0	8.1	2.0	11.3	10.1	1.6	0.0	5.4	9.1	0.0	16.4
Cycle Q Clear(g_c), s	7.2	0.0	8.1	2.0	11.3	10.1	1.6	0.0	5.4	9.1	0.0	16.4
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.23	1.00		0.59
Lane Grp Cap(c), veh/h	419	0	598	422	432	366	219	0	297	501	0	494
V/C Ratio(X)	0.65	0.00	0.46	0.17	0.77	0.71	0.23	0.00	0.53	0.61	0.00	0.87
Avail Cap(c_a), veh/h	843	0	1036	632	663	562	444	0	636	501	0	599
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	17.8	18.5	24.4	23.9	22.7	0.0	25.8	17.4	0.0	22.8
Incr Delay (d2), s/veh	1.7	0.0	0.5	0.2	3.1	2.5	0.5	0.0	1.4	2.2	0.0	11.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	3.3	0.8	5.2	3.9	0.7	0.0	2.3	3.8	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	0.0	18.3	18.7	27.5	26.4	23.2	0.0	27.3	19.7	0.0	34.2
LnGrp LOS	B	A	B	B	C	C	C	A	C	B	A	C
Approach Vol, veh/h		543			663			206			738	
Approach Delay, s/veh		18.0			26.1			26.3			28.2	
Approach LOS		B			C			C			C	
Timer Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	17.2	7.0	28.5	6.4	25.8	13.9	21.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	11.0	24.0	11.0	39.0	11.0	24.0	26.0	24.0				
Max Q Clear Time (g_c+I1), s	11.1	7.4	4.0	10.1	3.6	18.4	9.2	13.3				
Green Ext Time (p_c), s	0.0	0.7	0.1	1.8	0.0	1.4	0.7	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			24.8									
HCM 6th LOS			C									

HCM 6th AWSC  
5: Kamehameha Ave & Maui Lani Pkwy

04/26/2018

Intersection

Intersection Delay, s/veh67.7

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↱	↱		↱	↱	
Traffic Vol, veh/h	206	171	75	46	177	208	62	99	27	153	112	255
Future Vol, veh/h	206	171	75	46	177	208	62	99	27	153	112	255
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	224	186	82	50	192	226	67	108	29	166	122	277
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	109.2	76.9	17.4	42.2
HCM LOS	F	F	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	46%	11%	100%	0%
Vol Thru, %	0%	79%	38%	41%	0%	31%
Vol Right, %	0%	21%	17%	48%	0%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	126	452	431	153	367
LT Vol	62	0	206	46	153	0
Through Vol	0	99	171	177	0	112
RT Vol	0	27	75	208	0	255
Lane Flow Rate	67	137	491	468	166	399
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.189	0.359	1.122	1.018	0.421	0.9
Departure Headway (Hd)	10.689	10.002	8.221	8.25	9.62	8.586
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	338	362	442	445	378	427
Service Time	8.389	7.702	6.321	6.25	7.32	6.286
HCM Lane V/C Ratio	0.198	0.378	1.111	1.052	0.439	0.934
HCM Control Delay	15.9	18.2	109.2	76.9	19.1	51.9
HCM Lane LOS	C	C	F	F	C	F
HCM 95th-tile Q	0.7	1.6	17.2	13.4	2	9.6



HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/26/2018

Intersection						
Int Delay, s/veh	50.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	1	1	1			1
Traffic Vol, veh/h	206	45	405	225	68	626
Future Vol, veh/h	206	45	405	225	68	626
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	224	49	440	245	74	680

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1391	563	0	0	685
Stage 1	563	-	-	-	-
Stage 2	828	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	~ 157	526	-	-	908
Stage 1	570	-	-	-	-
Stage 2	429	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 136	526	-	-	908
Mov Cap-2 Maneuver	~ 136	-	-	-	-
Stage 1	495	-	-	-	-
Stage 2	429	-	-	-	-




















Approach	WB	NB	SB
HCM Control Delay, s	313.1	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	136	526	908	-
HCM Lane V/C Ratio	-	-	1.646	0.093	0.081	-
HCM Control Delay (s)	-	-	378.8	12.5	9.3	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %ile Q(veh)	-	-	16.2	0.3	0.3	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	12	8	60	14	51	5	652	68	47	685	29
Future Volume (veh/h)	12	12	8	60	14	51	5	652	68	47	685	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	13	9	65	15	55	5	709	74	51	745	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	200	338	204	60	134	306	853	89	319	1079	914
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.00	0.51	0.51	0.07	0.58	0.58
Sat Flow, veh/h	714	939	1585	632	280	627	1781	1665	174	1781	1870	1585
Grp Volume(v), veh/h	26	0	9	135	0	0	5	0	783	51	745	32
Grp Sat Flow(s),veh/h/ln	1652	0	1585	1539	0	0	1781	0	1839	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.3	3.5	0.0	0.0	0.1	0.0	28.1	0.9	21.8	0.7
Cycle Q Clear(g_c), s	0.9	0.0	0.3	5.6	0.0	0.0	0.1	0.0	28.1	0.9	21.8	0.7
Prop In Lane	0.50		1.00	0.48		0.41	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	422	0	338	397	0	0	306	0	942	319	1079	914
V/C Ratio(X)	0.06	0.00	0.03	0.34	0.00	0.00	0.02	0.00	0.83	0.16	0.69	0.04
Avail Cap(c_a), veh/h	571	0	490	541	0	0	666	0	1160	563	1180	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	24.2	26.2	0.0	0.0	10.9	0.0	16.1	12.5	11.6	7.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	5.7	0.1	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	2.1	0.0	0.0	0.0	0.0	11.9	0.3	8.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	24.2	26.4	0.0	0.0	10.9	0.0	21.8	12.6	13.8	7.1
LnGrp LOS	C	A	C	C	A	A	B	A	C	B	B	A
Approach Vol, veh/h		35			135			788			828	
Approach Delay, s/veh		24.3			26.4			21.7			13.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	45.8		22.6	4.3	50.8		22.6				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	49.0		24.0	16.0	49.0		24.0				
Max Q Clear Time (g_c+l1), s	2.9	30.1		2.9	2.1	23.8		7.6				
Green Ext Time (p_c), s	0.0	9.7		0.1	0.0	11.0		0.4				

## Intersection Summary

HCM 6th Ctrl Delay 18.3  
HCM 6th LOS B

HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/26/2018

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	59	67	84	124	108	42
Future Vol, veh/h	59	67	84	124	108	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	73	91	135	117	46

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	226	0	0 360 159
Stage 1	-	-	- 159 -
Stage 2	-	-	- 201 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1342	-	- 639 886
Stage 1	-	-	- 870 -
Stage 2	-	-	- 833 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1342	-	- 607 886
Mov Cap-2 Maneuver	-	-	- 607 -
Stage 1	-	-	- 827 -
Stage 2	-	-	- 833 -

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1342	-	-	-	666
HCM Lane V/C Ratio	0.048	-	-	-	0.245
HCM Control Delay (s)	7.8	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1



HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/26/2018

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	14	7	18	167	139	16
Future Vol, veh/h	14	7	18	167	139	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	8	20	182	151	17

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	382	160	168	0	-	0
Stage 1	160	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	620	885	1410	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	610	885	1410	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	815	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1410	-	610	885	-	-
HCM Lane V/C Ratio	0.014	-	0.025	0.009	-	-
HCM Control Delay (s)	7.6	0	11.1	9.1	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/26/2018

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	10	12	21	145	142	17
Future Vol, veh/h	10	12	21	145	142	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	13	23	158	154	18

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	367	163	172
Stage 1	163	-	-
Stage 2	204	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	633	882	1405
Stage 1	866	-	-
Stage 2	830	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	622	882	1405
Mov Cap-2 Maneuver	622	-	-
Stage 1	850	-	-
Stage 2	830	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBL	EBT	SBT	SBR
Capacity (veh/h)	1405	-	741	-	-	-
HCM Lane V/C Ratio	0.016	-	0.032	-	-	-
HCM Control Delay (s)	7.6	0	10	-	-	-
HCM Lane LOS	A	A	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/26/2018

Intersection

Int Delay, s/veh 2.9

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	50	39	38	117	120	76
Future Vol, veh/h	50	39	38	117	120	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	42	41	127	130	83

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	381	172	213	0	-	0
Stage 1	172	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	621	872	1357	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	601	872	1357	-	-	-
Mov Cap-2 Maneuver	601	-	-	-	-	-
Stage 1	830	-	-	-	-	-
Stage 2	826	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	11	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1357	-	696	-	-
HCM Lane V/C Ratio	0.03	-	0.139	-	-
HCM Control Delay (s)	7.7	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/26/2018

Intersection

Int Delay, s/veh 1.8

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	↖	↗		↖	↗	
Traffic Vol, veh/h	57	6	15	152	190	73
Future Vol, veh/h	57	6	15	152	190	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	7	16	165	207	79

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	444	247	286	0	-	0
Stage 1	247	-	-	-	-	-
Stage 2	197	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	571	792	1276	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	836	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	563	792	1276	-	-	-
Mov Cap-2 Maneuver	563	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	836	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	12	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 EBLn2 SBT SBR

Capacity (veh/h)	1276	-	563	792	-	-
HCM Lane V/C Ratio	0.013	-	0.11	0.008	-	-
HCM Control Delay (s)	7.9	0	12.2	9.6	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0	-	-



---

## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 AM
-

# HCM 6th Signalized Intersection Summary

## 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	325	225	440	30	190	110	265	565	10	40	440	110
Future Volume (veh/h)	325	225	440	30	190	110	265	565	10	40	440	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1567	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	464	245	478	33	207	120	288	614	0	43	478	0
Peak Hour Factor	0.70	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	514	436	237	259	220	387	769		245	599	
Arrive On Green	0.17	0.28	0.28	0.03	0.14	0.14	0.13	0.41	0.00	0.04	0.32	0.00
Sat Flow, veh/h	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	464	245	478	33	207	120	288	614	0	43	478	0
Grp Sat Flow(s),veh/h/ln	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	15.0	9.8	24.6	1.4	9.6	6.3	9.1	25.8	0.0	1.4	20.9	0.0
Cycle Q Clear(g_c), s	15.0	9.8	24.6	1.4	9.6	6.3	9.1	25.8	0.0	1.4	20.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	359	514	436	237	259	220	387	769		245	599	
V/C Ratio(X)	1.29	0.48	1.10	0.14	0.80	0.55	0.74	0.80		0.18	0.80	
Avail Cap(c_a), veh/h	359	514	436	480	502	425	558	1024		578	1024	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.3	27.1	32.4	31.4	37.3	35.9	19.2	23.1	0.0	20.8	27.8	0.0
Incr Delay (d2), s/veh	151.6	0.3	71.7	0.1	2.1	0.8	1.5	5.0	0.0	0.1	5.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.8	4.4	17.9	0.6	4.5	2.5	3.5	11.4	0.0	0.6	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	181.0	27.3	104.2	31.5	39.5	36.7	20.6	28.1	0.0	20.9	33.0	0.0
LnGrp LOS	F	C	F	C	D	D	C	C		C	C	
Approach Vol, veh/h		1187			360			902	A		521	A
Approach Delay, s/veh		118.3			37.8			25.7			32.0	
Approach LOS		F			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	42.8	7.8	30.6	16.4	34.6	20.0	18.4				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	3.4	27.8	3.4	26.6	11.1	22.9	17.0	11.6				
Green Ext Time (p_c), s	0.0	7.2	0.0	0.0	0.3	5.8	0.0	0.8				

### Intersection Summary

HCM 6th Ctrl Delay 65.3  
 HCM 6th LOS E

























### Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	160	75	310	70	300	20	495	410	335	605	10
Future Volume (veh/h)	60	160	75	310	70	300	20	495	410	335	605	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	174	82	337	76	326	22	538	0	364	658	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	225	216	424	447	592	243	637		392	861	795
Arrive On Green	0.04	0.11	0.11	0.17	0.24	0.24	0.01	0.34	0.00	0.13	0.46	0.46
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	65	174	82	337	76	326	22	538	0	364	658	11
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.4	6.7	3.5	13.3	2.6	13.2	0.7	21.8	0.0	10.5	23.9	0.3
Cycle Q Clear(g_c), s	2.4	6.7	3.5	13.3	2.6	13.2	0.7	21.8	0.0	10.5	23.9	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	225	216	424	447	592	243	637		392	861	795
V/C Ratio(X)	0.23	0.77	0.38	0.80	0.17	0.55	0.09	0.85		0.93	0.76	0.01
Avail Cap(c_a), veh/h	303	278	261	424	481	621	348	779		392	893	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	35.4	32.9	25.0	24.7	20.2	18.5	24.9	0.0	17.8	18.3	10.2
Incr Delay (d2), s/veh	0.4	7.9	0.4	10.1	0.1	0.5	0.1	9.1	0.0	27.7	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.8	1.5	6.6	1.2	4.8	0.3	10.6	0.0	6.8	10.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	43.3	33.4	35.1	24.7	20.6	18.5	34.1	0.0	45.5	23.0	10.2
LnGrp LOS	C	D	C	D	C	C	B	C		D	C	B
Approach Vol, veh/h	321			739			560			A1033		
Approach Delay, s/veh	38.3			27.7			33.5			30.8		
Approach LOS	D			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.8	18.0	14.9	5.2	43.6	7.4	25.5					
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	34.0	14.0	11.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+10), s	23.8	15.3	8.7	2.7	25.9	4.4	15.2					
Green Ext Time (p_c), s	0.0	4.0	0.0	0.2	0.0	6.1	0.0	0.5				

## Intersection Summary

HCM 6th Ctrl Delay 31.4  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



Intersection

Int Delay, s/veh 8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			↰	↱		↰	↱
Traffic Vol, veh/h	80	785	10	10	555	65	30	5	30	30	5	105
Future Vol, veh/h	80	785	10	10	555	65	30	5	30	30	5	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	853	11	11	603	71	33	5	33	33	5	114

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	674	0	0	864	0	0	1753	1729	859	1713	1699	639
Stage 1	-	-	-	-	-	-	1033	1033	-	661	661	-
Stage 2	-	-	-	-	-	-	720	696	-	1052	1038	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	917	-	-	779	-	-	67	88	356	71	92	476
Stage 1	-	-	-	-	-	-	281	310	-	452	460	-
Stage 2	-	-	-	-	-	-	419	443	-	274	308	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	917	-	-	779	-	-	44	78	356	56	82	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	78	-	56	82	-
Stage 1	-	-	-	-	-	-	254	281	-	409	454	-
Stage 2	-	-	-	-	-	-	310	437	-	221	279	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	121.2	46.5
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	47	356	917	-	-	779	-	-	59	476
HCM Lane V/C Ratio	0.809	0.092	0.095	-	-	0.014	-	-	0.645	0.24
HCM Control Delay (s)	211.2	16.1	9.3	-	-	9.7	-	-	141.3	14.9
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	3.3	0.3	0.3	-	-	0	-	-	2.7	0.9

HCM 6th Signalized Intersection Summary  
4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

	↖	→	↗	↖	←	↖	↗	↑	↖	↗	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↑	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	425	390	70	60	290	245	140	230	95	285	205	200
Future Volume (veh/h)	425	390	70	60	290	245	140	230	95	285	205	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	531	424	72	65	315	41	152	250	89	310	223	187
Peak Hour Factor	0.80	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	563	643	109	316	370	314	243	289	103	347	288	241
Arrive On Green	0.26	0.41	0.41	0.04	0.20	0.20	0.05	0.22	0.22	0.13	0.31	0.31
Sat Flow, veh/h	1781	1558	265	1781	1870	1585	1781	1317	469	1781	940	788
Grp Volume(v), veh/h	531	0	496	65	315	41	152	0	339	310	0	410
Grp Sat Flow(s),veh/h/ln	1781	0	1823	1781	1870	1585	1781	0	1786	1781	0	1728
Q Serve(g_s), s	24.0	0.0	22.9	3.0	16.9	2.2	5.0	0.0	19.0	13.7	0.0	22.5
Cycle Q Clear(g_c), s	24.0	0.0	22.9	3.0	16.9	2.2	5.0	0.0	19.0	13.7	0.0	22.5
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.26	1.00		0.46
Lane Grp Cap(c), veh/h	563	0	752	316	370	314	243	0	392	347	0	529
V/C Ratio(X)	0.94	0.00	0.66	0.21	0.85	0.13	0.63	0.00	0.86	0.89	0.00	0.78
Avail Cap(c_a), veh/h	603	0	841	466	575	487	243	0	601	347	0	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	24.7	31.3	40.2	34.4	35.2	0.0	39.1	27.5	0.0	32.8
Incr Delay (d2), s/veh	22.9	0.0	1.6	0.3	7.3	0.2	5.0	0.0	8.2	24.0	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	0.0	10.1	1.3	8.5	0.9	1.7	0.0	9.2	8.1	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	0.0	26.3	31.6	47.5	34.5	40.2	0.0	47.3	51.5	0.0	36.4
LnGrp LOS	D	A	C	C	D	C	D	A	D	D	A	D
Approach Vol, veh/h		1027			421			491			720	
Approach Delay, s/veh		37.0			43.8			45.1			42.9	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	28.8	8.3	48.9	9.0	37.8	30.6	26.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	35.0	13.0	48.0	5.0	44.0	29.0	32.0				
Max Q Clear Time (g_c+l1), s	15.7	21.0	5.0	24.9	7.0	24.5	26.0	18.9				
Green Ext Time (p_c), s	0.0	1.8	0.1	3.5	0.0	2.7	0.6	1.7				

Intersection Summary

HCM 6th Ctrl Delay	41.2
HCM 6th LOS	D

HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection

Intersection Delay, s/veh 26.0

Intersection LOS D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	554	418	604	718
Demand Flow Rate, veh/h	565	426	617	733
Vehicles Circulating, veh/h	494	760	599	521
Vehicles Exiting, veh/h	760	456	460	665
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.5	20.1	27.6	35.5
Approach LOS	C	C	D	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	565	426	617	733
Cap Entry Lane, veh/h	834	636	749	811
Entry HV Adj Factor	0.981	0.980	0.979	0.980
Flow Entry, veh/h	554	418	604	718
Cap Entry, veh/h	818	623	734	795
V/C Ratio	0.678	0.670	0.824	0.904
Control Delay, s/veh	16.5	20.1	27.6	35.5
LOS	C	C	D	E
95th %tile Queue, veh	5	5	9	12

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection

Int Delay, s/veh 117.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰
Traffic Vol, veh/h	230	45	590	720	45	590
Future Vol, veh/h	230	45	590	720	45	590
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	250	49	641	783	49	641

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1772	1033	0
Stage 1	1033	-	-
Stage 2	739	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	~ 91	282	-
Stage 1	343	-	-
Stage 2	472	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 77	282	-
Mov Cap-2 Maneuver	~ 77	-	-
Stage 1	288	-	-
Stage 2	472	-	-

Approach	WB	NB	SB
HCM Control Delay, s	945.4	0	0.9
HCM LOS	F		

Minor/Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	77	282	478	-
HCM Lane V/C Ratio	-	-	3.247	0.173	0.102	-
HCM Control Delay (s)	-	-	\$ 1126.4	20.4	13.4	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	25.3	0.6	0.3	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕		↖	↗		↖	↗	↖
Traffic Volume (veh/h)	30	20	10	100	5	55	5	695	130	170	790	10
Future Volume (veh/h)	30	20	10	100	5	55	5	695	130	170	790	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	22	11	109	5	60	5	755	141	185	859	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	139	316	226	23	95	267	796	149	283	1138	965
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	822	695	1585	788	117	477	1781	1533	286	1781	1870	1585
Grp Volume(v), veh/h	55	0	11	174	0	0	5	0	896	185	859	11
Grp Sat Flow(s),veh/h/ln	1517	0	1585	1382	0	0	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.5	7.9	0.0	0.0	0.1	0.0	39.7	3.6	28.3	0.2
Cycle Q Clear(g_c), s	2.3	0.0	0.5	10.2	0.0	0.0	0.1	0.0	39.7	3.6	28.3	0.2
Prop In Lane	0.60		1.00	0.63		0.34	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	370	0	316	344	0	0	267	0	945	283	1138	965
V/C Ratio(X)	0.15	0.00	0.03	0.51	0.00	0.00	0.02	0.00	0.95	0.65	0.75	0.01
Avail Cap(c_a), veh/h	495	0	448	465	0	0	596	0	945	453	1138	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	27.4	31.6	0.0	0.0	12.2	0.0	19.3	18.4	12.0	6.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	19.1	1.0	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.2	3.3	0.0	0.0	0.0	0.0	20.0	1.9	11.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	27.5	32.0	0.0	0.0	12.2	0.0	38.5	19.4	16.7	6.6
LnGrp LOS	C	A	C	C	A	A	B	A	D	B	B	A
Approach Vol, veh/h		66			174			901			1055	
Approach Delay, s/veh		28.1			32.0			38.3			17.1	
Approach LOS		C			C			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	50.2		22.9	4.3	57.7		22.9				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	5.6	41.7		4.3	2.1	30.3		12.2				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	0.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			27.3									
HCM 6th LOS			C									



HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection

Int Delay, s/veh 20.1

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	80	240	75	115	310	90
Future Vol, veh/h	80	240	75	115	310	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	261	82	125	337	98

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	207	0	-	0	580	145
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	435	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1364	-	-	-	477	902
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1364	-	-	-	441	902
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	653	-

Approach EB WB SB

HCM Control Delay, s	2	0	44.1
HCM LOS			E

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1364	-	-	-	498
HCM Lane V/C Ratio	0.064	-	-	-	0.873
HCM Control Delay (s)	7.8	0	-	-	44.1
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	9.4

HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	20	25	10	190	365	10
Future Vol, veh/h	20	25	10	190	365	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	27	11	207	397	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	632	403	408	0	-	0
Stage 1	403	-	-	-	-	-
Stage 2	229	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	444	647	1151	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	439	647	1151	-	-	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	809	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1151	-	439	647	-	-
HCM Lane V/C Ratio	0.009	-	0.05	0.042	-	-
HCM Control Delay (s)	8.2	0	13.6	10.8	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-



HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	25	20	5	200	345	10
Future Vol, veh/h	25	20	5	200	345	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	22	5	217	375	11

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	608	381	386	0	-	0
Stage 1	381	-	-	-	-	-
Stage 2	227	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	459	666	1172	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	811	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	457	666	1172	-	-	-
Mov Cap-2 Maneuver	457	-	-	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	811	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	12.5	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1172	-	531	-	-
HCM Lane V/C Ratio	0.005	-	0.092	-	-
HCM Control Delay (s)	8.1	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection

Int Delay, s/veh 3.3

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			4	1	
Traffic Vol, veh/h	75	80	15	215	280	35
Future Vol, veh/h	75	80	15	215	280	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	87	16	234	304	38

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	589	323	342	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	471	718	1217	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	464	718	1217	-	-	-
Mov Cap-2 Maneuver	464	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	14	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1217	-	568	-	-
HCM Lane V/C Ratio	0.013	-	0.297	-	-
HCM Control Delay (s)	8	0	14	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection

Int Delay, s/veh 2.6

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	↶	↷		↶	↷	
Traffic Vol, veh/h	100	25	5	280	290	35
Future Vol, veh/h	100	25	5	280	290	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	27	5	304	315	38

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	648	334	353	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	435	708	1206	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	433	708	1206	-	-	-
Mov Cap-2 Maneuver	433	-	-	-	-	-
Stage 1	721	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	14.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 EBLn2 SBT SBR

Capacity (veh/h)	1206	-	433	708	-	-
HCM Lane V/C Ratio	0.005	-	0.251	0.038	-	-
HCM Control Delay (s)	8	0	16.1	10.3	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1	0.1	-	-



---

## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 PM
-

# HCM 6th Signalized Intersection Summary 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	125	95	170	15	125	75	195	505	25	100	625	270
Future Volume (veh/h)	125	95	170	15	125	75	195	505	25	100	625	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	103	185	16	136	82	212	549	0	109	679	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	289	322	273	241	194	165	337	864		404	800	
Arrive On Green	0.09	0.17	0.17	0.02	0.10	0.10	0.09	0.46	0.00	0.06	0.43	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	136	103	185	16	136	82	212	549	0	109	679	0
Grp Sat Flow(s), veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.9	3.7	8.3	0.6	5.4	3.7	4.9	17.1	0.0	2.6	24.9	0.0
Cycle Q Clear(g_c), s	4.9	3.7	8.3	0.6	5.4	3.7	4.9	17.1	0.0	2.6	24.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	289	322	273	241	194	165	337	864		404	800	
V/C Ratio(X)	0.47	0.32	0.68	0.07	0.70	0.50	0.63	0.64		0.27	0.85	
Avail Cap(c_a), veh/h	483	588	499	558	588	499	639	956		766	956	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	27.7	29.6	29.6	33.0	32.3	15.5	15.6	0.0	12.3	19.6	0.0
Incr Delay (d2), s/veh	0.4	0.2	1.1	0.0	1.7	0.9	0.7	1.9	0.0	0.1	7.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.6	3.2	0.3	2.5	1.4	1.7	6.7	0.0	0.9	11.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	27.9	30.7	29.7	34.8	33.2	16.2	17.6	0.0	12.4	27.4	0.0
LnGrp LOS	C	C	C	C	C	C	B	B		B	C	
Approach Vol, veh/h		424			234			761	A		788	A
Approach Delay, s/veh		28.6			33.9			17.2			25.3	
Approach LOS		C			C			B			C	
Timer - Assigned Rfs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	41.2	6.4	19.1	12.1	38.7	11.6	13.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+1), s	4.6	19.1	2.6	10.3	6.9	26.9	6.9	7.4				
Green Ext Time (p_c), s	0.1	6.1	0.0	0.6	0.2	5.8	0.1	0.6				

## Intersection Summary

HCM 6th Ctrl Delay 24.1  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	15	95	35	490	145	280	50	435	430	260	535	40
Future Volume (veh/h)	15	95	35	490	145	280	50	435	430	260	535	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	103	38	533	158	304	54	473	0	283	582	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	153	186	590	605	717	234	546		364	727	640
Arrive On Green	0.01	0.07	0.07	0.26	0.32	0.32	0.03	0.29	0.00	0.13	0.39	0.39
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	16	103	38	533	158	304	54	473	0	283	582	43
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.6	4.0	1.6	22.0	5.2	10.8	1.8	19.9	0.0	8.7	23.0	1.4
Cycle Q Clear(g_c), s	0.6	4.0	1.6	22.0	5.2	10.8	1.8	19.9	0.0	8.7	23.0	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	192	153	186	590	605	717	234	546		364	727	640
V/C Ratio(X)	0.08	0.67	0.20	0.90	0.26	0.42	0.23	0.87		0.78	0.80	0.07
Avail Cap(c_a), veh/h	399	224	246	590	605	717	305	630		371	743	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	37.5	33.9	24.6	20.8	15.4	21.0	27.9	0.0	19.0	22.6	15.2
Incr Delay (d2), s/veh	0.2	1.9	0.2	17.4	0.1	0.1	0.2	12.9	0.0	8.9	7.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.1	0.7	12.0	2.3	3.8	0.7	10.3	0.0	4.2	10.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	39.5	34.1	42.0	20.9	15.6	21.2	40.8	0.0	27.9	29.6	15.3
LnGrp LOS	C	D	C	D	C	B	C	D		C	C	B
Approach Vol, veh/h	157			995			527			A	908	
Approach Delay, s/veh	37.7			30.6			38.7				28.4	
Approach LOS	D			C			D				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	30.3	26.0	12.1	6.7	38.3	5.2	32.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	28.0	22.0	22.0	9.0	6.0	33.0	10.0	21.0				
Max Q Clear Time (g_c+M), s	21.9	24.0	24.0	6.0	3.8	25.0	2.6	12.8				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.1	0.0	3.8	0.0	0.8				

## Intersection Summary

HCM 6th Ctrl Delay 31.9  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC  
3: Kuikahi Dr & Kehalani Village Dr

04/30/2018

Intersection												
Int Delay, s/veh	16											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Traffic Vol, veh/h	140	575	30	30	660	90	15	5	15	45	5	190
Future Vol, veh/h	140	575	30	30	660	90	15	5	15	45	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	625	33	33	717	98	16	5	16	49	5	207

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	815	0	0	658	0	0	1884	1827	642	1788	1794	766
Stage 1	-	-	-	-	-	-	946	946	-	832	832	-
Stage 2	-	-	-	-	-	-	938	881	-	956	962	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	812	-	-	930	-	-	54	77	474	63	80	403
Stage 1	-	-	-	-	-	-	314	340	-	363	384	-
Stage 2	-	-	-	-	-	-	317	365	-	310	334	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	812	-	-	930	-	-	21	60	474	~47	63	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	21	60	-	~47	63	-
Stage 1	-	-	-	-	-	-	255	276	-	295	371	-
Stage 2	-	-	-	-	-	-	147	352	-	239	272	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0.3	210.6	82.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	25	474	812	-	-	930	-	-	48	403
HCM Lane V/C Ratio	0.87	0.034	0.187	-	-	0.035	-	-	1.132	0.512
HCM Control Delay (s)	\$ 358.8	12.9	10.5	-	-	9	-	-	\$ 307.5	23
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %ile Q(veh)	2.7	0.1	0.7	-	-	0.1	-	-	4.9	2.8

Notes												
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon												



# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↑	↗	↖	↑		↖	↗	
Traffic Volume (veh/h)	285	275	80	135	430	285	85	195	80	325	260	290
Future Volume (veh/h)	285	275	80	135	430	285	85	195	80	325	260	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	310	299	78	147	467	63	92	212	74	353	283	280
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	491	128	371	522	442	174	350	122	442	314	310
Arrive On Green	0.14	0.34	0.34	0.08	0.28	0.28	0.04	0.26	0.26	0.14	0.36	0.36
Sat Flow, veh/h	1781	1430	373	1781	1870	1585	1781	1325	462	1781	863	854
Grp Volume(v), veh/h	310	0	377	147	467	63	92	0	286	353	0	563
Grp Sat Flow(s),veh/h/ln	1781	0	1803	1781	1870	1585	1781	0	1787	1781	0	1717
Q Serve(g_s), s	13.1	0.0	19.2	6.4	26.5	3.3	4.0	0.0	15.5	15.0	0.0	34.3
Cycle Q Clear(g_c), s	13.1	0.0	19.2	6.4	26.5	3.3	4.0	0.0	15.5	15.0	0.0	34.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.26	1.00		0.50
Lane Grp Cap(c), veh/h	352	0	620	371	522	442	174	0	472	442	0	624
V/C Ratio(X)	0.88	0.00	0.61	0.40	0.90	0.14	0.53	0.00	0.61	0.80	0.00	0.90
Avail Cap(c_a), veh/h	423	0	783	397	643	545	174	0	679	442	0	823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	30.1	25.8	38.3	29.9	32.2	0.0	35.6	26.3	0.0	33.3
Incr Delay (d2), s/veh	16.8	0.0	1.0	0.7	13.2	0.1	3.0	0.0	1.3	9.9	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	8.5	2.8	14.0	1.3	2.0	0.0	6.9	7.9	0.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	31.1	26.5	51.5	30.1	35.2	0.0	36.9	36.2	0.0	44.1
LnGrp LOS	D	A	C	C	D	C	D	A	D	D	A	D
Approach Vol, veh/h		687			677			378			916	
Approach Delay, s/veh		36.3			44.1			36.5			41.1	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	35.2	12.4	44.0	8.0	46.2	19.5	36.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	15.0	42.0	10.0	48.0	4.0	53.0	20.0	38.0				
Max Q Clear Time (g_c+I1), s	17.0	17.5	8.4	21.2	6.0	36.3	15.1	28.5				
Green Ext Time (p_c), s	0.0	1.8	0.1	2.6	0.0	3.8	0.4	2.3				

## Intersection Summary

HCM 6th Ctrl Delay 39.9  
HCM 6th LOS D

HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection

Intersection Delay, s/veh 23.4

Intersection LOS C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	723	554	327	728
Demand Flow Rate, veh/h	737	565	333	742
Vehicles Circulating, veh/h	415	615	764	454
Vehicles Exiting, veh/h	781	482	388	726
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.3	23.2	14.7	27.7
Approach LOS	C	C	B	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	737	565	333	742
Cap Entry Lane, veh/h	904	737	633	868
Entry HV Adj Factor	0.980	0.980	0.981	0.982
Flow Entry, veh/h	723	554	327	728
Cap Entry, veh/h	886	722	621	852
V/C Ratio	0.816	0.767	0.526	0.854
Control Delay, s/veh	23.3	23.2	14.7	27.7
LOS	C	C	B	D
95th %tile Queue, veh	9	7	3	10

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection

Int Delay, s/veh 171.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	270	45	510	285	70	760
Future Vol, veh/h	270	45	510	285	70	760
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	49	554	310	76	826

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1687	709	0
Stage 1	709	-	-
Stage 2	978	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	~ 103	434	-
Stage 1	488	-	-
Stage 2	364	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 84	434	-
Mov Cap-2 Maneuver	~ 84	-	-
Stage 1	400	-	-
Stage 2	364	-	-

Approach	WB	NB	SB
HCM Control Delay, s	1053.9	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	84	434	779	-
HCM Lane V/C Ratio	-	-	3.494	0.113	0.098	-
HCM Control Delay (s)	-	-	\$ 1227.2	14.3	10.1	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	29.9	0.4	0.3	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖		↖	↗		↖	↗	↖
Traffic Volume (veh/h)	15	15	10	175	20	130	5	745	180	115	810	30
Future Volume (veh/h)	15	15	10	175	20	130	5	745	180	115	810	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	16	11	190	22	141	5	810	196	125	880	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	182	393	232	22	139	237	815	197	175	1159	983
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.56	0.56	0.06	0.62	0.62
Sat Flow, veh/h	613	734	1585	756	88	561	1781	1455	352	1781	1870	1585
Grp Volume(v), veh/h	32	0	11	353	0	0	5	0	1006	125	880	33
Grp Sat Flow(s),veh/h/ln	1347	0	1585	1405	0	0	1781	0	1807	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.7	29.4	0.0	0.0	0.2	0.0	68.9	4.1	42.2	1.0
Cycle Q Clear(g_c), s	1.6	0.0	0.7	31.0	0.0	0.0	0.2	0.0	68.9	4.1	42.2	1.0
Prop In Lane	0.50		1.00	0.54		0.40	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	377	0	393	393	0	0	237	0	1013	175	1159	983
V/C Ratio(X)	0.08	0.00	0.03	0.90	0.00	0.00	0.02	0.00	0.99	0.71	0.76	0.03
Avail Cap(c_a), veh/h	377	0	393	393	0	0	273	0	1013	176	1159	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	0.0	35.5	47.9	0.0	0.0	16.8	0.0	27.2	33.2	17.0	9.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	22.2	0.0	0.0	0.0	0.0	26.6	11.0	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	13.5	0.0	0.0	0.1	0.0	35.5	2.7	18.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	35.6	70.1	0.0	0.0	16.8	0.0	53.8	44.2	20.6	9.2
LnGrp LOS	D	A	D	E	A	A	B	A	D	D	C	A
Approach Vol, veh/h		43			353			1011			1038	
Approach Delay, s/veh		35.8			70.1			53.7			23.0	
Approach LOS		D			E			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	76.0		37.0	4.5	83.4		37.0				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	70.0		31.0	3.0	75.0		31.0				
Max Q Clear Time (g_c+I1), s	6.1	70.9		3.6	2.2	44.2		33.0				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	15.3		0.0				

## Intersection Summary

HCM 6th Ctrl Delay 42.7  
HCM 6th LOS D

HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection

Int Delay, s/veh 10.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	100	105	150	255	215	85
Future Vol, veh/h	100	105	150	255	215	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	114	163	277	234	92

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	440	0	0 634 302
Stage 1	-	-	- 302 -
Stage 2	-	-	- 332 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1120	-	- 443 738
Stage 1	-	-	- 750 -
Stage 2	-	-	- 727 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1120	-	- 397 738
Mov Cap-2 Maneuver	-	-	- 397 -
Stage 1	-	-	- 672 -
Stage 2	-	-	- 727 -

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	30.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1120	-	-	-	457
HCM Lane V/C Ratio	0.097	-	-	-	0.714
HCM Control Delay (s)	8.6	0	-	-	30.2
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	-	5.6



HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↖	↗	
Traffic Vol, veh/h	15	10	20	340	285	20
Future Vol, veh/h	15	10	20	340	285	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	22	370	310	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	735	321	332
Stage 1	321	-	-
Stage 2	414	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	387	720	1227
Stage 1	735	-	-
Stage 2	667	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	378	720	1227
Mov Cap-2 Maneuver	378	-	-
Stage 1	718	-	-
Stage 2	667	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1227	-	378	720	-	-
HCM Lane V/C Ratio	0.018	-	0.043	0.015	-	-
HCM Control Delay (s)	8	0	15	10.1	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Vol, veh/h	10	15	25	315	290	20
Future Vol, veh/h	10	15	25	315	290	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	27	342	315	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	722	326	337
Stage 1	326	-	-
Stage 2	396	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	394	715	1222
Stage 1	731	-	-
Stage 2	680	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	383	715	1222
Mov Cap-2 Maneuver	383	-	-
Stage 1	711	-	-
Stage 2	680	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1222	-	531	-	-
HCM Lane V/C Ratio	0.022	-	0.051	-	-
HCM Control Delay (s)	8	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-



HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	50	40	40	290	270	80
Future Vol, veh/h	50	40	40	290	270	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	43	43	315	293	87

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	738	337	380
Stage 1	337	-	-
Stage 2	401	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	385	705	1178
Stage 1	723	-	-
Stage 2	676	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	368	705	1178
Mov Cap-2 Maneuver	368	-	-
Stage 1	691	-	-
Stage 2	676	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.7	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1178	-	467	-	-
HCM Lane V/C Ratio	0.037	-	0.209	-	-
HCM Control Delay (s)	8.2	0	14.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	60	10	15	325	340	75
Future Vol, veh/h	60	10	15	325	340	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	11	16	353	370	82

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	796	411	452	0	0
Stage 1	411	-	-	-	-
Stage 2	385	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	356	641	1109	-	-
Stage 1	669	-	-	-	-
Stage 2	688	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	350	641	1109	-	-
Mov Cap-2 Maneuver	350	-	-	-	-
Stage 1	657	-	-	-	-
Stage 2	688	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1109	-	350	641	-	-
HCM Lane V/C Ratio	0.015	-	0.186	0.017	-	-
HCM Control Delay (s)	8.3	0	17.6	10.7	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	0.1	-	-



## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 AM
-

# HCM 6th Signalized Intersection Summary

## 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	330	225	440	30	190	110	270	570	10	40	445	110
Future Volume (veh/h)	330	225	440	30	190	110	270	570	10	40	445	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1567	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	471	245	478	33	207	120	293	620	0	43	484	0
Peak Hour Factor	0.70	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	511	433	236	259	219	388	777		245	604	
Arrive On Green	0.17	0.27	0.27	0.03	0.14	0.14	0.13	0.42	0.00	0.04	0.32	0.00
Sat Flow, veh/h	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	471	245	478	33	207	120	293	620	0	43	484	0
Grp Sat Flow(s), veh/h/ln	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	15.0	9.9	24.7	1.4	9.7	6.4	9.4	26.2	0.0	1.4	21.3	0.0
Cycle Q Clear(g_c), s	15.0	9.9	24.7	1.4	9.7	6.4	9.4	26.2	0.0	1.4	21.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	355	511	433	236	259	219	388	777		245	604	
V/C Ratio(X)	1.33	0.48	1.10	0.14	0.80	0.55	0.75	0.80		0.18	0.80	
Avail Cap(c_a), veh/h	355	511	433	477	497	421	553	1015		575	1015	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.7	27.4	32.8	31.7	37.7	36.3	19.3	23.1	0.0	20.8	27.9	0.0
Incr Delay (d2), s/veh	164.8	0.3	74.2	0.1	2.2	0.8	1.9	5.1	0.0	0.1	5.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	4.4	18.2	0.6	4.6	2.5	3.6	11.6	0.0	0.6	9.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	194.5	27.7	107.0	31.8	39.9	37.0	21.2	28.1	0.0	21.0	33.2	0.0
LnGrp LOS	F	C	F	C	D	D	C	C		C	C	
Approach Vol, veh/h		1194			360			913	A		527	A
Approach Delay, s/veh		125.2			38.2			25.9			32.2	
Approach LOS		F			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	43.5	7.8	30.7	16.6	35.2	20.0	18.5				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	3.4	28.2	3.4	26.7	11.4	23.3	17.0	11.7				
Green Ext Time (p_c), s	0.0	7.2	0.0	0.0	0.3	5.8	0.0	0.8				

### Intersection Summary

HCM 6th Ctrl Delay 68.1  
HCM 6th LOS E

### Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	60	160	75	310	70	310	20	495	410	340	605	10
Future Volume (veh/h)	60	160	75	310	70	310	20	495	410	340	605	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	174	82	337	76	337	22	538	0	370	658	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	225	216	424	447	592	243	637		392	861	795
Arrive On Green	0.04	0.11	0.11	0.17	0.24	0.24	0.01	0.34	0.00	0.13	0.46	0.46
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	65	174	82	337	76	337	22	538	0	370	658	11
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.4	6.7	3.5	13.3	2.6	13.8	0.7	21.8	0.0	10.7	23.9	0.3
Cycle Q Clear(g_c), s	2.4	6.7	3.5	13.3	2.6	13.8	0.7	21.8	0.0	10.7	23.9	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	225	216	424	447	592	243	637		392	861	795
V/C Ratio(X)	0.23	0.77	0.38	0.80	0.17	0.57	0.09	0.85		0.94	0.76	0.01
Avail Cap(c_a), veh/h	301	278	261	424	481	621	348	779		392	893	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	35.4	32.9	25.0	24.7	20.4	18.5	24.9	0.0	17.8	18.3	10.2
Incr Delay (d2), s/veh	0.4	7.9	0.4	10.1	0.1	0.6	0.1	9.1	0.0	31.0	4.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.8	1.5	6.6	1.2	5.0	0.3	10.6	0.0	7.2	10.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	43.3	33.4	35.1	24.7	21.0	18.5	34.1	0.0	48.8	23.0	10.2
LnGrp LOS	C	D	C	D	C	C	B	C		D	C	B
Approach Vol, veh/h	321			750			560			A	1039	
Approach Delay, s/veh	38.3			27.7			33.5				32.0	
Approach LOS	D			C			C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.8	18.0	14.9	5.2	43.6	7.4	25.5					
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax),s	34.0	14.0	11.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+1/10),s	23.8	15.3	8.7	2.7	25.9	4.4	15.8					
Green Ext Time (p_c), s	0.0	4.0	0.0	0.2	0.0	6.1	0.0	0.5				

## Intersection Summary

HCM 6th Ctrl Delay 31.9  
HCM 6th LOS C

## Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.



HCM 6th TWSC  
3: Kuikahi Dr & Kehalani Village Dr

04/30/2018

Intersection												
Int Delay, s/veh	9.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑			↰	↑		↰	↑
Traffic Vol, veh/h	80	790	10	10	565	65	30	5	30	30	5	105
Future Vol, veh/h	80	790	10	10	565	65	30	5	30	30	5	105
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	859	11	11	614	71	33	5	33	33	5	114

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	685	0	0	870	0	0	1770	1746	865	1730	1716	650
Stage 1	-	-	-	-	-	-	1039	1039	-	672	672	-
Stage 2	-	-	-	-	-	-	731	707	-	1058	1044	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	908	-	-	775	-	-	65	86	353	69	90	469
Stage 1	-	-	-	-	-	-	279	308	-	445	454	-
Stage 2	-	-	-	-	-	-	413	438	-	272	306	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	908	-	-	775	-	-	43	77	353	54	80	469
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	77	-	54	80	-
Stage 1	-	-	-	-	-	-	252	278	-	402	448	-
Stage 2	-	-	-	-	-	-	304	432	-	219	277	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	125.6	48.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	46	353	908	-	-	775	-	-	57	469
HCM Lane V/C Ratio	0.827	0.092	0.096	-	-	0.014	-	-	0.667	0.243
HCM Control Delay (s)	219.4	16.2	9.4	-	-	9.7	-	-	150.1	15.1
HCM Lane LOS	F	C	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	3.3	0.3	0.3	-	-	0	-	-	2.8	0.9

# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↑	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	425	390	75	65	290	245	155	250	100	285	210	200
Future Volume (veh/h)	425	390	75	65	290	245	155	250	100	285	210	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	531	424	78	71	315	41	168	272	95	310	228	187
Peak Hour Factor	0.80	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	558	627	115	308	365	309	259	307	107	339	289	237
Arrive On Green	0.26	0.41	0.41	0.04	0.19	0.19	0.06	0.23	0.23	0.14	0.30	0.30
Sat Flow, veh/h	1781	1537	283	1781	1870	1585	1781	1324	463	1781	950	780
Grp Volume(v), veh/h	531	0	502	71	315	41	168	0	367	310	0	415
Grp Sat Flow(s),veh/h/ln	1781	0	1819	1781	1870	1585	1781	0	1787	1781	0	1730
Q Serve(g_s), s	26.2	0.0	25.0	3.5	18.1	2.4	7.0	0.0	22.0	14.4	0.0	24.4
Cycle Q Clear(g_c), s	26.2	0.0	25.0	3.5	18.1	2.4	7.0	0.0	22.0	14.4	0.0	24.4
Prop In Lane	1.00		0.16	1.00		1.00	1.00		0.26	1.00		0.45
Lane Grp Cap(c), veh/h	558	0	743	308	365	309	259	0	414	339	0	526
V/C Ratio(X)	0.95	0.00	0.68	0.23	0.86	0.13	0.65	0.00	0.89	0.91	0.00	0.79
Avail Cap(c_a), veh/h	581	0	788	437	523	443	259	0	548	339	0	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	26.8	33.4	43.2	36.9	33.9	0.0	41.2	28.7	0.0	35.4
Incr Delay (d2), s/veh	25.3	0.0	2.2	0.4	10.1	0.2	5.6	0.0	13.1	28.1	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	0.0	11.2	1.6	9.4	0.9	1.4	0.0	11.2	8.7	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	0.0	29.0	33.8	53.3	37.1	39.5	0.0	54.3	56.7	0.0	40.5
LnGrp LOS	D	A	C	C	D	D	D	A	D	E	A	D
Approach Vol, veh/h		1033			427			535			725	
Approach Delay, s/veh		40.9			48.5			49.6			47.5	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	31.7	8.9	51.3	11.0	39.7	32.6	27.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	15.0	34.0	13.0	48.0	7.0	42.0	30.0	31.0				
Max Q Clear Time (g_c+I1), s	16.4	24.0	5.5	27.0	9.0	26.4	28.2	20.1				
Green Ext Time (p_c), s	0.0	1.7	0.1	3.5	0.0	2.5	0.4	1.5				

## Intersection Summary

HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D



HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection

Intersection Delay, s/veh 26.1

Intersection LOS D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	560	418	604	718
Demand Flow Rate, veh/h	571	426	617	733
Vehicles Circulating, veh/h	494	760	599	521
Vehicles Exiting, veh/h	760	456	466	665
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.8	20.1	27.6	35.5
Approach LOS	C	C	D	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	571	426	617	733
Cap Entry Lane, veh/h	834	636	749	811
Entry HV Adj Factor	0.981	0.980	0.979	0.980
Flow Entry, veh/h	560	418	604	718
Cap Entry, veh/h	818	623	734	795
V/C Ratio	0.685	0.670	0.824	0.904
Control Delay, s/veh	16.8	20.1	27.6	35.5
LOS	C	C	D	E
95th %tile Queue, veh	6	5	9	12

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection

Int Delay, s/veh 120.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	230	45	595	730	45	595
Future Vol, veh/h	230	45	595	730	45	595
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	250	49	647	793	49	647

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1789	1044	0
Stage 1	1044	-	-
Stage 2	745	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	~ 89	278	-
Stage 1	339	-	-
Stage 2	469	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 75	278	-
Mov Cap-2 Maneuver	~ 75	-	-
Stage 1	284	-	-
Stage 2	469	-	-

Approach	WB	NB	SB
HCM Control Delay, s	979.9	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	75	278	471	-
HCM Lane V/C Ratio	-	-	3.333	0.176	0.104	-
HCM Control Delay (s)	-	\$	1167.6	20.7	13.5	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	25.5	0.6	0.3	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖		↖	↗		↖	↗	↖
Traffic Volume (veh/h)	30	20	10	100	5	55	5	695	130	170	790	10
Future Volume (veh/h)	30	20	10	100	5	55	5	695	130	170	790	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	22	11	109	5	60	5	755	141	185	859	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	139	316	226	23	95	267	796	149	283	1138	965
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	822	695	1585	788	117	477	1781	1533	286	1781	1870	1585
Grp Volume(v), veh/h	55	0	11	174	0	0	5	0	896	185	859	11
Grp Sat Flow(s),veh/h/ln	1517	0	1585	1382	0	0	1781	0	1819	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.5	7.9	0.0	0.0	0.1	0.0	39.7	3.6	28.3	0.2
Cycle Q Clear(g_c), s	2.3	0.0	0.5	10.2	0.0	0.0	0.1	0.0	39.7	3.6	28.3	0.2
Prop In Lane	0.60		1.00	0.63		0.34	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	370	0	316	344	0	0	267	0	945	283	1138	965
V/C Ratio(X)	0.15	0.00	0.03	0.51	0.00	0.00	0.02	0.00	0.95	0.65	0.75	0.01
Avail Cap(c_a), veh/h	495	0	448	465	0	0	596	0	945	453	1138	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	27.4	31.6	0.0	0.0	12.2	0.0	19.3	18.4	12.0	6.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0	19.1	1.0	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.2	3.3	0.0	0.0	0.0	0.0	20.0	1.9	11.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	27.5	32.0	0.0	0.0	12.2	0.0	38.5	19.4	16.7	6.6
LnGrp LOS	C	A	C	C	A	A	B	A	D	B	B	A
Approach Vol, veh/h		66			174			901			1055	
Approach Delay, s/veh		28.1			32.0			38.3			17.1	
Approach LOS		C			C			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	50.2		22.9	4.3	57.7		22.9				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	5.6	41.7		4.3	2.1	30.3		12.2				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	0.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			27.3									
HCM 6th LOS			C									

HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection

Int Delay, s/veh 22.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		Y	
Traffic Vol, veh/h	85	240	75	115	315	90
Future Vol, veh/h	85	240	75	115	315	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	261	82	125	342	98

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	207	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1364	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1364	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	48.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1364	-	-	-	490
HCM Lane V/C Ratio	0.068	-	-	-	0.898
HCM Control Delay (s)	7.8	0	-	-	48.6
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	10.1

HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection

Int Delay, s/veh

1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	20	25	10	190	375	10
Future Vol, veh/h	20	25	10	190	375	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	27	11	207	408	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	643	414	419
Stage 1	414	-	-
Stage 2	229	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	438	638	1140
Stage 1	667	-	-
Stage 2	809	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	433	638	1140
Mov Cap-2 Maneuver	433	-	-
Stage 1	660	-	-
Stage 2	809	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1140	-	433	638	-	-
HCM Lane V/C Ratio	0.01	-	0.05	0.043	-	-
HCM Control Delay (s)	8.2	0	13.8	10.9	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %ile Q(veh)	0	-	0.2	0.1	-	-



HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			4	1	
Traffic Vol, veh/h	25	20	5	205	355	10
Future Vol, veh/h	25	20	5	205	355	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	22	5	223	386	11

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	625	392	397	0	-	0
Stage 1	392	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	449	657	1162	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	447	657	1162	-	-	-
Mov Cap-2 Maneuver	447	-	-	-	-	-
Stage 1	680	-	-	-	-	-
Stage 2	806	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	12.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1162	-	521	-	-
HCM Lane V/C Ratio	0.005	-	0.094	-	-
HCM Control Delay (s)	8.1	0	12.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	75	80	15	215	285	35
Future Vol, veh/h	75	80	15	215	285	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	87	16	234	310	38

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	595	329	348
Stage 1	329	-	-
Stage 2	266	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	467	712	1211
Stage 1	729	-	-
Stage 2	779	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	460	712	1211
Mov Cap-2 Maneuver	460	-	-
Stage 1	718	-	-
Stage 2	779	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1211	-	563	-	-
HCM Lane V/C Ratio	0.013	-	0.299	-	-
HCM Control Delay (s)	8	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-



HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	100	25	5	285	300	35
Future Vol, veh/h	100	25	5	285	300	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	27	5	310	326	38

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	665	345	364	0	-	0
Stage 1	345	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	425	698	1195	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	423	698	1195	-	-	-
Mov Cap-2 Maneuver	423	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	736	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1195	-	423	698	-	-
HCM Lane V/C Ratio	0.005	-	0.257	0.039	-	-
HCM Control Delay (s)	8	0	16.4	10.4	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1	0.1	-	-

HCM 6th TWSC  
13: Waiale Rd & Project Access II

04/30/2018

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	20	10	5	405	320	5
Future Vol, veh/h	20	10	5	405	320	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	11	5	440	348	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	801	351	353	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	354	692	1206	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	353	692	1206	-	-	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1206	-	422	-	-
HCM Lane V/C Ratio	0.005	-	0.077	-	-
HCM Control Delay (s)	8	-	14.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 6th TWSC  
14: Waiale Rd & Project Access I

04/30/2018

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖		↖	↑	↗	
Traffic Vol, veh/h	20	10	5	420	325	10
Future Vol, veh/h	20	10	5	420	325	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	11	5	457	353	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	826	359	364
Stage 1	359	-	-
Stage 2	467	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	342	685	1195
Stage 1	707	-	-
Stage 2	631	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	341	685	1195
Mov Cap-2 Maneuver	341	-	-
Stage 1	704	-	-
Stage 2	631	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1195	-	410	-	-
HCM Lane V/C Ratio	0.005	-	0.08	-	-
HCM Control Delay (s)	8	-	14.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-



---

## APPENDIX C

### LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 PM
-

# HCM 6th Signalized Intersection Summary

## 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↖	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	125	95	170	15	125	75	200	505	25	100	625	270
Future Volume (veh/h)	125	95	170	15	125	75	200	505	25	100	625	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	103	185	16	136	82	217	549	0	109	679	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	288	322	273	241	194	164	339	866		405	799	
Arrive On Green	0.09	0.17	0.17	0.02	0.10	0.10	0.09	0.46	0.00	0.06	0.43	0.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	136	103	185	16	136	82	217	549	0	109	679	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	3.7	8.4	0.6	5.4	3.7	5.1	17.1	0.0	2.6	25.0	0.0
Cycle Q Clear(g_c), s	5.0	3.7	8.4	0.6	5.4	3.7	5.1	17.1	0.0	2.6	25.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	322	273	241	194	164	339	866		405	799	
V/C Ratio(X)	0.47	0.32	0.68	0.07	0.70	0.50	0.64	0.63		0.27	0.85	
Avail Cap(c_a), veh/h	482	586	497	556	586	497	636	953		765	953	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.8	27.8	29.7	29.7	33.2	32.4	15.6	15.6	0.0	12.3	19.7	0.0
Incr Delay (d2), s/veh	0.4	0.2	1.1	0.0	1.7	0.9	0.8	1.9	0.0	0.1	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.6	3.2	0.3	2.5	1.5	1.7	6.8	0.0	0.9	11.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	28.0	30.8	29.8	34.9	33.3	16.3	17.6	0.0	12.4	27.6	0.0
LnGrp LOS	C	C	C	C	C	C	B	B		B	C	
Approach Vol, veh/h		424			234			766	A		788	A
Approach Delay, s/veh		28.7			34.0			17.2			25.5	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	41.5	6.4	19.2	12.2	38.7	11.7	13.9				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s	4.6	19.1	2.6	10.4	7.1	27.0	7.0	7.4				
Green Ext Time (p_c), s	0.1	6.1	0.0	0.6	0.2	5.7	0.1	0.6				

### Intersection Summary

HCM 6th Ctrl Delay 24.1  
 HCM 6th LOS C

### Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



## HCM 6th Signalized Intersection Summary

### 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

	↖	→	↗	↖	←	↗	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗	
Traffic Volume (veh/h)	15	95	35	490	145	285	50	435	430	270	535	40	
Future Volume (veh/h)	15	95	35	490	145	285	50	435	430	270	535	40	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No			No			No			
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	16	103	38	533	158	310	54	473	0	293	582	43	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2	
Cap, veh/h	191	152	186	587	603	720	236	545		368	731	643	
Arrive On Green	0.01	0.07	0.07	0.26	0.32	0.32	0.03	0.29	0.00	0.13	0.39	0.39	
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585	
Grp Volume(v), veh/h	16	103	38	533	158	310	54	473	0	293	582	43	
Grp Sat Flow(s), veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585	
Q Serve(g_s), s	0.6	4.1	1.7	22.0	5.2	11.1	1.8	20.0	0.0	9.1	23.0	1.4	
Cycle Q Clear(g_c), s	0.6	4.1	1.7	22.0	5.2	11.1	1.8	20.0	0.0	9.1	23.0	1.4	
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Lane Grp Cap(c), veh/h	191	152	186	587	603	720	236	545		368	731	643	
V/C Ratio(X)	0.08	0.68	0.20	0.91	0.26	0.43	0.23	0.87		0.80	0.80	0.07	
Avail Cap(c_a), veh/h	397	223	245	587	603	720	307	627		368	739	650	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	35.0	37.7	34.1	24.8	20.9	15.5	21.1	28.0	0.0	19.1	22.5	15.1	
Incr Delay (d2), s/veh	0.2	2.0	0.2	18.1	0.1	0.2	0.2	13.0	0.0	10.6	6.9	0.1	
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.3	2.1	0.7	12.2	2.3	3.9	0.7	10.4	0.0	4.5	10.7	0.5	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	35.1	39.6	34.3	42.9	21.0	15.6	21.2	41.1	0.0	29.7	29.4	15.2	
LnGrp LOS	D	D	C	D	C	B	C	D		C	C	B	
Approach Vol, veh/h		157			1001			527	A		918		
Approach Delay, s/veh		37.9			31.0			39.1			28.8		
Approach LOS		D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8					
Phs Duration (G+Y+Rc), s	5.0	30.3	26.0	12.2	6.7	38.6	5.2	32.9					
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0					
Max Green Setting (Gmax), s	28.0	28.0	22.0	9.0	6.0	33.0	10.0	21.0					
Max Q Clear Time (g_c+Ilt), s	22.0	22.0	24.0	6.1	3.8	25.0	2.6	13.1					
Green Ext Time (p_c), s	0.0	0.0	2.3	0.0	0.1	0.0	3.8	0.0	0.8				

#### Intersection Summary

HCM 6th Ctrl Delay 32.3  
 HCM 6th LOS C

#### Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC  
3: Kuikahi Dr & Kehalani Village Dr

04/30/2018

Intersection

Int Delay, s/veh 16.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑			↑	↑		↑	↑
Traffic Vol, veh/h	140	585	30	30	665	90	15	5	15	45	5	190
Future Vol, veh/h	140	585	30	30	665	90	15	5	15	45	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	152	636	33	33	723	98	16	5	16	49	5	207

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	821	0	0	669	0	0	1901	1844	653	1805	1811	772
Stage 1	-	-	-	-	-	-	957	957	-	838	838	-
Stage 2	-	-	-	-	-	-	944	887	-	967	973	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	808	-	-	921	-	-	52	75	467	61	79	400
Stage 1	-	-	-	-	-	-	310	336	-	361	382	-
Stage 2	-	-	-	-	-	-	315	362	-	306	330	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	808	-	-	921	-	-	20	59	467	~ 46	62	400
Mov Cap-2 Maneuver	-	-	-	-	-	-	20	59	-	~ 46	62	-
Stage 1	-	-	-	-	-	-	252	273	-	293	368	-
Stage 2	-	-	-	-	-	-	145	349	-	235	268	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.3	223.9	84.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	24	467	808	-	-	921	-	-	47	400
HCM Lane V/C Ratio	0.906	0.035	0.188	-	-	0.035	-	-	1.156	0.516
HCM Control Delay (s)	\$ 382	13	10.5	-	-	9.1	-	-	\$ 319.5	23.2
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.7	0.1	0.7	-	-	0.1	-	-	5	2.9

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	285	275	85	145	430	285	90	205	85	325	285	290
Future Volume (veh/h)	285	275	85	145	430	285	90	205	85	325	285	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	310	299	83	158	467	63	98	223	79	353	310	280
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	475	132	363	519	440	165	345	122	446	339	306
Arrive On Green	0.14	0.34	0.34	0.08	0.28	0.28	0.03	0.26	0.26	0.15	0.37	0.37
Sat Flow, veh/h	1781	1409	391	1781	1870	1585	1781	1319	467	1781	905	818
Grp Volume(v), veh/h	310	0	382	158	467	63	98	0	302	353	0	590
Grp Sat Flow(s),veh/h/ln	1781	0	1800	1781	1870	1585	1781	0	1786	1781	0	1723
Q Serve(g_s), s	13.7	0.0	20.6	7.2	27.7	3.4	4.0	0.0	17.3	16.3	0.0	37.5
Cycle Q Clear(g_c), s	13.7	0.0	20.6	7.2	27.7	3.4	4.0	0.0	17.3	16.3	0.0	37.5
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.26	1.00		0.47
Lane Grp Cap(c), veh/h	343	0	607	363	519	440	165	0	468	446	0	646
V/C Ratio(X)	0.90	0.00	0.63	0.43	0.90	0.14	0.59	0.00	0.65	0.79	0.00	0.91
Avail Cap(c_a), veh/h	389	0	750	376	634	537	165	0	621	446	0	793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	32.1	27.1	40.1	31.3	36.1	0.0	37.8	26.0	0.0	34.2
Incr Delay (d2), s/veh	22.2	0.0	1.2	0.8	14.0	0.1	5.6	0.0	1.5	9.4	0.0	13.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	9.2	3.2	14.7	1.4	1.1	0.0	7.8	8.0	0.0	17.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.2	0.0	33.3	27.9	54.0	31.4	41.7	0.0	39.3	35.4	0.0	47.4
LnGrp LOS	D	A	C	C	D	C	D	A	D	D	A	D
Approach Vol, veh/h		692			688			400			943	
Approach Delay, s/veh		40.4			46.0			39.9			42.9	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	36.1	13.2	44.8	8.0	49.1	20.0	38.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	17.0	40.0	10.0	48.0	4.0	53.0	19.0	39.0				
Max Q Clear Time (g_c+I1), s	18.3	19.3	9.2	22.6	6.0	39.5	15.7	29.7				
Green Ext Time (p_c), s	0.0	1.9	0.0	2.6	0.0	3.7	0.3	2.3				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			42.6									
HCM 6th LOS			D									

HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection

Intersection Delay, s/veh 24.3

Intersection LOS C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	733	559	327	728
Demand Flow Rate, veh/h	748	571	333	742
Vehicles Circulating, veh/h	415	620	775	460
Vehicles Exiting, veh/h	787	488	388	731
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	24.4	24.2	15.0	28.4
Approach LOS	C	C	B	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	748	571	333	742
Cap Entry Lane, veh/h	904	733	626	863
Entry HV Adj Factor	0.981	0.980	0.981	0.982
Flow Entry, veh/h	733	559	327	728
Cap Entry, veh/h	886	718	614	847
V/C Ratio	0.828	0.779	0.532	0.860
Control Delay, s/veh	24.4	24.2	15.0	28.4
LOS	C	C	B	D
95th %tile Queue, veh	10	8	3	11

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection

Int Delay, s/veh 181.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	275	45	515	290	70	775
Future Vol, veh/h	275	45	515	290	70	775
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	49	560	315	76	842

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1712	718	0
Stage 1	718	-	-
Stage 2	994	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	~ 100	429	771
Stage 1	483	-	-
Stage 2	358	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	~ 82	429	771
Mov Cap-2 Maneuver	~ 82	-	-
Stage 1	394	-	-
Stage 2	358	-	-

Approach	WB	NB	SB
HCM Control Delay, \$ 1116.6		0	0.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	82	429	771	-
HCM Lane V/C Ratio	-	-	3.645	0.114	0.099	-
HCM Control Delay (s)	-	-	\$ 1297	14.5	10.2	0
HCM Lane LOS	-	-	F	B	B	A
HCM 95th %tile Q(veh)	-	-	30.8	0.4	0.3	-

Notes

~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕		↖	↑		↖	↑	↗
Traffic Volume (veh/h)	15	15	10	175	20	130	5	745	180	115	810	30
Future Volume (veh/h)	15	15	10	175	20	130	5	745	180	115	810	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	16	11	190	22	141	5	810	196	125	880	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	182	393	232	22	139	237	815	197	175	1159	983
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.56	0.56	0.06	0.62	0.62
Sat Flow, veh/h	613	734	1585	756	88	561	1781	1455	352	1781	1870	1585
Grp Volume(v), veh/h	32	0	11	353	0	0	5	0	1006	125	880	33
Grp Sat Flow(s),veh/h/ln	1347	0	1585	1405	0	0	1781	0	1807	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.7	29.4	0.0	0.0	0.2	0.0	68.9	4.1	42.2	1.0
Cycle Q Clear(g_c), s	1.6	0.0	0.7	31.0	0.0	0.0	0.2	0.0	68.9	4.1	42.2	1.0
Prop In Lane	0.50		1.00	0.54		0.40	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	377	0	393	393	0	0	237	0	1013	175	1159	983
V/C Ratio(X)	0.08	0.00	0.03	0.90	0.00	0.00	0.02	0.00	0.99	0.71	0.76	0.03
Avail Cap(c_a), veh/h	377	0	393	393	0	0	273	0	1013	176	1159	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	0.0	35.5	47.9	0.0	0.0	16.8	0.0	27.2	33.2	17.0	9.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	22.2	0.0	0.0	0.0	0.0	26.6	11.0	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.3	13.5	0.0	0.0	0.1	0.0	35.5	2.7	18.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	35.6	70.1	0.0	0.0	16.8	0.0	53.8	44.2	20.6	9.2
LnGrp LOS	D	A	D	E	A	A	B	A	D	D	C	A
Approach Vol, veh/h		43			353			1011			1038	
Approach Delay, s/veh		35.8			70.1			53.7			23.0	
Approach LOS		D			E			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	76.0		37.0	4.5	83.4		37.0				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	70.0		31.0	3.0	75.0		31.0				
Max Q Clear Time (g_c+I1), s	6.1	70.9		3.6	2.2	44.2		33.0				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	15.3		0.0				

## Intersection Summary

HCM 6th Ctrl Delay 42.7  
HCM 6th LOS D

HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection

Int Delay, s/veh 11.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4	4		4	
Traffic Vol, veh/h	100	105	150	260	215	90
Future Vol, veh/h	100	105	150	260	215	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	114	163	283	234	98

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	446	0	0 637 305
Stage 1	-	-	- 305 -
Stage 2	-	-	- 332 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1114	-	- 441 735
Stage 1	-	-	- 748 -
Stage 2	-	-	- 727 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1114	-	- 395 735
Mov Cap-2 Maneuver	-	-	- 395 -
Stage 1	-	-	- 670 -
Stage 2	-	-	- 727 -

Approach	EB	WB	SB
HCM Control Delay, s	4.2	0	31
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1114	-	-	-	457
HCM Lane V/C Ratio	0.098	-	-	-	0.725
HCM Control Delay (s)	8.6	0	-	-	31
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	-	5.8



HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection:

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	15	10	20	345	290	20
Future Vol, veh/h	15	10	20	345	290	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	22	375	315	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	745	326	337
Stage 1	326	-	-
Stage 2	419	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	382	715	1222
Stage 1	731	-	-
Stage 2	664	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	373	715	1222
Mov Cap-2 Maneuver	373	-	-
Stage 1	714	-	-
Stage 2	664	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1222	-	373	715	-	-
HCM Lane V/C Ratio	0.018	-	0.044	0.015	-	-
HCM Control Delay (s)	8	0	15.1	10.1	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	10	15	25	325	295	20
Future Vol, veh/h	10	15	25	325	295	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	27	353	321	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	739	332	343	0	-	0
Stage 1	332	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	385	710	1216	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	374	710	1216	-	-	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	672	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	522	-	-
HCM Lane V/C Ratio	0.022	-	0.052	-	-
HCM Control Delay (s)	8	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-



HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	50	40	40	295	275	80
Future Vol, veh/h	50	40	40	295	275	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	43	43	321	299	87

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	750	343	386	0	-	0
Stage 1	343	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	379	700	1172	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	362	700	1172	-	-	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	672	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1172	-	461	-	-
HCM Lane V/C Ratio	0.037	-	0.212	-	-
HCM Control Delay (s)	8.2	0	14.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↵	↵		↵	↵	
Traffic Vol, veh/h	60	10	15	330	345	75
Future Vol, veh/h	60	10	15	330	345	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	11	16	359	375	82

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	807	416	457
Stage 1	416	-	-
Stage 2	391	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	351	637	1104
Stage 1	666	-	-
Stage 2	683	-	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	345	637	1104
Mov Cap-2 Maneuver	345	-	-
Stage 1	654	-	-
Stage 2	683	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1104	-	345	637	-	-
HCM Lane V/C Ratio	0.015	-	0.189	0.017	-	-
HCM Control Delay (s)	8.3	0	17.9	10.8	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	0.1	-	-

HCM 6th TWSC  
13: Waiale Rd & Project Access II

04/30/2018

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖		↖	↑	↑	
Traffic Vol, veh/h	10	5	10	385	435	20
Future Vol, veh/h	10	5	10	385	435	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	11	418	473	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	924	484	495
Stage 1	484	-	-
Stage 2	440	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	299	583	1069
Stage 1	620	-	-
Stage 2	649	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	296	583	1069
Mov Cap-2 Maneuver	296	-	-
Stage 1	614	-	-
Stage 2	649	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBL	EBT	SBT	SBR
Capacity (veh/h)	1069	-	354	-	-	-
HCM Lane V/C Ratio	0.01	-	0.046	-	-	-
HCM Control Delay (s)	8.4	-	15.7	-	-	-
HCM Lane LOS	A	-	C	-	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-	-

HCM 6th TWSC  
14: Waiale Rd & Project Access I

04/30/2018

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Vol, veh/h	15	10	10	395	455	20
Future Vol, veh/h	15	10	10	395	455	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	11	429	495	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	957	506	517
Stage 1	506	-	-
Stage 2	451	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	286	566	1049
Stage 1	606	-	-
Stage 2	642	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	283	566	1049
Mov Cap-2 Maneuver	283	-	-
Stage 1	600	-	-
Stage 2	642	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1049	-	354	-	-
HCM Lane V/C Ratio	0.01	-	0.077	-	-
HCM Control Delay (s)	8.5	-	16	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



## **APPENDIX C**

### **LEVEL OF SERVICE CALCULATIONS**

- Future Year 2020 without Background Projects AM
-



# HCM 6th Signalized Intersection Summary 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	285	200	440	30	175	110	220	515	10	40	380	100
Future Volume (veh/h)	285	200	440	30	175	110	220	515	10	40	380	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1567	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	407	217	478	33	190	120	239	560	0	43	413	0
Peak Hour Factor	0.70	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	396	542	459	250	263	223	387	701		246	559	
Arrive On Green	0.18	0.29	0.29	0.03	0.14	0.14	0.11	0.37	0.00	0.04	0.30	0.00
Sat Flow, veh/h	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	407	217	478	33	190	120	239	560	0	43	413	0
Grp Sat Flow(s), veh/h/ln	1493	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	15.0	7.7	24.0	1.3	8.0	5.8	7.2	22.1	0.0	1.4	16.5	0.0
Cycle Q Clear(g_c), s	15.0	7.7	24.0	1.3	8.0	5.8	7.2	22.1	0.0	1.4	16.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	396	542	459	250	263	223	387	701		246	559	
V/C Ratio(X)	1.03	0.40	1.04	0.13	0.72	0.54	0.62	0.80		0.17	0.74	
Avail Cap(c_a), veh/h	396	542	459	515	542	459	614	1106		608	1106	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.8	23.6	29.4	28.9	34.0	33.1	17.9	23.1	0.0	20.3	26.1	0.0
Incr Delay (d2), s/veh	52.3	0.2	53.1	0.1	1.4	0.8	0.6	4.6	0.0	0.1	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	3.4	15.6	0.6	3.7	2.3	2.7	9.7	0.0	0.5	7.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.1	23.8	82.5	29.0	35.4	33.8	18.5	27.7	0.0	20.4	30.2	0.0
LnGrp LOS	F	C	F	C	D	C	B	C		C	C	
Approach Vol, veh/h		1102			343			799	A		456	A
Approach Delay, s/veh		69.7			34.3			24.9			29.3	
Approach LOS		E			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	37.0	7.7	30.0	14.4	30.8	20.0	17.7				
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0				
Max Green Setting (Gmax), s	20.0	49.0	15.0	24.0	20.0	49.0	15.0	24.0				
Max Q Clear Time (g_c+1), s	3.4	24.1	3.3	26.0	9.2	18.5	17.0	10.0				
Green Ext Time (p_c), s	0.0	6.9	0.0	0.0	0.2	5.1	0.0	0.8				

## Intersection Summary

HCM 6th Ctrl Delay 45.1  
HCM 6th LOS D

























## Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 6th Signalized Intersection Summary

## 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	130	75	280	60	245	15	460	350	290	485	10
Future Volume (veh/h)	55	130	75	280	60	245	15	460	350	290	485	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	141	82	304	65	266	16	500	0	315	527	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	198	188	438	431	580	325	618		415	851	782
Arrive On Green	0.04	0.10	0.10	0.17	0.23	0.23	0.01	0.33	0.00	0.14	0.45	0.45
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	60	141	82	304	65	266	16	500	0	315	527	11
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.1	5.0	3.3	10.9	2.1	9.6	0.5	18.4	0.0	8.2	16.1	0.3
Cycle Q Clear(g_c), s	2.1	5.0	3.3	10.9	2.1	9.6	0.5	18.4	0.0	8.2	16.1	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	198	188	438	431	580	325	618		415	851	782
V/C Ratio(X)	0.21	0.71	0.44	0.69	0.15	0.46	0.05	0.81		0.76	0.62	0.01
Avail Cap(c_a), veh/h	311	301	275	460	521	657	446	843		432	967	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	33.1	31.5	23.0	23.2	18.2	16.8	23.1	0.0	15.8	15.6	9.7
Incr Delay (d2), s/veh	0.4	1.8	0.6	4.2	0.1	0.2	0.0	6.5	0.0	6.5	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.6	1.4	4.9	0.9	3.4	0.2	8.6	0.0	3.6	6.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	34.9	32.1	27.3	23.2	18.4	16.8	29.6	0.0	22.3	17.3	9.8
LnGrp LOS	C	C	C	C	C	B	B	C		C	B	A
Approach Vol, veh/h	283			635			516			A	853	
Approach Delay, s/veh	32.9			23.2			29.2				19.1	
Approach LOS	C			C			C				B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.9	17.0	13.2	4.9	40.3	6.9	23.4					
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax),s	34.0	14.0	11.0	6.0	39.0	4.0	21.0					
Max Q Clear Time (g_c+M),s	20.4	12.9	7.0	2.5	18.1	4.1	11.6					
Green Ext Time (p_c), s	0.0	4.5	0.1	0.2	0.0	6.2	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	24.2											
HCM 6th LOS	C											
Notes												



HCM 6th TWSC  
3: Kuikahi Dr & Kehalani Village Dr

04/30/2018

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↶	↷		↶	↷
Traffic Vol, veh/h	65	675	10	0	505	60	0	0	0	30	0	90
Future Vol, veh/h	65	675	10	0	505	60	0	0	0	30	0	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	734	11	0	549	65	0	0	0	33	0	98

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	614	0	0	745	0	0	1513	1496	740	1464	1469	582
Stage 1	-	-	-	-	-	-	882	882	-	582	582	-
Stage 2	-	-	-	-	-	-	631	614	-	882	887	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	965	-	-	863	-	-	98	123	417	106	127	513
Stage 1	-	-	-	-	-	-	341	364	-	499	499	-
Stage 2	-	-	-	-	-	-	469	483	-	341	362	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	965	-	-	863	-	-	75	114	417	100	118	513
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	114	-	100	118	-
Stage 1	-	-	-	-	-	-	316	337	-	462	499	-
Stage 2	-	-	-	-	-	-	380	483	-	316	335	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.8		0		0		24.7
HCM LOS					A		C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	965	-	-	863	-	-	100	513
HCM Lane V/C Ratio	-	-	0.073	-	-	-	-	-	0.326	0.191
HCM Control Delay (s)	0	0	9	-	-	0	-	-	57.5	13.7
HCM Lane LOS	A	A	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	-	-	0.2	-	-	0	-	-	1.3	0.7

# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↑	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	385	310	70	30	260	235	125	195	65	265	140	190
Future Volume (veh/h)	385	310	70	30	260	235	125	195	65	265	140	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	481	337	76	33	283	255	136	212	71	288	152	207
Peak Hour Factor	0.80	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	554	609	137	318	372	315	284	256	86	387	188	255
Arrive On Green	0.24	0.41	0.41	0.02	0.20	0.20	0.08	0.19	0.19	0.15	0.26	0.26
Sat Flow, veh/h	1781	1477	333	1781	1870	1585	1781	1341	449	1781	717	977
Grp Volume(v), veh/h	481	0	413	33	283	255	136	0	283	288	0	359
Grp Sat Flow(s), veh/h/ln	1781	0	1810	1781	1870	1585	1781	0	1790	1781	0	1694
Q Serve(g_s), s	17.9	0.0	15.6	1.3	12.8	13.8	5.4	0.0	13.6	11.0	0.0	17.8
Cycle Q Clear(g_c), s	17.9	0.0	15.6	1.3	12.8	13.8	5.4	0.0	13.6	11.0	0.0	17.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.25	1.00		0.58
Lane Grp Cap(c), veh/h	554	0	747	318	372	315	284	0	342	387	0	443
V/C Ratio(X)	0.87	0.00	0.55	0.10	0.76	0.81	0.48	0.00	0.83	0.74	0.00	0.81
Avail Cap(c_a), veh/h	844	0	1029	512	563	477	284	0	618	441	0	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	20.1	27.5	33.9	34.3	26.8	0.0	34.8	23.6	0.0	31.0
Incr Delay (d2), s/veh	6.3	0.0	0.6	0.1	3.3	6.1	1.3	0.0	5.1	5.8	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	6.5	0.6	6.1	5.8	2.4	0.0	6.4	5.2	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	0.0	20.7	27.7	37.2	40.4	28.0	0.0	39.9	29.4	0.0	34.6
LnGrp LOS	C	A	C	C	D	D	C	A	D	C	A	C
Approach Vol, veh/h	894				571				419			
Approach Delay, s/veh	23.6				38.0				36.1			
Approach LOS	C				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.3	23.2	6.2	43.0	11.0	29.5	25.4	23.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	31.0	12.0	51.0	7.0	40.0	36.0	27.0				
Max Q Clear Time (g_c+1), s	13.0	15.6	3.3	17.6	7.4	19.8	19.9	15.8				
Green Ext Time (p_c), s	0.3	1.5	0.0	3.0	0.0	2.4	1.5	2.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	31.2											
HCM 6th LOS	C											



HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection				
Intersection Delay, s/veh 15.8				
Intersection LOS C				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	478	369	555	620
Demand Flow Rate, veh/h	488	376	566	633
Vehicles Circulating, veh/h	444	671	522	443
Vehicles Exiting, veh/h	632	417	410	604
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	12.1	14.0	17.8	17.8
Approach LOS	B	B	C	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	488	376	566	633
Cap Entry Lane, veh/h	877	696	810	878
Entry HV Adj Factor	0.980	0.980	0.980	0.980
Flow Entry, veh/h	478	369	555	620
Cap Entry, veh/h	860	682	794	860
V/C Ratio	0.556	0.540	0.699	0.721
Control Delay, s/veh	12.1	14.0	17.8	17.8
LOS	B	B	C	C
95th %ile Queue, veh	4	3	6	6

HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection						
Int Delay, s/veh	69.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰			↱
Traffic Vol, veh/h	205	45	555	670	45	520
Future Vol, veh/h	205	45	555	670	45	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	223	49	603	728	49	565

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1630	967	0	0	1331
Stage 1	967	-	-	-	-
Stage 2	663	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	~ 112	308	-	-	519
Stage 1	369	-	-	-	-
Stage 2	512	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 97	308	-	-	519
Mov Cap-2 Maneuver	~ 97	-	-	-	-
Stage 1	318	-	-	-	-
Stage 2	512	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	565.5	0	1
HCM LOS	F		





















Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	97	308	519	-
HCM Lane V/C Ratio	-	-	2.297	0.159	0.094	-
HCM Control Delay (s)	-	-	685.5	18.9	12.7	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	19.9	0.6	0.3	-

Notes						
~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    *: All major volume in platoon						



# HCM 6th Signalized Intersection Summary 7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	20	10	70	5	50	5	610	80	135	675	10
Future Volume (veh/h)	30	20	10	70	5	50	5	610	80	135	675	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	22	11	76	5	54	5	663	87	147	734	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	141	314	208	28	114	347	846	111	383	1140	966
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.52	0.52	0.09	0.61	0.61
Sat Flow, veh/h	847	713	1585	718	144	574	1781	1620	213	1781	1870	1585
Grp Volume(v), veh/h	55	0	11	135	0	0	5	0	750	147	734	11
Grp Sat Flow(s), veh/h/ln	1560	0	1585	1436	0	0	1781	0	1832	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.5	5.1	0.0	0.0	0.1	0.0	28.1	2.8	21.4	0.2
Cycle Q Clear(g_c), s	2.2	0.0	0.5	7.3	0.0	0.0	0.1	0.0	28.1	2.8	21.4	0.2
Prop In Lane	0.60		1.00	0.56		0.40	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	377	0	314	351	0	0	347	0	957	383	1140	966
V/C Ratio(X)	0.15	0.00	0.04	0.38	0.00	0.00	0.01	0.00	0.78	0.38	0.64	0.01
Avail Cap(c_a), veh/h	504	0	448	474	0	0	676	0	957	556	1140	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	27.5	30.3	0.0	0.0	10.7	0.0	16.4	12.8	10.7	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	6.4	0.2	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.2	2.5	0.0	0.0	0.0	0.0	12.4	1.0	8.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	27.5	30.5	0.0	0.0	10.7	0.0	22.8	13.1	13.5	6.5
LnGrp LOS	C	A	C	C	A	A	B	A	C	B	B	A
Approach Vol, veh/h	66			135			755			892		
Approach Delay, s/veh	28.1			30.5			22.7			13.3		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.8	50.4		22.9	4.3	57.8		22.9				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	16.0	29.0		24.0	16.0	29.0		24.0				
Max Q Clear Time (g_c+I1), s	4.8	30.1		4.2	2.1	23.4		9.3				
Green Ext Time (p_c), s	0.1	0.0		0.2	0.0	3.5		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				19.0								
HCM 6th LOS				B								

HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection

Int Delay, s/veh 7.3

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	65	175	60	70	190	70
Future Vol, veh/h	65	175	60	70	190	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	190	65	76	207	76

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	141	0	-	0	435	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1442	-	-	-	578	952
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1442	-	-	-	546	952
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	727	-

Approach EB WB SB

HCM Control Delay, s	2.1	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR/SBLn1

Capacity (veh/h)	1442	-	-	-	617
HCM Lane V/C Ratio	0.049	-	-	-	0.458
HCM Control Delay (s)	7.6	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4



HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	20	25	10	125	230	10
Future Vol, veh/h	20	25	10	125	230	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	27	11	136	250	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	414	256	261	0	-	0
Stage 1	256	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	595	783	1303	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	590	783	1303	-	-	-
Mov Cap-2 Maneuver	590	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1303	-	590	783	-	-
HCM Lane V/C Ratio	0.008	-	0.037	0.035	-	-
HCM Control Delay (s)	7.8	0	11.3	9.8	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-



HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection

Int Delay, s/veh 1.3

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations	Y			4	1	
Traffic Vol, veh/h	25	20	5	135	210	10
Future Vol, veh/h	25	20	5	135	210	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	22	5	147	228	11

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	391	234	239	0	-	0
Stage 1	234	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	613	805	1328	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	611	805	1328	-	-	-
Mov Cap-2 Maneuver	611	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	10.7	0.3	0
HCM LOS	B		

Minor Lane/Major/Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1328	-	684	-	-
HCM Lane V/C Ratio	0.004	-	0.072	-	-
HCM Control Delay (s)	7.7	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	75	80	15	150	145	35
Future Vol, veh/h	75	80	15	150	145	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	87	16	163	158	38

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	372	177	196	0	-	0
Stage 1	177	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	629	866	1377	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	621	866	1377	-	-	-
Mov Cap-2 Maneuver	621	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1377	-	727	-	-
HCM Lane V/C Ratio	0.012	-	0.232	-	-
HCM Control Delay (s)	7.6	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-



HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	100	25	5	220	155	35
Future Vol, veh/h	100	25	5	220	155	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	27	5	239	168	38

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	436	187	206	0	-	0
Stage 1	187	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	578	855	1365	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	576	855	1365	-	-	-
Mov Cap-2 Maneuver	576	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1365	-	576	855	-	-
HCM Lane V/C Ratio	0.004	-	0.189	0.032	-	-
HCM Control Delay (s)	7.6	0	12.7	9.3	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.7	0.1	-	-

HCM 6th TWSC  
13: Waiale Rd & Project Access II

04/30/2018

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	20	10	5	315	180	5
Future Vol, veh/h	20	10	5	315	180	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	11	5	342	196	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	551	199	201	0	-	0
Stage 1	199	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	495	842	1371	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	493	842	1371	-	-	-
Mov Cap-2 Maneuver	493	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	712	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1371	-	572	-	-
HCM Lane V/C Ratio	0.004	-	0.057	-	-
HCM Control Delay (s)	7.6	-	11.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



HCM 6th TWSC  
14: Waiale Rd & Project Access I

04/30/2018

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	20	10	5	330	185	10
Future Vol, veh/h	20	10	5	330	185	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	11	5	359	201	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	576	207	212	0	-	0
Stage 1	207	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	479	833	1358	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov. Cap-1 Maneuver	477	833	1358	-	-	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	699	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBL	EBT	SBT	SBR
Capacity (veh/h)	1358	-	556	-	-	-
HCM Lane V/C Ratio	0.004	-	0.059	-	-	-
HCM Control Delay (s)	7.7	-	11.9	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-	-



---

## APPENDIX C

























### LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 without Background Projects PM
-

# HCM 6th Signalized Intersection Summary

## 1: Honoapiilani Hwy & Kehalani Pkwy

04/30/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	110	55	125	15	90	75	135	425	25	100	550	195	
Future Volume (veh/h)	110	55	125	15	90	75	135	425	25	100	550	195	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No			No			No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	120	60	136	16	98	82	147	462	0	109	598	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2	
Cap, veh/h	303	281	238	252	165	140	356	784		445	771		
Arrive On Green	0.08	0.15	0.15	0.02	0.09	0.09	0.07	0.42	0.00	0.07	0.41	0.00	
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585	
Grp Volume(v), veh/h	120	60	136	16	98	82	147	462	0	109	598	0	
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1870	1585	
Q Serve(g_s), s	3.8	1.8	5.1	0.5	3.2	3.2	3.0	12.2	0.0	2.2	17.6	0.0	
Cycle Q Clear(g_c), s	3.8	1.8	5.1	0.5	3.2	3.2	3.0	12.2	0.0	2.2	17.6	0.0	
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Lane Grp Cap(c), veh/h	303	281	238	252	165	140	356	784		445	771		
V/C Ratio(X)	0.40	0.21	0.57	0.06	0.59	0.58	0.41	0.59		0.25	0.78		
Avail Cap(c_a), veh/h	577	703	596	636	703	596	782	1143		883	1143		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	
Uniform Delay (d), s/veh	22.9	23.8	25.2	25.6	28.0	28.0	12.2	14.3	0.0	10.4	16.2	0.0	
Incr Delay (d2), s/veh	0.3	0.1	0.8	0.0	1.3	1.4	0.3	1.5	0.0	0.1	3.8	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.5	0.8	1.9	0.2	1.5	1.2	0.9	4.6	0.0	0.7	7.0	0.0	
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh	23.3	24.0	26.0	25.7	29.2	29.4	12.4	15.8	0.0	10.6	20.0	0.0	
LnGrp LOS	C	C	C	C	C	C	B	B		B	C		
Approach Vol, veh/h	316			196			609			A	707		A
Approach Delay, s/veh	24.6			29.0			15.0				18.6		
Approach LOS	C			C			B				B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8					
Phs Duration (G+Y+Rc), s	9.3	32.7	6.2	15.6	9.7	32.3	10.2	11.6					
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0					
Max Green Setting (Gmax), s	20.0	39.0	15.0	24.0	20.0	39.0	15.0	24.0					
Max Q Clear Time (g_c+I1), s	4.2	14.2	2.5	7.1	5.0	19.6	5.8	5.2					
Green Ext Time (p_c), s	0.1	5.4	0.0	0.4	0.1	6.7	0.1	0.4					

### Intersection Summary

HCM 6th Ctrl Delay 19.5

HCM 6th LOS B

### Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 2: Honoapiilani Highway & Kuikahi Drive

04/30/2018

	↖	→	↗	↙	←	↘	↖	↗	↙	↘	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	10	70	25	415	100	185	40	395	360	210	470	35
Future Volume (veh/h)	10	70	25	415	100	185	40	395	360	210	470	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2067	2067	2067	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	76	27	451	109	201	43	429	0	228	511	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	168	188	607	604	689	257	529		364	690	602
Arrive On Green	0.01	0.08	0.08	0.25	0.32	0.32	0.03	0.28	0.00	0.11	0.37	0.37
Sat Flow, veh/h	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	11	76	27	451	109	201	43	429	0	228	511	38
Grp Sat Flow(s),veh/h/ln	1968	2067	1751	1781	1870	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.4	2.6	1.0	16.0	3.1	6.1	1.3	15.7	0.0	6.3	17.5	1.1
Cycle Q Clear(g_c), s	0.4	2.6	1.0	16.0	3.1	6.1	1.3	15.7	0.0	6.3	17.5	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	168	188	607	604	689	257	529		364	690	602
V/C Ratio(X)	0.05	0.45	0.14	0.74	0.18	0.29	0.17	0.81		0.63	0.74	0.06
Avail Cap(c_a), veh/h	461	252	259	689	604	689	356	710		430	837	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	32.3	29.8	20.4	18.0	13.5	18.9	24.6	0.0	16.9	20.2	14.5
Incr Delay (d2), s/veh	0.1	0.7	0.1	3.8	0.1	0.1	0.1	7.7	0.0	1.1	4.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.3	0.4	6.9	1.3	2.1	0.5	7.6	0.0	2.4	7.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	33.0	30.0	24.2	18.0	13.6	19.0	32.3	0.0	18.0	24.4	14.6
LnGrp LOS	C	C	C	C	B	B	B	C		B	C	B
Approach Vol, veh/h	114			761			472			777		
Approach Delay, s/veh	32.1			20.5			31.1			22.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.3	26.9	22.6	12.0	5.9	33.2	4.8	29.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	28.0	22.0	22.0	9.0	6.0	33.0	10.0	21.0				
Max Q Clear Time (g_c+I), s	17.7	17.7	18.0	4.6	3.3	19.5	2.4	8.1				
Green Ext Time (p_c), s	0.1	3.1	0.6	0.1	0.0	4.8	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	24.0											
HCM 6th LOS	C											

HCM 6th TWSC  
3: Kuikahi Dr & Kehalani Village Dr

04/30/2018

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	100	505	0	0	520	85	0	0	0	35	0	130
Future Vol, veh/h	100	505	0	0	520	85	0	0	0	35	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	109	549	0	0	565	92	0	0	0	38	0	141

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	657	0	0	549	0	0	1449	1424	549	1378	1378	611
Stage 1	-	-	-	-	-	-	767	767	-	611	611	-
Stage 2	-	-	-	-	-	-	682	657	-	767	767	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	931	-	-	1021	-	-	109	136	535	122	145	494
Stage 1	-	-	-	-	-	-	395	411	-	481	484	-
Stage 2	-	-	-	-	-	-	440	462	-	395	411	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	931	-	-	1021	-	-	71	120	535	111	128	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	120	-	111	128	-
Stage 1	-	-	-	-	-	-	349	363	-	425	484	-
Stage 2	-	-	-	-	-	-	314	462	-	349	363	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0	0	23.3
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	931	-	-	1021	-	-	111	494
HCM Lane V/C Ratio	-	-	0.117	-	-	-	-	-	0.343	0.286
HCM Control Delay (s)	0	0	9.4	-	-	0	-	-	53.5	15.2
HCM Lane LOS	A	A	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	-	-	0.4	-	-	0	-	-	1.4	1.2



# HCM 6th Signalized Intersection Summary 4: Waiale Rd & Kuikahi Dr/Maui Lani Pkwy

04/30/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	215	65	75	325	255	50	130	40	300	195	250
Future Volume (veh/h)	265	215	65	75	325	255	50	130	40	300	195	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	288	234	71	82	353	277	54	141	43	326	212	272
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	462	140	392	450	382	213	275	84	520	249	319
Arrive On Green	0.14	0.34	0.34	0.05	0.24	0.24	0.03	0.20	0.20	0.17	0.33	0.33
Sat Flow, veh/h	1781	1377	418	1781	1870	1585	1781	1375	419	1781	744	955
Grp Volume(v), veh/h	288	0	305	82	353	277	54	0	184	326	0	484
Grp Sat Flow(s),veh/h/ln	1781	0	1795	1781	1870	1585	1781	0	1795	1781	0	1699
Q Serve(g_s), s	9.3	0.0	11.1	2.8	14.4	13.1	2.0	0.0	7.5	11.1	0.0	21.6
Cycle Q Clear(g_c), s	9.3	0.0	11.1	2.8	14.4	13.1	2.0	0.0	7.5	11.1	0.0	21.6
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.23	1.00		0.56
Lane Grp Cap(c), veh/h	397	0	602	392	450	382	213	0	359	520	0	568
V/C Ratio(X)	0.72	0.00	0.51	0.21	0.78	0.73	0.25	0.00	0.51	0.63	0.00	0.85
Avail Cap(c_a), veh/h	555	0	1035	499	849	719	283	0	682	721	0	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	21.7	21.6	29.0	28.5	25.4	0.0	29.1	19.1	0.0	25.2
Incr Delay (d2), s/veh	2.9	0.0	0.7	0.3	3.0	2.6	0.6	0.0	1.1	1.2	0.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	4.7	1.2	6.7	5.2	0.9	0.0	3.3	4.6	0.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.2	0.0	22.4	21.8	32.0	31.1	26.0	0.0	30.2	20.3	0.0	29.0
LnGrp LOS	C	A	C	C	C	C	C	A	C	C	A	C
Approach Vol, veh/h	593			712			238			810		
Approach Delay, s/veh	22.3			30.5			29.3			25.5		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.8	22.3	8.1	33.3	6.8	33.3	15.8	25.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	23.0	31.0	9.0	47.0	6.0	48.0	19.0	37.0				
Max Q Clear Time (g_c+I1), s	13.1	9.5	4.8	13.1	4.0	23.6	11.3	16.4				
Green Ext Time (p_c), s	0.7	1.0	0.1	2.1	0.0	3.7	0.5	3.2				
Intersection Summary												
HCM 6th Ctrl Delay	26.6											
HCM 6th LOS	C											

HCM 6th Roundabout  
5: Kamehameha Ave & Maui Lani Pkwy

04/30/2018

Intersection				
Intersection Delay, s/veh 12.0				
Intersection LOS B				
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	538	494	218	597
Demand Flow Rate, veh/h	549	504	223	609
Vehicles Circulating, veh/h	353	439	626	349
Vehicles Exiting, veh/h	604	410	276	594
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.6	12.4	8.8	13.2
Approach LOS	B	B	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	549	504	223	609
Cap Entry Lane, veh/h	963	882	729	967
Entry HV Adj Factor	0.980	0.980	0.977	0.981
Flow Entry, veh/h	538	494	218	597
Cap Entry, veh/h	943	864	712	948
V/C Ratio	0.570	0.572	0.306	0.630
Control Delay, s/veh	11.6	12.4	8.8	13.2
LOS	B	B	A	B
95th %tile Queue, veh	4	4	1	5



HCM 6th TWSC  
6: Waiale Rd & Waiinu Rd

04/30/2018

Intersection

Int Delay, s/veh 77.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	225	45	435	245	70	670
Future Vol, veh/h	225	45	435	245	70	670
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	245	49	473	266	76	728

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1486	606	0
Stage 1	606	-	-
Stage 2	880	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	- 137	497	-
Stage 1	545	-	-
Stage 2	406	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	- 117	497	-
Mov Cap-2 Maneuver	- 117	-	-
Stage 1	465	-	-
Stage 2	406	-	-

Approach	WB	NB	SB
HCM Control Delay, s	485.2	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	117	497	867	-
HCM Lane V/C Ratio	-	-	2.09	0.098	0.088	-
HCM Control Delay (s)	-	-	\$ 579.6	13	9.6	0
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	20.4	0.3	0.3	-

Notes

-: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th Signalized Intersection Summary  
7: Honoapiilani Hwy & W Waiko Rd/E Waiko Rd

04/30/2018

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖		↗	↑		↗	↑	↗
Traffic Volume (veh/h)	15	15	10	65	15	60	5	690	75	50	735	30
Future Volume (veh/h)	15	15	10	65	15	60	5	690	75	50	735	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	16	11	71	16	65	5	750	82	54	799	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	175	304	177	52	126	313	926	101	329	1163	986
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.00	0.56	0.56	0.07	0.62	0.62
Sat Flow, veh/h	691	912	1585	609	271	658	1781	1657	181	1781	1870	1585
Grp Volume(v), veh/h	32	0	11	152	0	0	5	0	832	54	799	33
Grp Sat Flow(s), veh/h/ln	1603	0	1585	1538	0	0	1781	0	1838	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.5	5.3	0.0	0.0	0.1	0.0	32.0	1.0	24.8	0.7
Cycle Q Clear(g_c), s	1.2	0.0	0.5	7.6	0.0	0.0	0.1	0.0	32.0	1.0	24.8	0.7
Prop In Lane	0.50		1.00	0.47		0.43	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	369	0	304	355	0	0	313	0	1027	329	1163	986
V/C Ratio(X)	0.09	0.00	0.04	0.43	0.00	0.00	0.02	0.00	0.81	0.16	0.69	0.03
Avail Cap(c_a), veh/h	618	0	560	598	0	0	367	0	1465	372	1598	1354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	0.0	28.9	31.6	0.0	0.0	10.5	0.0	15.6	12.8	11.0	6.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	3.8	0.1	1.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.6	0.0	0.2	2.9	0.0	0.0	0.0	0.0	13.1	0.4	9.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.2	0.0	28.9	31.9	0.0	0.0	10.5	0.0	19.4	12.9	12.5	6.4
LnGrp LOS	C	A	C	C	A	A	B	A	B	B	B	A
Approach Vol, veh/h	43			152			837			886		
Approach Delay, s/veh	29.1			31.9			19.4			12.3		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	55.1		22.9	4.3	60.6		22.9				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	70.0		31.0	3.0	75.0		31.0				
Max Q Clear Time (g_c+I1), s	3.0	34.0		3.2	2.1	26.8		9.6				
Green Ext Time (p_c), s	0.0	15.1		0.1	0.0	16.0		0.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay	17.3											
HCM 6th LOS	B											



HCM 6th TWSC  
8: E Waiko Rd & Waiale Rd

04/30/2018

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	70	70	90	135	115	50
Future Vol, veh/h	70	70	90	135	115	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	76	98	147	125	54

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	245	0	0 400 172
Stage 1	-	-	- 172 -
Stage 2	-	-	- 228 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1321	-	- 606 872
Stage 1	-	-	- 858 -
Stage 2	-	-	- 810 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1321	-	- 570 872
Mov Cap-2 Maneuver	-	-	- 570 -
Stage 1	-	-	- 807 -
Stage 2	-	-	- 810 -

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	12.9
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1321	-	-	-	637
HCM Lane V/C Ratio	0.058	-	-	-	0.282
HCM Control Delay (s)	7.9	0	-	-	12.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2

HCM 6th TWSC  
9: Waiale Rd & Ohana Hana Loop

04/30/2018

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	15	10	20	185	155	20
Future Vol, veh/h	15	10	20	185	155	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	22	201	168	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	424	179	190	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	587	864	1384	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	576	864	1384	-	-	-
Mov Cap-2 Maneuver	576	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	796	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1384	-	576	864	-	-
HCM Lane V/C Ratio	0.016	-	0.028	0.013	-	-
HCM Control Delay (s)	7.6	0	11.4	9.2	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-



HCM 6th TWSC  
10: Waiale Rd & Nokekula Lp

04/30/2018

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰			↱	↱	
Traffic Vol, veh/h	10	15	25	160	160	20
Future Vol, veh/h	10	15	25	160	160	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	27	174	174	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	413	185	196	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	595	857	1377	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	582	857	1377	-	-	-
Mov Cap-2 Maneuver	582	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1377	-	721	-	-
HCM Lane V/C Ratio	0.02	-	0.038	-	-
HCM Control Delay (s)	7.7	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCM 6th TWSC  
11: Waiale Rd & Haawi St

04/30/2018

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			+	+	
Traffic Vol, veh/h	50	40	40	135	135	80
Future Vol, veh/h	50	40	40	135	135	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	43	43	147	147	87

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	424	191	234	0	-	0
Stage 1	191	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	587	851	1333	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	566	851	1333	-	-	-
Mov Cap-2 Maneuver	566	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	806	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBL	EBT	SBT	SBR
Capacity (veh/h)	1333	-	665	-	-	-
HCM Lane V/C Ratio	0.033	-	0.147	-	-	-
HCM Control Delay (s)	7.8	0	11.3	-	-	-
HCM Lane LOS	A	A	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-	-



HCM 6th TWSC  
12: Waiale Rd & Kokololio St

04/30/2018

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱		↰	↱	
Traffic Vol, veh/h	60	10	15	170	205	75
Future Vol, veh/h	60	10	15	170	205	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	11	16	185	223	82

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	481	264	305	0	-	0
Stage 1	264	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	544	775	1256	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	536	775	1256	-	-	-
Mov Cap-2 Maneuver	536	-	-	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1256	-	536	775	-	-
HCM Lane V/C Ratio	0.013	-	0.122	0.014	-	-
HCM Control Delay (s)	7.9	0	12.6	9.7	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0	-	-

HCM 6th TWSC  
13: Waiale Rd & Project Access II

04/30/2018

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	10	5	10	215	275	20
Future Vol, veh/h	10	5	10	215	275	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	11	234	299	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	566	310	321	0	-	0
Stage 1	310	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	486	730	1239	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	730	1239	-	-	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	737	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBL	EBT	SBT	SBR
Capacity (veh/h)	1239	-	544	-	-	-
HCM Lane V/C Ratio	0.009	-	0.03	-	-	-
HCM Control Delay (s)	7.9	-	11.8	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-	-



HCM 6th TWSC  
14: Waiale Rd & Project Access I

04/30/2018

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	15	10	10	225	290	20
Future Vol, veh/h	15	10	10	225	290	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	11	11	245	315	22

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	593	326	337	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	468	715	1222	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	464	715	1222	-	-	-
Mov Cap-2 Maneuver	464	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	778	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1222	-	540	-	-
HCM Lane V/C Ratio	0.009	-	0.05	-	-
HCM Control Delay (s)	8	-	12	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %ile Q(veh)	0	-	0.2	-	-



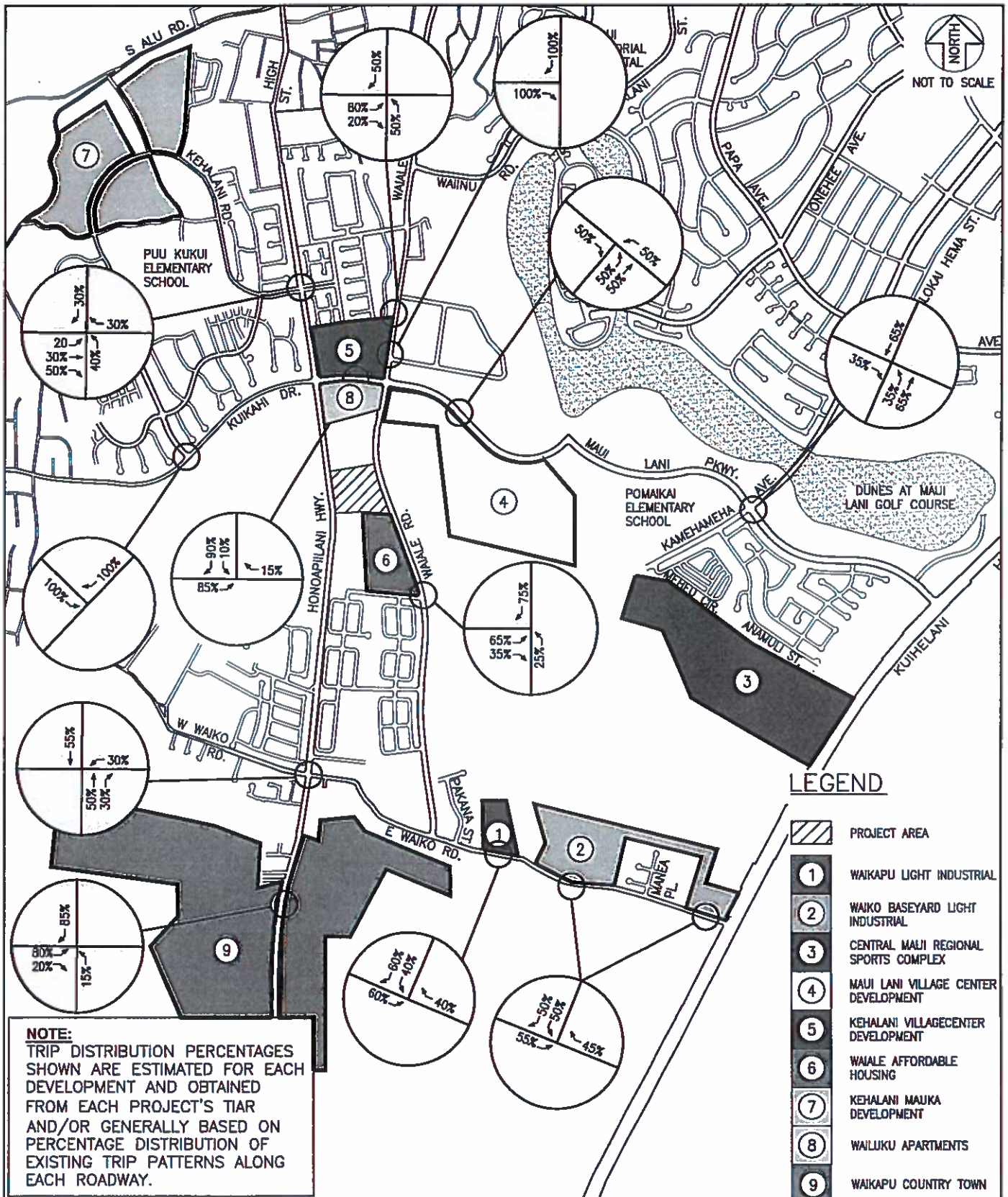
AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
CIVIL ENGINEERS • SURVEYORS

---

## APPENDIX D

### BACKGROUND PROJECT TRIPS

---



WAIKAPU 201-H  
AFFORDABLE HOUSING



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS

HONOLULU, HAWAII

DISTRIBUTION OF BACKGROUND DEVELOPMENT  
TRIPS IN PROJECT VICINITY

FIGURE

D



AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
CIVIL ENGINEERS • SURVEYORS

---

## APPENDIX E

### ADDITIONAL FORECAST SCENARIOS

---



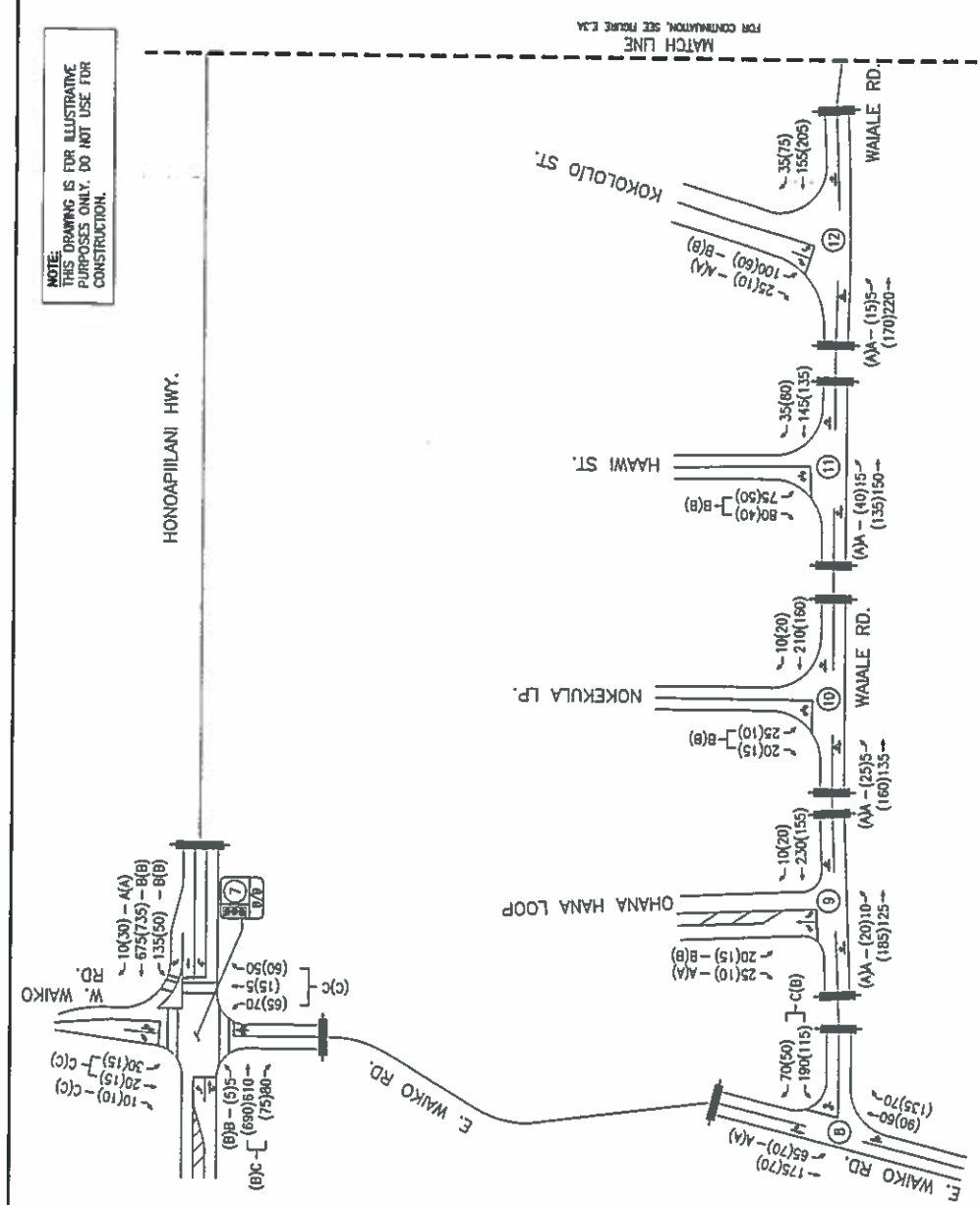
Table E1: Background Trips Impact on Project Intersections

No.	Intersection	Waikapu Light Industrial Project		Waiko Baseyard Light Industrial Development		Central Maui Regional Sports Complex		Kahalani Village Center		Maui Lani Village Center (formerly VMX)		Waiale Affordable Housing		Kahalani Mauka		Waialuku Apartments		Waikapu Country Town	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Honoapiilani Highway/ Kahalani Parkway	22	11	35	48	2	5	0	17	3	13	19	12	208	265	39	33	32	42
2	Honoapiilani Highway/ Kukahi Drive	13	13	63	63	19	19	78	78	50	50	12	12	148	148	47	47	74	74
3	Kukahi Drive/ Kahalani Village Center Dwy	9	6	13	50	12	23	26	105	31	50	14	12	60	67	82	92	25	32
4	Waiale Road/ Kukahi Drive	39	22	55	185	33	64	7	33	78	126	12	53	60	67	67	80	30	45
5	Maui Lani Parkway/ Kamehameha Avenue	7	4	10	34	22	33	6	29	48	103	2	7	42	35	10	12	13	18
6	Waiale Road/ Waiinu Road	23	12	32	101	10	19	4	18	16	25	23	30	12	13	48	64	18	27
7	Honoapiilani Highway/ Waiko Road	29	17	48	148	0	0	5	16	27	31	5	7	97	68	10	20	90	124
8	Waiale Road/ Waiko Road	68	39	68	316	8	17	1	4	26	47	18	19	0	0	27	25	8	28
9	Waiale Road/ Ohana Hana Loop	39	22	55	185	12	23	1	5	31	50	19	24	0	0	29	33	10	19
10	Waiale Road/ Nokekula Loop	39	22	55	185	12	23	1	5	31	50	19	24	0	0	29	33	10	19
11	Waiale Road/ Haawi Street	39	22	55	185	12	23	1	5	31	50	19	24	0	0	29	33	10	19
12	Waiale Road/ Kokololio Street	39	22	55	185	12	23	1	5	31	50	19	24	0	0	29	33	10	19



NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.

HONOAPIILANI HWY.

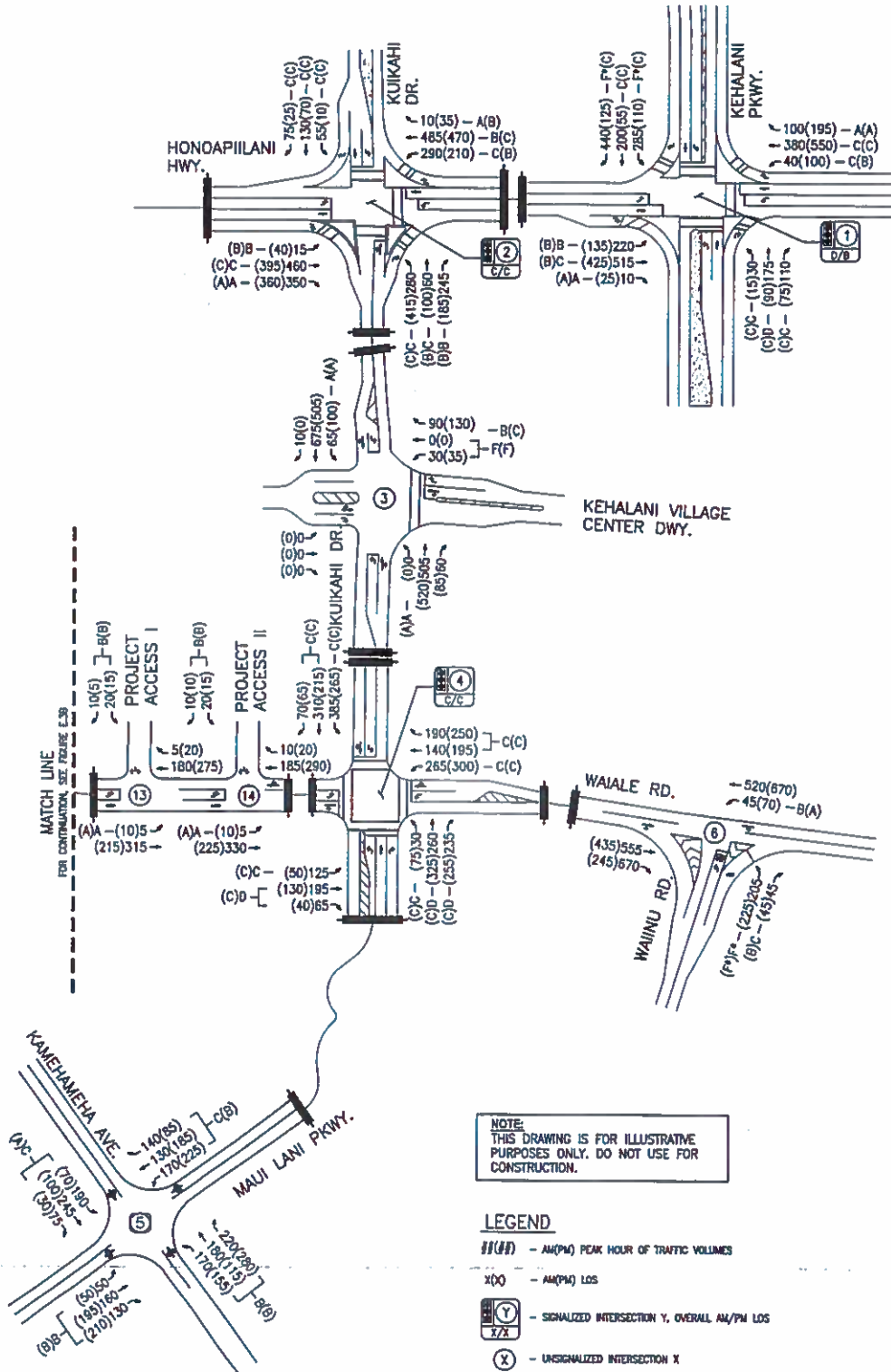


MATCH LINE  
FOR CONTINUATION, SEE FIGURE E.3A

- LEGEND
- ### - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
  - X(X) - AM(PM) LOS
  - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
  - UNSIGNALIZED INTERSECTION X

WAIKAPU 201-H AFFORDABLE HOUSING	ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS, SURVEYORS HONOLULU, HAWAII	FIGURE
	FUTURE YEAR 2020 WITH PROJECT AND AMBIENT GROWTH WITHOUT BACKGROUND DEVELOPMENTS	
E.3B		



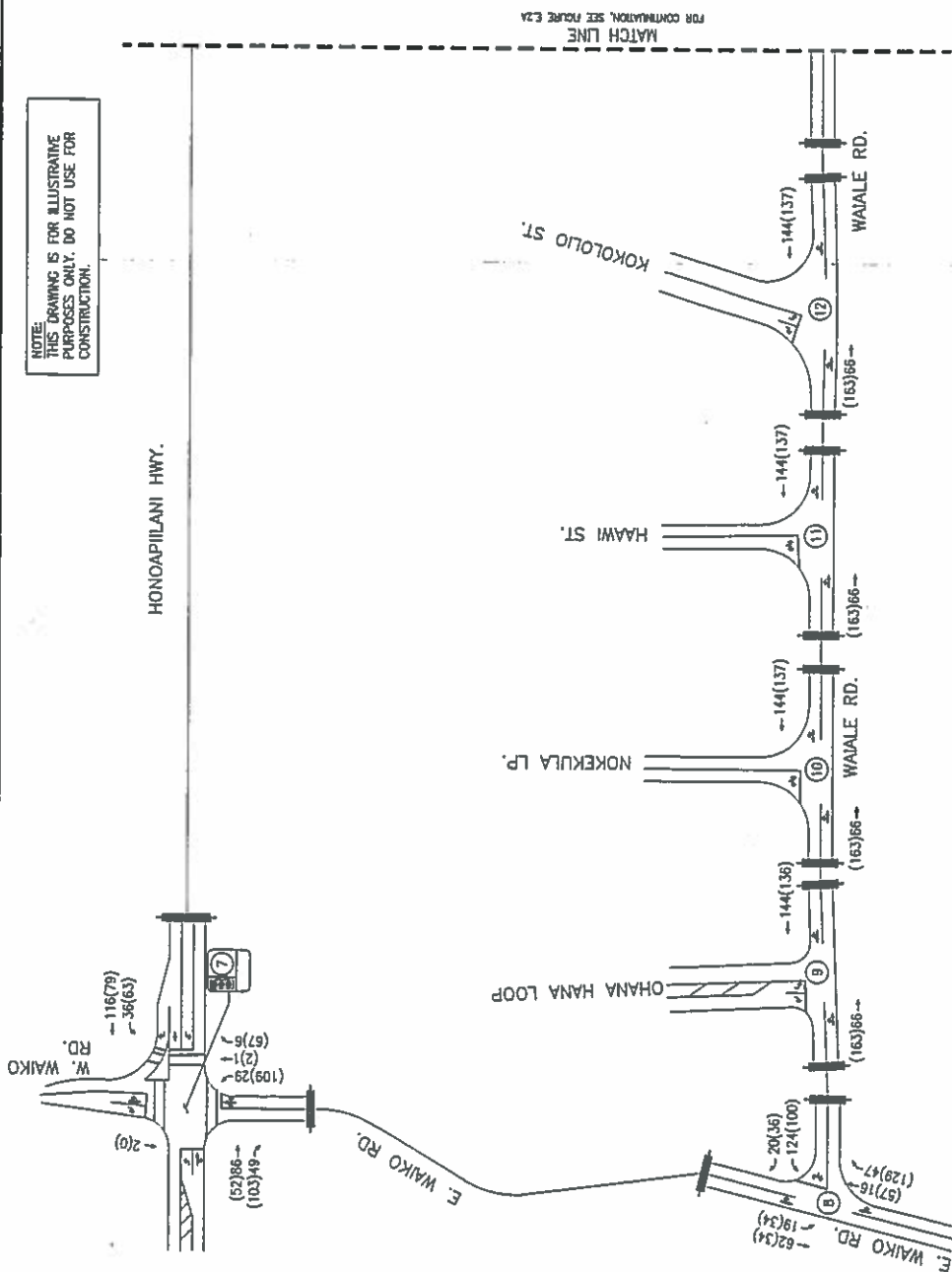


NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.

- LEGEND**
- II(II) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
  - X(0) - AM(PM) LOS
  - (Y) X/X - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
  - (X) - UNSIGNALIZED INTERSECTION X
  - (X) - ROUNDABOUT X



NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



LEGEND

### - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

Y - SIGNALIZED INTERSECTION

X - UNSIGNALIZED INTERSECTION

X - ROUNDABOUT

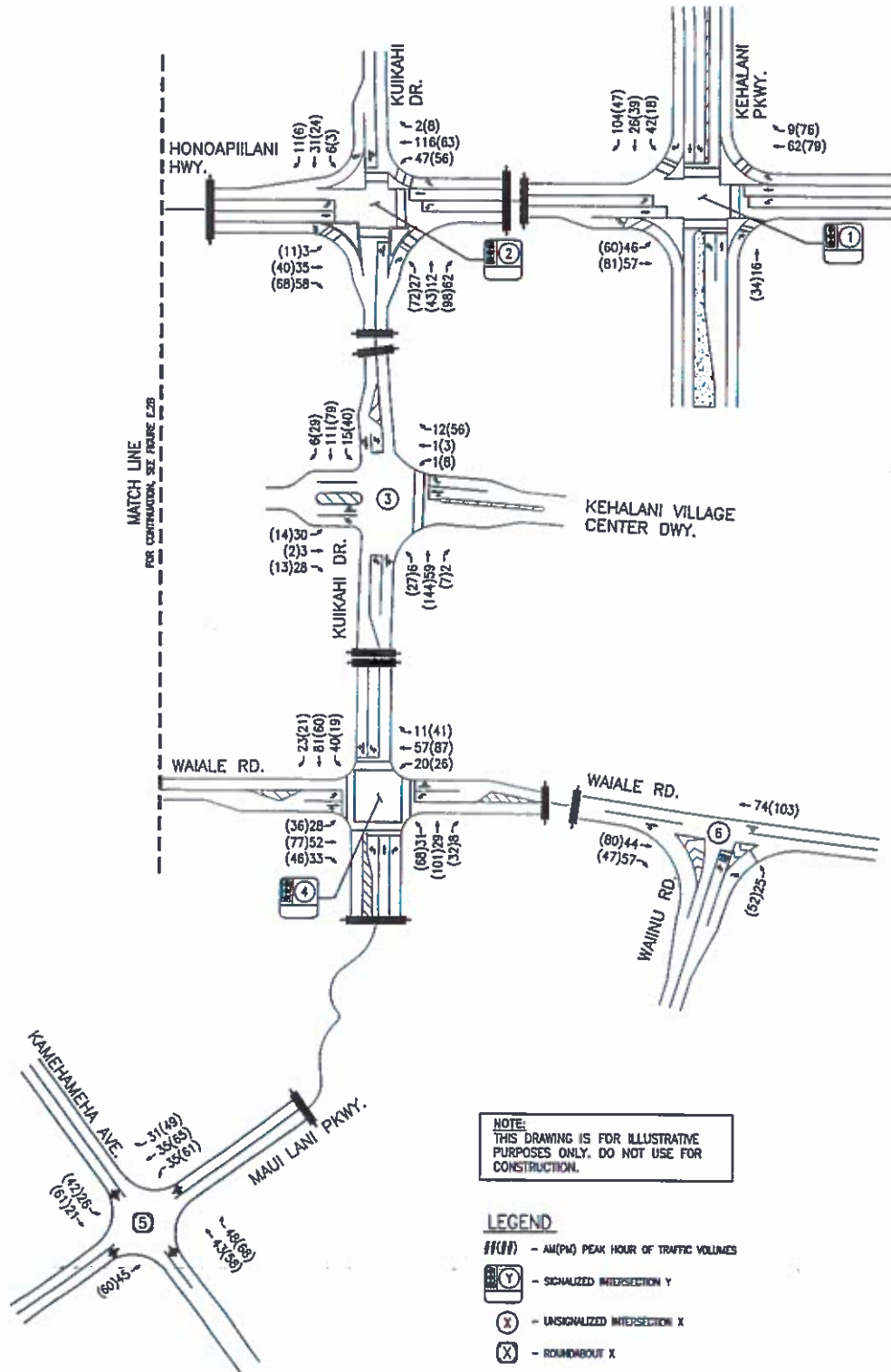
FIGURE

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS  
HONOLULU, HAWAII

WAKAPU 201-H AFFORDABLE HOUSING

TRAFFIC GENERATED BY OTHER KNOWN DEVELOPMENTS ONLY

E.2B



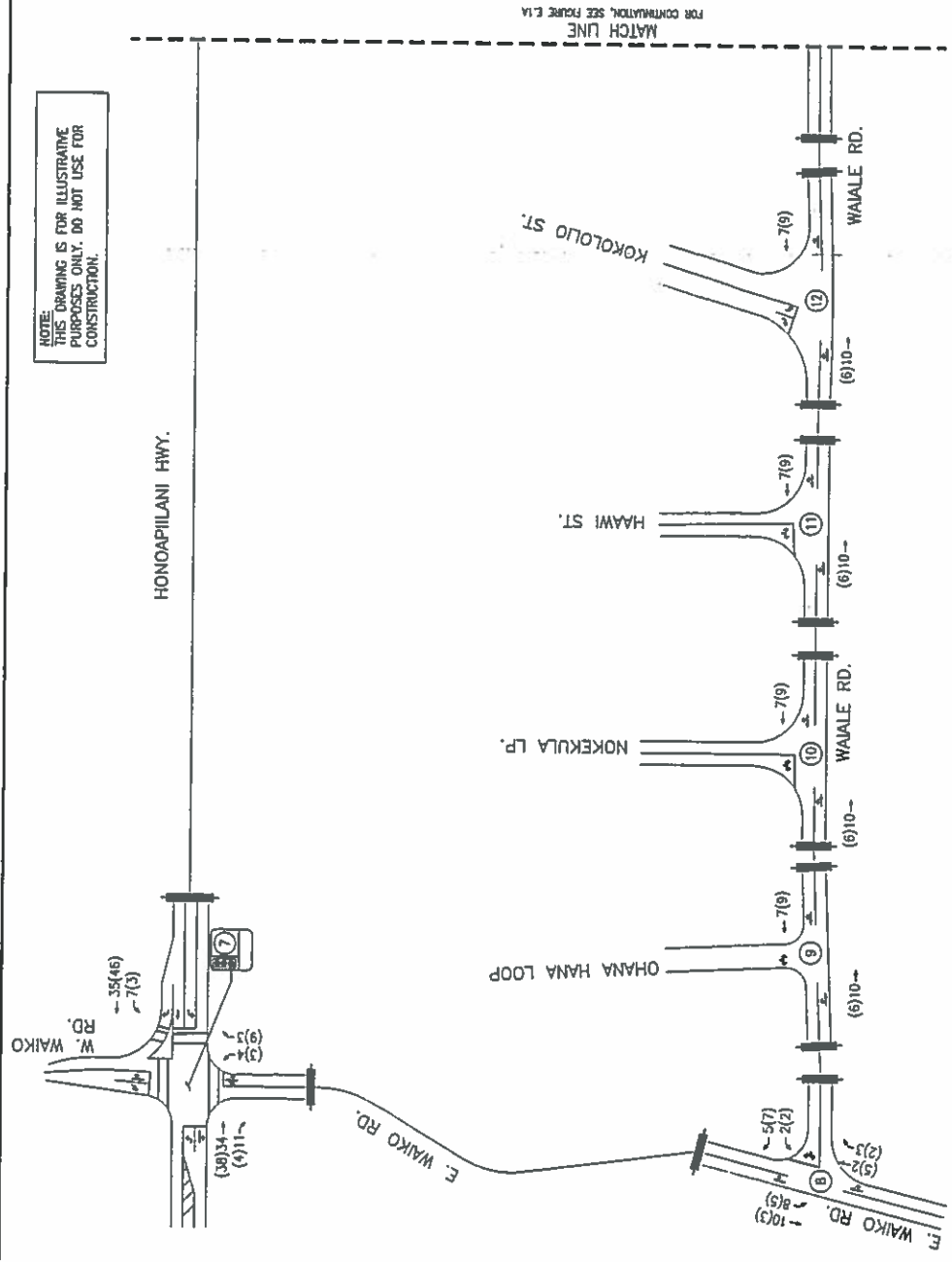
NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.

**LEGEND**

- ##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES
- SIGNALIZED INTERSECTION Y
- UNSIGNALIZED INTERSECTION X
- ROUNDABOUT X



NOTE:  
THIS DRAWING IS FOR ILLUSTRATIVE  
PURPOSES ONLY. DO NOT USE FOR  
CONSTRUCTION.



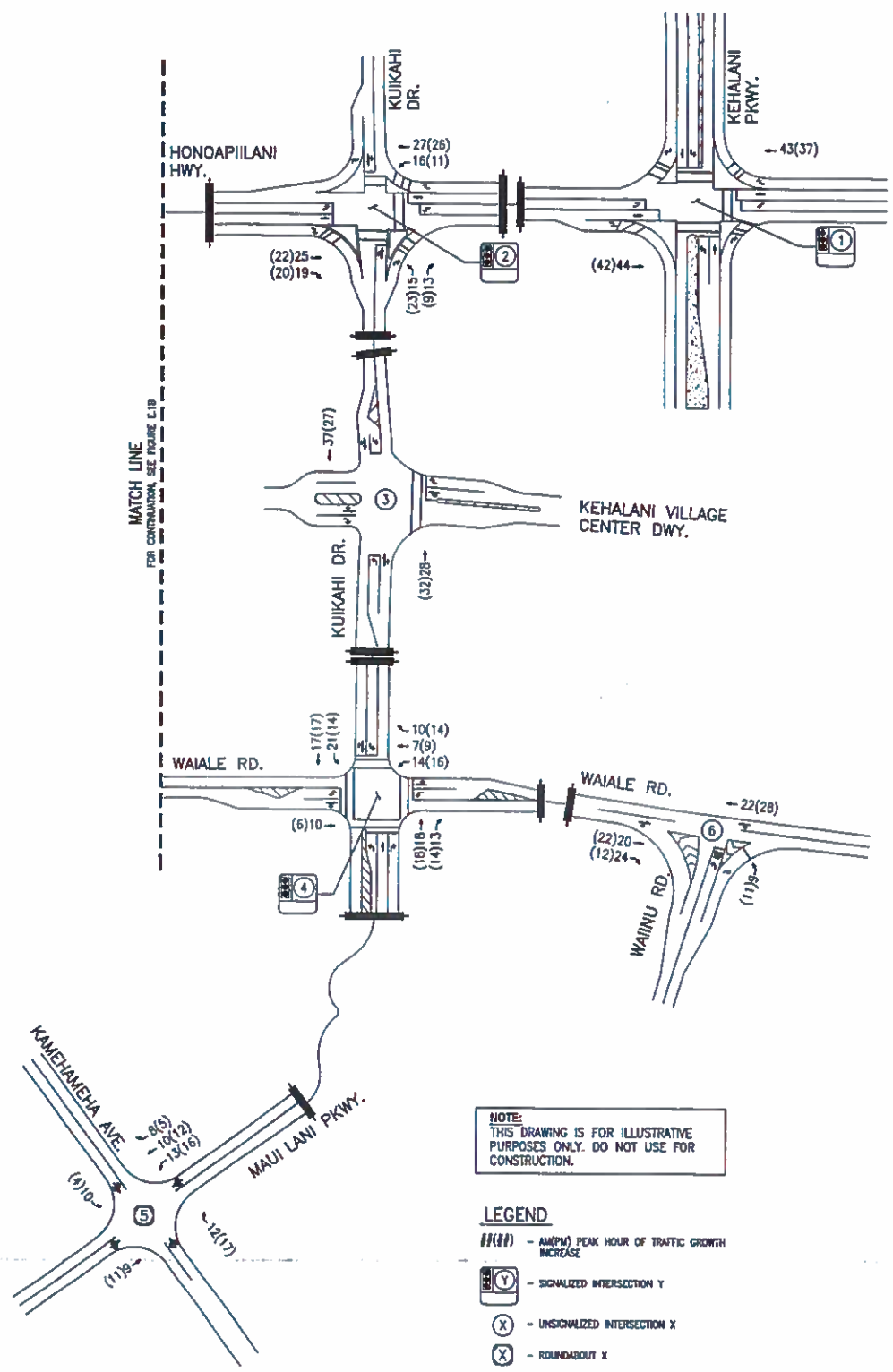
- LEGEND**
- ▲▲▲▲ - AMPM PEAK HOUR OF TRAFFIC GROWTH INCREASE
  - Y - SIGNALIZED INTERSECTION Y
  - X - UNSIGNALIZED INTERSECTION X

FIGURE  
**E.1B**

**ATA** AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS  
HONOLULU, HAWAII

PROJECTED AMBIENT MRTDM GROWTH (2017-2020)  
ANNUAL 19% INCREASE

WAKAPU 201-H AFFORDABLE HOUSING



WAIKAPU 201-H AFFORDABLE HOUSING

ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS HONOLULU, HAWAII

PROJECTED AMBIENT MRTDM GROWTH (2017-2020)  
ANNUAL 19% INCREASE

FIGURE

E.1A

Table E.2: Existing Conditions vs Future Year 2020 with Project, with Growth, without Background Projects Comparison

Intersection	Existing Conditions						Future Year 2020 with Project, with Growth without Background Projects					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>1: Honoapiilani Hwy &amp; Kehalani Pkwy</b>												
NB LT	17.9	0.59	B	11.9	0.39	B	18.5	0.62	B	12.4	0.41	B
NB TH	26.6	0.77	C	15.3	0.55	B	27.7	0.80	C	15.8	0.59	B
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	59.2	0.97	E	22.1	0.37	C	79.1	1.03	F*	23.3	0.40	C
EB TH	21.6	0.38	C	22.6	0.21	C	23.8	0.40	C	24.0	0.21	C
EB RT	30.6	0.77	C	24.3	0.54	C	82.5	1.04	F*	26.0	0.57	C
WB LT	27.4	0.12	C	24.2	0.05	C	29.0	0.13	C	25.7	0.06	C
WB TH	33.8	0.75	C	27.5	0.57	C	35.4	0.72	D	29.2	0.59	C
WB RT	32.2	0.57	C	27.4	0.54	C	33.8	0.54	C	29.4	0.58	C
SB LT	20.0	0.17	C	10.3	0.22	B	20.4	0.17	C	10.6	0.25	B
SB TH	29.7	0.72	C	19.1	0.75	B	30.2	0.74	C	20.0	0.78	C
SB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
Overall	32.5	-	C	18.6	-	B	45.1	-	D	19.5	-	B
<b>2: Honoapiilani Highway &amp; Kuikahi Drive</b>												
NB LT	16.1	0.04	B	17.6	0.14	B	16.8	0.05	B	19.0	0.17	B
NB TH	26.8	0.78	C	27.0	0.75	C	29.6	0.81	C	32.3	0.81	C
NB RT	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A
EB LT	27.7	0.19	C	28.3	0.04	C	29.5	0.21	C	30.6	0.05	C
EB TH	33.7	0.70	C	30.3	0.40	C	34.9	0.71	C	33.0	0.45	C
EB RT	29.9	0.37	C	27.7	0.13	C	32.1	0.44	C	30.0	0.14	C
WB LT	23.6	0.65	C	23.7	0.72	C	27.3	0.69	C	24.2	0.74	C
WB TH	22.0	0.15	C	17.4	0.18	B	23.2	0.15	C	18.0	0.18	B
WB RT	17.4	0.42	B	13.4	0.28	B	18.4	0.46	B	13.6	0.29	B
SB LT	17.8	0.70	B	15.8	0.55	B	22.3	0.76	C	18.0	0.63	B
SB TH	16.4	0.60	B	21.4	0.70	C	17.3	0.62	B	24.4	0.74	C
SB RT	9.6	0.01	A	13.8	0.06	B	9.8	0.01	A	14.6	0.06	B
Overall	21.9	-	C	21.7	-	C	24.2	-	C	24.0	-	C
<b>3: Kuikahi Dr &amp; Kehalani Village Center Dr</b>												
NB LT/TH	-	-	-	-	-	-	0.0	0.00	A	0.0	0.00	A
NB RT	-	-	-	-	-	-	0.0	0.00	A	0.0	0.00	A
EB LT	8.8	0.07	A	9.2	0.11	A	9.0	0.07	A	9.4	0.12	A
WB LT	-	-	-	-	-	-	0.0	0.00	A	0.0	0.00	A
SB LT/TH	-	-	-	-	-	-	57.5	0.33	F	53.5	0.34	F
SB RT	13.0	0.18	B	14.4	0.27	B	13.7	0.19	B	15.2	0.29	C

\* Denotes overcapacity condition, v/c ≥ 1.



Table E.2: Existing Conditions vs Future Year 2020 with Project, with Growth, without Background Projects Comparison

Intersection	Existing Conditions						Future Year 2020 with Project, with Growth without Background Projects					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>4: Waiale Rd &amp; Kuikahi Dr/Maui Lani Pkwy</b>												
NB LT	24.9	0.43	C	23.2	0.23	C	28.0	0.48	C	26.0	0.25	C
NB TH/RT	35.4	0.80	D	27.3	0.53	C	39.9	0.83	D	30.2	0.51	C
EB LT	22.8	0.82	C	17.6	0.65	B	26.2	0.87	C	22.2	0.72	C
EB TH/RT	18.0	0.50	B	18.3	0.46	B	20.7	0.55	C	22.4	0.51	C
WB LT	24.1	0.10	C	18.7	0.17	B	27.7	0.10	C	21.8	0.21	C
WB TH	32.1	0.73	C	27.5	0.77	C	37.2	0.76	D	32.0	0.78	C
WB RT	33.9	0.78	C	26.4	0.71	C	40.4	0.81	D	31.1	0.73	C
SB LT	26.1	0.69	C	19.7	0.61	B	29.4	0.74	C	20.3	0.63	C
SB TH/RT	35.4	0.82	D	34.2	0.87	C	34.6	0.81	C	29.0	0.85	C
Overall	27.9	-	C	24.8	-	C	31.2	-	C	26.6	-	C
<b>5: Kamehameha Ave &amp; Maui Lani Pkwy</b>												
NB TH/RT	53.9	0.90	F	18.2	0.38	C	-	-	-	-	-	-
NB LT/TH/RT	-	-	-	-	-	-	17.8	0.70	C	8.8	0.31	A
EB LT/TH/RT	82.3	1.03	F*	109.2	1.11	F*	12.1	0.56	B	11.6	0.57	B
WB LT/TH/RT	57.4	0.93	F	76.9	1.05	F*	14.0	0.54	B	12.4	0.57	B
SB LT	23.0	0.52	C	19.1	0.44	C	-	-	-	-	-	-
SB TH/RT	88.0	1.06	F*	51.9	0.93	F	-	-	-	-	-	-
SB LT/TH/RT	-	-	-	-	-	-	17.8	0.72	C	13.2	0.63	B
<b>6: Waiale Rd &amp; Waiinu Rd</b>												
WB LT	485.7	1.86	F*	378.8	1.65	F*	685.5	2.30	F*	579.6	2.09	F*
WB RT	17.7	0.15	C	12.5	0.09	B	18.9	0.16	C	13.0	0.10	B
SB LT	12.1	0.08	B	9.3	0.08	A	12.7	0.09	B	9.6	0.09	A
<b>7: Honoapiilani Hwy &amp; W Waiko Rd/E Waiko Rd</b>												
NB LT	10.4	0.01	B	10.9	0.02	B	10.7	0.01	B	10.5	0.02	B
NB TH/RT	20.2	0.72	C	21.8	0.83	C	22.8	0.78	C	19.4	0.81	B
EB LT/TH	28.2	0.12	C	24.4	0.06	C	28.2	0.15	C	29.2	0.09	C
EB RT	27.6	0.03	C	24.2	0.03	C	27.5	0.04	C	28.9	0.04	C
WB LT/TH/RT	30.1	0.34	C	26.4	0.34	C	30.5	0.38	C	31.9	0.43	C
SB LT	11.3	0.33	B	12.6	0.16	B	13.1	0.38	B	12.9	0.16	B
SB TH	12.5	0.60	B	13.8	0.69	B	13.5	0.64	B	12.5	0.69	B
SB RT	6.4	0.01	A	7.1	0.04	A	6.5	0.01	A	6.4	0.03	A
Overall	17.2	-	B	18.3	-	B	19.0	-	B	17.3	-	B
<b>8: E Waiko Rd &amp; Waiale Rd</b>												
EB LT	7.6	0.04	A	7.8	0.05	A	7.6	0.05	A	7.9	0.06	A
SB LT/RT	14.2	0.40	B	12.1	0.25	B	15.7	0.46	C	12.9	0.28	B

\* Denotes overcapacity condition, v/c ≥ 1.

Table E.2: Existing Conditions vs Future Year 2020 with Project, with Growth, without Background Projects Comparison

Intersection	Existing Conditions						Future Year 2020 with Project, with Growth without Background Projects					
	AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>9: Waiale Rd &amp; Ohana Hana Loop</b>												
NB LT	7.7	0.01	A	7.6	0.01	A	7.8	0.01	A	7.6	0.02	A
EB LT	10.9	0.03	B	11.1	0.03	B	11.3	0.04	B	11.4	0.03	B
EB RT	9.6	0.03	A	9.1	0.01	A	9.8	0.04	A	9.2	0.01	A
<b>10: Waiale Rd &amp; Nokekula Lp</b>												
NB LT	7.7	0.00	A	7.6	0.02	A	7.7	0.00	A	7.7	0.02	A
EB LT/RT	10.4	0.07	B	10.0	0.03	B	10.7	0.07	B	10.2	0.04	B
<b>11: Waiale Rd &amp; Haawi St</b>												
NB LT	7.6	0.01	A	7.7	0.03	A	7.6	0.01	A	7.8	0.03	A
EB LT/RT	11.0	0.22	B	11.0	0.14	B	11.4	0.23	B	11.3	0.15	B
<b>12: Waiale Rd &amp; Kokololio St</b>												
NB LT	7.6	0.00	A	7.9	0.01	A	7.6	0.00	A	7.9	0.01	A
EB LT	12.2	0.18	B	12.2	0.11	B	12.7	0.19	B	12.6	0.12	B
EB RT	9.2	0.03	A	9.6	0.01	A	9.3	0.03	A	9.7	0.01	A
<b>13: Waiale Rd &amp; Project Access II</b>												
NB LT	-	-	-	-	-	-	7.6	0.00	A	7.9	0.01	A
EB LT/RT	-	-	-	-	-	-	11.7	0.06	B	11.8	0.03	B
<b>14: Waiale Rd &amp; Project Access I</b>												
NB TH	-	-	-	-	-	-	7.7	0.00	A	8.0	0.01	A
EB LT/TH	-	-	-	-	-	-	11.9	0.06	B	12.0	0.05	B

\* Denotes overcapacity condition, v/c ≥ 1.



***Appendix H***

***Biological Resources***

***Survey***



**BIOLOGICAL RESOURCES SURVEY**

**for the**

**WAIKAPŪ DEVELOPMENT VENTURE 201-H**

**WAIKAPŪ, MAUI, HAWAII**

**by**

**ROBERT W. HOB DY  
ENVIRONMENTAL CONSULTANT  
Kokomo, Maui  
July 2017**

**Prepared for:  
Frampton & Ward LLC.**



FLORA AND FAUNA SURVEY  
WAIKAPŪ DEVELOPMENT VENTURE 201-H  
WAIKAPU, MAUI, HAWAII

INTRODUCTION

The Waikapū Development Venture 201-H project is located between Wailuku and Waikapū in Central Maui. It lies between Honoapiilani Highway and Waiale Road, and encompasses 12.50 acres of undeveloped land, TMK (2) 3-5-02:011 (see figure 1). This biological resources study of the project area was initiated by the owners in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The project area lies on gently sloping land on the lower eastern slopes of the West Maui Mountains. The vegetation consists of dense grassland with scattered shrubs and small trees. Elevations range between 370 and 390 feet above sea level. The soil is characterized as Iao silty clay, 0 – 3% slopes (IaA) with moderate amounts of windblown sand intermixed (Foote et al, 1972). Rainfall averages 25 inches per year with winter maximums, (Armstrong, 1983).

BIOLOGICAL HISTORY

The original vegetation in this area consisted of a dense low statured native forest and shrubland with such components as 'ōhi'a (*Metrosideros polymorpha*), 'a'ali'i (*Dodonaea viscosa*), olopua (*Nestegis sandwicensis*), lama (*Diospyros sandwicensis*), halapepe (*Chrysodracon auwahiensis*), and a variety of ferns, vines and herbaceous plants.

Hawaiians lived in the area for several centuries, farming in the valley bottoms and lowlands and utilizing forest plants for food, construction materials, tools, fiber and medicines. They altered the landscape somewhat through cultivation and burning. This area is situated on farming lands that were irrigated with waters from the ancient Kama Ditch.

During the mid-1800's this area was cleared for sugar cane agriculture and the area was plowed, planted, burned and harvested in continuous cycles for over 100 years. Native ecosystems were replaced by sugar cane and increasing numbers of agricultural weeds.

When sugar production ended in the 1990s this area was converted to cattle grazing. All of these practices, along with recent fires that have swept through the grass lands, have resulted in an environment that is now nearly totally lacking in native plants and animal species.

## **SURVEY OBJECTIVES**

This report summarizes the findings of a flora and fauna survey of the proposed Waikapū Development Venture 201-H Affordable Housing project which was conducted in July 2017. The objectives of the survey were to:

1. Document what plant, and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

## BOTANICAL SURVEY REPORT

### SURVEY METHODS

A walk-through botanical survey method was used covering the entire project area. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

A special focus was on identifying any native species and ascertaining if there were any Endangered or Threatened species (USFWS, 2017) that would require special focus. A complete plant species list is presented herein.

### DESCRIPTION OF THE VEGETATION

The vegetation in the project area is dominated by two non-native species: Guinea grass (*Megathyrsus maximus*) which can grow in dense stands to eight feet deep, and glycine (*Neonotonia wightii*), a twining vine that forms tangles of growth over and through other vegetation. Also common were koa haole (*Leucaena leucocephala*), 'opiuma (*Pithecellobium dulce*) and marunggay (*Moringa oleifera*).

A total of 48 plant species were recorded during the survey during two site visits to the project area. Just one common indigenous native plant species was found, the widespread 'uhaloa (*Waltheria indica*). The remaining 47 plants were all non-native pasture plants or agricultural weeds.

### DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area is dominated by non-native species that are of no particular environmental interest or concern. Just one common indigenous plant, 'uhaloa was found growing in the area. No federally listed Endangered or Threatened plant species (USFWS, 2017) were found, nor do any plants that are candidates for such status occur on the project area. No special plant habitats occur on or near the project and no potential wetlands occur in this dry upland site.

This project is not expected to have any significant negative impacts on the botanical resources in this part of West Maui. No recommendations regarding botanical resources are deemed necessary or appropriate.

## PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within each of two groups: Monocots and Dicots. Taxonomy and nomenclature of the flowering plants (Monocots and Dicots) are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

Polynesian = all those plants brought to Hawaii during the course of Polynesian migrations

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<b>MONOCOTS</b>			
<b>POACEAE (Grass Family)</b>			
<i>Cenchrus ciliaris</i> L.	buffelgrass	non-native	uncommon
<i>Cenchrus purpureus</i> (Schumach.) Morrone	Napier grass	non-native	uncommon
<i>Chloris barbata</i> (L.) Sw.	swollen fingergrass	non-native	rare
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	non-native	rare
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	non-native	rare
<i>Megathyrsus maximus</i> (Jacq.) Simon & Jacobs	Guinea grass	non-native	abundant
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	non-native	rare
<b>DICOTS</b>			
<b>ANACARDIACEAE (Mango Family)</b>			
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	non-native	uncommon
<b>APOCYNACEAE (Dogbane Family)</b>			
<i>Asclepias physocarpa</i> (E. Mey.) Schlechter	balloon plant	non-native	rare
<b>ASTERACEAE (Sunflower Family)</b>			
<i>Conyza bonariensis</i> (L.) Cronq.	hairy horseweed	non-native	uncommon
<i>Conyza canadensis</i> (L.) Cronq.	horseweed	non-native	rare
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	non-native	rare
<i>Senecio madagascariensis</i> Poir.	fireweed	non-native	rare
<i>Tridax procumbens</i> L.	coat buttons	non-native	uncommon
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	golden crown-beard	non-native	uncommon
<b>BIGNONIACEAE (Bignonia Family)</b>			
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	non-native	uncommon
<b>BORAGINACEAE (Borage Family)</b>			
<i>Heliotropium procumbens</i> Mill.	fourspike heliotrope	non-native	rare
<b>COMBRETACEAE (Combretum Family)</b>			
<i>Terminalia catappa</i> L.	Indian almond	non-native	uncommon
<b>CUCURBITACEAE (Gourd Family)</b>			
<i>Momordica charantia</i> L.	bitter melon	non-native	rare
<b>EUPHORBIACEAE (Spurge Family)</b>			
<i>Euphorbia hypericifolia</i> L.	graceful spurge	non-native	rare
<i>Macaranga tanarius</i> (L.) Mull. Arg.	parasol leaf tree	non-native	uncommon
<i>Ricinus communis</i> L.	Castor bean	non-native	uncommon
<b>FABACEAE (Pea Family)</b>			
<i>Bauhinia monandra</i> Kurz	St. Thomas tree	non-native	rare
<i>Canavalia cathartica</i> Thouars	maunaloa	non-native	rare
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	non-native	rare
<i>Crotalaria incana</i> L.	fuzzy rattlepod	non-native	rare
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Desmanthus pernambucanus</i> (L.) Thellung	slender mimosa	non-native	uncommon
<i>Indigofera spicata</i> Forssk.	creeping indigo	non-native	rare
<i>Indigofera suffruticosa</i> Mill.	inikō	non-native	rare
<i>Lablab purpureus</i> (L.) Sweet	pāpapa bean	non-native	rare
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole	non-native	common
<i>Macroptilium atropurpureum</i> (DC.) Urb.	siratro	non-native	uncommon
<i>Macroptilium lathyroides</i> (L.) Urb.	wild bean	non-native	rare
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey	glycine	non-native	abundant
<i>Pithcellobium dulce</i> (Roxb.) Benth.	ōpiuma	non-native	common
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe	non-native	uncommon
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	non-native	rare
MALVACEAE (Mallow Family)			
<i>Abutilon grandifolium</i>	hairy abutilon	non-native	rare
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	non-native	uncommon
<i>Sida rhombifolia</i> L.	arrowleaf sida	non-native	uncommon
<i>Waltheria indica</i> L.	'uhaloa	indigenous	uncommon
MORACEAE (Mulberry Family)			
<i>Broussonetia luzonicus</i> (Blanca) Bureau	alokon	non-native	uncommon
MORINGACEAE (Drumstick Tree Family)			
<i>Moringa oleifera</i> Lamarck	marunggay, horeradish tree	non-native	common
MYRTACEAE (Myrtle Family)			
<i>Psidium guajava</i> L.	common guava	non-native	rare
<i>Syzygium cumini</i> (L.) Skeels	Java plum	non-native	uncommon
PROTEACEAE (Protea Family)			
<i>Grevillia robusta</i> A. Cunn. Ex R. Br.	silk oak	non-native	rare
SOLANACEAE (Nightshade Family)			
<i>Solanum torvum</i> Sw.	pea aubergine	non-native	rare



## FAUNA SURVEY REPORT

### SURVEY METHODS

A walk-through survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

### RESULTS

#### MAMMALS

Two mammal species were recorded in the project area. Taxonomy and nomenclature follow Tomich (1986). Most common was the axis deer (*Axis axis*). While not seen, their trails, tracks, scent, signs of feeding and abundant droppings all testify to regular and recent use of this area.

The evening survey revealed presence of the endemic and endangered 'ōpe'ape'a or Hawaiian hoary bat in the project area. A bat detector (Batbox IIID) was employed, set to the frequency of 27,000 Hertz which is the frequency these bats are known to emit when echolocating for nocturnal flying insect prey.

Other non-native mammals likely to be found here include mongoose (*Herpestes auropunctatus*), roof rat (*Rattus rattus*), mice (*Mus domesticus*) and domestic cats (*Felis catus*).

#### BIRDS

Birdlife was modest in both species diversity and in total numbers. Just seven species of non-native birds were recorded during two site visits. Taxonomy and nomenclature follow American Ornithologists Union (2017). Most common was the zebra dove (*Geopelia striata*), while the spotted dove (*Streptopelia chinensis*) was uncommon. An additional five species were rare. No native birds were seen. The migratory Pacific golden-plover (*Pluvialis fulva*) might show up during the winter months.

#### INSECTS

Insect life was rather modest in this dense grassland. Just twelve insect species were recorded during two site visits. Taxonomy and nomenclature follow Nishida et al (1992). Just two species were of common occurrence: the sleepy orange butterfly (*Eurema nicippe*) and the dung fly (*Musca sorbens*). Five species were uncommon and five more species were rare. One of these was the indigenous native globe skimmer dragonfly (*Pantala flavescens*).

#### REPTILES

One non-native gecko, the mourning gecko (*Lepidodactylus lugubris*) was recorded during the evening survey.

## DISCUSSION AND RECOMMENDATIONS

The wildlife within the project was composed primarily of non-native species. Just two species were native in Hawaii: the endemic and endangered Hawaiian hoary bat and the indigenous globe skimmer dragonfly.

The Hawaiian hoary bat is a cryptic nocturnal creature that can be neither seen nor heard by humans when they are active at night. Little is known of their population and movements. With bat detectors we can determine when they are nearby at particular locations, but they often move about with shifting food resources.

A single bat was detected in one portion of the project area, indicating that these bats are likely to use this habitat at least occasionally. Because of its federally endangered status the standard U.S. Fish and Wildlife Service guidance designed to protect this bat and its young during its vulnerable breeding and pupping season requires that trees greater than 15 feet in height should not be removed between the months between April and mid-September. The Service can be consulted for any further guidance.

The globe skimmer dragonfly is common throughout Hawaii and is found throughout the tropics and subtropics nearly worldwide. It carries no protective status and is of no particular environmental concern.

The endemic and endangered Blackburn's sphinx moth (*Manduca blackburni*) was not found during the survey and none of its specific host plants were found either.

No nēnē or Hawaiian goose (*Branta sandvicensis*) were seen in or around this project area. The deep, dense grass provides no suitable habitat for these birds and there are no suitable wet habitats for them either.

While no protected seabirds were found on the property, the Endangered ua'u (*Pterodroma sandwichensis*) and Threatened 'a'o (*Puffinus newelli*) are known to overfly the area at dawn and dusk to their burrows high in the mountains between the months of March and November. In late fall, young birds fledge from their burrows to take their first tentative flights out to sea. These inexperienced birds are easily confused and distracted by bright lights and often crash to the ground where they are particularly vulnerable to being run over by vehicles or killed by predators. It is recommended that any significant outdoor lighting such as street lights or flood lights that are incorporated into the project design be shielded to direct the light downward so that it is not visible from above.

As a result of these findings, it is determined that there is little of environmental concern beyond the recommendations offered with regard to animal life within the proposed project. The development of this project is not expected to have a significant negative impact on the native wildlife resources in this part of West Maui.

## ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within four groups: Mammals, Birds, Insects and Reptiles.

For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:

endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

abundant = many flocks or individuals seen throughout the area at all times of day.

common = a few flocks or well scattered individuals throughout the area.

uncommon = only one flock or several individuals seen within the project area.

rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<b>MAMMALS</b>			
<b>CERVIDAE (Deer Family)</b>			
<i>Axis axis</i> Erxleben	axis deer	non-native	common
<b>VESPERTILIONIDAE (Bat Family)</b>			
<i>Lasiurus cinereus semotus</i> H. Allen	'ōpe'ape'a, Hawaiian hoary bat	endemic	rare
<b>BIRDS</b>			
<b>COLUMBIDAE (Dove Family)</b>			
<i>Geopelia striata</i> L.	zebra dove	non-native	common
<i>Streptopelia chinensis</i> Scopoli	spotted dove	non-native	uncommon
<b>FRINGILLIDAE (True Finch Family)</b>			
<i>Carpodacus mexicanus</i> Muller	house finch	non-native	rare
<b>STURNIDAE (Starling Family)</b>			
<i>Acridotheres tristis</i> L.	common myna	non-native	rare
<b>ESTRILDIDAE (Estrildid Finch Family)</b>			
<i>Lonchura punctulata</i> L.	nutmeg mannikin	non-native	rare
<b>ZOSTEROPIDAE (White-eye Family)</b>			
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese white-eye	non-native	rare
<b>THRAUPIDAE (Tanager Family)</b>			
<i>Paroaria coronata</i> Miller	red-crested cardinal	non-native	rare

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE
<b>INSECTS</b>			
Order ARANAE - true spiders			
ARANEIDAE (Orb-Weaver Family)			
<i>Angiope appensa</i> Walkenaer	common garden spider	non-native	uncommon
<i>Gasteracantha mammosa</i> Koch	Asian spiny-backed spider	non-native	uncommon
Order COLEOPTERA - beetles			
COCCINELLIDAE (Lady Beetle Family)			
<i>Coccinella septempunctata brucki</i> Mulstant	seven-spot lady beetle	non-native	rare
Order DIPTERA - flies			
MUSCIDAE (Housefly Family)			
<i>Musca sorbens</i> Wiedemann	dung fly	non-native	common
Order LEPIDOPTERA - butterflies, moths			
LYCAENIDAE (Gossamer-winged Butterfly Family)			
<i>Lampdies boeticus</i> L.	long-tailed blue butterfly	non-native	uncommon
NOCTUIDAE (Owlet Moth Family)			
<i>Achaea janata</i> L.	Castor semi-looper	non-native	rare
NYMPHALIDAE (Brush-footed Butterfly Family)			
<i>Danaus plexippus</i> L.	monarch butterfly	non-native	rare
PIERIDAE (White and Sulphur Butterfly Family)			
<i>Eurema nicippe</i> Cramer	sleepy orange butterfly	non-native	common
<i>Pieris rapae</i> L.	cabbage butterfly	non-native	uncommon
Order ODONATA - dragonflies & damselflies			
LIBELLULIDAE (Skipper Dragonfly Family)			
<i>Pantala flavescens</i> Fabricius	globe skimmer	indigenous	rare
Order ORTHOPTERA - grasshoppers, crickets			
ACRIDIDAE (Grasshopper Family)			
<i>Oedaleus abruptus</i> Thunberg	short-horned grasshopper	non-native	uncommon
TETTIGONIIDAE (Katydid Family)			
<i>Elimaea punctifera</i> Walker	katydid	non-native	rare

**COMMON NAME****SCIENTIFIC NAME****STATUS****ABUNDANCE****REPTILES****GEKKONIDAE (Gecko Family)***Lepidodactylus lugubris* Dumeril & Bibron

mourning gecko

non-native

rare



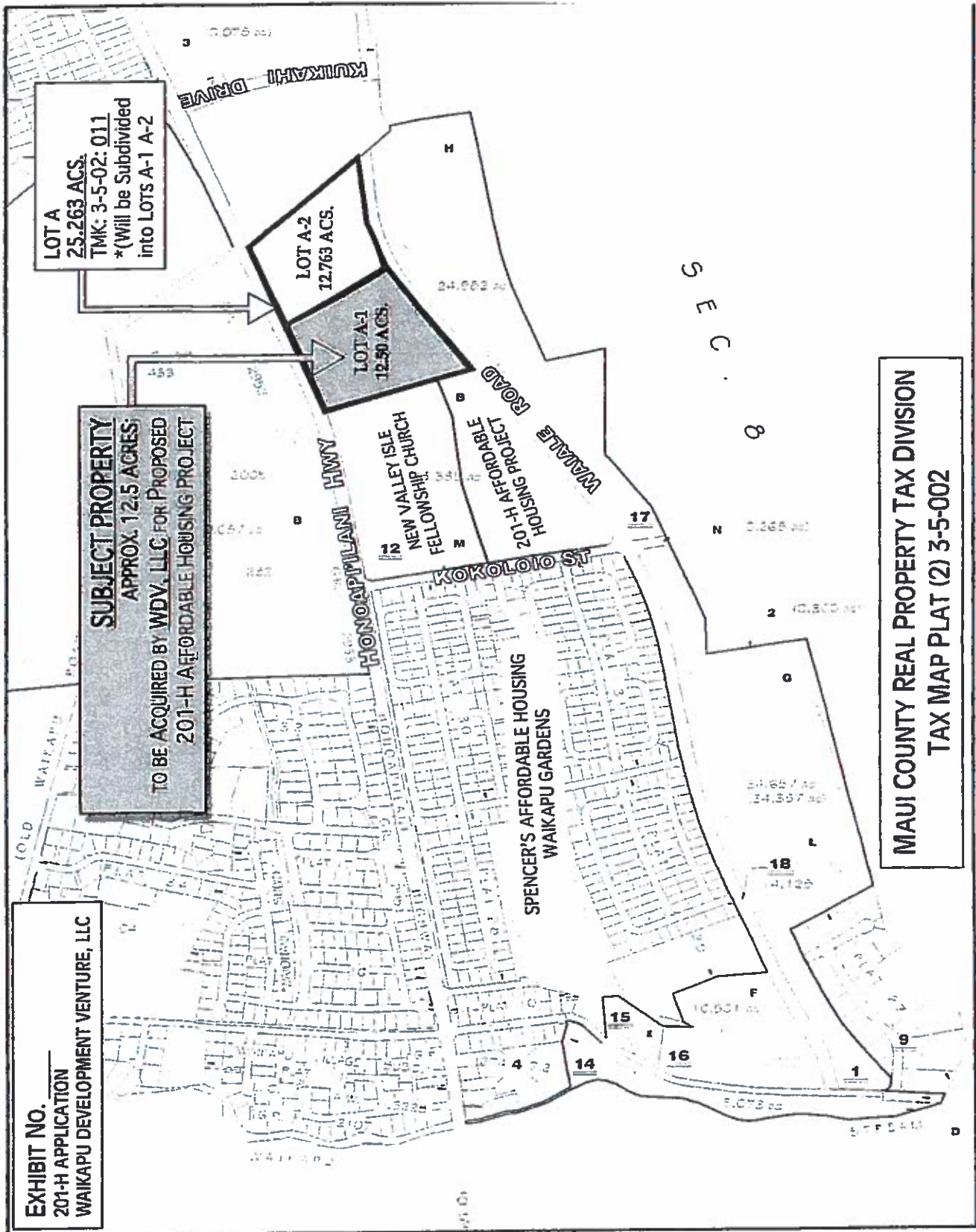


Figure 1. Project Area Location

### Literature Cited

- American Ornithologists' Union, 2017. Check-list of North American Birds. 7<sup>th</sup> edition. American Ornithologists' Union. Washington D.C.
- Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2<sup>nd</sup> ed.) University of Hawaii Press.
- Foote, D.E. , E.L. Hill, S. Nakamura, and F. Stephens. 1972. Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Dept. of Agriculture, Soil Conservation Service. Washington, D.C.
- Nishida, G.M. & G.A. Samuelson, J.S. Strazanac & K.S. Kami. 1992. Hawaiian Terrestrial Arthropod Checklist. Hawaiian Biological Survey.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.
- U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and Plants. Listings and Occurrences for Hawaii [www.fws.gov/endangered](http://www.fws.gov/endangered)
- Wagner, W. L., D.R. Herbst, and S. H. Sohmer, 1999. Manual of the flowering plants of Hawai'i. Univ. of Hawai'i Press and Bishop Museum Press. Honolulu.



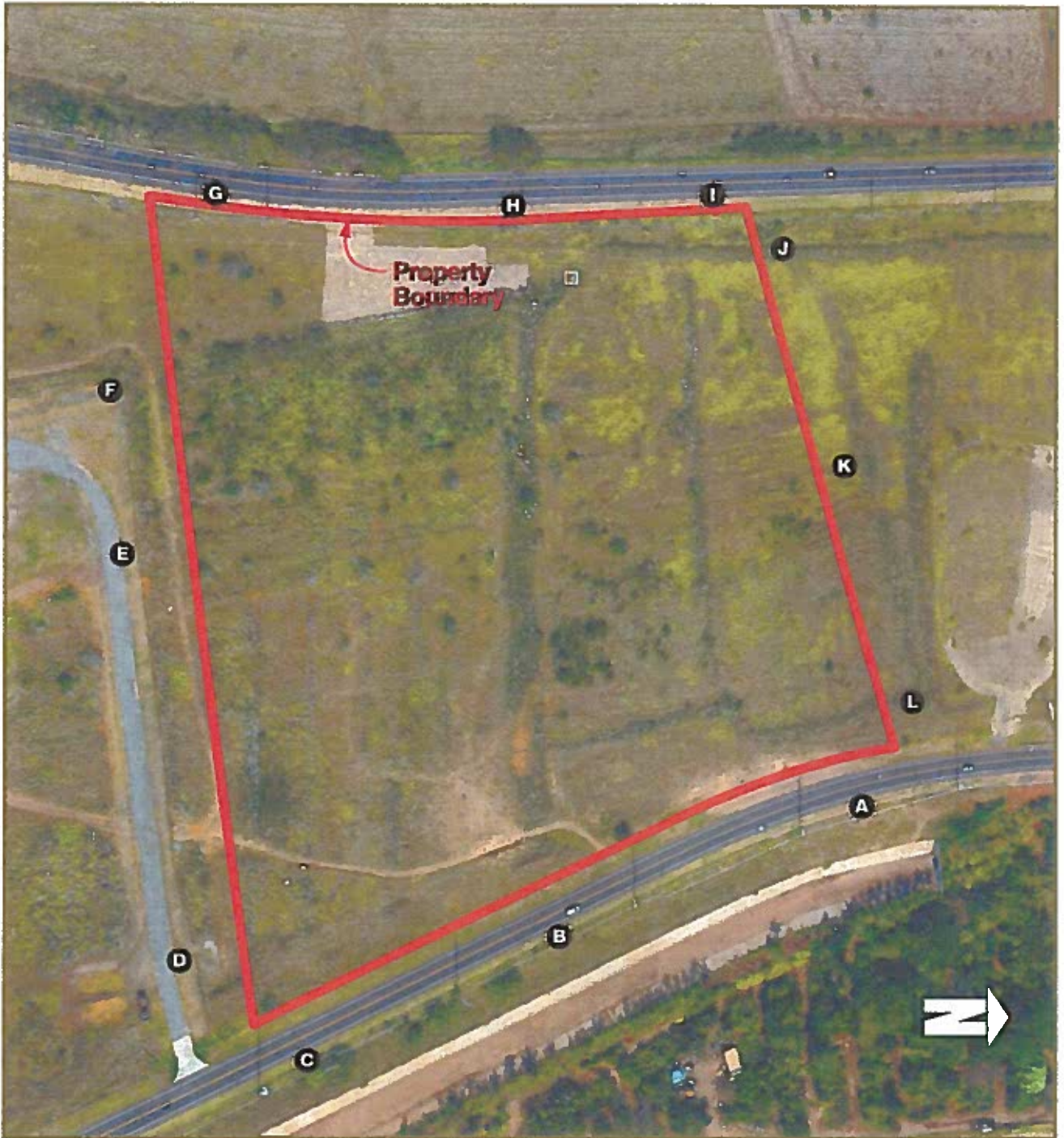
***Appendix I***

***Aerial Photo and View***

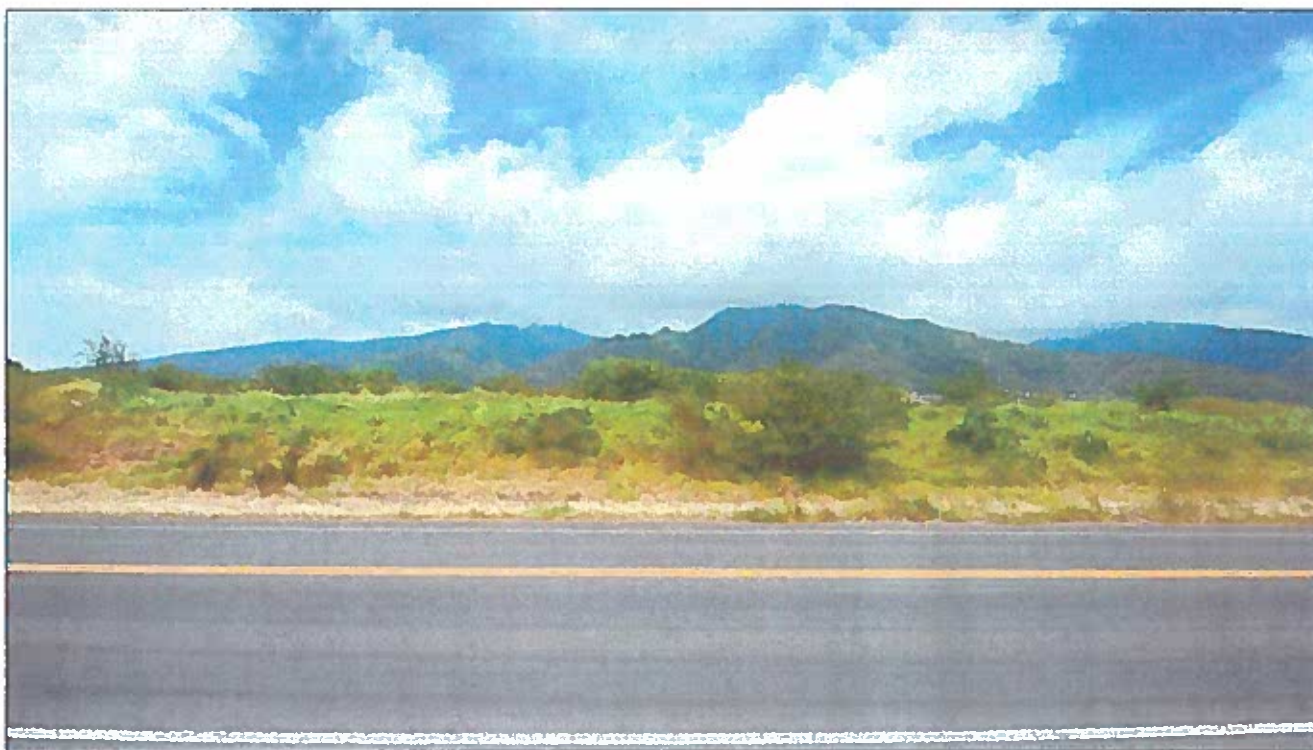
***Photos of Project Site***



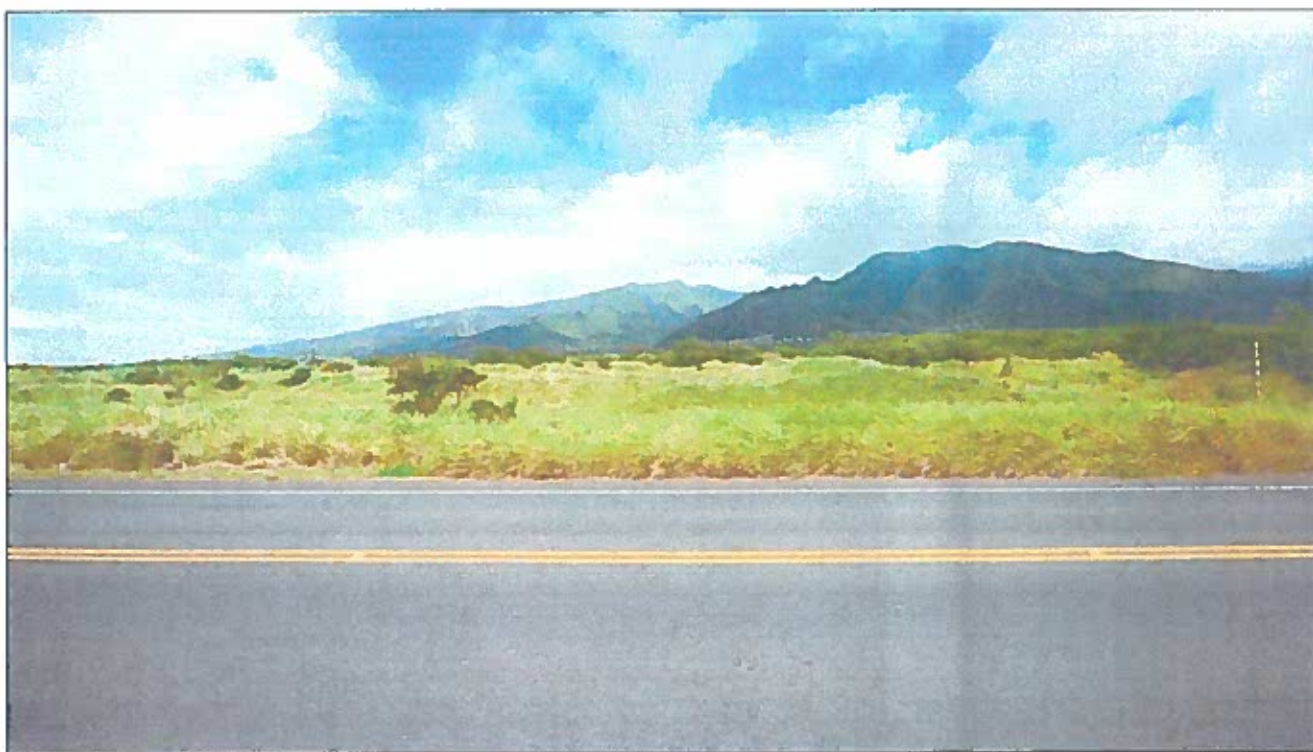
# Aerial Photo of Project Site



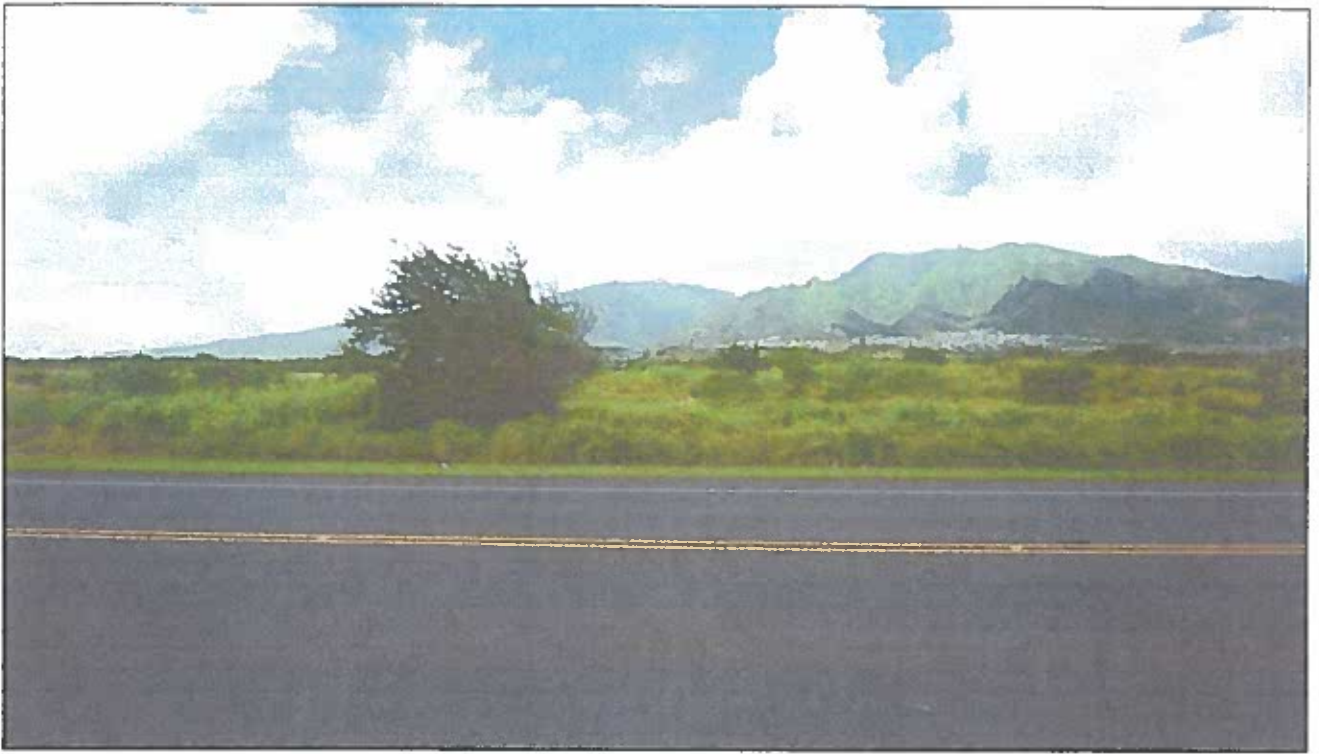




**A** View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.



**B** View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.



**© View facing West from Wai'ale Road on boundary of Kīhei Garden & Landscaping Co.**



**© View facing North from South adjoining property Valley Isle Fellowship Church**





**E** View facing North from South adjoining property Valley Isle Fellowship Church



**F** View facing North from South adjoining property Valley Isle Fellowship Church





**G** View facing East from Western boundary of property on Honoapi'ilani Highway



**H** View facing East from Western boundary of property on Honoapi'ilani Highway



**① View facing East from Western boundary of property on Honoapi'ilani Highway**

Image  
T/K

**① View facing South from Northern boundary of property**

***Appendix J***

***Market Demand Analysis***

***Report***





*Market Demand Study for an For-Sale 80-Unit  
Proposed 201H-38 Home Affordable Housing  
Project, Wailea Road, Waikapu,  
Island and County of Maui, Hawaii  
TMKs (2) 3-5-2-11 (portion)*

---

*Prepared For*  
**WAIKAPU DEVELOPMENT VENTURE, LLC**  
William Frampton - Project Manager  
56 Paliuli Place  
Kula, Hawaii 96790

**R.W. SPANGLER LLC**  
**Real Estate Analysis**

08.11.17

**WAIKAPU DEVELOPMENT VENTURE, LLC**

William Frampton  
Project Manager  
56 Paliuli Place  
Kula, Hawaii 96790

RE: Market demand study for proposed 201H-38 Affordable Housing Development Project  
Wailea Road, Waikapu, Island and County of Maui, State of Hawaii 96793  
TMKs (2) 3-5-2-11 (portion)

Dear Mr. William Frampton:

In accordance with your request and authorization, I have conducted an affordable housing market study in relation to your proposed 80-unit for-sale affordable development to be processed as a 201-H application under Chapter 2.96, Maui County Code.

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council.

The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet. The following report presents the findings of the market study as of the effective date of the report on August 11, 2017.

Respectfully submitted,



**Robert W. Spangler, MAI**  
Hawaii State Certified General Appraiser, CGA-967  
Expiration Date December 31, 2017

## *Table of Contents*

---

### **Contents**

SUMMARY OF PROPOSED PROJECT .....	2
CERTIFICATION .....	4
ASSUMPTIONS AND LIMITING CONDITIONS .....	5
INTRODUCTION .....	8
IDENTIFICATION OF THE SUBJECT.....	8
INTENDED USE AND USERS .....	10
SCOPE OF THE ASSIGNMENT.....	10
- Reporting Process .....	10
POPULATION .....	14
EMPLOYMENT .....	15
UNEMPLOYMENT .....	18
TOURISM.....	18
INCOME LEVELS.....	19
RESIDENTIAL MARKET CONDITIONS – VALUE TRENDS, ABSORPTION, ETC.....	19
ABSORPTION .....	22
MAUI COMMERCIAL REAL ESTATE SUMMARY STATISTICS .....	23
RETAIL MARKET CONDITIONS .....	25
OFFICE MARKET CONDITIONS .....	26
INDUSTRIAL MARKET CONDITIONS.....	29
INVESTMENT MARKET .....	31
CONCLUSION.....	32
MARKET AREA.....	33
LOCATION.....	33
ACCESSIBILITY.....	34
NEIGHBORHOOD .....	35
- Trends.....	35
- Surrounding Land Uses.....	35
- Conclusion .....	35
AFFORDABLE FOR-SALE HOUSING MARKET OVERVIEW .....	36
AFFORDABLE PROGRAMS .....	36
MARKET HOME SALE COMPOSITION APPROXIMATING CURRENT AFFORDABLE PRICING.....	36
SUPPLY AND DEMAND CHARACTERISTICS - INTERVIEWS WITH MARKET PARTICIPANTS .....	38
RE-SALE ENCUMBRANCES .....	38
SUMMARY OF RELEVANT FOR-SALE AFFORDABLE PROJECTS .....	39
FINANCING.....	46
CONCLUSION.....	46
SUPPLY AND DEMAND CHARACTERISTICS .....	47
SUPPLY .....	47
DEMAND .....	48
AFFORDABILITY .....	51

*Table of Contents*

---

CONCLUSION.....53

QUALIFICATION SUMMARY ..... Addenda

**SUMMARY OF PROPOSED PROJECT**

**Property Location:** Wailea Road/Honoapiilani Highway, Waikapu, Island and County of Maui, State of Hawaii 96793

**Tax Map Keys:** (2) 3-5-2-11 (portion)

**Land Description:**

**Area:** Gross area – 12.5 AC

**Shape:** Rectangular

**Topography:** Modest upward slope from makai to mauka; curb grade

**Utilities and off-sites:** All to site

**Zoning:** The project is being processed under 201H-38, HRS exemptions precluding amendment of the community plan, zoning and other land use regulations

    State Land Use District – Urban

    Maui Island Plan – Urban growth boundary

    County Zoning – Public/Quasi-Public (P-1)

    Wailuku-Kahului Community Plan – Public/Quasi-Public

    Special Designations – not within SMA district

**Flood zone:** Zone X; no mandatory flood insurance required

**Proposed Project Description:** The project manager provided the following description of the proposed development



### *Summary of Proposed Project*

UNIT TYPE	LOT SIZE	DWELLING SIZE / LOT SIZE	UNIT COUNT
S.F. Dwelling and Lot	<u>5,400</u> Sq.Ft. (54' x 100')	1 or 2 Story Dwellings; 3-4 Bed/2-Bath; 1 Car Garage (fire-wall) & Stacked Parking.	28
S.F. Dwelling and Lot	<u>4,860</u> Sq.Ft. (54' x 90')	1 or 2 Story Dwellings; 2- 4 Bed/2 Bath; 2 Car Garage or Carport.	8
S.F. Dwelling and Lot	<u>3,200</u> Sq.Ft. (40' x 80')	1 or 2 Story Dwellings; 2 or 3 Beds/1 or 2 Baths; 2 Car Garage or Carport.	32
Duplex Dwelling (CPR Shared Lot)	<u>3,200</u> Sq.Ft. (40' x 80')	2 Unit/2-Story Duplex Dwellings; 2 or 3 Beds / 1 or 2 Baths; 2 Car Garage or Carport.	12
<b>Total Unit Count:</b>			<b>80</b>

The project manager provided the following distribution of the proposed development units by AMI %

INCOME RANGE	NO. UNITS	PERCENT OF TOTAL UNITS
70%-80%	12 Units*	15%
81%-100%	12 Units	15%
101%-120%	40 Units	50%
121%-140%	16 Units	20%

\*NOTE: These Units will be Duplex Units.

## **EXECUTIVE SUMMARY**

### **BACKGROUND**

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income subject to the County of Maui Department of Housing and Human Concerns Affordable Sales Price Guidelines.

The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet.

The proposed development will consist of 80 total units comprised of 68 detached single-family homes and twelve duplex homes. The detached houses will be a mix of one- and two-story dwellings of two to four bedrooms and one to two bathrooms, while the duplex product will be two or three bedrooms and one or two bathrooms. Parking will be a mix of carport and garage stalls.

### **STUDY OBJECTIVES**

R.W. Spangler LLC was retained by Mr. William Frampton, Project Manager for Waikapu Development Venture, LLC, to prepare a market demand study in relation to the application for the proposed development. The scope of work was comprised of the following:

1. Delineation of the market area that the proposed development will serve
2. Analysis of market area supply and demand characteristics applicable to the proposed development
3. Determination of sufficiency of market demand for the proposed development

### **CONCLUSION**

The market demand study concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 71% to 140% of Area Median Income (AMI). The findings are detailed and supported in the body of the report with the following representing a high-level executive summary of factors and conclusions illustrating strong demand for the proposed development.

1. Strong local new housing demand
  - a. One-third of the projected annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected housing demand is from buyers under 141% of AMI
  - b. Active ongoing land acquisitions and subdivision development of market-rate and affordable for-sale homes
2. Suitability of the proposed project's physical characteristics relative to Central Maui demand preferences (two-to four-bedrooms, principally detached single-family, etc.)
3. Significant housing price inflation inhibiting the ability of many households to purchase market-rate housing
  - a. Rapid decoupling of the median home value in Central Maui from the affordable prices based on county guidelines. Through June 2017, the differential between the Central Maui median single-family home value and the affordable price of a three-bedroom house at 100% AMI and 4.5% interest rate was \$204,100 or 53%. The differential was only \$7,840 or 2% as recently as 2013.
  - b. Annualized matched-pair house sale inflation ranging from 5% to 12% between 2010 and 2017
  - c. New subdivision and condominium sales absorption achieving 49% to 59% unit value (\$/SF) price inflation from 2012 through 2017
4. Proposed project's pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017
5. Proposed project size is only 2.5% of the projected Maui housing demand through 2025 for 71% to 140% of AMI
6. Excess demand for affordable projects clearly evident by their complete pre-sale absorption prior to construction within the local markets
7. Shortage of new development and inventory
  - a. The cumulative entitled and planned single- and multi-family housing in the Maui Island Plan totals 16,857, which is minimally sufficient to meet the projected housing demand
  - b. Less than six months of single-family inventory available for sale at present; down from a standing supply in 2011 of over 18 months
  - c. Seven-year standard entitlement period for new residential subdivision projects, which limits the supply of housing
8. Strong value price support (bracketing) for the anticipated sale prices of the proposed development as measured by re-sales and new absorption sales of projects in the local market.

## *Executive Summary*

---

9. Anticipated full pre-sale absorption of the subject based on precedence of unilateral affordable project pre-sales and strong pre-sale activity for similar market-rate housing.

**CERTIFICATION**

I, Robert W. Spangler, certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice*.
- The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
- I have not made a personal inspection of the property that is the subject of this report.
- No one provided significant real property appraisal assistance to the person signing this certification.
- The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
- As of the date of this report, I have completed the requirements of the continuing education program for Designated Members of the Appraisal Institute and am also certified as a general real estate appraiser in the State of Hawaii, identification number CGA-967, with an expiration date of December 31, 2017.
- I have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

Respectfully submitted,



Robert W. Spangler, MAI  
Hawaii State Certified General Appraiser, CGA-967  
Expiration Date December 31, 2017

## **ASSUMPTIONS AND LIMITING CONDITIONS**

Per the Uniform Standards of Professional Practice (USPAP), it is necessary to "clearly and accurately disclose any extraordinary assumptions, hypothetical condition, or limiting condition that directly affects the appraisal and indicate its impact on value." In this instance, there were no hypothetical conditions or extraordinary assumptions. The assumptions and limiting conditions of the appraisal are detailed as follows:

1. No opinion as to title of the subject is rendered. No preliminary title report was made available for the assignment. Title is assumed to be marketable and free of all liens, encumbrances and restrictions except those specifically discussed in the report.
2. Unless otherwise stated in this report, the existence of hazardous material, which may or may not be present on the property, was not observed by the appraiser. The appraiser has no knowledge of the existence of such materials on or in the property. The appraiser, however, is not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation or other potentially hazardous materials may adversely affect the value of the property. The value estimate in this report is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.
3. The property is appraised assuming it to be in full compliance with all applicable federal, state, and local environmental regulations and laws, unless otherwise stated.
4. The property is appraised assuming that all applicable zoning and use regulations and restrictions have been complied with, unless otherwise stated.
5. The property is appraised assuming that all required licenses, certificates of occupancy, consents or other legislative or administrative authority from any local, state or national government or private entity or organization have been, can be obtained or renewed for any use on which the value estimate contained in this report is based, unless otherwise stated.
6. The property is appraised assuming it to be under responsible ownership and competent management, and available for its highest and best use.
7. The appraiser assumes no responsibility for economic, physical or demographic factors that may affect or alter the opinions in this report which occur after the date of the letter transmitting the report. The appraiser is not obligated to predict future political, economic or social events.



### *Assumptions and Limiting Conditions*

---

8. In the appraisal of real estate, forecasts and projections are generally required to support reasonable value conclusions. Forecasts relate to supply, demand and market equilibrium; projections relate to income and expenses. These forecasts and projections are not predictions of the future, but are the best estimate of the current market perception regarding future trends. The appraiser makes no warranty in connection with forecasts and projections.
9. The information furnished by others is believed to be reliable. However, no warranty, either expressed or implied, is given for its accuracy and the appraiser assumes no responsibility for information relied upon later found to have been inaccurate. The appraiser reserves the right to make such adjustments to the analyses, opinions and conclusions set forth in this report as may be required by consideration of additional data or more reliable data that may become available.
10. The appraiser assumes no responsibility for hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for arranging for engineering, geologic or environmental studies that may be required to discover them.
11. No engineering survey has been made by the appraiser. Except as specifically stated, data relative to size and area were taken from sources considered reliable and no encroachment of real property improvements is considered to exist.
12. No opinion is expressed as to the value of subsurface oil, gas or mineral rights or whether the property is subject to surface entry for the exploration or removal of such materials except as is expressly stated.
13. Maps, plats and exhibits included in this report are for illustration only as an aid in visualizing matters discussed within the report. They should not be considered as surveys or relied upon for any other purpose, nor should they be removed from, reproduced, or used apart from the report.
14. No opinion is intended to be expressed for matters that require legal expertise or specialized investigation or knowledge beyond that customarily employed by real estate appraisers.
15. The distribution, if any, of the total valuation in this report between land and improvements applies only under the stated program of utilization. The separate allocations for land and buildings must not be used in conjunction with any other appraisal and are invalid if so used.
16. Possession of this report, or a copy of it, does not carry with it the right of publication. It may not be used for any purpose by any person other than the party to whom it is addressed without the written consent of the appraiser, and in any event only with proper written qualification and only in its entirety.

### *Assumptions and Limiting Conditions*

---

17. No detailed soil or geologic studies covering the subject property were available to the appraiser. The appraiser assumes no responsibility for the presence of any soils or geological conditions on or near the subject, nor for any expertise or engineering knowledge required to discover the presence of such conditions. Soils and geological conditions such as load bearing capacity, site stability and drainage are assumed to be adequate for most probable uses.
18. The subject is within a geographic area prone to earthquakes and other seismic disturbances. Except as specifically indicated in the report, no seismic or geologic studies have been provided to the appraiser concerning the seismic and/or geologic condition of the subject. The appraiser assumes no responsibility for the possible effect on the subject or seismic activity and/or earthquake or for assessing the reliability of the seismic qualifications of structures on the subject.
19. Testimony or attendance in court or at any other hearing is not required by reason of rendering this appraisal unless such arrangements are made a reasonable time in advance. Further, unless otherwise indicated, separate arrangements shall be made considering compensation for the appraiser's time and expertise to prepare for and attend any such hearing.
20. No consideration has been given in this appraisal as to the value of the property located on the premises considered by the appraiser to be personal property, nor has he given consideration to the cost of moving or relocating such personal property; only the real property has been considered.
21. No archaeological reports were provided. It was assumed that there are no adverse archaeological conditions that would negatively influence the development or marketability of the subject.

## INTRODUCTION

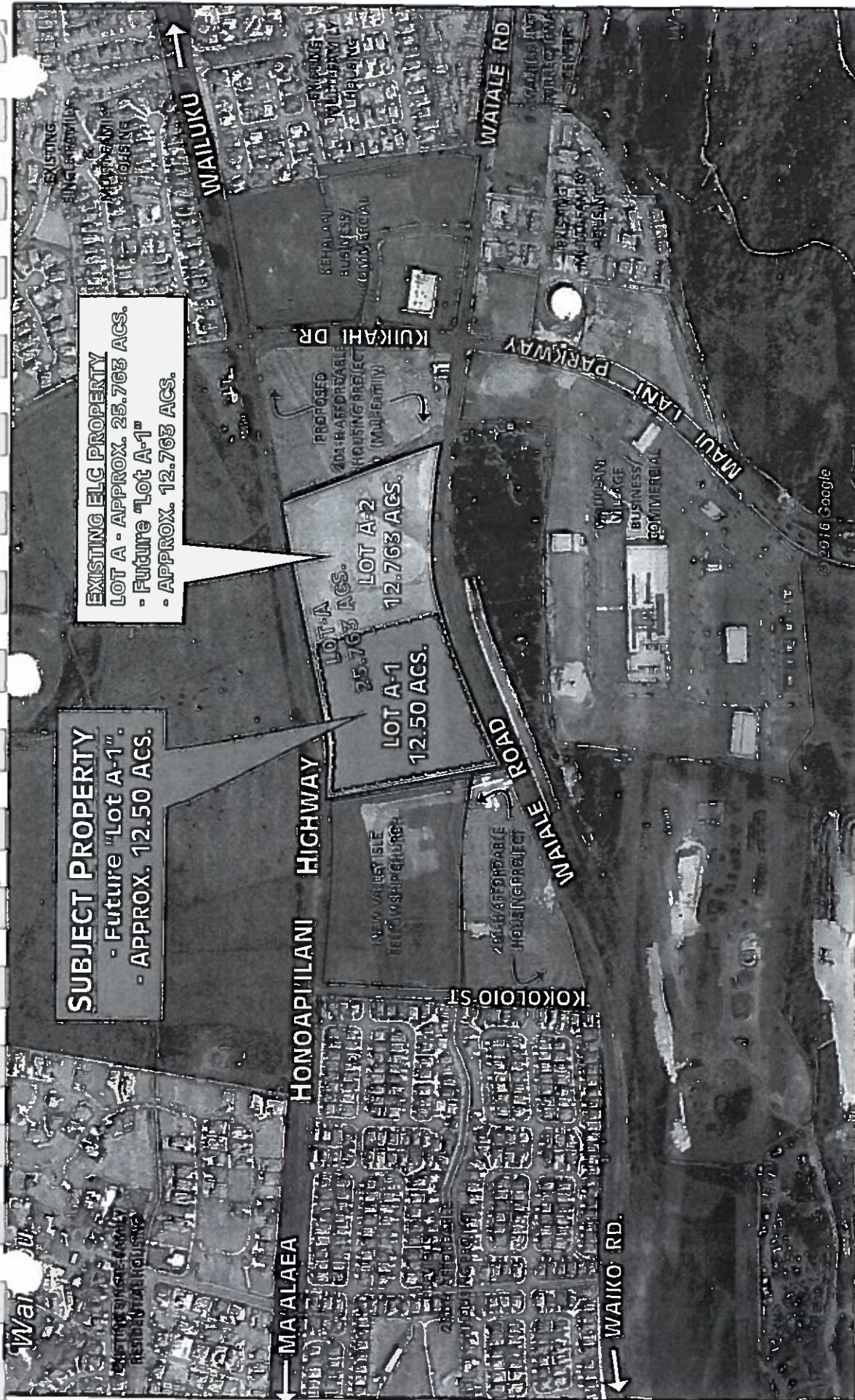
### IDENTIFICATION OF THE SUBJECT

Waikapu Development Venture, LLC is a proposed 80-unit affordable single-family residential housing development and a neighborhood park pursuant to 201H-38, Hawaii Revised Statutes (HRS). The proposed development is located at Waiale Road, Wailuku, Maui, Hawaii further identified as TMK: (2) 3-5-2-11 (portion). The subject property consists of approximately 12.5 acres.

The project will be developed under the 210H, HRS and the housing units will be affordably-priced to families making 71 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38, Hawaii Revised Statutes. These exemptions request by the Applicant will be processed through the County of Maui with approval to be granted by the Maui County Council. The proposed subdivided single-family residential lots will have a lot sizes ranging from 3,200 to 5,400 square feet.

- *Location:* The subject is located in Waikapu, Island and County of Maui, State of Hawaii. More specifically, the subject spans between Waiale Road and Honoapiilani Highway between Kokilolio Street and Kuikahi Drive. The site is identified on the Hawaii Tax maps as Second Division Map Key 3-5-2-11 (portion), which is illustrated in the following map.





SOURCE: GOOGLE EARTH

**PROJECT LOCATION MAP**  
PROPOSED 201-H AFFORDABLE HOUSING PROJECT  
WAIKAPU DEVELOPMENT VENTURE, LLC  
WAIKAPU, MAUI, HAWAII  
TAX MAP KEY: (2) 3-5-002: 11 (Portion)

**INTENDED USE AND USERS**

The market demand study will be utilized exclusively by WAIKAPU DEVELOPMENT VENTURE, LLC for processing of a 201-H Affordable Housing Project application. No other use is intended by the appraiser. The intended users of this report are the client, WAIKAPU DEVELOPMENT VENTURE, LLC, its officers, administrators, employees and/or affiliates, and the appropriate regulatory agencies. This market demand study has been prepared for the exclusive benefit of the above-named clients and stated intended users. No other users are intended by the appraiser. Any party who uses or relies upon any information in this report without the preparer's written consent does so at their own risk.

**SCOPE OF THE ASSIGNMENT**

The scope of work was comprised of the following:

1. Delineation of the market area that the proposed development will serve
  2. Analysis of market area supply and demand characteristics applicable to the proposed development
  3. Determination of sufficiency of market demand for the proposed development
- *Reporting Process:* The market demand study is presented in accordance with the reporting requirements set forth by the Uniform Standards of Professional Appraisal Practice (USPAP).

## MAUI COUNTY OVERVIEW

The subject is located within Maui County and the following section provides an overview of the area as part of the delineation of the market area that the proposed development will serve.

Maui County, the second largest of the four counties in Hawaii, is comprised of the inhabited islands of Maui, Molokai and Lanai and the uninhabited island of Kahoolawe. In Maui County, there are no subordinate or separate municipal entities. Maui County is governed by provision of a County Charter with the executive power of the county vested in the mayor and legislative power vested in the County Council.

Maui is a worldwide tourism destination with West and South Maui comprising the island's major resort areas and Central Maui, the market area most likely to attract prospective buyers from that represents the population and business center.

The following table provides a summary of key economic data for the County of Maui.

SERIES	1st QUARTER			YEAR-TO-DATE		
	2016	2017	% CHANGE	2016	2017	% CHANGE
Civilian labor force, NSA (persons) 1/	85,000	87,000	2.4	85,000	87,000	2.4
Civilian employed	82,250	84,350	2.6	82,250	84,350	2.6
Civilian unemployed	2,800	2,700	-3.6	2,800	2,700	-3.6
Unemployment rate, NSA (%) 1/ 2/	3.3	3.1	-0.2	3.3	3.1	-0.2
Total wage and salary jobs	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Total non-agric. wage & salary jobs	74,200	75,200	1.3	74,200	75,200	1.3
Nat. Resources, Mining, Constr.	3,800	4,000	5.3	3,800	4,000	5.3
Manufacturing	1,200	1,100	-8.3	1,200	1,100	-8.3
Wholesale Trade	1,500	1,500	0.0	1,500	1,500	0.0
Retail Trade	9,800	9,700	-1.0	9,800	9,700	-1.0
Transp., Warehousing, Util.	4,100	4,200	2.4	4,100	4,200	2.4
Information	500	600	20.0	500	600	20.0
Financial Activities	3,000	3,100	3.3	3,000	3,100	3.3
Professional & Business Services	7,000	7,100	1.4	7,000	7,100	1.4
Educational Services	1,100	1,200	9.1	1,100	1,200	9.1
Health Care & Social Assistance	5,500	5,600	1.8	5,500	5,600	1.8
Arts, Entertainment & Recreation	2,100	2,600	23.8	2,100	2,600	23.8
Accommodation	12,000	11,800	-1.7	12,000	11,800	-1.7
Food Services & Drinking Places	9,800	9,800	0.0	9,800	9,800	0.0
Other Services	3,100	3,100	0.0	3,100	3,100	0.0
Government	9,700	9,800	1.0	9,700	9,800	1.0
Federal	800	900	12.5	800	900	12.5



## Maui County Overview

SERIES	1st QUARTER			YEAR-TO-DATE		
	2016	2017	% CHANGE	2016	2017	% CHANGE
State	6,300	6,300	0.0	6,300	6,300	0.0
Local	2,600	2,700	3.8	2,600	2,700	3.8
Agriculture wage and salary jobs	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
General excise & use tax rev. (\$1,000)	54,503	(NA)	(NA)	54,503	(NA)	(NA)
Income-individual	20,351	(NA)	(NA)	20,351	(NA)	(NA)
Declaration estimated taxes	7,227	(NA)	(NA)	7,227	(NA)	(NA)
Payment with returns	4,138	(NA)	(NA)	4,138	(NA)	(NA)
Withholding tax on wages	20,847	(NA)	(NA)	20,847	(NA)	(NA)
Refunds	-11,860	(NA)	(NA)	-11,860	(NA)	(NA)
Transient accommodations tax	10,543	(NA)	(NA)	10,543	(NA)	(NA)
Honolulu County Surcharge 3/	370	(NA)	(NA)	370	(NA)	(NA)
Private Building Permits (\$1,000)	92,120	127,429	38.3	92,120	127,429	38.3
Residential	46,418	59,045	27.2	46,418	59,045	27.2
Commercial & industrial	15,451	35,211	127.9	15,451	35,211	127.9
Additions & alterations	30,251	33,173	9.7	30,251	33,173	9.7
Visitor Days - by air	5,938,663	5,901,057	-0.6	5,938,663	5,901,057	-0.6
Domestic visitor days - by air	4,620,099	4,648,294	0.6	4,620,099	4,648,294	0.6
International visitor days - by air	1,318,564	1,252,763	-5.0	1,318,564	1,252,763	-5.0
Visitor arrivals by air - by air	665,338	671,671	1.0	665,338	671,671	1.0
Domestic flight visitors - by air	515,452	524,130	1.7	515,452	524,130	1.7
International flight visitors - by air	149,886	147,541	-1.6	149,886	147,541	-1.6
Visitor expenditures - by air (\$1,000)	1,280,179	1,328,152	3.7	1,280,179	1,328,152	3.7
Hotel occupancy rates 2/	79..3	(NA)	(NA)	79..3	(NA)	(NA)

NA Not available.

1/ Labor force and jobs are Hawaii DLIR monthly and annual data. Quarterly averages computed by the Hawaii DBEDT.

2/ Change represents absolute change in rates rather than percentage change in rates.

3/ 0.5% added to the general excise tax to pay for Oahu's mass transit system and took effect January 1, 2007.

Includes taxpayers who have business activities on Oahu but whose businesses are located outside Oahu.

Source: Hawaii State Department of Business, Economic Development, & Tourism <<http://www.hawaii.gov/dbedt/inf/>>,  
Hawaii State Department of Labor & Industrial Relations <<http://www.hawaii.gov/dli/dataanalysis/?PAGEID=94>>,  
Hawaii State Department of Taxation <[http://www.hawaii.gov/tax/a5\\_3txcolrpt.htm](http://www.hawaii.gov/tax/a5_3txcolrpt.htm)> and Hospitality Advisors, LLC.

Gradual ongoing improvement in the local economy is evidenced by the decline in unemployment rate and improvement in construction permits.

The University of Hawaii Economic Research Organization (UHERO) indicated a positive outlook for Hawaii's economy through the remainder of 2017. The presentation of their update 2017 forecast was summarized in a recent Hawaii Business Journal article<sup>1</sup> as follows:

*Hawaii's economic outlook for this year remains favorable, despite uncertainty on the national front, according to the University of Hawaii Economic Research Organization's state forecast update released today (May 5, 2017).*

*"Hawaii's economy has started the year in fine form," the report says. "Moderate job and income growth are continuing, and generally favorable global and national conditions are maintaining impressive tourism numbers."*

*Carl Bonham, executive director of UHERO and co-author of the forecast, told Pacific Business News despite the positive outlook for the state, events in Washington are creating an element of uncertainty for Hawaii.*

*The report said while developments in Washington could hurt the state, "for now, prospects look good for continued growth, if at a less rapid pace than we have seen in recent years."*

*"The bottom line on what is going on in Washington is it's creating uncertainty," said Bonham. "We don't know what will come out. It feels even more uncertain because of all the sound bites and tweets."*

*With the Trump administration's plans for tax reform and changes to health care, Bonham said there is still much to be seen in terms of how legislation in Washington will impact the Aloha State. "The short-term federal hiring freeze has been lifted, and I don't think we'll see a big boost in federal, military spending, which would mostly impact salaries for federal employees. I don't expect to see a big build up in troops here," he added.*

*Bonham said the report found that job counts on Oahu have been declining, driven by the plateau in construction projects.*

*In the report, UHERO says the multi-year ramp-up of construction has ended, with industry jobs topping out early last year and in March running more than 2 percent lower than year-earlier levels.*

*"However, there is enough activity in the pipeline to maintain employment near the current level for the next several years," the report said. "Statewide construction employment will remain near 38,000 workers through 2018, before easing lower as the current cycle begins to wind down." The report said seven years of economic expansion has led to improved household finances in the state.*

---

<sup>1</sup><http://www.bizjournals.com/pacific/news/2017/05/05/economy-outlook-favorable-as-per-capita-income.html?s=print>

## **Maui County Overview**

---

*"The latest figures on personal income illustrate both the gains to date and point to continuing moderate expansion," UHERO says. "Now that recovery is complete and inflation is beginning to pick up, further gains will be smaller."*

*According to the report, real personal income growth will slow to 1.6 percent this year and 1.3 percent by 2019.*

*"We're seeing growth in real per-capita income," Bonham said. "People's standards of living are improving."*

*The study also said Hawaii's labor market is at full employment conditions, meaning, "unemployment has receded to the normal level consistent with an economy growing along its long-term trend path."*

*The latest unemployment rate for the state, released by the Hawaii State Department of Labor & Industrial Relations last month, was 2.7 percent, the lowest figure in 10 years.*

*While the visitor industry continues to be strong, UHERO predicts growth will slow below 1 percent by the end of the decade "as capacity constraints bite."*

*"Still, despite slowing growth, the state's visitor industry will continue to operate at robust levels of activity, with visitor volumes at all time highs in all counties," the report adds.*

### **POPULATION**

According to the December 2009 draft Maui Island Plan, Maui's resident population is expected to grow from 129,471 in 2005 to 176,687 in 2030. This is a 1.46% annual growth rate which equates to a 36.5% increase in population over the 25-year period. These projections indicate a population increase of 16% between 2010 and 2020, and an increase of 12% between 2020 and 2030.

Maui's population was 164,726 in 2015 representing 12% of the state's total. The population increased on Maui at a rate of 0.8% matching the state's overall growth rate.

## Maui County Overview

	State of Hawaii	C & C Honolulu	Hawaii County	Maui County 1/	Kauai County
Population, 2015	1,431,603	998,714	196,428	164,726	71,735
Population, 2014	1,420,257	992,082	194,016	163,487	70,672
Numeric change	11,346	6,632	2,412	1,239	1,063
% change	0.8	0.7	1.2	0.8	1.5
Percent of total	100%	0.6976194	14%	12%	5%

1/ Maui County includes Kalawao County.

Source: U.S. Census Bureau, Population Division; compiled by the Hawaii State Department of Business, Economic Development & Tourism, Research and Economic Analysis Division.

The following table provides a geographic breakdown of historic and projected population in Maui. The Wailuku-Kahului district represents the largest population center with 37% of the islands residents.

**Table 1 - 2: Community Plan Area Population 2000 – 2030**

Community Plan Area	2000	2005	2010	2015	2020	2025	2030
West Maui	17,967	19,852	22,156	29,103	31,410	33,743	36,058
Kihei-Mākena	22,870	25,609	27,244	37,850	40,850	43,885	46,896
Wailuku-Kahului	41,503	46,626	54,433	52,343	56,492	60,689	64,853
Makawao-Pukalani-Kula	21,571	23,176	25,198	23,919	25,815	27,732	29,635
Pā'ia-Ha'ikū	11,866	12,210	13,122	11,332	12,230	13,139	14,040
Hāna	1,867	1,998	2,291	2,541	2,743	2,947	3,149
Total Maui Island	117,644	129,471	144,444	157,087	169,540	182,135	194,630

### EMPLOYMENT

The strength of the economy is largely measured by job growth, which exhibited signs of improvement. Maui County saw a net gain of 1,000 jobs or a 1.3 percent increase in the first quarter of 2017 over the same quarter of 2016. Jobs gained the most in Arts, Entertainment & Recreation (500 jobs), followed by Natural Resources, Mining, and Construction (200 jobs). The largest private sector job losses occurred in Accommodation (200 jobs lost). Government added 100 jobs in the quarter.

Maui County employment is heavily concentrated in government and the hospitality industry as evidenced by the following table of the largest employers. The table from the Maui County Annual Financial Report, dated June 20, 2013, provides a comparison of principal employers in 2016 vs. nine years ago.

**COUNTY OF MAUI  
PRINCIPAL EMPLOYERS  
FISCAL YEARS 2016 AND NINE YEARS AGO - (UNAUDITED)**

Employer	2016			2007		
	Employees <sup>3</sup>	Rank	Percentage of Total County Employment	Employees <sup>1</sup>	Rank	Percentage of Total County Employment
State of Hawaii <sup>2</sup>	6,400 <sup>3</sup>	1	7.90%	5,673 <sup>1</sup>	1	8.35%
County Government	2,419 <sup>2</sup>	2	2.98%	2,309 <sup>2</sup>	2	3.83%
Town Realty of Hawaii	2,001	3	2.47%			
Grand Wailea-Waldorf Astoria	1,400	4	1.73%			
Ritz-Carlton-Kapalua	1,000	5	1.23%			
Federal Government <sup>2</sup>	800 <sup>1</sup>	6	0.99%	776	6	1.14%
Four Seasons Resort-Maui	800	6	0.99%	810	5	1.19%
Maui Brand Sugar	800	6	0.99%			
Maui Memorial Medical Center	800	6	0.99%			
Four Seasons Resort-Lanai	700	7	0.86%			
Westin-Maui Resort & Spa	700	7	0.86%			
Fairmont-Kea Lani Maui	600	8	0.74%			
Hyatt Regency-Maui Resort & Spa	600	8	0.74%			
Makena Beach & Golf Resort	518	9	0.64%			
Kaanapali Beach Club	500	10	0.62%			
Royal Lahaina Resort	500	10	0.62%			
Walmart	500	10	0.62%			
TS Restaurant of Hawaii & California				1,800	3	2.65%
Maui Land & Pineapple Co., Inc.				1,275	4	1.88%
Hale Makua				450	7	0.66%
West Maui Resort Partners LP				440	8	0.65%
Dorvin D. Leis Co., Inc.				375	9	0.55%
Maui Medical Group				237	10	0.35%
<b>Total</b>	<b>21,030</b>		<b>25.97%</b>	<b>14,145</b>		<b>21.25%</b>

<sup>1</sup> Maui County Data Book 2008 & 2015

<sup>2</sup> 2007, 2016 County of Maui actual employee count.

<sup>3</sup> Hawaii Business Research Library

The following table provides a more recent survey conducted by the Pacific Business News of private employers ranking the top ten as of year-end 2015 in descending order. Note that only two of the top ten companies are outside of the tourism business.

No.	Company	# Employees Year End 2015
1	Grand Wailea	1,320
3	Four Seasons Resort Maui at Wailea	900
2	Hyatt Regency Maui Resort & Spa	759
4	The Fairmont Kea Lani	720
5	The Westin Maui Resort & Spa Kaanapali	676
6	Four Seasons Resort Lanai	658
7	Kamehameha Schools Maui	497
8	Monsanto Hawaii	479
9	Hale Makua Health Services	462
10	Safeway	446

Two County Council bills are cited as detrimental to the local jobs market. The workforce housing policy, passed in 2006, requires projects with fewer than half of the homes to be sold for more than \$600,000 to provide 40% of their units at affordable prices. Developments with half or more of the homes to be priced above \$600,000 would have a 50% affordable requirement.

Importantly, the Maui County Council voted in December 2014 to relax its workforce housing rules to require between 20 and 25 percent affordable housing in projects from developers - down from a 50 percent requirement. The lack of new affordable housing actually built at a time of rising demand was cited by the council members as rational for the change.

The 2007 "show me the water bill" requires subdivision and condominium developers to prove to Maui County they have a long-term source of water. The ordinance was revised in April 2011, exempting infill development (10 residential dwellings or less) within areas already developed and having consistent land use; residential workforce housing units built by a qualified housing provider; residential development projects with 100 percent affordable units; and public or quasi-public development projects. The exemptions are only applicable within areas serviced by the Water Department's Central or West Maui water systems.

Developers have indicated that these bills have had significant negative repercussions on home building and job creation. According to industry sources, newer projects are having a difficult time getting off the ground not just because of the economy, but because of the show me the water and workforce housing ordinances. These ordinances are making new water meters almost impossible to obtain and the high workforce housing requirement makes project financing unfeasible.

The agricultural industry also plays an important role in the local economy. Ongoing water shortages and the slow economy have resulted in a negative business environment for the largest agricultural employers.

- After 97 years of operations, Maui Land & Pineapple Company announced in November 2009 that it will immediately stop planting pineapple and will cease pineapple operations by the end of the year. An estimated 285 layoffs were planned by the end.

Fortunately, Hali'imaile Pineapple Company purchased and licensed key assets, and leased farm land, equipment and buildings from ML&P with plans to serve the Hawaii market. "Hali'imaile Pineapple Company brings new hope for a new year by immediately saving 65 agricultural jobs with an expectation of adding more in the future.

- Hawaii Commercial and Sugar (HC&S), a division of Alexander Baldwin (A&B), directly supported 800 jobs in this rural community, paying more than \$47 million a year in wages and benefits to its employees and retirees. HC&S infused a total of \$100 million into the economy each year, primarily on Maui.



## Maui County Overview

A&B made a business decision to phase out standard sugar operations with a final harvest in 2016. Hundreds of employees were terminated in 2017. The company will instead pursue a diversified agricultural model the results of which are unknown. However, despite the end of the sugar era on Maui, the unemployment rate remains exceedingly low.

### UNEMPLOYMENT

The Island of Maui recorded a 2.9 percent unemployment rate in April 2017, up from 2.8 percent rate recorded in March, and unchanged from the 2.9 percent rate reported in April of last year. Important to note, the State Department of Labor and Industrial Relations is attributing the Maui Region hospital privatization as being mostly responsible for a large growth of workers in the educational and health services jobs sector in July 2017. The educational and health services category increased by 2,300, according to the report. Maui County unemployment rate dipped to 2.7 percent in July, down from 3.4 percent in June and from 3.3 percent a year ago, the State Department of Labor and Industrial Relations reported. According to recent report, Maui County's economic picture is marked by impressive tourism industry rebound, which is the major economic drivers for Maui's economy.

### TOURISM

Tourism represents the largest sector of the local economy. Growth in visitor days (+8.6%) and higher daily spending (+2.4% to \$210 per person) contributed to a sizeable gain in visitor spending in April 2017 (+11.2% to \$371.2 million). Visitor arrivals rose (+7% to 226,511), with increases from Canada (+17.2%), U.S. West (+8%), U.S. East (+6.6) and Japan (+4.2%). Through April 2017, both visitor spending (+4.5% to \$1.7 billion) and arrivals (+2.6% to 886,859) surpassed year-to-date 2016.

	TOTAL VISITORS BY AIR					
	<u>April</u>			<u>YEAR-TO-DATE</u>		
	2017P	2016	% CHANGE	2017P	2016	% CHANGE
VISITOR DAYS	737,783	677,671	8.9	2,961,721	2,851,017	3.9
TOTAL VISITORS	499,197	459,184	8.7	1,950,338	1,887,048	3.4
DOMESTIC	238,586	218,487	9.2	1,011,383	963,969	4.9
INTERNATIONAL	6,411,268	5,875,417	9.1	27,567,196	26,478,999	4.1
AVERAGE DAILY CENSUS	213,709	195,847	9.1	229,727	218,835	5.0
TOTAL AIR SEATS (EST)	978,406	974,939	0.4	3,966,364	4,012,169	-1.1
TOTAL LOAD FACTOR (EST)	86.9	80.9	7.4	86.1	83.2	3.5
ISLANDS VISITED						
Oahu	437,436	408,319	7.1	1,769,001	1,707,731	3.6
Oahu only	329,934	310,644	6.2	1,334,284	1,307,856	2.0
Maui County	229,708	215,291	6.7	901,379	880,630	2.4
Maui	226,511	211,613	7.0	886,859	864,292	2.6
Maui only	152,419	139,146	9.5	579,668	571,715	1.4

Source: <http://hawaii.gov/dbedt/info/visitor-stats/tourism/>

Statewide room revenue for hotels in Hawaii hit \$1.07 billion during the first quarter of 2017, according to preliminary data from Hospitality Advisors LLC and STR Inc. When compared with preliminary data released last year, revenue per available room for Hawaii hotels jumped 6.7 percent to \$222.78 during the first quarter. But a spokesman for Hospitality Advisors said last year's data may be changed to reflect new information when the company releases its finalized report of first quarter hotel figures, expected to come out next month.

According to the preliminary figures, occupancy for Hawaii hotels in the first quarter reached 81.7 percent, while the statewide average daily rate hit \$272.72. Maui had the highest revenue per available room, or RevPAR, at \$300.93, with an average daily rate reaching \$375.99.

On Oahu, RevPar hit \$193.16, with an average daily rate of \$233.39. Oahu hotels were 82.8 percent occupied during the first three months of the year.

Kauai hotels had RevPAR of \$218.49, while average daily room rates were \$218.49, with an occupancy of 80.7 percent.

On the Big Island, RevPAR was \$212.59, hotel occupancy was 80.7 percent and room rates averaged at \$263.53.

#### **INCOME LEVELS**

The median household income by location in demand of workforce housing in Maui is as follows:

- Lahaina - \$67,362
- Wailuku - \$69,768
- Kahului - \$66,625
- Kihei - \$64,747

#### **RESIDENTIAL MARKET CONDITIONS – VALUE TRENDS, ABSORPTION, ETC.**

Maui County residential market conditions for annual 2016 were generally improved but still well below peak levels. The following table provides a summary of absolute residential market sales and value trends for Maui County between 2004 and 2016, while the second table provides a summary of the rate of annual change. The peak data, which occurred from 2005 through 2007, are in bold figures in the following table.

## Maui County Overview

### MAUI COUNTY RESIDENTIAL SALES DATA Absolute Amounts - 2004-2016

	Sales SFR	Sales Condo	Sales Total	Dollars SFR	Dollars Condo	Dollars Total	Median SFR	Median Condo
2004	1,221	1,933	3,154	\$891,652,502	\$847,147,291	\$1,738,799,793	\$550,000	\$310,000
2005	1,317	2,000	3,317	\$1,221,325,592	\$1,100,762,199	\$2,322,087,791	\$679,000	\$390,000
2006	1,088	1,210	2,298	\$1,024,279,861	\$935,590,294	\$1,959,870,155	\$693,000	\$505,000
2007	1,138	1,179	2,317	\$1,047,878,879	\$963,086,267	\$2,010,965,146	\$630,069	\$550,000
2008	907	788	1,695	\$754,102,000	\$725,797,356	\$1,479,899,356	\$577,867	\$549,500
2009	693	824	1,517	\$494,764,887	\$593,273,850	\$1,088,038,737	\$498,106	\$450,000
2010	814	1,147	1,961	\$608,783,134	\$743,305,403	\$1,352,088,537	\$460,000	\$377,500
2011	898	1,155	2,053	\$707,221,757	\$561,184,549	\$1,268,406,306	\$433,500	\$310,000
2012	933	1,248	2,181	\$660,301,782	\$587,326,038	\$1,247,627,820	\$470,000	\$358,995
2013	984	1,333	2,317	\$774,983,738	\$758,403,883	\$1,533,387,621	\$530,000	\$373,000
2014	943	1,199	2,142	\$822,520,160	\$753,772,368	\$1,576,292,528	\$570,000	\$415,000
2015	1,089	1,199	2,288	\$931,646,757	\$763,806,071	\$1,695,452,828	\$580,000	\$410,000
2016	1,076	1,310	2,386	\$1,040,936,510	\$808,166,264	\$1,849,102,774	\$636,750	\$415,000

### MAUI COUNTY RESIDENTIAL SALES DATA Rate of Annual Change - 2005-2016

	Change Sales SFR	Change Sales Condo	Change Sales Total	Change Dollars SFR	Change Dollars Condo	Change Dollars Total	Change Median SFR	Change Median Condo
2005	7.86%	3.47%	5.17%	36.97%	29.94%	33.55%	23.45%	25.81%
2006	-17.39%	-39.50%	-30.72%	-16.13%	-15.01%	-15.60%	2.06%	29.49%
2007	4.60%	-2.56%	0.83%	2.30%	2.94%	2.61%	-9.08%	8.91%
2008	-20.30%	-33.16%	-26.85%	-28.04%	-24.64%	-26.41%	-8.29%	-0.09%
2009	-23.59%	4.57%	-10.50%	-34.39%	-18.26%	-26.48%	-13.80%	-18.11%
2010	17.46%	39.20%	29.27%	23.04%	25.29%	24.27%	-7.65%	-16.11%
2011	10.32%	0.70%	4.69%	16.17%	-24.50%	-6.19%	-5.76%	-17.88%
2012	3.90%	8.05%	6.23%	-6.63%	4.66%	-1.64%	8.42%	15.80%
2013	5.04%	6.89%	6.10%	16.18%	29.78%	22.58%	12.77%	4.32%
2014	-4.17%	-10.05%	-7.55%	6.13%	-0.61%	2.80%	7.55%	11.26%
2015	15.36%	-0.33%	6.57%	13.27%	1.33%	7.56%	1.75%	-1.20%
2016	-1.28%	10.18%	4.70%	11.73%	5.81%	9.06%	9.78%	1.22%

## Maui County Overview

The following table provides a summary of matched-pair sales as a more precise measure of home value appreciation in the past several years. The annualized rates of change from 2010 through 2017 ranged from 5% to 12%.

<b>New Traditions</b>	<b>91 Mehue</b>		<b>61 Mehue</b>		<b>210 Alake</b>		<b>63 Mehue</b>	
Date Range	3/28/2014	12/21/2016	11/30/2012	6/21/2016	11/24/2014	9/22/2016	7/9/2015	7/1/2016
Price Range	\$399,105	\$519,000	\$412,125	\$525,000	\$459,045	\$527,000	\$485,000	\$545,000
Difference	\$119,895		\$112,875		\$67,955		\$60,000	
% Difference	30%		27%		15%		12%	
Months Between Sales	33		43		22		12	
Annualized Rate of Change	11%		8%		8%		12%	

<b>New Traditions</b>	<b>63 Mehue</b>		<b>361 Uluna</b>		<b>102 Meheu</b>		<b>83 Meheu</b>	
Date Range	1/25/2013	7/1/2016	9/17/2013	8/30/2016	9/6/2013	7/22/2016	4/5/2013	4/1/2016
Price Range	\$416,426	\$545,000	\$427,401	\$565,000	\$413,500	\$529,000	\$413,333	\$565,000
Difference	\$128,574		\$137,599		\$115,500		\$151,667	
% Difference	31%		32%		28%		37%	
Months Between Sales	41		34		35		36	
Annualized Rate of Change	9%		11%		10%		12%	

<b>Milo Court</b>	<b>Unit 77</b>		<b>Unit 92</b>		<b>Unit 82</b>		<b>Unit 57</b>	
Date Range	10/14/2011	6/27/2016	11/12/2010	9/23/2016	3/28/2014	12/2/2016	3/6/2014	3/10/2017
Price Range	\$347,990	\$460,000	\$349,990	\$495,000	\$430,000	\$500,500	\$439,000	\$510,000
Difference	\$112,010		\$145,010		\$70,500		\$71,000	
% Difference	32%		41%		16%		16%	
Months Between Sales	56		73		32		36	
Annualized Rate of Change	7%		7%		6%		5%	

<b>Milo Court</b>	<b>Unit 76</b>	
Date Range	10/17/2012	7/6/2017
Price Range	\$360,000	\$524,000
Difference	\$164,000	
% Difference	46%	
Months Between Sales	52	
Annualized Rate of Change	11%	

The following table provides a summary of annual sales trends at three recent/ongoing for-sale residential projects. Price escalation has been evident ever since 2013.

## Maui County Overview

### AVERAGE \$/SF VALUE TRENDS AT NEW DEVELOPMENTS

New Traditions	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	--	--	--	7	47	60	32	5	5
Average SF	--	--	--	1,401	1,338	1,282	1,278	1,283	1,307
Average Sale Price	--	--	--	\$418,961	\$415,999	\$435,059	\$485,363	\$535,200	\$580,600
Average \$/SF	--	--	--	\$299	\$311	\$339	\$380	\$417	\$444
% Change	--	--	--	--	4%	9%	12%	10%	6%

2012 to 2017 - Average \$/SF Increase	49%
---------------------------------------	-----

Parkways	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	--	--	--	--	--	6	32	43	18
Average SF	--	--	--	--	--	2,045	1,914	1,802	1,783
Average Sale Price	--	--	--	--	--	\$631,569	\$608,655	\$614,963	\$644,390
Average \$/SF	--	--	--	--	--	\$309	\$318	\$341	\$361
% Change	--	--	--	--	--	--	3%	7%	6%

2014 to 2017 Avg. \$/SF Inc.	17%
------------------------------	-----

Villas	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Sales	13	10	11	6	1	25	23	31	2
Average SF	1,615	1,738	1,547	1,746	1,853	1,627	1,642	1,668	1,446
Average Sale Price	\$484,092	\$493,260	\$434,064	\$481,667	\$612,500	\$566,072	\$607,904	\$647,694	\$633,500
Average \$/SF	\$300	\$284	\$281	\$276	\$331	\$348	\$370	\$388	\$438
% Change	--	-5%	-1%	-2%	20%	5%	6%	5%	13%

2012 to 2017 - Average \$/SF Increase	59%
---------------------------------------	-----

### ABSORPTION

The following table provides a summary of absorption rates for market-rate single-family and condominium product in Central Maui between 2010 and the present. The monthly absorption rates varied from 1.1 to 4.9 per month.

Importantly, these projects are all market-rate lacking the pre-sale capacity of the affordable projects. Kamani at Kehalani is the best market-rate representation of the subject based on its pricing within the subject projections of less than \$538,800. Kamani, a duplex condominium product, is being constructed by Towne Development in phases with each newly released phase sold out well in advance of completion of construction. An even faster absorption could be achieved with quicker construction.

Affordable housing projects generally pre-sell before ground breaking as illustrated by the current projects:



## ***Maui County Overview***

---

<b>New Traditions</b>		<b>Villas at Kehalani</b>	
Initial Listing	3/12/2012	Initial Listing	6/21/2007
Final Sale	11/25/2015	Final Sale	Current
Sales Period (months)	44	Sales Period (months)	114
Homes Sold	143	Homes Sold (including escrows)	121
Monthly Absorption Rate (sales/mo.)	3.3	Monthly Absorption Rate (sales/mo.)	1.1

<b>Parkways</b>		<b>Kamani at Kehalani</b>	
Initial Listing	12/18/2013	Initial Listing	3/4/2016
Final Sale	Current	Final Sale	Current
Sales Period (months)	36	Sales Period (months)	17
Homes Sold (including escrows)	144	Homes Sold (including escrows)	83
Monthly Absorption Rate (sales/mo.)	4.0	Monthly Absorption Rate (sales/mo.)	4.9

<b>Milo Court</b>	
Initial Listing	1/25/2010
Final Sale	4/21/2014
Sales Period (months)	51
Homes Sold	94
Monthly Absorption Rate (sales/mo.)	1.8

New development in Central Maui priced from the high \$400,000 to the low \$700,000s have been pre-selling in phases prior to the completion of construction, as exemplified by ongoing Towne and DR Horton projects in Kehalani and Maui Lani.

Demand for subdivision lots was illustrated by the recent pre-sale event for Kualono, a 49-lot market-rate residential subdivision in Makawao. All 49 lots pre-sold on September 11, 2016 at prices ranging from \$270,000 to the high \$300,000s. A total of 73 qualified buyers participated in the lot selection event resulting in the pre-sales. The project has lot sizes ranging from 18,074 to 35,465 square feet with an average of 19,821 square feet. Importantly, the conditions of approval preclude ohana units.

### **MAUI COMMERCIAL REAL ESTATE SUMMARY STATISTICS**

The following page provides a summary of investment and market sector statistics from the Colliers International Maui Market Report Year-End 2016.



**COLLIERS INTERNATIONAL  
MAUI MARKET REPORT  
YEAR-END 2016**

**INVESTMENT SALES 2016**

Property Type	# Transaction	Sales Volume	% of Sales Volume	% of Sale Count
Multi-Family	0	\$0	0.0%	0.0%
Development Land	13	\$54,765,940	11.5%	37.1%
Industrial Warehouse	8	\$24,439,000	5.1%	22.9%
Resort/Golf	1	\$210,000,000	44.2%	2.9%
Office	5	\$14,650,000	3.1%	14.3%
Retail	8	\$170,988,905	36.0%	22.9%
Totals	35	\$474,843,845	100.0%	100.0%

**2016 RETAIL MARKET STATISTICS**

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Low Asking Rent (\$/SF/mo.)	Avg. High Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Central Maui	1,429,243	206,314	14.44%	(90,052)	\$2.39	\$3.67	\$0.99
South Maui	823,165	76,394	9.28%	33,714	\$2.56	\$2.96	\$1.13
West Maui	887,853	89,988	10.14%	353	\$3.25	\$4.14	\$1.61
Totals	3,140,261	372,696	11.87%	(55,985)	\$2.71	\$3.56	\$1.25

**2016 OFFICE MARKET STATISTICS**

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Kahului	260,040	21,916	8.43%	400	\$1.92	\$1.96	\$1.30
Wailuku	297,096	46,873	15.78%	(9,935)	\$1.46	\$1.64	\$0.89
Kihei	415,157	129,037	31.08%	(33,109)	\$1.73	\$1.93	\$0.92
Totals	972,293	197,826	20.35%	(42,644)	\$1.70	\$1.85	\$1.02

**2016 INDUSTRIAL MARKET STATISTICS**

Trade Area	Inventory	Available Space	Vacancy Rate	Net Absorption (SF)	Avg. Asking Rent (\$/SF/mo.)	Avg. Operating Expenses (\$/SF/Mo.)
Wailuku	1,324,706	31,070	2.35%	(9,246)	\$1.11	\$0.24
Kahului	3,869,421	38,582	1.00%	49,697	\$1.26	\$0.28
South Maui	209,611	7,625	3.64%	15,589	\$1.27	\$0.46
West Maui	502,120	5,964	1.19%	1,501	\$1.50	\$0.49
Totals	5,905,858	83,241	1.41%	57,541	\$1.24	\$0.29

Source: Colliers International Maui Market Report Year-End 2016

## **RETAIL MARKET CONDITIONS**

The Maui retail market is comprised of 3.14 million square feet of inventory, of which 46% is concentrated in Central Maui. The other large compositions are in South Maui (26%) and West Maui (28%).

Maui's retail market posted a negative 55,985 square feet of absorption as vacancy rose to 11.87%, its highest level in seventeen years. Much of this lost occupancy occurred in the Central Maui market, which experienced a record high vacancy rate of 14.4%. Most of the Central Maui vacancies occurred at Queen Kaahumanu Center, Maui Marketplace, Maui Mall and Kahului Shopping Center.

Central Maui is the location of two new large-scale shopping centers of note. The Maui Lani Shopping Center, a 103,000-square-foot Safeway anchored retail center in Wailuku, was completed in September 2013. Absorption remains relatively slow with only eight additional leases in the in-line and pad building spaces. The junior anchor space remains vacant.

Target anchors the Puunene Shopping Center, a 273,280 square-foot center located in Kahului. Target employs about 200 people to staff its new 140,000-square-foot store, which opened in March 2015. Besides the Target store, the shopping center will include both local and national retailers, including inline retail space, pad and restaurant space and mid-box opportunities. Petco is reported to be relocating to Puunene Shopping Center from Maui Marketplace. Asking rate vary from \$3.00 to \$5.50 per square foot.

Maui Marketplace, the 16<sup>th</sup> largest shopping center in Hawaii at 262,978 square feet, has two dark anchors with the recent bankruptcy of Sports Authority (vacated August 2016) and the relocation of Lowes to its new store next to Target. Apparently, Lowes still has a relatively long lease term and is attempting to sublet the original space. The remaining anchors include OfficeMax and Old Navy. The former Sports Authority space is being marketed as two demised spaces of 20,000 and 32,000 square feet at a negotiable rate.

While market softness was experienced in Central Maui, South Maui and West Maui both posted occupancy gains of 33,714 square feet and 353 square feet, respectively.

The average asking retail base rents for Maui trade areas have been generally downward trending since 2008 but did increase in the most recent period.

Despite new records for Maui air passenger arrivals and visitor expenditures, total retail sales (inclusive of visitor retail expenditures) for Maui County posted a 12.3% decline from \$1.55 billion for 2015 and \$1.36 billion for October 2016 YTD as residents cut spending. Unfortunately, this continues the downward trend that started in 2013.

Regardless, developers are optimistic that South Maui will continue to post strong retail demand as both Downtown Kihei and Wailea Village projects have begun their pre-leasing efforts for a combined total of 191,000 square feet of space.

Alexander & Baldwin also recently announced it will be building a new shopping center in the Maui Business Park, which will be anchored by a Safeway grocery store and gas station. The 94,000-square-foot Hookele Shopping Center will be located on the Paia side of the Hookele Street-Hana Highway intersection. The center is on the opposite end of Hookele Street from Target and the Puunene Shopping Center. Construction is expected to begin in the first quarter of 2018 and to be completed by the second quarter of 2019.

In general, the retail market has been improving for several years characterized by escalating transactional rental rates (despite the decline in asking rates), declining vacancy and new, large-scale development. However, the introduction of new supply has resulted in a reversal of declining vacancy in Central Maui. Real estate sales activity in the retail sector declined in 2016 after significant volume in 2015.

#### **OFFICE MARKET CONDITIONS**

The Maui office market is comprised of roughly 970,000 square feet of inventory, of which 58% is located in Central Maui. Kihei comprises the remainder.

Of the primary commercial land uses, the office market has recovered the least from the recent recession with a market-wide office vacancy rate of 20.4%, a rate that has been upward trending since 2009.

Maui's office market posted its seventh consecutive year of lost occupancy as the island-wide vacancy rate rose to its highest level in fifteen years. Although the Kahului office submarket generated positive net absorption for the year, continued soft market conditions in the Kihei and Wailuku submarkets resulted in a negative 38,198 square feet of island-wide absorption as vacancy rates rose to 20.35%. Premier Place lost Boeing Company as a tenant resulting in 22,000 square feet of negative net absorption and Kihei's office vacancy rate rising to a record high of 31.81%.

Maui office submarkets are also prone to volatility as the small inventory size (less than 1.0 million square feet) makes them vulnerable to even small changes in demand. Vacancy rates for Kihei remained elevated above 31% as overbuilding during the past decade has kept this market from recovering. The Central Maui office markets of Kahului and Wailuku fared better than the Kihei market, as County government offices and many of Maui's principal businesses have fueled nominal office demand. Similar to vacancy rates, average asking base rents also tend to fluctuate. The Kahului average asking base rent rose by a healthy 20.5% over the past year from \$1.61 psf/mo to \$1.94 psf/mo. The Kihei office market posted a healthy gain of 11.9% as rents rose from \$1.63 psf/mo to \$1.82 psf/mo. The Wailuku office market posted a loss of 7.6%, falling from \$1.67 psf/mo to \$1.54 psf/mo.

Not captured in the Collier's data is owner/user acquisition demand - a market highlight. Owner/user acquisitions in 2016/17 are detailed in the following table, which summarizes recent sales activity within four of the newest office condominium projects in Maui. The data and interviews with brokers actively marketing the projects indicate that sales demand is strong. The limited supply of available units inflates the values of the Wailea units.

## *Maui County Overview*

---

Newer, previously unsold units sell in shell condition based on the new construction at Maui Lani and their business model along with unsold inventory from construction at the market peak.

Absent the Maui Lani Village construction, the office supply in Central Maui is older. Significant development of new office product during the peak of the market in South Maui boosted inventory absent real demand. South Maui remains overbuilt with softer market conditions that are improving based on the owner/user demand.

*Maui County Overview*

**OFFICE BUILDING AND CONDOMINIUM SALES IN NEWER MAUI PROJECTS**

<i>Location</i>	# 2016-17 <i>Sales/Escrows</i>	<i>Size Range (SF)</i>	<u><i>Shell Condition Acquisitions</i></u>		<i>Comments</i>
			<i>\$ Amount</i>	<i>\$/SF</i>	
Maui Lani Village Center, Kahului	3	2,859	\$999,000	\$349	New construction; larger sized; sold in shell condition with TIs ranging from \$102 to \$118/SF
Keawe Business Center Lahaina	1	1,305	\$514,000	\$394	New construction; 4 units sold to TS Restaurants totaling 4,293 SF; sold in shell condition with TIs ranging from \$90 to \$150/SF
Park Plaza Kihei	7	674-3,258	Confidential	Confidential	Shell condition with medical office build out of up to \$208/SF
Wailea Town Center Wailea	2	1,908-23110	\$1.335-\$1.48m	\$640-\$700	Resales with existing interior buildout

## **INDUSTRIAL MARKET CONDITIONS**

Maui has two primary and two decidedly secondary submarkets. The Kahului and Wailuku submarkets contain 66% and 22% of the Maui's industrial inventory. As there is no clear delineation between the two, these submarkets are often referred to as Central Maui.

The Central Maui market area is the most vital to the economic engine for the island with its proximity to the Kahului deep draft harbor where all ocean shipped containers arrive and the Kahului International Airport which handles approximately 98% of all passenger and air freight into and out of the island.

The eight submarket industrial areas in Central Maui are:

- Maui Business Park - 75 Acres
- Maui Business Park II - 121 Acres
- Kahului Industrial Area - 200 Acres
- Maui Lani - 50 Acres
- Wailuku Industrial Park - 55 Acres
- Millyard Industrial Subdivision - 30 Acres
- Consolidated Baseyards - 23 Acres and Waiko Baseyard - 19 Acres
- Central Maui Base Yards - 43 Acre

The industrial market represents the healthiest sector on Maui characterized by low vacancy rates, escalating rents and demand for new construction and repositioning properties. Despite the slow recovery in the residential home building industry, industrial market conditions have improved significantly over the past several years with particular emphasis in the past six to twelve months.

Tight market conditions persisted as Maui's industrial vacancy rate fell to 1.41%, its lowest level in four years. Healthy demand for warehouse space generated nearly 58,000 square feet of new occupancy for 2016. The Kahului and South Maui markets posted the largest gains in net absorption for the year with 49,697 square feet and 15,589 square feet, respectively.

The recent surge in construction activity, helped to boost contracting sales for fiscal year-end 2016 to \$788.18 million, a healthy 12.5% jump in activity over fiscal year-end 2015 levels. The construction sector is a primary driver of Maui's economy and is instrumental in boosting warehouse demand. The 1<sup>st</sup> quarter 2017 increase in construction building permits is a positive sign for the industrial market.

Wholesalers constitute the largest segment of users of Maui's industrial space with a heavy concentration located in Kahului near the harbor. Wholesale/distributor sales revenue for fiscal year-end 2016 (July to June) declined by 1% from \$438.61 million to \$434.17 million over the past year. This slowdown coincides with the reduction in retail sales reported earlier.



During the past year, the direct weighted average asking base rent for warehouse space on Maui declined 3.2% from \$1.24 psf/mo to \$1.20 psf/mo. While the average asking rent has remained between \$1.19 and \$1.24 psf/mo for the past four years, the severe shortage of warehouse spaces, coupled with strong tenant demand, will likely push rents upward by 5% to 7% over the next year.

Colliers anticipates that current market conditions will likely persist for the mid-term time horizon (i.e., one to three years). While speculative construction has started on a few projects, developers are finding that current land prices and rising construction costs make the financial feasibility of a new warehouse project difficult. For tenants with available capital that are unable to find a suitable space to lease for their business, build-to-suit opportunities will likely be more seriously considered if current market conditions persist.

One additional observation of note is the abundance of industrial zoned land. The unsold inventory in Maui Lani Village Center alone approximates 31 acres, while A & B's new Maui Business Park Phase II added 121 acres of finished lot product at the end 2013 for a total of 152 acres. The land supply will support approximately 2.2 million square feet of additional building area or roughly 37% of the existing inventory. It appears that the industrial land market in central Maui will be over supplied for years to come based on current and historical absorption.

As the industrial subdivision land supply is controlled by only two entities, there may not be much influence on land values as evidenced by their sales amounts.

To date, 32.8 acres at Maui Business Park Phase II have closed or are in escrow to eleven buyers representing 40% of the total sellable lot area released to date. Nearly all of the sold inventory remains undeveloped. The pricing ranges from \$42 to \$60 per square foot. A future phase totaling an additional 37.8 acres along the south side of Hookele Street have yet to be released. Initial closings commenced in November 2014 following contract dates in mid 2014. The listing broker reported that the sales to date have exceeded the seller's expectations. The unit values obtained reflect the high end of the market.

Maui Lani Village Center has 38 lots remaining ranging from 9,950 square feet to 7.5 acres and listed from \$50 to \$60 per square foot. The developer has attempted to maintain original high unit values, which has produced virtually no absorption in the past few years.

In contrast, the Pulehuniu Heavy Industrial Park has experienced substantive pre-sale demand. The new 28-lot subdivision offering M-3 heavy industrial lots with prices ranging between \$16 to \$24 per square foot. M-3 zoning allows uses such as construction and lumber baseyards, manufacturing, recycling, stockpiling, crushing, and heavy equipment storage. Construction to start in the 2nd quarter of 2017 with delivery of the lots in 2018. Only 12 lots remaining available.

Lastly, Lowe's moved its Maui store from one A & B property to another at the Maui Business Park II next to the Valley Isle's first Target store. This follows the land purchase by the local Lexus and Subaru dealership that will be relocating from their existing, smaller facility near Costco to Maui Business Park II. These transactions appear to highlight a market trend toward new or renovated/repositioned commercial/industrial properties from older, more depreciated properties. The market's capacity to absorb the abandoned buildings remains unclear.

#### **INVESTMENT MARKET**

Maui commercial real estate investment activity registered a total sales volume of nearly \$475 million for 2016. This is a drop of 34.6% from \$726 million that was sold in 2015. Despite this decline in sales volume, the number of transactions increased for the second consecutive year, rising from 23 for 2014 to 35 for 2016, a jump of 52% during this two-year period. Prime resort and retail properties constituted the majority of the dollars spent on commercial real estate on Maui with a combined \$380 million which represented more than 80% of the total dollar volume for the year. Development land, inclusive of agricultural zoned and residential zoned parcels, was the most popular property type acquired with 13 (37%) of the 35 transactions of the year.

Prime resort and retail properties constituted the majority of the dollars spent on commercial real estate on Maui with a combined \$380 million which represented more than 80% of the total dollar volume for the year. Development land, inclusive of agricultural zoned and residential zoned parcels, was the most popular property type acquired with 13 (37%) of the 35 transactions of the year. Off shore money provided the majority of the capital for acquisition with \$397.7 million or 82.5% of the total. While off shore money acquired many of the big-ticket properties, local investors also were very active. Of the 35 transactions, 28 were by local investors. The average transaction size for off shore buyers (\$55.93 million) was nearly 20 times larger than the average transaction size by local investors (\$2.97 million).

The most expensive acquisition for the year was for the Ritz Carton Kapalua by a consortium including Trinity Investments, Ares Property Partners, SMW Hospitality and Wafra Investment Advisory Group. The group purchased this property from Woodbridge Capital and Colony Capital for \$210 million in November 2016. This transaction included a total of 297 hotel rooms and 107 resort condominiums.

Colliers projects that Maui's prime hotels and retail centers will continue to be an attractive target for off shore and international investors seeking to place their capital in safe haven investments. The recent increase in the number of land acquisitions on Maui will hopefully fuel additional development activity and boost the island's construction sector. The outlook for Maui remains optimistic as economic factors are projected to remain healthy for 2017.

**CONCLUSION**

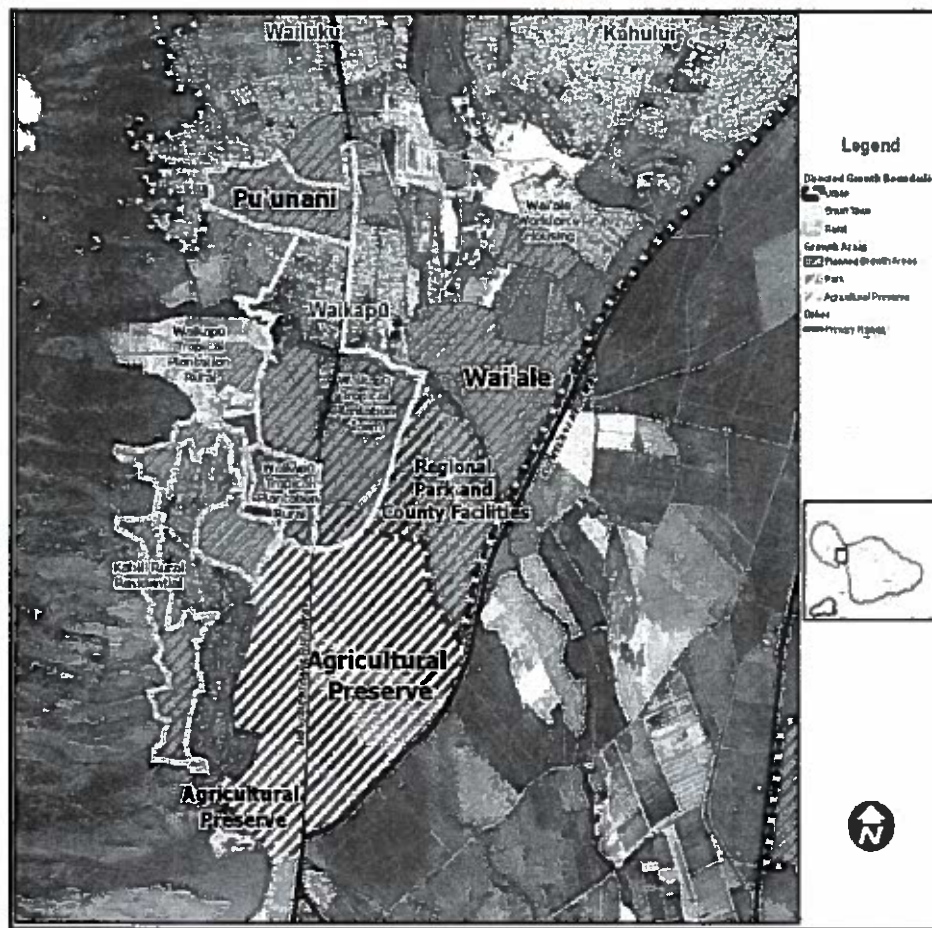
The local economy has made significant improvements from the recent recession with tourism leading the resurgence. All real estate market sections of exhibited strong growth but have yet to fully recover from the market peak. Residential subdivision development is returning with the re-emergence of land acquisition on a speculative basis and rapid absorption of new for-sale subdivision product. Affordable housing projects have become a significant component of new and proposed projects signaling strong demand this product type. Moderate economic growth is anticipated throughout 2017 and beyond aided by low fuel costs.

## MARKET AREA

### LOCATION

The subject is located within Central Maui primarily comprised of Wailuku and Kahului. Within Central Maui, the subject is located in Waikapu, a small rural town between Wailuku and Maalaea on Honoapiilani Highway. The town is primarily residential with a small commercial component. Historically, Waikapu has been surrounded by sugarcane fields, providing a clear distinction between the town and other nearby communities. As Wailuku and Kahului grow southward, the separation between these sub-regions and Waikapu is being diminished.

The following map from the Maui Island Plan illustrates the long-term planned supply of housing in the subject area. The planned growth areas of Waiale, Puunani and Tropical Plantation are intended for the additional supply of 4,437 units of houses and apartments over the next several decades. The timing of these large-scale planned development areas is well beyond the anticipated availability of the proposed subject units as early as the first quarter of 2020.





### ***Market Area***

---

It is important to understand that the proposed subject development will effectively serve all of Central Maui based on its geographic concentration, large population and employment base and predominance of households within the local working community.

The neighborhood is positively influenced by two master-planned communities – Maui Lani and Kehalani. Maui Lani is a 1,012-acre master planned community located in the heart of Central Maui, within minutes of the airport, Kahului Harbor, schools, churches, medical facilities, recreational amenities, shopping and business. Within Maui Lani, the Maui Lani Village Center, a mixed-use commercial and residential center with 79 commercial lots ranging from 7,500 to 328,000 square feet immediately east from the subject. To date, 44% of the commercial lot area has been sold by the developer.

Zoning allows for multiple uses including light industrial, office, and retail to be integrated with single-family and multi-family uses along a newly constructed regional roadway that will serve as a major connector to all parts of the island.

A partial list of owners and occupants within the Maui Lani Village Center include:

Walgreens	Paradise Beverages
Oceanic Time Warner Cable	GP Roadway Solutions
76 Gas	Retina Institute of Hawaii
Marmac Ace Hardware	Group Builders
Commercial Plumbing	Menehune Water

Kehalani is a master-planned community of 2,400 homes on 550 acres located immediately south of Wailuku Town at the base of the West Maui Mountains. The residential portion of Kehalani is approximately 70% built out with a wide variety of for-sale housing ranging from condominiums to luxury homes in a gated community.

The commercial components of Maui Lani and Kehalani are bisected by Waiale Road just one block north from the subject. Development progress for the Maui Lani Village Center is much farther along with finished lots and a number of recently constructed buildings. Construction commenced in 2011 on Kehalani's \$50 million, 200,000 square-foot commercial component known as Kehalani's Village Center. The project developer, Stanford Carr, lost the project to the lender in January 2013. Completed buildings include Longs Drug, Aloha Gas, Foodland and McDonalds.

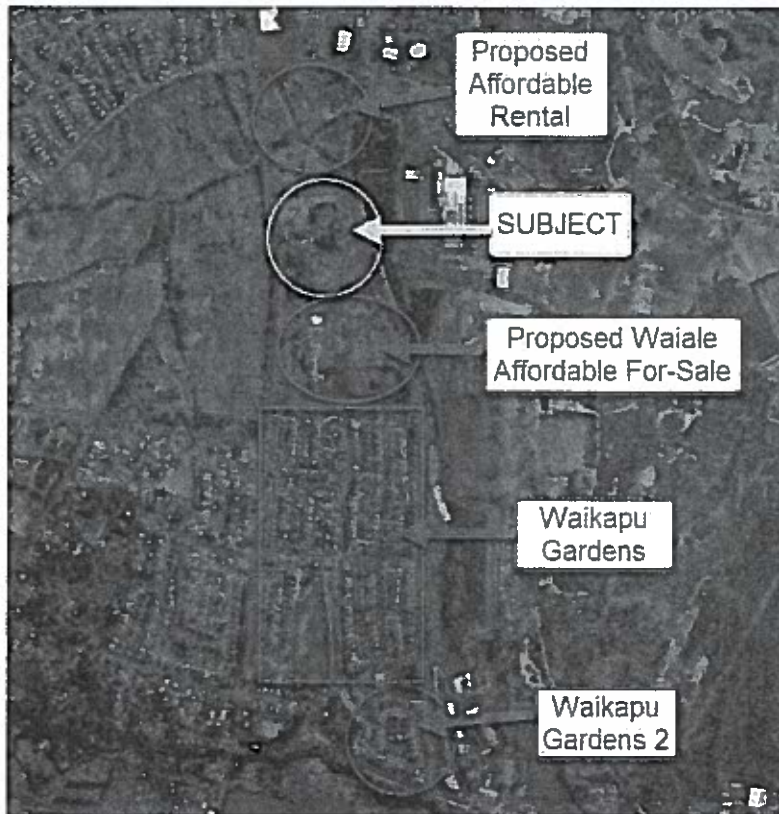
### **ACCESSIBILITY**

The subject market area accessibility is good due to its proximity to the main commercial arterial, Honoapiilani Highway and Maui Lani Parkway.

## NEIGHBORHOOD

The subject neighborhood is largely comprised of for-sale residential housing comprised of a mix of newer affordable and older market rate and a mixed-use commercial/industrial subdivision, Maui Lani Village Center.

- *Trends:* Trends in the neighborhood include land acquisition for affordable housing development.
- *Surrounding Land Uses:* The subject is surrounded by four affordable housing projects illustrated by the following aerial. The two existing projects, Waikapu Gardens and Waikapu Gardens II, sold out as successful and popular projects with excess demand. The abutting proposed Waiale project (to the south) recently received Maui County Council Land Use Committee fast-track approval for a 70-home single-family project in 2016. A proposed 324-unit workforce rental apartment was recently proposed abutting the subject to the north.



- *Conclusion:* The subject location is highly suitable for residential uses inclusive of the proposed affordable for-sale project.



## **AFFORDABLE FOR-SALE HOUSING MARKET OVERVIEW**

### **AFFORDABLE PROGRAMS**

The subject project will be a Section 201H-38, HRS application processed through the Maui County Department of Human Concerns consistent with Chapter 2.96 of the Maui County Code.

### **MARKET HOME SALE COMPOSITION APPROXIMATING CURRENT AFFORDABLE PRICING**

The maximum allowable subject home sale price ranges from \$228,990 to \$538,800 per the 2017 guidelines as detailed in the following table. Importantly, 57% of all house and condominium sales 2017 year-to-date in Wailuku were within this range.

AMI %	2-Bed.	3-Bed.	
71%-80%	\$228,990	--	--
81%-100%	--	\$346,400	\$384,900
101%-120%	--	\$423,300	\$461,800
121%-140%	--	\$500,300	\$538,800

The following table provides a summary of year-to-date 2017 single-family and condominium sales in Central Maui districts of Wailuku and Kahului through July 24, 2017. The table contains a summary of sales volume in \$50,000 increments from \$200,000 through \$550,000, an amount bracketing the maximum allowable at the subject based on an assumed 4.5% interest rate to illustrate the respective home sale character.

# WAILUKU KAHULUI YTD HOUSE AND CONDO SALES BY \$50,000 INCREMENT

Wailuku - YTD SF Home Sales Thru 7.24.17

# Sold	Low	High	Median
108	\$275,000	\$1,400,000	\$611,000

# Sold	Low	High	% of Total
0	\$0	\$200,000	0%
0	\$200,001	\$250,000	0%
3	\$250,001	\$300,000	3%
5	\$300,001	\$350,000	5%
3	\$350,001	\$400,000	3%
8	\$400,001	\$450,000	7%
8	\$450,001	\$500,000	7%
<u>13</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>12%</u>
40	--	--	37%

Kahului - YTD SF Home Sales Thru 7.24.17

# Sold	Low	High	Median
81	\$350,000	\$1,125,000	\$589,000

# Sold	Low	High	% of Total
0	\$0	\$200,000	0%
0	\$200,001	\$250,000	0%
0	\$250,001	\$300,000	0%
1	\$300,001	\$350,000	1%
2	\$350,001	\$400,000	2%
2	\$400,001	\$450,000	2%
6	\$450,001	\$500,000	7%
<u>11</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>14%</u>
22	--	--	27%

Wailuku - YTD Condo Sales Thru 7.24.17

# Sold	Low	High	Median
66	\$115,000	\$641,000	\$405,267

# Sold	Low	High	% of Total
3	\$0	\$200,000	5%
10	\$200,001	\$250,000	15%
8	\$250,001	\$300,000	12%
2	\$300,001	\$350,000	3%
9	\$350,001	\$400,000	14%
6	\$400,001	\$450,000	9%
20	\$450,001	\$500,000	30%
<u>5</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>8%</u>
63	--	--	95%

Kahului - YTD Condo Sales Thru 7.24.17

# Sold	Low	High	Median
18	\$74,000	\$280,000	\$95,000

# Sold	Low	High	% of Total
15	\$0	\$200,000	83%
1	\$200,001	\$250,000	6%
2	\$250,001	\$300,000	11%
0	\$300,001	\$350,000	0%
0	\$350,001	\$400,000	0%
0	\$400,001	\$450,000	0%
0	\$450,001	\$500,000	0%
<u>0</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>0%</u>
18	--	--	100%

Wailuku - YTD Total Residential Sales Thru 7.24.17

# Sold	Low	High	Median
174	\$115,000	\$1,400,000	\$503,600

# Sold	Low	High	% of Total
3	\$0	\$200,000	2%
10	\$200,001	\$250,000	6%
11	\$250,001	\$300,000	6%
7	\$300,001	\$350,000	4%
12	\$350,001	\$400,000	7%
14	\$400,001	\$450,000	8%
28	\$450,001	\$500,000	16%
<u>18</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>10%</u>
103	--	--	59%

Kahului - YTD Ctotal Residential Sales Thru 7.24.17

# Sold	Low	High	Median
99	\$74,000	\$1,125,000	\$570,000

# Sold	Low	High	% of Total
15	\$0	\$200,000	15%
1	\$200,001	\$250,000	1%
2	\$250,001	\$300,000	2%
1	\$300,001	\$350,000	1%
2	\$350,001	\$400,000	2%
2	\$400,001	\$450,000	2%
6	\$450,001	\$500,000	6%
<u>11</u>	<u>\$501,000</u>	<u>\$550,000</u>	<u>11%</u>
40	--	--	40%

Source: Maui MLS

#### **SUPPLY AND DEMAND CHARACTERISTICS - INTERVIEWS WITH MARKET PARTICIPANTS**

Interviews with the following market participants indicated that Maui County has extensive excess demand for affordable for-sale housing with virtually no currently available supply and limited pending supply.

- Susie Thieman, Executive Director of Lokahi Pacific
- Cassandra J. Leolani Abdul, Executive Director of Na Hale O Maui
- Vince Bagoyo, Principal with Development Consulting Group
- Steve Baker, listing broker for A & B's Kamalani project in Kihei

Susie Thieman indicated that they have all 16 homes at an affordable project located in Happy Valley in escrow at \$380,000 with a wait list. Buyers are restricted to 81% to 120% of area median income (AMI). Construction and closings are scheduled to occur between September and December 2017. The three-bedroom/two-bathroom homes will be 1,116 square feet in livable area with a one-car garage on an average lot size of 4,018 square feet.

Cassandra J. Leolani Abdul indicated that they have a standing list of 60 families pre-qualified with 10% to 15% expressing interest for every home they have available.

Vince Bagoyo recently pre-sold 56 affordable homes at Waikapu Gardens II based on a pre-approval list of 800. His recently approved 201H project with 70 affordable, single-family homes has a wait list of 150 based solely on interest generated from newspaper coverage.

Steve Baker indicated that A & B's marketing gathered 1,500 web site registrations leading to 350-400 prospective buyers that took (and paid for) an 8-hour mandatory homebuyer education course resulting in 43 qualified applications. This amount was low due to demand for homes in the \$200,000s of which there are none and many disqualifications stemming from a misunderstanding with county regarding income limitations. The inaugural sales weekend produced 22 sale contracts for the 49 available units. Once qualified, the initial weekend of sales produced sales for over 50% of the qualified buyers.

#### **RE-SALE ENCUMBRANCES**

The re-sale encumbrances appear to vary markedly by project and development type as characterized as follows:

- The period of restrictions varies from five years to 25 years for fee simple property rights and into perpetuity for leasehold
- Maximum allowable re-sale appreciation varies from 7% of cash equity to 25% of difference between appraisals with some phased and others fully available from day one

Importantly, all of the developers of affordable housing indicated that the re-sale encumbrances are not material to the buyers based on the limited availability of substitutable options and overwhelming priority of simply gaining entry into homeownership. Re-sale is a secondary or tertiary consideration at best and highly speculative.

#### **SUMMARY OF RELEVANT FOR-SALE AFFORDABLE PROJECTS**

The following section details a wide variety of for-sale affordable projects on Maui spanning from entitled but not commenced to recently completed and sold out in order to better characterize current market conditions for affordable for-sale housing in Central Maui.

##### **Mokuhau, Happy Valley – Under Construction Lokahi Pacific**

All 16 houses pre-sold and are in escrow at a sales price of \$380,000 or \$341 per square foot. The houses are two-store, single-family, detached with a one-car garage. The livable area is 1,116 square feet with a 303-square-foot garage. The lot sizes average 4,018 square feet. The project has a waitlist since the closing on these houses will not take place until September (4), October (4), November (4) and the final four in December 2017. This project is being developed by Lokahi Pacific, a non-profit housing and community development corporation, in association with the County of Maui's Department of Housing & Human Concerns. The proposed development is subject to a Residential Workforce Housing Agreement.

The project is designed in accordance with Maui County Code (MCC) Title 19.84 R-O Lot Line Overlay District, which allows for increased density for affordable housing projects. The housing will be offered to first-time homebuyers and subject to occupancy requirements and resale restrictions consistent with market practice for affordable for-sale housing. Importantly, the feasibility of this project was only made viable with the assistance of over \$2 million in government funding.

##### **Waikapu Gardens II – Completed and Sold by January 2016 Spencer Homes**

The project features 56 affordable, single-family homes and a small neighborhood park located on 10.5 acres on Waiale Road and Waiko roads, Wailuku. The subdivision was originally 48 homes and commercial, which was reconfigured without the commercial components. The project received in 2013 HRS Section 201H-38 approval by The County of Maui and was built and sold by January 2016. The following table provides a summary of the average sales by bedroom count.

### *Market Area*

<i>Bed Count</i>	<i># Homes</i>	<i>Average Livable Area</i>	<i>Average Lot Area</i>	<i>Average Price</i>	<i>Average \$/SF</i>
3	39	1,517	6,231	\$422,332	\$278
4	17	1,853	6,524	\$506,093	\$273
Total	56	1,619	6,320	\$447,759	\$277

The development best serves to illustrate the excess demand for affordable housing based on its extensive pre-qualification list and 100% pre-sale results.

An interview with Vince Bagoyo, the project contractor, indicated the following:

- Sale resulted from a pre-qualified list of over 800
- Initial sales in 2015
- Last move-in January 2016
- 56 units of 3 and 4 bedrooms
- 30% 81-100%
- 30% 101-120%
- 40% 121-140%; approximates market values
- Average unit size 1,600 SF (excluding garage)
- Smallest plan 3+2; single story; 1,300 SF (+460 SF garage)
- Maximum sale prices of just above \$577,300
- 10-year restriction on re-sales based on 7% maximum increase on the cash equity; county given first option to re-purchase; developer given 2<sup>nd</sup> option to repurchase; if neither exercise option, owner can sell at market
- Strength of local market at \$575,000 and below
- 101-140% good market; best approximates market pricing and availability of profit
- \$175-180/SF vertical construction cost (inclusive of garage) for the cheapest; county sponsorship may require higher cost due to prevailing wage requirement
- Land values - \$125,000 to \$130,000/lot with infrastructure vs. raw land of \$25,000 to \$30,000/acre; infrastructure cost of \$60,000 to \$65,000/lot
- Minimum return on investment of 15%
- Waikapu Gardens I has some units with expired affordable re-sale restrictions with the rest within 1 year
- Waikapu Gardens II received \$800,000 in exemptions

**Waiale Affordable Housing Project – Newly Approved  
Bagoyo Development Consulting Group**

The project features 70 affordable, single-family homes and a small neighborhood park located on 10.36 acres on Waiale Road in Wailuku, north of the Waikapu Gardens subdivision. Housing prices are dependent on median family incomes and prevailing mortgage rates, but they will range from roughly \$338,000 to \$465,000 according to the developers.

The subdivision would be primarily three-bedroom, two-bathroom homes ranging from lot sizes of 3,900 to 7,000 square feet. Twenty one homes (30%) would be priced for families earning 80 to 100 percent of Maui's median income. Another 21 (30%) would be sold to families making from 101 to 120 percent of median, while 28 (40%) would go to those earning from 121 to 140 percent.

The project is expected to take three years to complete, barring any unexpected delays. Elements of the proposed project include the following:

- HRS Section 201H-38 approval by The County of Maui granted June 3, 2016
- \$1.4 million purchase price or \$20,000 per lot
- State and County AG zoning; received exemption per the 201-H approval
- June 29, 2015 date of purchase agreement
- \$14 million vertical construction cost estimate or \$200,000 per home
- \$4.5 million subdivision improvement cost or \$64,286 per home
- 150 on wait list prior to any formal advertising

**Kamalani, Kihei – Recently Commenced Construction  
A & B**

Kamalani is a new planned community of attached and detached condominium homes in north Kihei that recently commenced construction. Completion of the affordable phase is anticipated between April and August 2017. Kamalani is planned to include approximately 600 units to be developed in multiple increments and phases with parks and other recreational amenities, linked by a cycle track, pedestrian walkways and common area landscaping. The first neighborhood (Increment 1) will consist of 170, two- and three-bedroom condominium flats and townhomes that will be offered as residential workforce housing with priority given to Maui County residents that are income eligible under rules established by the County of Maui.

Residential Workforce Housing (“RWH”) was established by the Maui County Council under Chapter 2.96, Maui County Code (“MCC”). The RWH Units will be located within a combination of 2- and 3-bedroom condominiums, including 3-bedroom townhomes within Increment 1 of the Project. The 2- and 3-bedroom condominiums are designated initially for the “below-moderate income” and “moderate income” categories, while the 3-bedroom townhomes are designated initially for the “above-moderate income” category.



## Market Area

The RWH condominium units in Kamalani will be developed and sold in multiple phases. The initial phase will be comprised of 41 condominium homes. Future homes will be made available in phases as construction and sales progress. The table below identifies the RWH unit types available in the initial phase of Kamalani's Increment 1, with starting prices by model type. Please note that the maximum annual income shown is based on AMI figures for 2016.

Maximum RWH Income	Unit Category	Model Type	Floor	Net Living Area (sq. ft.)	Covered Lot Area (sq. ft.)	Yard Area (sq. ft.)	Bedroom	Bath	Starting Price
\$81,500	A	Flat A-1	FIRST	755	40	74	2	1.5	\$299,210
\$81,500	A	Flat A-2	SECOND	755	-	105-115	2	1.5	\$296,210
\$81,500	A	Flat B-1	FIRST	925	40	74	3	2	\$352,600
\$81,500	A	Flat B-2	SECOND	925	-	105-115	3	2	\$346,600
\$97,800	B	Flat C-1	FIRST	804	40	74	2	2	\$340,000
\$97,800	B	Flat C-2	SECOND	804	-	115	2	2	\$335,000
\$97,800	B	Flat D-1	FIRST	1022	40	74	3	2	\$400,000
\$97,800	B	Flat D-2	SECOND	1022	-	115	3	2	\$393,000
\$114,000	C	Townhome E	-	1174	-	357-418	3	2.5	\$456,600
\$114,000	C	Townhome F	-	1180	-	226-372	3	2.5	\$446,600

An interview with Steve Baker, the project selling broker, indicated the following:

- 1) 1,500 web site registrations
- 2) Of the 1,500, 350-400 took and paid for 8-hour mandatory homebuyer education course
- 3) Of the 350-400 that took the course, there were 43 qualified applications
  - a) Reduction due to the demand for homes in the \$200,000s of which there are essentially none
  - b) Many disqualified based misunderstanding with county regarding income limitations (rental vs. ownership); will call back and hopefully increase eligibility count
- 4) 7/16-7/17 firm contracts with \$5,000 down and 30-day rescission; additional \$5,000 down at end of recession with the \$10,000 contractually non-refundable
- 5) 22 (of 49 offered) units went into contract in initial weekend 7/16-7/17, including four townhouse contracts with three of the four to the 81-100% of AMI bracket and the fourth in the 102-140% of AMI bracket; with only 26 currently under contract
- 6) Base pricing
  - a) 2+1.5 - \$296,210
  - b) 2+2 - \$335,000
  - c) 3+2 (small) - \$346,600
  - d) 3+2 (large) - \$393,000
  - e) 3+2.5TH - \$446,600 and \$456,600
- 7) End of 2017 for completion of five buildings comprised of April-August 2017 completion date for phase 1 of increment 1

## Market Area

Importantly, the largest units most approximating the subject have been available for three months to the general public without residential workforce housing restrictions at a price range of \$482,300 to \$487,700 for 1,180 square feet, as summarized in the table below. The sales agent indicated that 2<sup>nd</sup> home buyers have been the predominant demographic interested in the market priced units but that none have sold. He cited several disadvantages as rationale for the lack of sales, which include: (1) the lack of a model and any completed vertical construction; and (2) affordable stigma for market buyers.

### KAMALANI INCREMENT 1 CONDOMINIUM HOMES NOW AVAILABLE

Previously reserved only for Maui residents and first-time homeowners with income restrictions, these condominium homes are now available to the public without Residential Workforce Housing restrictions:

BLDG. NO.	BLDG TYPE	UNIT NO.	MODEL TYPE	BEDROOMS /BATHROOMS	NET LIVING AREA	PORCH AREA	GARAGE AREA	YARD AREA	SALES PRICE	MONTHLY MAINT. FEE
19	4-PLEX	1902	F	3/2.5	1180	64	209	226	\$482,300	\$393.52
19	4-PLEX	1903	FR	3/2.5	1180	64	209	226	\$482,300	\$393.52
21	4-PLEX	2102	F	3/2.5	1180	64	209	226	\$487,700	\$393.52
21	4-PLEX	2103	FR	3/2.5	1180	64	209	226	\$487,700	\$393.52

### Kahoma Village – Recently Commenced Construction Stanford Carr

Stanford Carr Development recently broke ground on a \$90 million residential neighborhood Makai from the subject. The Kahoma Village project is a mix of affordable and market rate for-sale housing that includes 101 three- and four-bedroom single-family homes and 102 two- and three-bedroom townhouses for a total of 203 homes. Stanford Carr's SCD Kahoma Village LLC recently purchased the project's 22-acre vacant parcel between Honoapiilani Highway and Front Street from The Harry & Jeanette Weinberg Foundation for \$14 million.

Construction on Kahoma Village, which is located south of the Safeway and Longs Drugs-anchored Lahaina Cannery Mall, is scheduled to take about two years to complete. This project will not directly compete with the subject.

**Pulelehua – Entitled Project**

**Maui Oceanview LP, a partnership led by USA Infrastructure Investments**

In June 2016, Maui Land & Pineapple Co. sold a 304-acre, fully entitled working-class community project located in West Maui, commonly referred to as Pulelehua, for \$15.0 million. The sale resulted in a gain of approximately \$14.3 million. Proceeds from the sale were used to pay down the Company's long-term debt that was due.

Pulelehua, near the Kapalua West Maui Airport, has been more than a decade in the making with calls for community involvement in the planning of the project going back to 2004. In its latest annual report, ML&P said that the project was designed for 882 single-family and multi-family residences, 95,000 square feet of commercial and retail space, an elementary school, churches and a community center. The site has conforming state and county land use designations, according to the annual report. Per the Maui Land & Pineapple Co. 2016 annual report, projected costs to complete ranged from \$300 million to \$500 million. Completion of any housing is years away.

**Kai A Ulu – Pending Groundbreaking**

**Kaanapali**

**Aina Lani Pacific LLC**

Kaiaulu at Kaanapali is a proposed 100 percent workforce housing development with a pending groundbreaking. Located on 7.65 acres mauka of Honoapiilani Highway approximately 800 feet north of the Kaanapali Parkway intersection, Kaiaulu is a 33-unit affordable single-family residential housing subdivision comprised of three- and four-bedroom homes varying from 1,118 to 1,641 square feet. Individual lot sizes will be approximately 5,286 square feet.

"The entire proposed project will be 100 percent affordable and sold as house and lot packages in fee simple initial offering with pricing based on 80% to 140% area median income levels. The homes were all presold at auction held in October 2016 at prices ranging from \$395,150 to \$650,500 totaling 95% of the maximum allowable amounts.

**Kahoma Residential Subdivision – Land Development Recently Completed**

**68-Lot Residential Workforce Housing Development**

**Lahaina**

**West Maui Land**

The Kahoma Residential Subdivision is a 100% affordable 68-lot residential subdivision approved under 201H-38, HRS. The development, which received final subdivision approval on November 29, 2016, has all off-site and land development improvements completed. The 68 lots vary from 6,047 to 8,459 square feet.

## Market Area

The development is subject to a Residential Workforce Housing Agreement inclusive of the 2015 affordable sale price guidelines established by the Maui County Housing Division, Department of Housing and Human Concerns along with County Resolution 11-126, which addressed affordable housing credits associated with the larger project.

The project will offer affordably priced housing to qualified owner/occupant buyers per the agreement regarding residential workforce housing requirements, which remain in place for ten years after the closing of the initial sale. The housing will be offered subject to occupancy requirements and resale restrictions consistent with market practice for affordable for-sale housing.

Kahoma Homes is an income-qualified project for Maui's workforce who meet the basic eligibility criteria established by the County of Maui including but not limited to the following:

- A citizen of the United States or a permanent resident alien of the County of Maui;
- Is 18 years of age or older;
- A gross annual family income which does not exceed 160% of the County's median income as established by HUD;
- Assets that do not exceed 160% of the County's median income as established by HUD;
- No ownership or joint ownership that was 50% or more of a property in fee or leasehold in the United States for 3 years before submittal of the buyer interest form.

The proposed development is conditioned based on the Residential Workforce Housing Agreement with the County of Maui. The agreement documents the development approval and related encumbrances. The agreement is standard for affordable for-sale housing.

The maximum sales prices were established based on the 2015 affordable guidelines as follows:

No. of Units	Percentage of Project	HUD Income Range	Annual Household Income <sup>1</sup>	1 Bedroom House & Lot	2 Bedroom House & Lot	3 Bedroom House & Lot	4 Bedroom House & Lot	Lot Only <sup>3</sup>
10	15%	< 80%	\$ 60,080	\$ 231,840	\$ 281,520	\$ 331,200	\$ 380,880	\$ 165,600
12	12%	< 100%	\$ 75,100	\$ 289,800	\$ 351,900	\$ 414,000	\$ 476,100	\$ 207,000
13	25%	<120%	\$ 90,120	\$ 347,760	\$ 422,280	\$ 496,800	\$ 571,320	\$ 248,400
10	15%	< 140%	\$ 105,140	\$ 405,650	\$ 492,575	\$ 579,500	\$ 666,425	\$ 289,750
23	33%	< 160%	\$ 120,160	\$ 463,610	\$ 562,955	\$ 662,300	\$ 761,645	\$ 331,150

1) Based on 2015 Affordable Sales Price Guidelines prepared by Housing Division, Dept. of Housing and Human Concerns, County of Maui, Effective May 1, 2015 with an assumed interest rate of 4%.

2) Annual Household Income is based on a family of four and in accordance with the 2015 Affordable Sales Price Guidelines prepared by Housing Division, Dept. of Housing and Human Concerns, County of Maui, Effective May 1, 2015.

3) Lot only prices are based on 50% of the sales price of a 3 bedroom house & lot.

## **FINANCING**

It is important to note that the subject location is eligible for USDA financing for home buyers. The USDA program allows for more affordable loan terms than conventional lenders with no down payment requirement with the buyer only responsible for closing costs and PMI for any loan-to-value above 80%. The current USDA interest rates approximate 3.375% for a 30-year amortization. In contrast, conventional finance terms for affordable home purchases include a down payment as little as 3% to 5% (with PMI applicable for anything under 20%) and 30-year fixed interest rate approximating 4.0% to 4.25% with zero points. The low down payment options and relatively low interest rates are favorable to home ownership of any kind.

## **CONCLUSION**

The proposed subject development will fill a small portion of the substantive shortfall in available for-sale affordable residential housing.

## SUPPLY AND DEMAND CHARACTERISTICS

### SUPPLY

The future supply of new housing as measured by the entitled, partially entitled and plan only single- and multi-family projects (see tables below) totaled nearly 28,000 effective May 1, 2016 per the Maui County Planning Department. Of the total, only 11,752 were entitled and 16,857 were at least partially entitled. The anticipated Maui housing demand would be satisfied if all of the entitled and partially entitled projects are completed by 2025. The ability to add additional large-scale supply not reflected in the table prior to 2025 is questionable (other than fast-track affordable projects) based on the recent comments by County Department of Planning Director William Spence that the entitlement process to develop housing takes an average of about seven years<sup>2</sup>.

<i>Unit Type</i>	<i>Total SF &amp; MF Units</i>
Entitled	11,752
Partially Entitled	5,105
Plan Only	<u>10,990</u>
Total	27,847 <sup>3</sup>

Source: Maui County Department of Planning

	<i>Entitled</i>		<i>Partially Entitled</i>		<i>Plan Only</i>		<i>Total</i>
	<i>SF</i>	<i>MF</i>	<i>SFD</i>	<i>MF</i>	<i>SFD</i>	<i>MF</i>	
Kapalua - North Lahaina	2,119	1,164	875	930	635	630	6,353
South Lahaina - Ukumehame	0	0	0	0	4,100	360	4,460
Waihee - Wailuku - Kahului	806	1,550	360	0	150	45	2,911
Waikapu - Maalaea - North Kihei	1,571	2,071	1,300	605	2,665	1,515	9,727
South Kihei - Makena - Ulupalakua	881	1,117	149	600	0	0	2,747
Paia - Haiku - Haliimaile	148	0	16	0	825	65	1,054
Makawao - Pukalani - North Kula	194	131	170	0	0	0	495
South Kula - Keokea	0	0	0	36	0	0	36
Nahiku - Hana	<u>0</u>	<u>0</u>	<u>43</u>	<u>21</u>	<u>0</u>	<u>0</u>	<u>64</u>
Total	5,719	6,033	2,913	2,192	8,375	2,615	27,847

Source: Maui County Department of Planning

<sup>2</sup> <http://www.mauinews.com/news/local-news/2017/07/summit-focuses-on-affordable-housing-hurdles/>

<sup>3</sup> Excludes Hale Mua and Olowalu



## Supply and Demand Characteristics

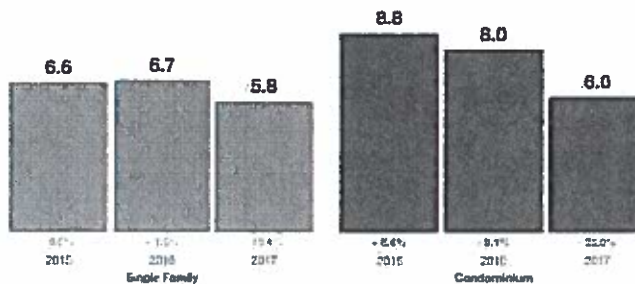
Recent statistics from the Realtors Association of Maui illustrates a shrinking supply of standing inventory declining to only 5.8 months, down 13.4% year-over-year. In contrast, the monthly supply of inventory was nearly 18 months as recently as the first quarter 2011.

### Months Supply of Inventory

The inventory of homes for sale at the end of a given month, divided by the average monthly sales, shows the number of months it will take to sell the inventory.



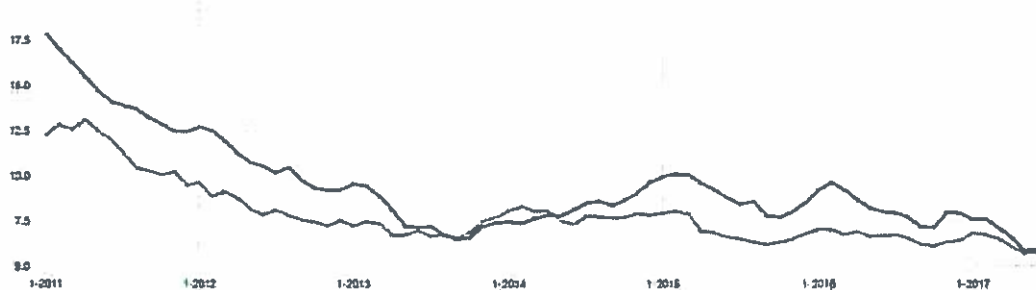
June



Month	Single Family	Year-Over-Year Change	Condominium	Year-Over-Year Change
Jul-2016	8.7	+ 3.1%	7.8	- 6.0%
Aug-2016	8.6	- 4.8%	7.7	- 10.5%
Sep-2016	8.2	0.0%	7.2	- 7.7%
Oct-2016	8.1	- 3.2%	7.1	- 7.6%
Nov-2016	8.4	+ 1.5%	8.0	0.0%
Dec-2016	8.4	- 5.9%	7.9	- 7.1%
Jan-2017	8.8	- 2.9%	7.8	- 17.4%
Feb-2017	8.7	- 4.3%	7.8	- 20.8%
Mar-2017	8.9	- 4.4%	7.1	- 22.8%
Apr-2017	8.1	- 11.8%	6.6	- 24.1%
May-2017	5.7	- 13.8%	5.8	- 29.3%
Jun-2017	5.8	+ 13.4%	6.0	+ 25.0%
12-Month Avg	8.4	- 3.2%	7.3	- 14.8%

Source: REALTOR ASSOCIATION OF MAUI, INC. Data as of 6/1/2017. All figures are estimates and subject to change.

Historical Months Supply of Inventory by Month



Source: REALTOR ASSOCIATION OF MAUI, INC. Data as of 6/1/2017. All figures are estimates and subject to change.

### DEMAND

The projected housing demand for Maui County from 2015 through 2025 was estimated at 14,373 to 16,698 units by the Department of Business, Economic Development and Tourism<sup>4</sup> as summarized by the following table.

<sup>4</sup> Department of Business, Economic Development & Tourism, Research and Economic Analysis Division, March 2015, "Measuring Housing Demand in Hawaii, 2015-2025", 30

## Supply and Demand Characteristics

**Table 4.20: Estimated Future Housing Demand for Maui County, 2015-2025**

	Baseline Scenario	Middle Scenario	Aggressive Scenario
Household Growth	11,512	11,512	11,512
Change in Vacant Unit Demand	2,437	2,652	3,496
<b>Total</b>	<b>13,949</b>	<b>14,164</b>	<b>15,008</b>
By Ratio of Completions to Household Growth	14,373	15,237	16,698

Source: DBEDT, calculations based on methods suggested by the Harvard Center for Housing Studies

The Hawaii Housing Planning Study, 2016 further refines the housing demand from 2015 through 2025 by HUD income classification (% of area median income or AMI)<sup>5</sup>. The AMIs planned to be served by the subject are outlined in red.

**Table 27b. Housing Demand by HUD Income Classification, Counties & State of Hawai'i, 2015-2025**

	HUD Income Classification (% of Area Median Income)								Total
	Less than 30%	30-50%	50-60%	60-80%	80-120%	120-140%	140-180%	More than 180%	
<b>Maui</b>	2,947	2,775	1,414	2,393	1,626	1,493	500	801	13,949
Ownership Units	1,079	824	351	1,151	1,308	1,292	469	766	7,240
Single-Family	1,022	783	234	1,022	1,112	1,032	368	610	6,183
Multi-Family	57	41	117	129	196	260	101	156	1,057
Rental Units	1,868	1,951	1,063	1,242	318	201	31	35	6,709
Single-Family	1,295	1,226	771	1,050	239	156	17	30	4,784
Multi-Family	573	725	292	192	79	45	14	6	1,926

Source: Hawaii Housing Planning Study

The proposed subject represents only 2.5% of the total ten-year demand estimate by AMI percentage. The anticipated timing of the project is within the initial five years of the period of forecasted demand and collectively, the project pipeline of current and future supply will not remotely approach exceeding demand within the anticipated project timeline.

# of Subject Units	AMI %	Maui Demand 2015-2025	Subject As % of Total
12	71%-80%	1,022	1.2%
52	81%-120%	1,112	4.7%
16	121%-140%	1,032	1.6%
80		3,166	2.5%

<sup>5</sup> SMS Research & Marketing Services, Inc., December 2016 "Hawaii Housing Planning Study, 2016, 34

## *Supply and Demand Characteristics*

The Hawaii Housing Planning Study, 2016 survey results indicated that raw demand for Maui households with the intention to move is 52.3% with 20.6% in year one and 19.9% in year two.<sup>6</sup>

The proposed subject development has favorable demand characteristics summarized as follows:

- Preferred number of proposed bedrooms (2 to 4) accounts for 97.8% of surveyed demand— two (18.1%), three (56.1%) and four (23.6%)
- Per Housing Demand Survey, the proposed pricing for the subject will capture roughly 80%<sup>7</sup> of respondents regarding what they can afford for monthly housing costs
- Wailuku housing stock is 76.2% single family, which is consistent with the majority of the proposed development

Recent sales activity at two local projects serve to provide an excellent illustration of demand for for-sale housing that brackets the pricing and product quality of the proposed development: (1) Kehalani Gardens on the lower end; and (2) Kamani at Kehalani on the upper end.

Kehalani Gardens, which is located ¾ miles north of the subject, was developed in 2005 by Stanford Carr as a 132-unit condominium with most unit sales subject to affordable restrictions. The townhouse-style units are comprised of two- and three-bedroom floor plans in clusters of six adjoining units with one carport and one open stall for dedicated parking. The unit sizes range from 935 to 1,133 square feet. Importantly, the affordable encumbrances have expired and all of the homes are now part of the market housing supply.

The following table provides a summary of annual sales statistics at Kehalani Gardens by bedroom count. Importantly, the three-bedroom units, which are the most representative of the proposed subject product, have increased in average sale price and declined in days on market in 2016 and year-to-date 2017. The two-bedroom sale prices have also escalated with one aberrant listing inordinately influencing the year-to-date days on market.

<i><u>Two-Bedroom Units</u></i>				<i><u>Three-Bedroom Units</u></i>		
<i>Year</i>	<i># Sales</i>	<i>Avg. Sale Price</i>	<i>DOM</i>	<i># Sales</i>	<i>Avg. Sale Price</i>	<i>DOM</i>
2017 YTD	3	\$333,333	183	3	\$383,000	52
2016	6	\$331,667	126	10	\$372,800	89
2015	8	\$303,531	98	6	\$325,333	121
2014	6	\$311,667	120	--	--	--

6 SMS Research & Marketing Services, Inc., December 2916 "Hawaii Housing Planning Study, 2016, 100  
7 Monthly mortgage payments of at 80% LTV, 4.25% interest rate and 30-year amortization

The subject three-bedroom units are projected to be priced from \$346,400 to \$538,800, which overlaps the lower end of the Kehalani Gardens sales. The subject two-bedroom units will be priced below the range of the Kehalani Gardens sales at \$228,900. Importantly, Kehalani Gardens is a markedly inferior property based on its 12-year-old construction and condominium ownership and location across from the county prison.

Kamani at Kehalani is a duplex CPR product with 138 units of three bedrooms ranging from 1,425 to 1,465 square feet. The project commenced sales in March 2016 with 83 homes sold or in escrow. The standard sales practice is for release of project phases prior to completion of construction, so that all homes are pre-sold pending completion. The project pricing has spanned from \$479,000 to \$513,000 with each subsequent phase resulting in incremental price escalations. The ability to raise prices and maintain strong pre-sales serves to illustrate the strength of the local market for the for-sale product approximating the subject.

Clearly, the strong demand exhibited at Kehalani Gardens re-sales and pre-sales at Kamani at Kehalani illustrate the shortage of affordable ownership opportunities in the subject market.

#### **AFFORDABILITY**

Market priced housing has escalated considerably since 2012 with the strong economic recovery resulting in a greater spread between the affordable pricing. The following table illustrates the rapid decoupling of the median home value in Central Maui from the affordable price based on county guidelines. Through June 2017, the Central Maui median single-family home value was \$204,100 or 53% more than the affordable price of a three-bedroom house per the Maui County affordability guidelines at 100% AMI and 4.5% interest rate.

---

### *Supply and Demand Characteristics*

---

<i>Year</i>	<i>Central Maui Median Price<sup>8</sup></i>	<i>Affordable Price<sup>9</sup></i>	<i>Median-to-Affordable Price Premium</i>	
			<i>Absolute</i>	<i>Percentage</i>
2010	\$430,000	\$394,700	\$35,300	9%
2011	\$375,000	\$394,700	-\$19,700	-5%
2012	\$380,000	\$400,400	-\$20,400	-5%
2013	\$416,040	\$408,200	\$7,840	2%
2014	\$445,000	\$393,700	\$51,300	13%
2015	\$507,381	\$390,000	\$117,381	30%
2016	\$557,000	\$423,300	\$133,700	32%
2017	\$589,000	\$384,900	\$204,100	53%

Availability of affordable for-sale projects, such as the subject project, will serve to satisfy pent-up demand for genuine buyers of meeting the income and other eligibility requirements.

---

<sup>8</sup> Realtors Association of Maui; 2017 figure is year-to-date through June 2017

<sup>9</sup> County of Maui Department of Housing and Human Concerns, Housing Division; 3-bedroom single-family dwelling at 100% AMI and 4.5% interest rate

## **CONCLUSION**

The market demand study concluded that the proposed development will be well received by the local market and will be an incremental, yet important source of supply of affordable for-sale housing to address the substantive shortage of entry-level housing for Central Maui households priced within 71% to 140% of Area Median Income (AMI).

The findings are detailed and supported by the following:

1. Strong local new housing demand
  - a. One-third of the projected annual new supply requirement of 1,437 to 1,670 units to meet the ten-year projected housing demand is from buyers under 141% of AMI
  - b. Active ongoing land acquisitions and subdivision development of market-rate and affordable for-sale homes
2. Suitability of the proposed project's physical characteristics relative to Central Maui demand preferences (two-to four-bedrooms, principally detached single-family, etc.)
3. Significant housing price inflation inhibiting the ability of many households to purchase market-rate housing
  - a. Rapid decoupling of the median home value in Central Maui from the affordable prices based on county guidelines. Through June 2017, the differential between the Central Maui median single-family home value and the affordable price of a three-bedroom house at 100% AMI and 4.5% interest rate was \$204,100 or 53%. The differential was only \$7,840 or 2% as recently as 2013.
  - b. Annualized matched-pair house sale inflation ranging from 5% to 12% between 2010 and 2017
  - c. New subdivision and condominium sales absorption achieving 49% to 59% unit value (\$/SF) price inflation from 2012 through 2017
4. Proposed project's pricing is consistent with 57% of the single-family and condominium sales in Wailuku year-to-date 2017
5. Proposed project size is only 2.5% of the projected Maui housing demand through 2025 for 71% to 140% of AMI
6. Excess demand for affordable projects clearly evident by their complete pre-sale absorption prior to construction within the local markets
7. Shortage of new development and inventory



### *Conclusion*

---

- a. The cumulative entitled and planned single- and multi-family housing in the Maui Island Plan totals 16,857, which is minimally sufficient to meet the projected housing demand
  - b. Less than six months of single-family inventory available for sale at present; down from a standing supply in 2011 of over 18 months
  - c. Seven-year standard entitlement period for new residential subdivision projects, which limits the supply of housing
8. Strong value price support (bracketing) for the anticipated sale prices of the proposed development as measured by re-sales and new absorption sales of projects in the local market.
9. Anticipated full pre-sale absorption of the subject based on precedence of unilateral affordable project pre-sales and strong pre-sale activity for similar market-rate housing.

## *Qualifications Summary*

---

### **ROBERT W. SPANGLER, MAI**

**EDUCATION:**      **University of Southern California, Los Angeles, California**  
                         Master of Real Estate Development; finance emphasis, May 1997; graduated with honors

**Claremont McKenna College, Claremont, California**  
                         Bachelor of Arts in Mathematics and Economics, May 1990; graduated Cum Laude  
**King's College University, London, England; January to June 1989**

**EXPERIENCE:**      **R.W. SPANGLER LLC** (previously incorporated) February 2004-Present  
Southern California commercial appraisal specialist relocated to Hawaii in 2010 with core competencies allowing broad geographic and property type coverage; recently completed assignments in all Hawaii counties, Alabama, Arizona, Florida, Mississippi, Nevada, Texas and Washington

Extensive focus on complex valuation and disposition analysis of troubled assets

Recent appraisal and consulting experience with the following property types:

- |              |                        |                           |
|--------------|------------------------|---------------------------|
| ▪ Apartment  | ▪ Proposed development | ▪ Casino                  |
| ▪ Retail     | > Apartment            | ▪ Land                    |
| ▪ Office     | > Condominium          | > Residential infill      |
| ▪ Industrial | > Independent living   | > Residential subdivision |
| ▪ Hotel      | > Self-storage         | > Residential acreage     |
| ▪ Marina     | > Retail               | > Commercial infill       |

**Eichel, Inc., 1990-2004**

Performed commercial real estate appraisals and consulting service throughout the greater Southern California area, Northern California, Arizona, Florida, Nevada and Washington

- Property types appraised include, but are not limited to, marinas, office buildings, shopping centers, industrial buildings, residential subdivisions, apartments, infill and hillside acreage land, proposed construction of apartments, condominiums, self-storage, office, etc.
- Extensive involvement in valuation and analysis of complex litigation assignments, including full takes, part takes and rights of way for public agencies

**LICENSES/OTHER:** Member, Appraisal Institute (11580)

Certified General License (967) - State of Hawaii

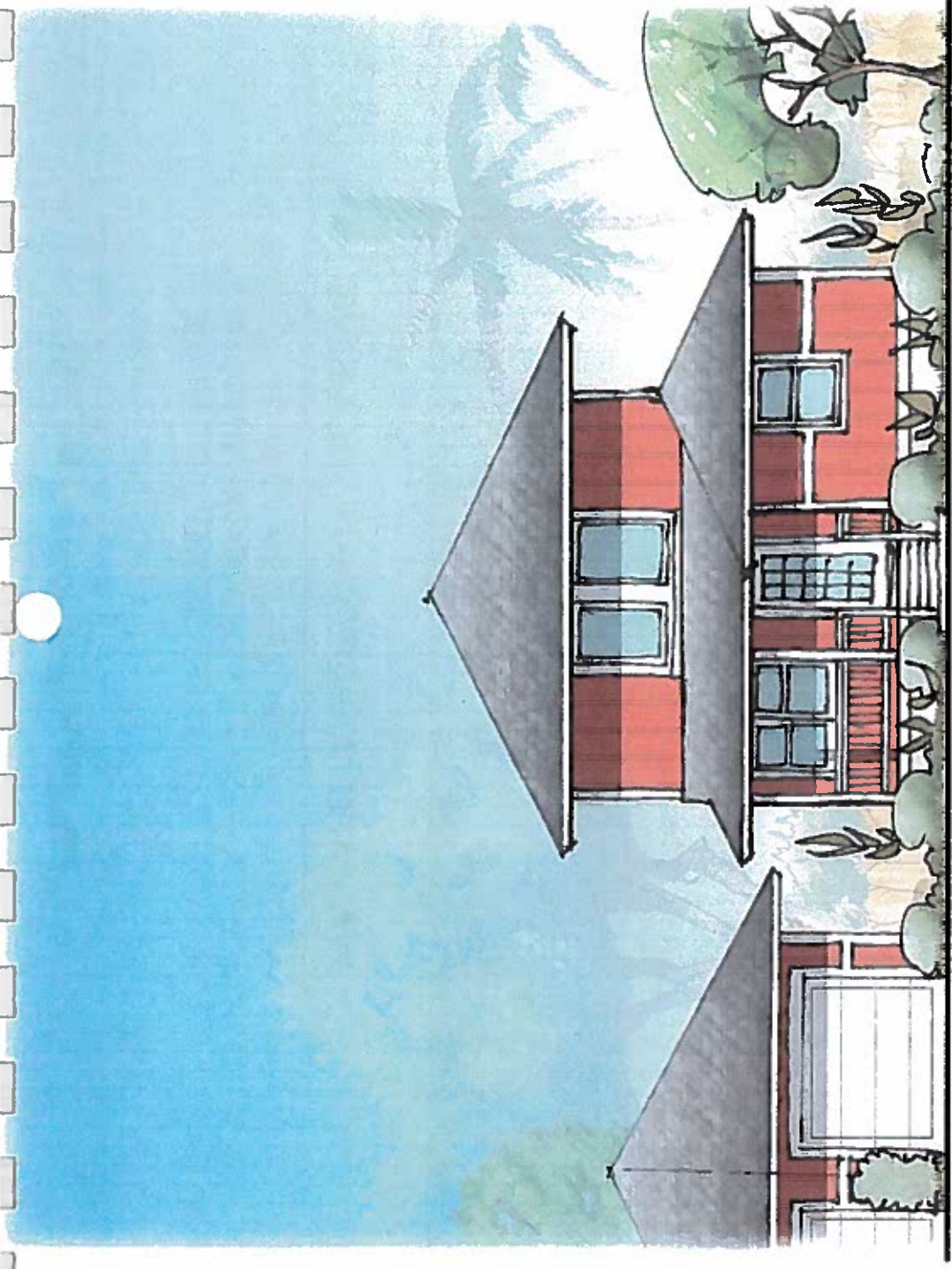
Former Board Member: Regatta Seaside HOA, a 224-unit high-rise condominium



## ***Appendix K***

### ***House Models***





## WAIKAPU AFFORDABLE HOUSING

MODEL A - 2 STORY, 4 BED RM. / 2 BATH  
APPROX. 1,900 SQ. FT. INTERIOR LIVING SPACE  
240 SQ. FT. SINGLE CAR GARAGE

artel<sup>INC.</sup>

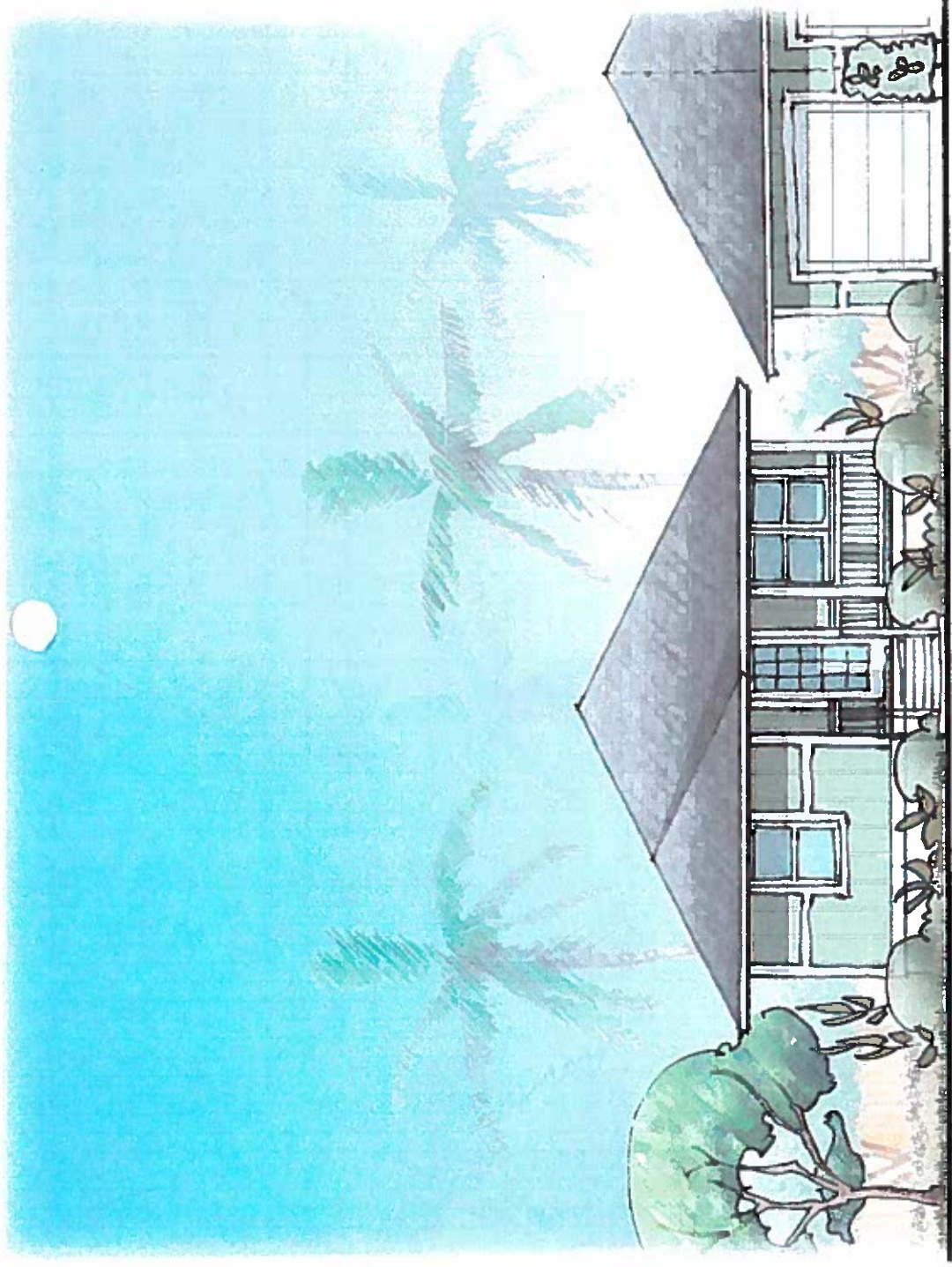
SCALE  
1/8" = 1'-0"



DATE  
07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.





## WAIKAPU AFFORDABLE HOUSING

MODEL B - 1 STORY, 3 BED RM. / 2 BATH  
 APPROX. 1,200 SQ. FT. INTERIOR LIVING SPACE  
 240 SQ. FT. SINGLE CAR GARAGE

artel INC.

SCALE  
 1/8" = 1'-0"



DATE  
 07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
 ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
 OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.



## WAIKAPU AFFORDABLE HOUSING

MODEL C - 2 STORY, 3 BED RM. / 2 BATH  
- 2 STORY, 4 BED RM. / 2 BATH

APPROX. 1,200 - 1,400 SQ. FT. INTERIOR LIVING SPACE  
400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel<sup>INC.</sup>

SCALE  
1/8" = 1'-0"



DATE  
07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.





## WAIKAPU AFFORDABLE HOUSING

MODEL D - 1 STORY, 2 BED RM. / 1 BATH  
 APPROX. 700 SQ. FT. INTERIOR LIVING SPACE  
 400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE  
 1/8" = 1'-0"



DATE  
 07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
 ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
 OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.



## WAIKAPU AFFORDABLE HOUSING

MODEL E - 1 STORY, 3 BED RM. / 2 BATH

APPROX. 900 SQ. FT. INTERIOR LIVING SPACE

400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE  
1/8" = 1'-0"



DATE  
07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.





## WAIKAPU AFFORDABLE HOUSING

MODEL F - 2 STORY - DUPLEX, 2 BED RM. / 1 BATH - EACH  
 APPROX. 600-700 SQ. FT. INTERIOR LIVING SPACE  
 400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

SCALE  
 1/8" = 1'-0"



DATE  
 07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
 ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
 OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.

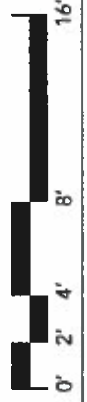


## WAIKAPU AFFORDABLE HOUSING

MODEL G - 2 STORY - DUPLEX, 3 BED RM. / 2 BATH - EACH  
 APPROX. 800 - 900 SQ. FT. INTERIOR LIVING SPACE  
 400 SQ. FT. OPTIONAL - TWO CAR GARAGE / CARPORT

artel INC.

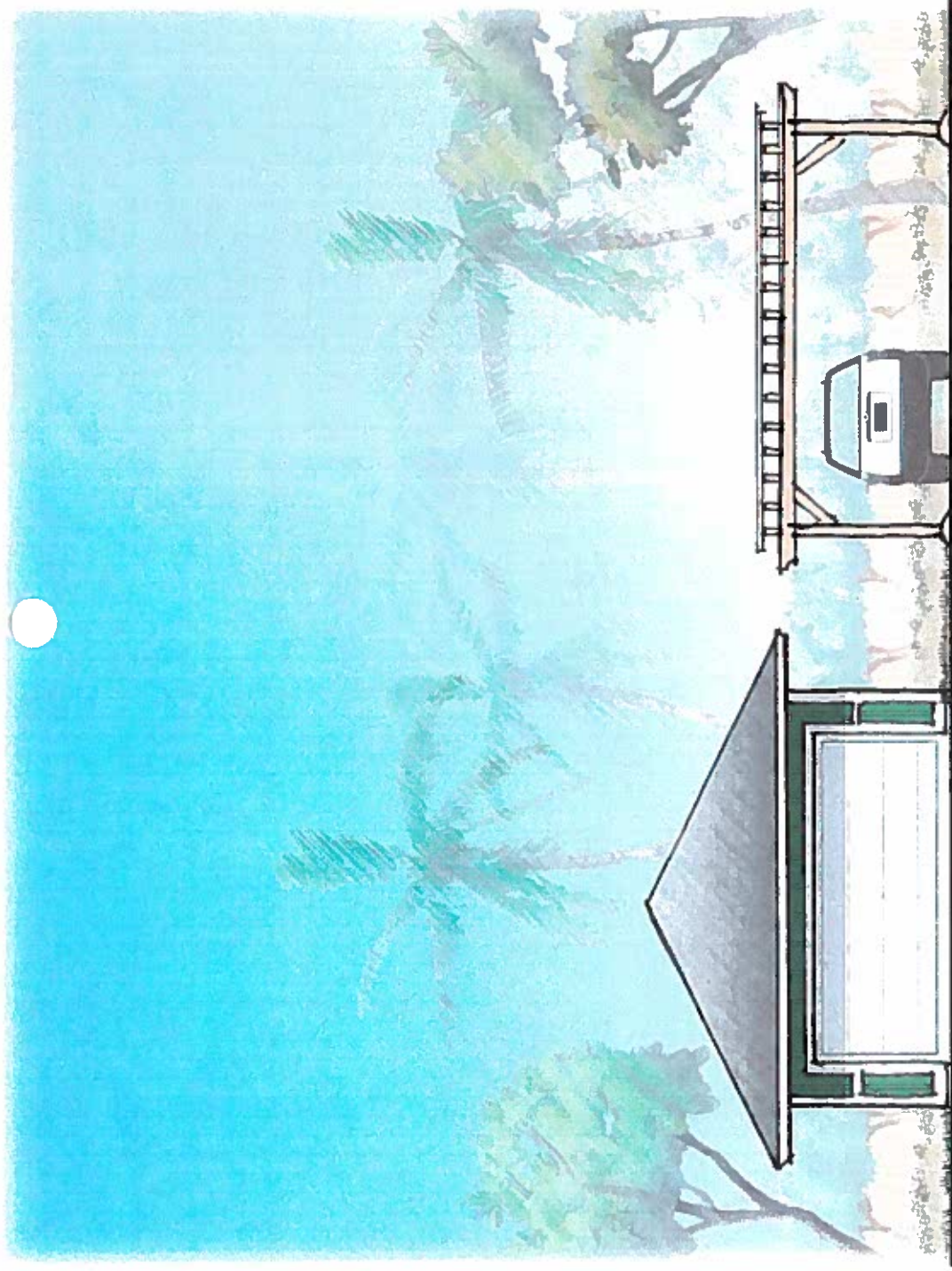
SCALE  
 $\frac{1}{8}" = 1'-0"$



DATE  
 07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
 ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
 OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.





## WAIKAPU AFFORDABLE HOUSING

DETACHED TWO CAR GARAGE OR CARPORT  
APPROX. 400 SQ. FT. GARAGE / CARPORT

artel INC.

SCALE  
1/8" = 1'-0"



DATE  
07-10-17

THIS DRAWING IS THE PROPERTY OF THE FIRM  
ARTEL INC. REPRODUCTION OR RE-USE IN WHOLE  
OR IN PART WITHOUT WRITTEN PERMISSION IS FORBIDDEN.

***Appendix L***

***Zoning and Flood  
Confirmation Form***





17/1321-SN

## ZONING AND FLOOD CONFIRMATION FORM

(This section to be completed by the Applicant)

APPLICANT NAME Vince BAGOYO

TELEPHONE (808) 257-3842

PROJECT NAME

E-MAIL vbagap-degroup@hawaii.com

PROPERTY ADDRESS WAILUKU, ISLAND OF MAUI

TAX MAP KEY (2) 3-5-002:011

☐ Yes ☒ No Will this Zoning & Flood Confirmation Form be used with a Subdivision Application?  
IF YES, answer questions A and B below and comply with instructions 2 & 3 below:

A) ☐ Yes ☒ No Will it be processed under a consistency exemption from Section 18.04.03(B), MOC?  
IF YES, which exemption? (No. 1, 2, 3, 4 or 5)

B) State the purpose of subdivision and the proposed land uses (ie 1-lot into 2-lots for all land uses allowed by law):

- INSTRUCTIONS:
- 1) Please use a separate Zoning & Flood Confirmation Form for each Tax Map Key (TMK) number.
  - 2) If this will be used with a subdivision application AND the subject property contains multiple district/designations of (1) State Land Use Districts, (2) Maui Island Plan Growth Boundaries, (3) Community Plan Designations, or (4) County Zoning Districts; submit a signed and dated Land Use Designations Map, prepared by a licensed surveyor, showing the metes & bounds of the subject parcel and of each district/designation including any subdistricts.
  - 3) If this will be used with a subdivision application AND the subject property contains multiple State Land Use Districts; submit an approved District Boundary Interpretation from the State Land Use Commission.

(This section to be completed by ZAED)

### LAND USE DISTRICTS/DESIGNATIONS (LUD) AND OTHER INFORMATION: <sup>1</sup>

☐ (SMA)

Special

Management Area

STATE DISTRICT: ☒ Urban ☐ Rural ☐ Agriculture ☐ Conservation

MAUI ISLAND PLAN Growth Boundary: ☒ Urban ☐ Small Town ☐ Rural ☐ Planned Growth Area ☐ Outside Growth Boundaries

Protected Area: ☐ Preservation ☐ Park ☐ Greenbelt ☐ Greenway ☐ Sensitive Land ☒ Outside Protected Areas

COMMUNITY PLAN: <sup>2</sup> Public/Quasi-Public

COUNTY ZONING: Public/Quasi-Public District

OTHER/COMMENTS:

FEMA FLOOD INFORMATION: A Flood Development Permit is required if any portion of a parcel is designated V, VE, A, AO, AE, AH, D, or Floodway, and the project is on that portion.

FLOOD HAZARD AREA ZONES <sup>3</sup>

& BASE FLOOD ELEVATIONS: Zone X

☐ FEMA DESIGNATED FLOODWAY

For Flood Zone AO, FLOOD DEPTH:

☐ (PD)

Planned  
Development

☐ (PH)

Project District

☐ See

Additional  
Comments (Pg.2)

☐ See

Attached LUD Map

SUBDIVISION LAND USE CONSISTENCY: ☐ Not Consistent, (LUDs appear to have NO permitted uses in common).

☐ Not Applicable, (Due to processing under consistency exemption No. ☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5).

(Signature)

☐ Interim Zoning, (The parcel or portion of the parcel that is zoned interim shall not be subdivided).

☐ <sup>4</sup> Consistent, (LUDs appear to have ALL permitted uses in common).

☐ <sup>4</sup> Consistent, upon obtaining an SMA, PD, or PH subdivision approval from Planning.

☐ <sup>4</sup> Consistent, upon recording a permissible uses unilateral agreement processed by Public Works (See Pg.2).

### NOTES:

- 1 The conditions and/or representations made in the approval of a State District Boundary Amendment, Community Plan Amendment, County Change in Zoning, SMA Permit, Planned Development, Project District and/or a previous subdivision, may affect building permits, subdivisions, and uses on the land.
- 2 Please review the Maui Island Plan and the Community Plan document for any goals, objectives, policies or actions that may affect this parcel.
- 3 Flood development permits might be required in zones X and XS for any work done in streams, gulches, low-lying areas, or any type of drainageway; Flood development permits are required for work in all other zones. Subdivisions that include/adjoin streams, gulches, low-lying areas, or any type of drainageway might require the following designations to be shown on the subdivision map: 100-year flood inundation limits; base flood elevations; drainage reserves.
- 4 Subdivisions will be further reviewed during the subdivision application process to verify consistency, unilateral agreement requirements, and the conditions associated with a unilateral agreement [Section 18.04.03.D, Maui County Code].

### REVIEWED & CONFIRMED BY:

For: John S Rapacz (Signature) 3/14/17 (Date)  
Planning Program Administrator, Zoning Administration and Enforcement Division



## *Appendix M*

### *ALISH Map*

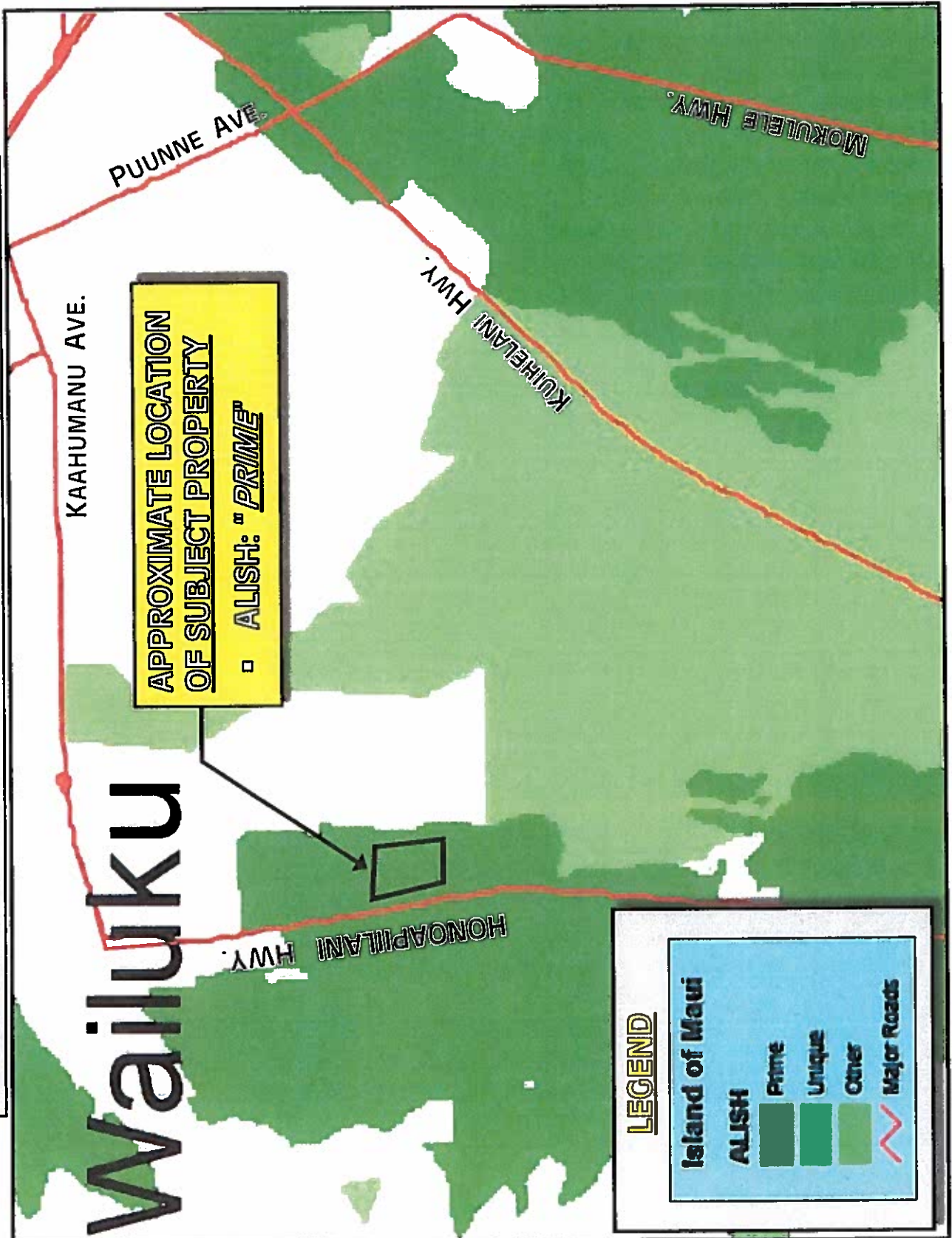




**SOURCE:** STATE OF HAWAII, OFFICE OF STATE PLANNING WEB-SITE  
STATE DEPARTMENT OF AGRICULTURE, 1977

**AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII ("ALISH")**

PROPOSED 201-H AFFORDABLE HOUSING PROJECT BY: WAIKAPU DEVELOPMENT VENTURES, LLC.  
LOCATED IN VICINITY OF WAIKAPU, ISLAND OF MAUI, HAWAII // TAX MAP KEY: (2) 3-5-002: 11 (portion)





***Appendix N***

***Phase I Environmental***

***Site Assessment***





Consultants, Inc.

## Environmental Site Assessment: *Phase I Investigation*



Subject Site:

UNDEVELOPED, AGRICULTURAL LAND  
Honoapiilani Highway  
(Southeast of Kuikahi Drive)  
Wailuku, Hawaii  
T.M.K. (2) 3-5-02:1

Prepared for:

EMMANUEL LUTHERAN CHURCH  
AND VALLEY ISLE FELLOWSHIP  
c/o Carlsmith Ball, LLP  
One Main Plaza, Suite 400  
2200 Main Street  
Wailuku, Hawaii 96793  
Attn: Mr. Tom Leuteneker

Conducted and Compiled by:

Vuich Environmental Consultants, Inc.  
VEC Project Number #0403-760  
May 14, 2004

*Notice:* Confidential and privileged client communication. Do not distribute, commingle, quote or duplicate without prior approval from the report recipients listed above. © 2004 VEC.





Consultants, Inc.

## Environmental Site Assessment: Phase I Investigation



**Property:** UNDEVELOPED, AGRICULTURAL LAND  
Honoapiilani Highway  
(Southeast of Kuikahi Drive)  
Wailuku, Hawaii  
T.M.K. (2) 3-5-02:1

**Prepared for:** EMMANUEL LUTHERAN CHURCH  
AND VALLEY ISLE FELLOWSHIP  
c/o Carlsmith Ball, LLP  
One Main Plaza, Suite 400  
2200 Main Street  
Wailuku, Hawaii 96793  
Attn: Mr. Tom Leuteneker

*I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared by the investigator under direct supervision and provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances.*

  
Joseph Beaulieu, Site Investigator

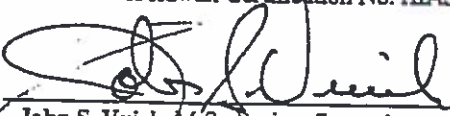
- B.A. (Environmental Science and Geography)

5/13/04  
Date

  
Jeffrey E. Kermode, Project Manager

- B.A. (Geography), B.Tech. (Environmental Engineering)
- Lead-Based Paint Inspector (EPA Accredited Course)  
EPA Certification No. HI-03-0920045008
- Asbestos Building Inspector (AHERA Accredited Course)  
State of Hawaii Certification No. HIASB-0351

5/13/04  
Date

  
John S. Vuich, M.S., Project Supervisor  
➤ Registered Environmental Assessor  
Registration No. 1433 (State of California)

5/13/04  
Date

# Table of Contents

TABLE OF CONTENTS.....	I
DISCLOSURE.....	III
EXECUTIVE SUMMARY.....	IV
1.0 INTRODUCTION.....	1
1.1 PURPOSE.....	1
1.2 DETAILED SCOPE OF SERVICES.....	1
1.3 SIGNIFICANT ASSUMPTIONS.....	1
1.4 LIMITATIONS AND EXCEPTIONS.....	1
1.5 SPECIAL TERMS AND CONDITIONS.....	2
2.0 SITE AND REGIONAL DESCRIPTION.....	3
2.1 LOCATION AND LEGAL DESCRIPTION.....	3
2.2 SITE AND VICINITY GENERAL CHARACTERISTICS.....	3
2.3 DESCRIPTION OF STRUCTURES, ROADS, OTHER IMPROVEMENTS.....	3
2.4 CURRENT USE OF THE PROPERTY.....	3
2.5 CURRENT USES OF THE ADJOINING PROPERTIES.....	4
3.0 USER PROVIDED INFORMATION.....	5
4.0 RECORDS REVIEW.....	6
4.1 STANDARD ENVIRONMENTAL RECORD SOURCES.....	6
4.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES.....	7
4.3 PHYSICAL SETTING SOURCE(S).....	10
4.4 HISTORICAL USE INFORMATION REGARDING THE PROPERTY AND ADJOINING PROPERTIES.....	10
5.0 SITE RECONNAISSANCE.....	12
5.1 METHODOLOGY AND LIMITING CONDITIONS.....	12
5.2 GENERAL SITE SETTING.....	12
5.2.1 <i>Current and Past Use(s) of the Property</i> .....	12
5.2.2 <i>Current and Past Uses(s) of the Adjoining Properties and Surrounding Area</i> .....	13
5.2.3 <i>Topography</i> .....	14
5.2.4 <i>Geology and Soils</i> .....	14
5.2.5 <i>Hydrology</i> .....	14
5.2.6 <i>Hydrogeology</i> .....	14
5.2.7 <i>Potable Water Supply and Sewage Disposal System</i> .....	15
5.3 INTERIOR AND EXTERIOR OBSERVATIONS.....	15
5.3.1 <i>Hazardous/Regulated Substances and Petroleum Products in Connection with Identified Uses</i> .....	15
5.3.2 <i>Hazardous/Regulated Substances and Petroleum Products/Containers (not in connection with identified current uses)</i> .....	16
5.3.3 <i>Unidentified Substance Containers</i> .....	16
5.3.4 <i>Storage Tanks</i> .....	16
5.3.5 <i>Odors</i> .....	16
5.3.6 <i>Pools of Liquid</i> .....	16
5.3.7 <i>Indications of PCBs</i> .....	16
5.4 INTERIOR OBSERVATIONS.....	17
5.4.1 <i>Heating and Cooling Systems of On-site Building Structures</i> .....	17
5.4.2 <i>Stains and Corrosion</i> .....	17
5.4.3 <i>Indoor Wastewater Drains, Sumps and Grease Interceptors</i> .....	17
5.5 EXTERIOR OBSERVATIONS.....	17
5.5.1 <i>Pits, Ponds, and Lagoons</i> .....	17
5.5.2 <i>Stained Soil or Pavement</i> .....	17
5.5.3 <i>Stressed Vegetation</i> .....	17
5.5.4 <i>Solid Waste</i> .....	17
5.5.5 <i>Wastewater or Storm Water – Discharge Drains, Dry Wells, Drainage Ways, and Retention Basins</i> .....	18

5.5.6 Wells .....	18
5.5.7 Septic and Cesspool Systems .....	18
5.6 NON-SCOPE CONSIDERATIONS .....	18
5.6.1 Asbestos-Containing Materials (ACM) .....	18
5.6.2 Lead-Based Paint .....	19
5.6.3 Arsenic-Containing Substances .....	20
5.6.4 Radon .....	20
5.6.5 Lead in Drinking Water .....	20
5.6.6 Ecological Resources, Endangered Species, Cultural and Historic Resources, and Wetlands .....	20
5.6.7 Indoor Air Quality .....	21
5.6.8 High Voltage Transmission Lines .....	22
6.1 RECOGNIZED ENVIRONMENTAL CONDITIONS .....	23
6.1.1 Database Listings (See Section 4.0 & EDR Report, Appendix B) .....	23
6.1.2 Current and Historic Use or Storage of Hazardous and Regulated Substances (See Section 5.3.2) .....	23
6.2 OTHER ENVIRONMENTAL CONCERNS .....	24
6.2.1 Solid Waste Management (See Section 5.5.4) .....	24
6.2.2 Surface Waters and Area Aquifer Protection (See Section 5.5.5) .....	24
7.0 REFERENCES .....	25
7.1 PUBLISHED REFERENCES .....	25
7.2 MAP AND OTHER REFERENCES .....	26
7.3 RECORD OF PERSONAL COMMUNICATIONS .....	26
APPENDIX A: .....	27
MAPS, PLANS, AND PHOTOGRAPHS .....	27
APPENDIX B: .....	28
REGULATORY RECORDS DOCUMENTATION .....	28
SITE SPECIFIC DOCUMENTATION .....	28
APPENDIX C: .....	29
QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS .....	29
APPENDIX D: .....	30
ACRONYMS AND ABBREVIATIONS .....	30



End of Section



## Disclosure

This document contains the results of services performed on this Project by **Vuich Environmental Consultants, Inc. (VEC)** pursuant to Agreement. The results represent the application of a variety of scientific and analytical disciplines that have been rendered using the standard of care, skill, and diligence normally provided by professionals in the performance of similar services under similar circumstances.

VEC assessments are intended to reduce, but not eliminate, uncertainty regarding recognized environmental conditions in connection with the Subject Site, as conducted within reasonable limits of time and cost. A general consensus of EPA's guidance on landowner liability is that *no environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property.*

The use of this document and the results reported are limited to the services performed and areas examined as described in this document and no inferences are intended with respect to anything not described herein.

VEC is not responsible for conditions or consequences arising from relevant data, facts, and information that were concealed, missing, withheld, not fully disclosed, or not reasonably available at the time these services were performed. VEC is not responsible for any indirect, incidental, or consequential damages of any nature arising from any cause.

VEC has no beneficial economic interest in the Project other than as an independent professional organization performing the agreed services. VEC's warranties are as described above and there are no other warranties of any kind, expressed or implied, regarding the services.

## 2.0 SITE AND REGIONAL DESCRIPTION

Refer to Figure 1, Regional Setting Map, in Appendix A, for a depiction of the general site setting of the subject property in relation to topographic features. Also depicted are the projected groundwater flows, regional surface water flows, and locations of other significant physical features or structures.

### 2.1 Location and Legal Description

The subject site is located one (1) mile south of the community of Wailuku, Maui, Hawaii. It lies on the east side of Honoapiilani Highway, southeast of the intersection of Kuikahi Drive. The site is further described on the Tax Maps of the State of Hawaii as a portion of Division 2, Zone 3, Section 5, Plat 02, Parcel 01 (See Figure 3, Appendix B). Property access is from Honoapiilani Highway and Waiale Road.

### 2.2 Site and Vicinity General Characteristics

The property consists of two (2) parcels of land, irregular in shape, measuring approximately twenty-five (25) acres each. The property is essentially agricultural land. Small tenant farmers use approximately eighty (80) percent of the property with the remainder being fallow fields. The predominant vegetation consists of tall grasses, fruit trees and mixed agricultural fields (See Figure 2, Appendix A). No commercial or industrial activities are currently taking place on the subject site.

The northern adjoining property is being used temporarily as a construction field office area for Goodfellow Brothers. Beyond this to the north is Kuikahi Drive. The eastern adjoining property is the future Waikapu Bypass beyond which are a commercial nursery and a former county landfill. Some trenching and earth moving has begun for this future roadway. The southern adjoining property consists of fallow fields. The Honoapiilani Highway is located along the western property boundary beyond which is fallow agricultural land. (See Figure 2, Appendix A).

Wailuku is Maui's traditional population center located on the eastern slopes of the West Maui Mountains. (See Figure 1, Appendix A). Kahului Bay on the Pacific Ocean is located approximately two (2) miles northeast of the subject property.

### 2.3 Description of Structures, Roads, Other Improvements

A network of unpaved agricultural roads has been established on the property. Several building structures were located on-site at the time of VEC's site reconnaissance. The majority of these are wood frame and plywood banana shacks. Two (2) more substantial buildings appeared to be residential. Several chicken coops were also located on site (See Figure 2 and Photo # 1, 15, and 16, Appendix A).

### 2.4 Current Use of the Property

The subject site consists primarily of mixed use tenant farming operations and heavily vegetated fallow agricultural land. No commercial or industrial activities are currently being conducted on-site. Some banana shacks located on-site appear to be residential in nature. The Maui County Planning Department currently describes the land's zoning as "Agricultural".

## 2.5 Current Uses of the Adjoining Properties

The current uses of the adjoining properties as observed by the investigator during the site reconnaissance are as follows (see also Figure 2, Site Plan, in Appendix A):

▪ <i>Northern Adjoining Property:</i>	Goodfellow Brothers construction office area beyond which is Kuikahi Drive.
▪ <i>Eastern Adjacent Property:</i>	Planned Waikapu Bypass, beyond which is a plant nursery and a former county landfill (Waikapu Landfill).
▪ <i>Southern Adjoining Property:</i>	Fallow agricultural land.
▪ <i>Western Adjacent Property:</i>	Honoapiilani Highway, beyond which is fallow agricultural land.



End of Section



### 3.0 USER PROVIDED INFORMATION

a standard of practice, the following information was requested from the Client during the preliminary phases of this investigation:

- Title records and knowledge of environmental liens;
- Personal, specialized knowledge or experience in regard to *recognized environmental conditions* concerning the property; and
- If applicable, actual knowledge of a significant, low purchase price for the property, and explanation for the lower price.

The purpose of this information is to help identify the possibility of *recognized environmental conditions* in connection with the property. These tasks do not require the technical expertise of an environmental professional and are generally not performed by environmental professionals performing the Phase I ESA. VEC submits a Preliminary Environmental Investigation questionnaire to the Client for this information. The completed questionnaire is attached in Appendix B.

According to information provided by the Client in the Preliminary Environmental Investigation, the Client is not aware of any environmental liens, proceedings, or investigations *against* the subject property as of the date of this ESA.



End of Section

## 4.0 RECORDS REVIEW

The purpose of a record review is to obtain and review records that will help identify *recognized environmental conditions* in connection with the subject property. The service of Environmental Data Resources, Inc. (EDR) was utilized to compile the database listings.

### 4.1 Standard Environmental Record Sources

The subject property and properties within the minimum search distances were reviewed from the following record sources (see below). Risk sites, if any, that may be located on or adjacent to the subject property, or are within close proximity to the subject site are described. Refer to Appendix B, EDR Radius Map Report, for a complete listing and description of all sites located within the designated search distances, details, and government agency database release dates.

The EDR Report bases the location of the listed risk sites on longitude/latitude information provided by the respective government agency. VEC confirms the locations of risk sites within close proximity to the subject site during the site visit. When the VEC site visit contradicts the EDR Report, it has been so stated.

**THE SUBJECT SITE IS NOT LISTED ON ANY OF THE FOLLOWING FEDERAL OR STATE DATABASE LISTINGS OF THE EDR REPORT.**

#### *Federal Database Listings*

- ▼ **National Priorities List (NPL or Superfund) and Proposed NPL, EPA.** The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program.
  - *The EDR database report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Comprehensive Environmental Response, Compensation and Liability Information System List (CERCLIS), EPA.** The CERCLIS list contains data on potentially hazardous waste sites that have been reported to EPA by states, municipalities, private companies and private persons, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites that are either proposed to or on the NPL and sites, which are in the screening and assessment phase for possible inclusion on the NPL.
  - *The EDR Report indicates no listing within the 1/2-mile search radius of the subject site.*
- ▶ **CERCLIS – No Further Remedial Action Planned (NFRAP), EPA.** NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.
  - *The EDR Report indicates one (1) listing within the 1/4-mile search radius of the subject site.*

The EDR Report (amended) indicates one (1) listing within the 1/4-mile search radius of the subject site. The former Maui County Waikapu Dump is located immediately southeast of the subject site. See the amended EDR Report, Appendix B. CERCLIS listings indicate facilities that have a known or suspect abandoned, inactive or uncontrolled hazardous waste site.
- ▼ **Corrective Action Report (CORRACTS), EPA.** The CORRACTS report lists hazardous waste handlers with RCRA corrective action activity.
  - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Resource Conservation and Recovery Information System (RCRIS), EPA/NTIS.** RCRIS includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

- The EDR Report indicates no listings of RCRIS treatment, storage and disposal (TSD) site within the 1/2-mile search radius of the subject site.
- The EDR Report indicates no listing for the subject property and no listing for a RCRIS large quantity generators within the 1/4-mile search radius of the subject site. Large quantity generators are entities that generate at least 1,000 kg/month of non-acutely hazardous waste or 1.0 kg/month of acutely hazardous waste (Lg. Quan. Gen. - LQG).
- The EDR Report indicates no listing for the subject property and no listings for a RCRIS small quantity generator (Sm. Quan. Gen. - SQG) within 1/4-mile of the subject site. RCRIS small quantity generators are entities that generate less than 1,000 kg/month of non-acutely hazardous waste.

▼ **Emergency Response Notification System (ERNS), EPA/NTIS.** Records and stores information on reported releases of oil and hazardous substances.

- The subject site is not listed.

#### **State of Hawaii Database Listings**

► **Sites List (SHWS), DOH.** A list of facilities, sites, or areas in which the Office of Hazard Evaluation and Emergency Response (HEER) has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

- The subject site is not listed.
- The EDR Report indicates one (1) listing within the 1-mile search radius of the subject site.

The Waiale Ash Pile is located northeast of the subject property (See EDR report, Appendix B). Also, see CERCLIS (NFRAP) listing above.

► **Permitted Landfills in the State of Hawaii (SWF/LF), DOH.** An inventory of solid waste disposal facilities or landfills in the State of Hawaii. These may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

- The subject site is not listed.
- The EDR Report indicates no listing within the 1/2-mile search radius of the subject site.

See amended EDR Report, Waikapu Dump (Appendix B) and CERCLIS (NFRAP) listing above.

▼ **Leaking Underground Storage Tank (LUST) database, DOH.** An inventory of reported leaking underground storage tank incidents.

- The subject site is not listed.
- The EDR Report indicates no listings within a 1/2-mile radius of the subject site.

▼ **Underground Storage Tank (UST) database, DOH.** USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with DOH.

- The subject site is not listed.
- The EDR Report indicates no listings within 1/4-mile of the subject property.

#### **4.2 Additional Environmental Record Sources**

The subject property and properties within the minimum search distances were reviewed from the following record sources. Refer to Appendix B, EDR Radius Map Report, for a complete listing and description of all sites located within the designated search distances, details, and database release dates.



### *Federal Database Listings*

- ▼ **Superfund (CERCLA) Consent Decrees (CONSENT), EPA Regional Offices.** Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites.
  - *The subject site is not listed.*
  - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Records of Decisions (ROD), EPA.** ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.
  - *The subject site is not listed.*
  - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **National Priority List Deletions (De-listed NPL), EPA.** A list of sites that have been deleted from the NPL where no further response is appropriate.
  - *The subject site is not listed.*
  - *The EDR Report indicates no listings within the one-mile search radius of the subject site.*
- ▼ **Facility Index System/Facility Identification Initiative Program Summary Report (FINDS), EPA.** Contains both facility information and 'pointers' to other sources that contain more detail.
  - *The subject site is not listed.*
- ▼ **Hazardous Materials Information Reporting System (HMIRS) DOT.** A list of hazardous material spill incidents reported to DOT.
  - *The subject site is not listed.*
- ▼ **Material Licensing Tracking System (MLTS), Nuclear Regulatory Commission (NRC).** A list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements.
  - *The subject site is not listed.*
- ▼ **Mines Master Index File (MINES), Department of Labor, Mine Safety and Health Administration.** Contains both facility information and 'pointers' to other sources that contain more detail.
  - *The subject site is not listed.*
  - *The EDR Report indicates no listings within the 1/4-mile search radius of the subject site.*
- ▼ **Federal Superfund Liens (NPL Liens), EPA.** A list of properties whereby the EPA has filed liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability.
  - *The subject site is not listed.*
- ▼ **PCB Activity Database System (PADS).** Identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify EPA of such activities.
  - *The subject site is not listed.*
- ▼ **RCRA Administrative Action Tracking System (RAATS), EPA.** A historical archived database containing records on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by EPA. The database was discontinued on September 30, 1995.
  - *The subject site is not listed.*
- ▼ **Toxic Chemical Release Inventory System (TRIS), EPA.** A list of facilities which release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III, Section 313.
  - *The subject site is not listed.*

- ▼ **Toxic Substances Control Act (TSCA), EPA.** Identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list.
  - *The subject site is not listed.*
- ▼ **Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/TSCA Tracking System (FTTS INSP and FTTS), EPA – Office of Prevention, Pesticides and Toxic Substances.** FTTS tracks administrative cases, pesticide enforcement actions, and compliance activities related to FIFRA, TSCA, and Emergency Planning and Community Right-to-Know Act (EPCRA).
  - *The subject site is not listed.*

#### *State of Hawaii Database Listings*

- ▼ **Release Notifications (SPILLS), DOH.** Releases of hazardous substances to the environment reported to the HEER Office. The following databases are included in the HEER Spill List:  
 Release Notification Report: a compilation of releases reported to HEER.  
 Hawaii Emergency Planning and Community Right-to-Know Act (HEPCRA): a list of facilities that have submitted Tier II and Form Rs as a reporting requirement.
  - *The subject site is not listed.*
- ▼ **Registered Wells and Dry Wells, DLNR.** (See Section 5.5.6). There are no registered wells listed for the subject property. (2002 DLNR data).
- ▼ **Air Quality Permit, DOH.** Current activities conducted on-site do not require an air quality permit.
- ▼ **Storm Water Discharge (NPDES) Permit, DOH.** Current activities conducted on-site do not require a NPDES permit.

#### *County and Other Database Listings*

Other local records of environmental interest that were reviewed or considered for review by VEC included:

- ▼ **Fire Department, County of Maui.** The Maui County Fire Department (MCFD) maintains file material that is not on a database. MCFD was contacted for an inquiry on the subject property.
- ▼ **Former Manufactured Gas (Coal Gas) Sites.** EDR provides exclusive information regarding the existence and location of Coal Gas sites.
  - The EDR Report indicates no listings within the one-mile search radius.
- ▼ **Grading/Grubbing Permit, County of Maui.** The current activities being conducted on-site do not require a grading/grubbing permit.
- ▼ **Hazardous Waste Disposal Documents.** VEC did not review any hazardous waste disposal documents.
- ▼ **Maui Electric Company.** Maintains records on county power transformers regarding PCB-containing equipment and equipment maintenance. One (1) pole-mounted electrical transformer was observed at the northeast corner of Lot 1 of the subject property (See Photo #20 and Figure 2, Appendix A).
- ▼ **Other Environmental Reports.** Environmental site assessment reports that were previously completed by VEC in close proximity to the subject site were reviewed.
- ▼ **Planning & Zoning, County of Maui.** According to the Maui County Department of Planning, the subject site's zoning is "Agricultural" and is not within the boundaries of the Special Management Area (SMA).

- ▼ **Property Tax Office, County of Maui.** The Maui County Property Tax Office maintains records of past ownership, maps, sketches and other information as it pertains to the subject property. (See also Section 7.1). The property owner is listed as Wailuku Agribusiness Company, Inc.
- ▼ **Wastewater Discharge Permit, County of Maui.** VEC did not identify any wastewater discharge permits registered to the subject property.

#### **4.3 Physical Setting Source(s)**

The following sources were reviewed for physical setting information (refer to Section 7.0 for a complete listing):

- Atlas of Hawaii;
- Civil Defense Tsunami Evacuation Map;
- Geologic and Topographic Map (Hawaii Atlas & Gazetteer);
- Groundwater Map and Water Quality Plan for State of Hawaii;
- U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, HI;
- U.S. Geological Survey, 7.5 Minute Topographic Map, Wailuku Quadrangle, 1983.

These data sources were used to provide information regarding physical characteristics of the subject site and surrounding area. This information is typically used in analysis of potential geological trends, which might impact environmental conditions of the subject site. Note that this investigation is not intended to identify geologic hazards associated with the subject property.

#### **4.4 Historical Use Information Regarding the Property and Adjoining Properties**

The following historical data sources were reviewed for this report (refer to Section 7.0 for a complete listing):

- Aerial Photographs;
- Department of Planning and Zoning, County of Maui;
- Maui County Fire Department (Fire Prevention Bureau / Hazardous Materials Division);
- Maui County Real Property Tax Records;
- Personal Interviews;
- Sanborn Maps (no coverage);
- State of Hawaii, Department of Health, Environmental Management Division;
- Environmental Data Resources (EDR).



## Historic Aerial Photographs

A series of aerial photographs with coverage of the subject property and surrounding areas were examined. See Figure 2, Appendix A, for clarification of specific locations.

Table 1.0 Historical Aerial Photograph Analysis		
Date	Aerial Photo Analysis	
12/20/50	SS: N, S, W: E: RG:	Agricultural land use (sugarcane). Agricultural land use (sugarcane). Undeveloped vegetated land. Agricultural land use with undeveloped land to the east.
6/2/64	SS: N, E, S, W: RG:	No changes noted. No changes noted. No changes noted.
1/30/77	SS: N, S, W: E: RG:	No changes noted. No changes noted. Agricultural land use (sugarcane). County landfill noted to the southeast. Water tank noted to the northeast.
9/11/85	SS: N: E, S, W: RG:	No changes noted. Kuikahi Drive added. No changes noted. Agricultural land with increasing residential growth.
10/8/90	SS: N, S, W: E: RG:	Crop changed from sugarcane to pineapple. Crop changed from sugarcane to pineapple. Agricultural land use changed to commercial nursery. County landfill appears to be closed. Agricultural land with increasing residential.
5/3/97	SS: N, S, W: E: RG:	Agricultural use has changed to small fields with banana shacks evident. No changes noted. Agricultural use has changed to small fields with banana shacks evident. Agricultural use with increased residential development.
<b>Notes:</b> SS: Subject Site N: Northern Adjoining Property E: Eastern Adjoining Property S: Southern Adjoining Property W: Western Adjoining Property RG: Regional Area		

VEC did not observe any features on aerial photographs examined that would suggest the presence of significant vegetative stress, soil staining, or bulk storage of chemicals such as drums or tanks.



End of Section

the groundwater management area as the *Iao Aquifer System* within the *Wailuku Aquifer Sector*. The groundwater underlying the subject site is defined as follows:

Table 4.0. Aquifer Classification of the subject site						
Aquifer	Aquifer Type: Hydrology & Geology	Status of Groundwater				
		Development Status	Utility	Salinity (mg/L Cl)	Uniqueness	Vulnerability to Contamination
Upper	Unconfined basal aquifer occurring in horizontally extensive lavas (Flank)	Currently Used	Drinking	Fresh	Irreplaceable	High

The following are descriptions of the aquifer classification codes, according to Water Quality Plan of 1992:

*Aquifer Type Hydrogeology* (basal, high level, unconfined, confined, or confined/unconfined: basal – freshwater in contact with seawater; *high level* – freshwater not in contact with seawater; *unconfined* – water table is the upper surface of the saturated aquifer; *confined* – aquifer is bounded by impermeable or poorly permeable formations; and *confined or unconfined* – the actual condition is uncertain.

*Aquifer Type Geology*: flank, dike, flank/dike, perched, dike/perched, and sedimentary.

*Development Stage* – *currently used, potential use, no potential use*: Aquifers are differentiated according to those already being used (currently used), those with potential utility (potential use), and those having no potential for development.

*Utility* – *drinking, ecologically important, neither*: Identifies aquifers by use.

*Salinity* – *fresh, low, moderate, high and seawater*: The gradation of groundwater from fresh to seawater is a feature of all basal aquifers in Hawaii. The upper limit of the standard for drinking water is 250 mg/l Chlorine (Cl) (fresh) and true seawater has a chloride content of 18,980 mg/l.

*Uniqueness* – *irreplaceable and replaceable*: The classes irreplaceable and replaceable are direct EPA derivatives. Virtually all-potable water in the state of Hawaii should be considered irreplaceable over the long term.

*Vulnerability to Contamination* – *high, moderate, low, none*: Because of the geographical limits of resources, interconnection among groundwater sources and the relatively rapid time of groundwater travel, aquifers can be described as being either vulnerable or not vulnerable to contamination.

The estimated depth to the basal groundwater ranges from approximately 300 to 350 feet below the ground surface, depending on the location on the subject property. The flow direction is expected to be in an easterly direction.

The subject site is located makai (below) of the Underground Injection Control (UIC) line. The UIC line is the designated boundary that divides protected inland areas situated over drinking water sources from seaward areas located over non-potable water sources. Sites makai of the UIC line are not considered drinking water sources and permit limitations are imposed by Maui County, Clean Water Branch (CWB).

### 5.2.7 Potable Water Supply and Sewage Disposal System

The property is undeveloped at this time. The shacks on-site could not be accessed to determine what water supply and sewage disposal systems they used, if any.

## 5.3 Interior and Exterior Observations

### 5.3.1 Hazardous/Regulated Substances and Petroleum Products in Connection with Identified Uses.

VEC did not identify any hazardous/regulated substances and/or petroleum products in connection with identified current uses as visually and physically observed on the property at the time of the site visit. However, VEC was limited in their investigation of the entire site (See Section 1.4). While no bulk storage



of regulated substances was observed, it should be noted that small farming operations, like those observed on-site, do commonly use fertilizers and pesticides. VEC observed limited containers of petroleum products that were empty. No bulk storage of petroleum products and associated soil staining was noted.

#### **5.3.2 Hazardous/Regulated Substances and Petroleum Products/Containers (not in connection with identified current uses).**

VEC did not identify any hazardous/regulated substances and/or petroleum products that are not in connection with identified current uses as visually and physically observed on the property at the time of the site visit. There is no evidence of any historic misuse, improper bulk storage, or significant spills of hazardous or regulated substances on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

A review of the historical information identified the subject property to be part of the Wailuku Sugar Company's Plantation that has been operating in this area for several decades. It was also discovered that Maui Land and Pineapple company leased the property for pineapple cultivation for several years up until 1998. Hazardous materials potentially associated with sugarcane and pineapple cultivation include pesticides and herbicides. The U.S. Environmental Protection Agency (EPA) has long recognized these chemicals as a contaminant to surface soils and ground water. Clayton Suzuki, Land Manager for Wailuku Agribusiness has provided a list of chemicals potentially used on site (See letter in Appendix B).

#### **5.3.3 Unidentified Substance Containers**

VEC did not observe any unidentified substances suspected of being possible hazardous/regulated substances or petroleum products as visually and physically observed on the property at the time of the site visit.

#### **5.3.4 Storage Tanks**

No indication regarding the historic or current presence of underground storage tanks (USTs) on the subject site was obtained through our review of regulatory databases, interviews or through VEC's site reconnaissance.

#### **5.3.5 Odors**

VEC identified no suspect odors on the subject property.

#### **5.3.6 Pools of Liquid**

The investigators did not observe any pools or sumps of liquids likely to be hazardous substances or petroleum products to the extent visually and/or physically observed on the subject property at the time of the site visit or from interviews or records review.

#### **5.3.7 Indications of PCBs**

Pole or pad-mounted transformers numbered 7777 or above are considered non-PCB containing by the Maui Electric Company. One (1) pole-mounted electrical transformer was observed on the subject property at the northeast corner of Lot 1. This transformer was determined to be non-PCB containing based on its ID number (See Photo # 20 and Figure 2 in Appendix A). This transformer appeared to be in good condition with no sign of leaking or staining.

#### ***Background Information:***

Polychlorinated biphenyls (PCBs) are groups of manufactured organic chemicals that contain 209 individual chlorinated chemicals (known as congeners) and were introduced in 1929. PCBs have been used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. Products

containing PCBs are old fluorescent lighting fixtures, electrical appliances containing PCB capacitors, old microscope oil, and hydraulic fluids.

The manufacture of PCBs stopped in the United States in 1977 because of evidence that they build up in the environment and cause harmful effects. The distribution in commerce of PCB containing items was banned in 1979 (40 CFR 761.20). The EPA aggressively enforces regulations concerning PCB manufacturing, use, distribution, release and disposal under the Toxic Substance Control Act (TSCA). This federal agency extensively regulates the use, servicing, and disposal of PCBs in electrical equipment by enforcing marking, notification, inspection, and record keeping requirements.

## **5.4 Interior Observations**

### **5.4.1 Heating and Cooling Systems of On-site Building Structures**

VEC identified several small shacks related to the tenant farming activities that did not have any heating or cooling systems. However, VEC was limited in their investigation of the entire site (See Section 1.4).

### **5.4.2 Stains and Corrosion**

VEC did not identify any significant staining or corrosion in the shacks on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

### **5.4.3 Indoor Wastewater Drains, Sumps and Grease Interceptors**

No drains, sumps or grease interceptors were noted by VEC during the site reconnaissance.

## **5.5 Exterior Observations**

### **5.5.1 Pits, Ponds, and Lagoons**

There were no areas identified as man-made or natural depressions that are, or would have been, likely to hold waste liquids or sludge from industrial operations or other activities.

### **5.5.2 Stained Soil or Pavement**

No significant petroleum-like staining was noted on the subject property. However, VEC was limited in their investigation of the entire site (See Section 1.4).

### **5.5.3 Stressed Vegetation**

There were no areas of stressed vegetation identified on the subject property at the time of the site visit that are, or would have been, likely caused from something other than insufficient water (or flooding).

### **5.5.4 Solid Waste**

There were no indications of significant solid waste dumping or suspect fill materials, mounds, depressions or excavations, observed on this property during the site reconnaissance, nor on historic aerial photographs. Historical on-site disposal practices are unknown. A limited amount of earth moving and filling activities have been undertaken by Goodfellow Brothers in the northeast corner of Lot 1. This is related to adjacent infrastructure improvements and is not considered a significant environmental concern. Agricultural tilling and grading has taken place on the subject property.

The following solid wastes were noted during the site reconnaissance (See Photos #4, #17, #19, #21):

- Landscape debris (i.e. tree limbs, palm fronds, grasses, shrubs, etc.);
- Construction debris (i.e. concrete, lumber, metal, plastics);
- Soil stockpiles of less than 10 square meters (no odors or staining were detected);
- Road material stockpile of less than 10 square meters (tarmac odor detected);

- White goods (discarded washers, dryers or refrigerators, etc.);
- Several abandoned vehicles are located on the subject property.

Some wastes may be considered "Special Wastes" according to the Hawaii Administrative Rules (HAR) on Solid Waste, Title 11, Chapter 58.1. Special wastes are those wastes that do not fit in the mixed municipal solid waste (MMSW) category, either by general nature or because of special handling requirements. Special waste categories include: asbestos, sludge, medical waste, used oil, batteries, agricultural wastes, tires, derelict vehicles and white goods (i.e., appliances). Locally, the County of Maui, Department of Public Works, Solid Waste Division administers the disposal of these materials. These wastes need to be disposed of in a permitted solid waste landfill such as the Maui County Central Landfill. Special wastes' management needs to be performed in a manner that complies with all local, state, and federal regulations as applicable to the specific waste type.

#### 5.5.5 Wastewater or Storm Water – Discharge Drains, Dry Wells, Drainage Ways, and Retention Basins

VEC did not identify any storm water drains located along the property boundaries. Some ditches and sewer manholes were noted along the eastern property boundary. These relate to the future Waikapu Bypass (See Figure 2, Appendix A).

Any future grubbing or grading activity that may take place on the subject site (especially if > 1 acre of soil disturbance) will likely require, both a Maui County Grading Permit and a Department of Health, Clean Water Branch, NPDES (National Pollutant Discharge Elimination System) permit.

#### 5.5.6 Wells

From VEC's observations and database search, there are no production, domestic, abandoned, irrigation or monitor wells located on the subject site. Wells located near the subject property are mainly used for irrigation purposes or are unused at this time. See Figure 1, Appendix A for well locations.

#### 5.5.7 Septic and Cesspool Systems

VEC did not obtain evidence of any current or historic septic or cesspool system located on the subject site. However, VEC was limited in their investigation of the entire site (See Section 1.4).

### 5.6 Non-Scope Considerations

The concerns listed below are not normally considered relevant under CERCLA, however, they may be considered regulated under other environmental laws and ordinances and may present a potential liability to the property owner.

#### 5.6.1 Asbestos-Containing Materials (ACM)

The on-site structures inspected by VEC did not appear to consist of any asbestos-containing building materials. VEC did not note any significant quantities of construction debris that may contain asbestos. However, VEC was limited in their investigation of the entire site (See Section 1.4).

#### *Background Information:*

Asbestos was widely used in building materials and in fire retardant applications up through the 1980s. Asbestos use in the United States did not start to decline until the EPA banned the spray-applied materials during 1973-1978. Further restrictions on U.S. manufactured asbestos products continued into the 1990s. The EPA ban rule and phase-out of all asbestos-containing materials (ACMs) was to be implemented in stages from 1990 to 1997, but the Rule was overturned in federal court.

Asbestos is a known health hazard causing progressive lung scarring and cancer. Asbestos related conditions usually develop within 15 to 40 years after exposure. Exposed smokers have an increased risk factor of 50 to 90 times that of the non-smoking population.



State and federal rules have established standards for the use and control of ACM. These standards apply to worker protection, notification procedures, renovation/demolition activities, and construction debris (waste) management.

Under the EPA's Asbestos Hazard Emergency Response Act (AHERA), 40CFR763, asbestos-containing material (ACM) is defined as any substance whose asbestos content exceeds one percent (1%) of the total volume as determined by Polarized Light Microscopy (PLM) analysis. Building inspector training, sampling procedures and laboratory analysis are also addressed under this rule. Some aspects of this rule have been extended to public and commercial buildings. The Hawaii Administrative Rules 11-502 have essentially adopted EPA's AHERA standard.

Current OSHA regulations for occupational exposure to asbestos hazards require commercial building owners to *presume* all thermal system insulation, sprayed or textured surfacing materials and asphaltic and vinyl flooring installed in buildings constructed before 1981 to contain ACM. The Federal Occupational Safety and Health Act (OSHA) Construction Standard for Asbestos requires that building owners communicate any potential or actual asbestos hazards (29CFR1926.1101(k)). Owner/Operators must inform in-house employees and any outside contractor (workers) who apply or bid for work in or adjacent to areas known or *presumed* to contain asbestos. Included asbestos materials are Thermal system insulation (TSI), sprayed or troweled-on surfacing materials, and asphalt or vinyl flooring material installed prior to 1981. Hawaii Occupational Safety and Health (HIOSH) under HAR 12-141.1 has adopted the federal standard.

Under EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) 40CFR Part 61, are requirements for renovation and demolition work involving ACM.

#### **5.6.2 Lead-Based Paint**

Due to the age of the structures noted by VEC, some of the buildings may contain lead-based paints. VEC did not note any significant quantities of construction debris that may contain lead-based paint. However, VEC was limited in their investigation of the entire site (See Section 1.4).

##### *Background Information:*

Lead is a metal element in pure form but is found in other chemical compounds used within manufactured and formulated products. Among these are pipe solder, paint and other coatings and water pipes - items commonly found in older buildings and homes.

Lead becomes toxic to the human body even in low levels by chronic over exposure. The exposure may occur by breathing dust, eating dust (on food, tobacco, fingers, or eating paint chips (children)). Lead poisoning affects the brain and central nervous system; especially susceptible are young children. Lead is also known to impact kidney and liver functions.

The EPA/HUD defines lead-based paint as paint or other coatings containing lead equal to or in excess of 0.5% lead by weight or 1.0 mg/cm<sup>2</sup>. The prevalence of lead-based paint in housing built before 1940 is especially high according to research conducted by the U.S. Department of Housing and Urban Development (HUD). After 1940, its use diminished until 1972 when U.S. manufactured housing paint became regulated at 0.5 percent lead by weight and "banned" in 1978; this means that paint could not be manufactured and sold for housing use if it contained lead above the U.S. Consumer Products Safety Commission's (CC) 0.06 percent by weight. The "ban" provided a basis for using the cut-off date of 1978 when disclosing the possibility of lead-containing paint in sales and rentals of housing units.

Any detected lead-level in paint below HUD and the CPSC's criteria remains an environmental concern under the U.S. Occupational Safety and Health Administration's (OSHA) Lead Standard for Construction Workers, 29CFR1926.62 and the HIOSH equivalent, HAR 12-148.1. Communication of lead-levels in



paint is required for worker safety, when conducting renovation or demolition, and for construction debris (waste) management.

### 5.6.3 Arsenic-Containing Substances

The on-site structures inspected by VEC did not appear to contain arsenic (canec). VEC did not note any significant quantities of construction debris that may contain elevated levels of arsenic. Pesticides historically used on-site could have included arsenic-containing compounds. However, VEC was limited in their investigation of the entire site (See Section 1.4).

#### *Background Information*

Arsenic, like several other heavy metals, tends to accumulate in the body. Ingestion of a small dose may seemingly exert no adverse effect at all, while ingestion of multiple small doses could cause death. In lesser amounts, arsenic-containing compounds cause other health problems, like mottling of the skin, skin lesions, nervous disorder, and severe, irreversible liver damage. Arsenic is a human carcinogen, causing skin tumors when ingested and lung tumors when inhaled.

Arsenic-containing compounds were once used as components of some inorganic pesticides. In the 1940s, these pesticides were used to control insects and rodents.

To protect against exposure to high arsenic concentrations, OSHA requires workers to use air-purifying respirators and to wear protective clothing in areas where airborne arsenic compounds are known to exist.

The Resource Conservation and Recovery Act (RCRA), Subtitle C lists arsenic and arsenic-containing compounds as a hazardous waste. Therefore, construction/demolition debris (waste) management should be conducted in accordance with all Federal, State, and Local regulations. This typically requires waste segregation into construction material and dust/debris waste. Sampling using the Toxicity Leach Characteristic Procedure (TCLP) for arsenic is required for hazardous waste determination.

### 5.6.4 Radon

VEC did not identify any man-made products on the subject property that are known or suspected to emit radioactive decay elements.

#### *Background Information:*

Radon is a colorless and odorless radioactive gas that can produce health effects such as cellular injury. Radon gas can occur in the natural environment as concentrations from certain rocks and geologic conditions have a high radon-emanation potential.

These surface rock types are not known to occur in Hawaii. It is possible that increased concentrations of Radon could occur in regions where geologic fault and volcanic rift zones may release gases from deeper earth sources. However, the State of Hawaii, Department of Health (DOH) has not addressed concerns for any significant levels of gas to occur anywhere in Hawaii. This was based on the 1992 and 1996 DOH investigations conducted in elementary schools throughout the State.

### 5.6.5 Lead in Drinking Water

The subject property is not developed for potable water. This section does not apply.

### 5.6.6 Ecological Resources, Endangered Species, Cultural and Historic Resources, and Wetlands

There are no known wetlands, critical habitats, or threatened and endangered species designated for the subject site. The subject site is not located within the County of Maui's Special Management Area (SMA).

### 5.6.7 Indoor Air Quality

VEC did not identify any building surfaces that had characteristics that resembled possible mold contamination at the time of the site visit. VEC did not observe any mold related odors. However, VEC was limited in their investigation of the entire site (See Section 1.4).

#### *Background Information:*

Indoor air quality (IAQ) problems primarily result from indoor pollution sources that release gases or airborne particles. The term "Sick Building Syndrome" (SBS) is used to describe situations in which building occupants experience acute health and discomfort effects that appear to be linked to time spent in a building and may be localized in a particular room or zone or may be widespread throughout the building. Frequently, problems result when a building is operated or maintained in a manner that is inconsistent with its original design or prescribed operating procedures or as a result of poor building design or occupant activities.

Sources of indoor air contaminants can originate from within the building or be drawn in from the outdoors. The following causes contribute to IAQ problems:

1. *Inadequate ventilation* – As a result of the oil embargo in 1973, national energy conservation measures called for a reduction in the amount of outdoor air provided for ventilation. In many cases the reduced outdoor air ventilation rates were found to be inadequate to maintain the health and comfort of building occupants. Potential air pollutant sources in ventilation or heating, ventilating, or air-conditioning (HVAC) systems include, but are not limited to: dust or dirt in ductwork; microbiological growth (i.e. mold, mildew, or bacteria); improper use of biocides, sealants, and cleaning compounds; improper venting of combustion products; and refrigerant leakage. Inadequate ventilation may increase the concentrations of these indoor air contaminants.
2. *Biological contaminants* – Bacteria, molds, pollen and viruses are types of biological contaminants. These contaminants may breed in stagnant water that has accumulated in ducts, humidifiers and drain pans, or where water has collected on ceiling tiles, carpeting, or insulation. Surfaces exposed to high humid conditions with limited air movement may also be subject to microbiological contamination.
3. *Chemical contaminants from indoor sources* – Most indoor air pollution comes from sources inside the building. Potential air pollutant sources of indoor chemical contaminants include, but are not limited to: adhesives, carpeting, upholstery, manufactured wood products, pesticides, combustion products (i.e. carbon monoxide, carbon dioxide, and nitrogen oxides), and cleaning agents emitting volatile organic compounds (VOCs). Tobacco smoke contributes high levels of VOCs, other toxic compounds, and respirable particulate matter. Research has shown that some VOCs can cause chronic and acute health effects at high concentrations, and some are known carcinogens.
4. *Chemical contaminants from outdoor sources* – The outdoor air that enters a building can be a source of indoor air pollution. Potential air pollutant sources of outdoor chemical contaminants include, but are not limited to: motor vehicle exhausts; plumbing vents; combustion products (i.e. carbon monoxide, carbon dioxide, and nitrogen oxides); and building exhausts (i.e. bathrooms and kitchens). These contaminants can enter the building through poorly located air intake vents, windows, and other openings.

Indicators of SBS or IAQ related health problems include, but are not limited to, headache, eye, nose, or throat irritation, dry cough, dry or itchy skin, dizziness or nausea, fatigue, and sensitivity to odors. Most complaints or symptoms are relieved soon after leaving the building.

### 5.6.8 High Voltage Transmission Lines

Transmission and or distribution lines are located along the northern, eastern and western property boundaries. These lines are not a concern to the subject property at this time and would unlikely be a

concern for any future development on site. However, an EMF (Electromagnetic Frequency) survey can be conducted by MECO (Maui Electric Company) if there is client concern.



End of Section



## 6.0 FINDINGS, OPINIONS, AND CONCLUSIONS

### 6.1 Recognized Environmental Conditions

*Recognized environmental conditions*, as defined by ASTM Standard E1527-00, are the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. *Recognized environmental conditions* are described with regard to (1) the nature and extent of the environmental condition, (2) potential or actual environmental threat, (3) potential for transport (migration) of any environmental conditions, and (4) consideration for further investigation. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

VEC has performed this Phase I Environmental Site Assessment in conformance with the scope and limitations of the ASTM Practice E 1527-00 for the property located southeast of the intersection of Honoapiilani Highway and Kuikahi Drive in the community of Wailuku, Maui (TMK Number (2) 3-5-02:01 portion, defined as the subject property. Any exceptions to or deletions from, this practice are described in Section 1.4, Limitations and Exceptions, of this report.

This assessment has revealed no evidence of *recognized environmental conditions* in connection with the property, except for the following:

#### 6.1.1 Database Listings (See Section 4.0 & EDR Report, Appendix B)

##### Findings/Concerns:

The subject site is not listed on any Federal, State or County databases as a site with any recognized environmental concerns. There is one (1) nearby listed site (Waiale Ash Pile), as indicated by the EDR Report, within the appropriate search distance from the subject property. In addition, a former county landfill (Waikapu Dump) is located adjacent to the subject property (See Figure 2, Appendix A and EDR Report Addendum, Appendix B). These sites are located down gradient of the subject site.

##### Opinions and Conclusions:

Due to the close proximity of the former Waikapu Landfill relative to Lot 2 of the subject property it is possible that this site has or has had reasonable potential to adversely impact the environmental condition of Lot 2 of the subject property. However, due to the down gradient and predominantly down wind location of this landfill relative to Lot 2 of the subject property it is less likely that groundwater and or surface soils would contain contamination above regulated levels. Groundwater and or soil sampling could be conducted to confirm this.

#### 6.1.2 Current and Historic Use or Storage of Hazardous and Regulated Substances (See Section 5.3.2)

##### Findings/Concerns:

There is no evidence of any historic or current significant misuse of hazardous or regulated substances on the subject property. Historically, pineapple and sugarcane agriculture had been occurring on, and adjacent to, the subject property for several decades. These operations have been associated with the application of pesticides and fertilizers.

##### Opinions and Conclusions:

While the use of pesticides and herbicides on and near the property does not necessarily result in adverse impacts to the environmental condition of the subject site, it is possible (yet unlikely) for residual amounts of these substances to accumulate to concentrations that present a potential threat to human health or the environment. Soil sampling and laboratory testing would provide additional information to evaluate

potential environmental effects from these agricultural activities. A standard, pro-active procedure would be to conduct such a survey prior to future development at this site. There is, however, no regulatory requirement to conduct this sampling.

## **6.2 Other Environmental Concerns**

The concerns listed below may not be considered *recognized environmental conditions* by ASTM definition. However, they may be considered regulated under other environmental laws and ordinances and may present a potential liability to the property owner.

### **6.2.1 Solid Waste Management (See Section 5.5.4)**

#### **Findings/Concerns:**

A moderate amount of "wildcat" dumping has taken place on-site. Some items noted included regulated items (white goods). Due to some heavily vegetated areas, the entire subject site and underlying soils were not visibly inspected.

#### **Opinions and Conclusions:**

Any waste disposal should be in a permitted solid waste landfill or recycled in a manner that complies with all local, state, and federal regulations as applicable to the specific waste type with special attention given to regulated items.

It is important to note that if additional clearing of the property commences and large amounts of construction debris or unidentifiable substances (containers) are further discovered, proper waste identification, testing and applicable waste handling/disposal procedures are followed.

### **6.2.2 Surface Waters and Area Aquifer Protection (See Section 5.5.5)**

#### **Findings/Concerns:**

Development may be planned for the subject site. For any future grubbing and grading and construction activities planned for the site, the property owner should be aware of the potential for contaminants to run off-site and into on-site watercourses or adjacent storm water drains. Products of concern relating to any future development activity would be earthen material (silt), oils, antifreezes and other fluids from automobile or on-site machinery, or leaks from on-site stocked items.

#### **Opinions and Conclusions:**

Future land clearing projects will likely require a County of Maui grading/grubbing permit and if the size of a project creates greater than one (1) acre of soil disturbance, the developer will also require a National Pollution Discharge Elimination System (NPDES) General Permit (State of Hawaii, Department of Health, Clean Water Branch).

In order to minimize any potential regulatory profiling of the subject site as a potential responsible party for any newly discovered groundwater or surface water contamination, management may consider practicing conservative, proactive environmental policies. These policies might include written environmental protection contracts with any construction contractors and posted notices regarding any use, storage and handling of hazardous substances and/or petroleum product. Special attention should be addressed to storm water entering the nearby storm drains or drainageways.



End of Section

The conclusions stated above should not be construed to mean that any regulatory agency would have the same opinion as this author, nor is any implication proposed therefrom. The results of this environmental assessment are intended for general reference purposes only and are not intended as legal advice. The advice of legal counsel should be sought in regard to individual facts, circumstances and interpretation of environmental liability.

## 7.0 REFERENCES

### 7.1 Published References

1. American Standard of Testing and Materials, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E1527-00, 2000.
2. "Atlas of Hawaii", 2<sup>nd</sup> Edition, Department of Geography, University of Hawaii at Hilo, 1983, University of Hawaii Press.
3. "Atlas of Hawaii", 3<sup>rd</sup> Edition, Department of Geography, University of Hawaii at Hilo, 1998, University of Hawaii Press.
4. County of Maui, Real Property Tax Division, Historical Records for TMK Number (2) 3-5-02:01 (portion). April 21, 2004.
5. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 58.1, Solid Waste Management Control.
6. State of Hawaii, Department of Health, Solid and Hazardous Waste Branch, Underground Storage Tank Section, List of Leaking Underground Storage Tank Release Sites, August 2003.
7. State of Hawaii, Department of Health, Solid and Hazardous Waste Branch, Underground Storage Tank Section, List of Underground Storage Tank Facilities, August 2003.
8. State of Hawaii, Department of Health, Voluntary Response Program (VRP), List of Voluntary Response Program Sites, October 2003.
9. State of Hawaii, Department of Health, Office of Hazard Evaluation and Emergency Response, List of Release Notifications, September 2000.
10. State of Hawaii, Department of Health, Office of Hazard Evaluation and Emergency Response, List of Sites List, July 2001.
11. State of Hawaii, Department of Land and Natural Resources, Registered Wells and Dry Wells, 2002.
12. State of Hawaii, Department of Land and Natural Resources, "State of Hawaii Water Quality Plan and Groundwater Map", June 1990, Revised December 1991.
13. U.S. Department of Agriculture, Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii", 1972.
14. U.S. Environmental Protection Agency, Office of Air and Radiation et al., Indoor Air Facts No. 4 (revised) Sick Building Syndrome, April 1991.
15. U.S. Environmental Protection Agency, Building Air Quality: A Guide for Building Owners and Facility Managers, 1991.



## 7.2 Map and Other References

1. Environmental Data Resources, Inc., "The EDR Field Check Report", May 11, 2004.
2. Federal Emergency Management Agency, "Flood Insurance Rate Map", Number #150003 0170B dated June 1, 1981.
3. R.M. Towill Corporation, Aerial Photographs, Honolulu, Hawaii.
4. Air Survey Hawaii, Aerial Photographs, Honolulu, Hawaii.
5. Sanborn Maps (no coverage)
6. U.S. Geological Survey, 7.5 Minute Topographic Map, Wailuku Quadrangle, Hawaii 1983.
7. Site plan map provided by Carlsmith Ball, LLC.

## 7.3 Record of Personal Communications

Table 3.0: List of personal interviews conducted by VEC

Date	Interviewee	Title & Organization	Address	Phone Number
4/14/04	Mr. Thomas Leuteneker	Counsel, Carlsmith Ball, LLC.	One Main Plaza, 2200 Main St., Wailuku, HI 96793	(808)242-4535
4/22/04	Mr. Clayton Suzuki	Land Manager, Wailuku Agribusiness	255 Waiko Rd Wailuku, HI 96793	(808)244-2208
4/22/04	Ms. Jackie Takakura	Administrative Officer, Maui County Department of Water Supply	200 South High Street Wailuku, HI 96793	(808) 270-8046
4/26/04	Mr. Randall Moore	Manager, Hawaii Commercial & Sugar Company	Puunene, HI	(808) 877-6968
4/28/04	Mr. Derrick Heafey	Environmental Manager, Hawaii Commercial & Sugar Company	Puunene, HI	(808) 877-2958

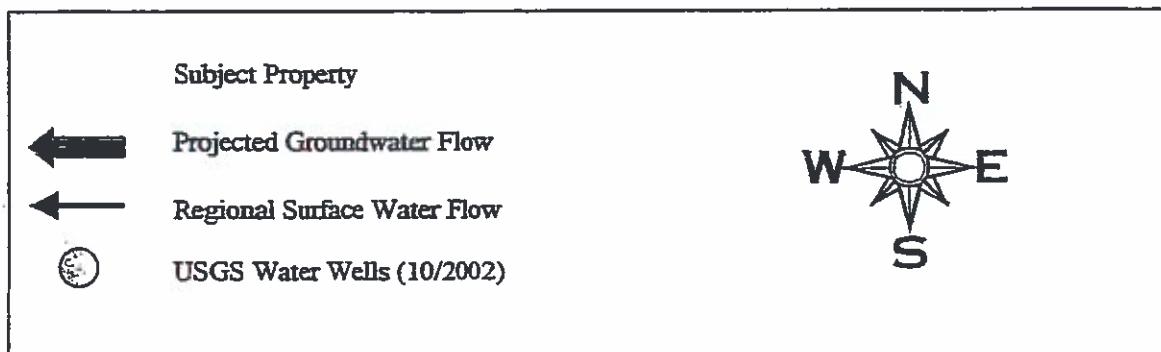
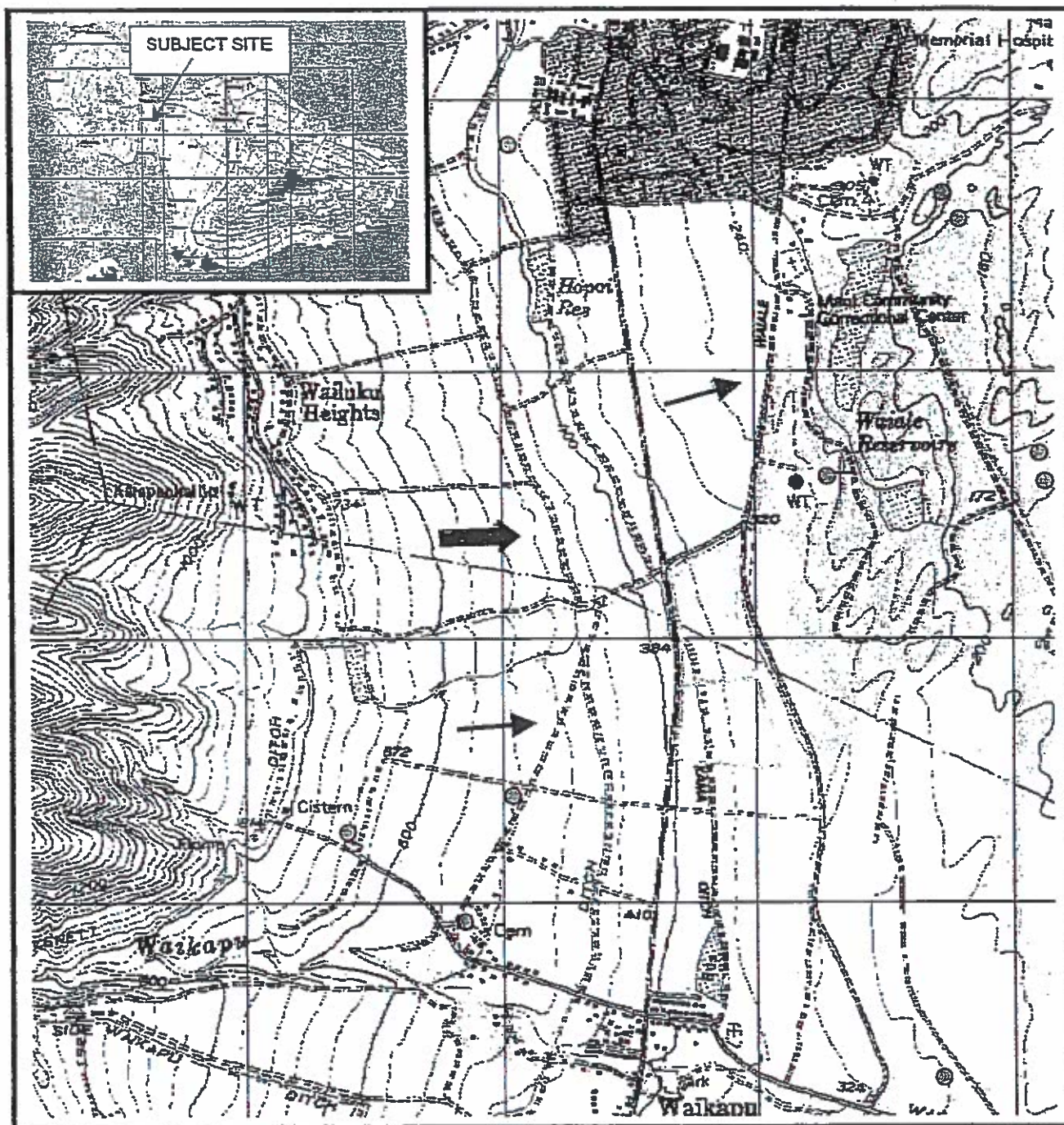


End of Section

# **Appendix A:**

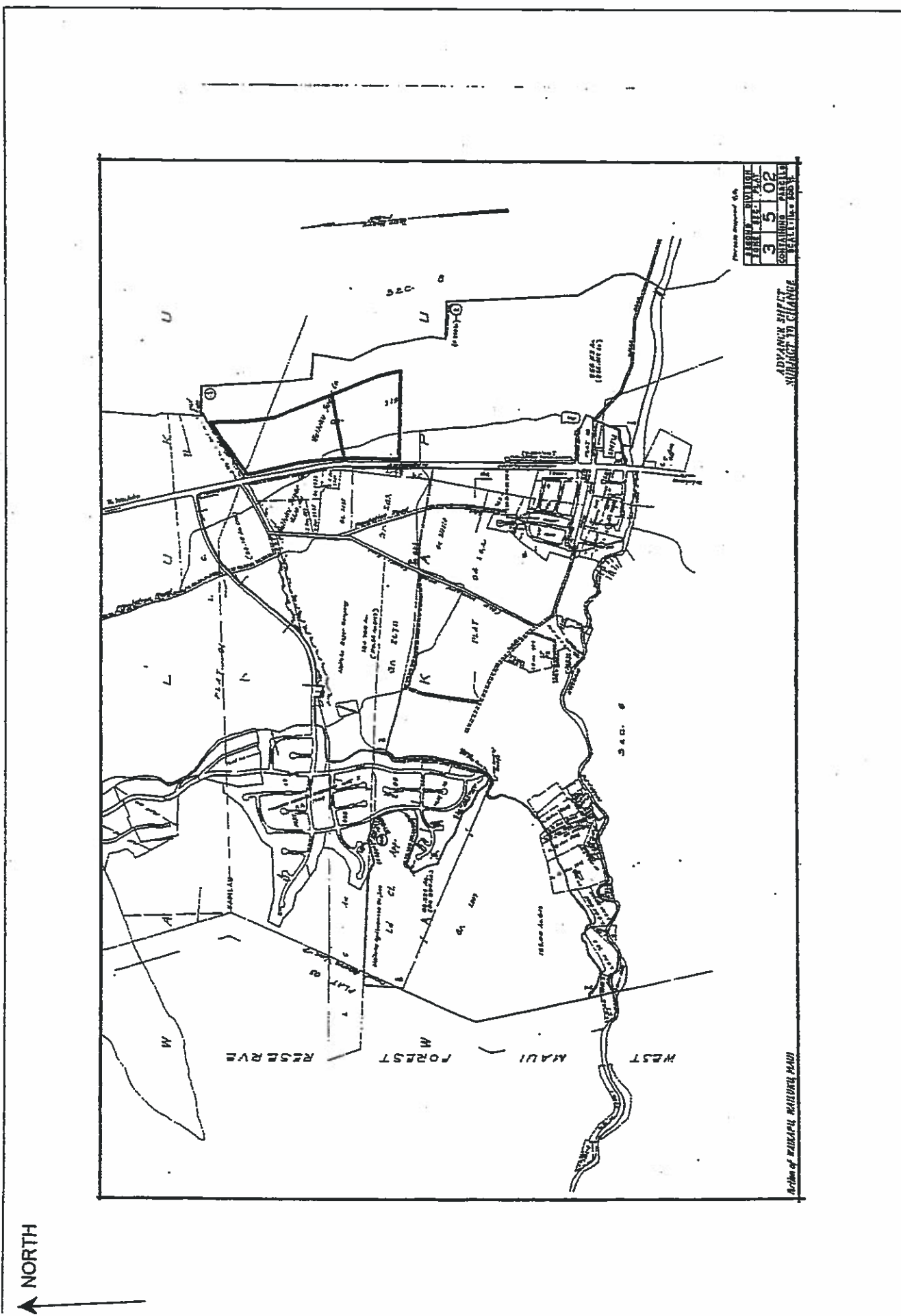
## **Maps, Plans, and Photographs**

# FIGURE 1: REGIONAL SETTING MAP





# FIGURE 3: TAX MAP KEY





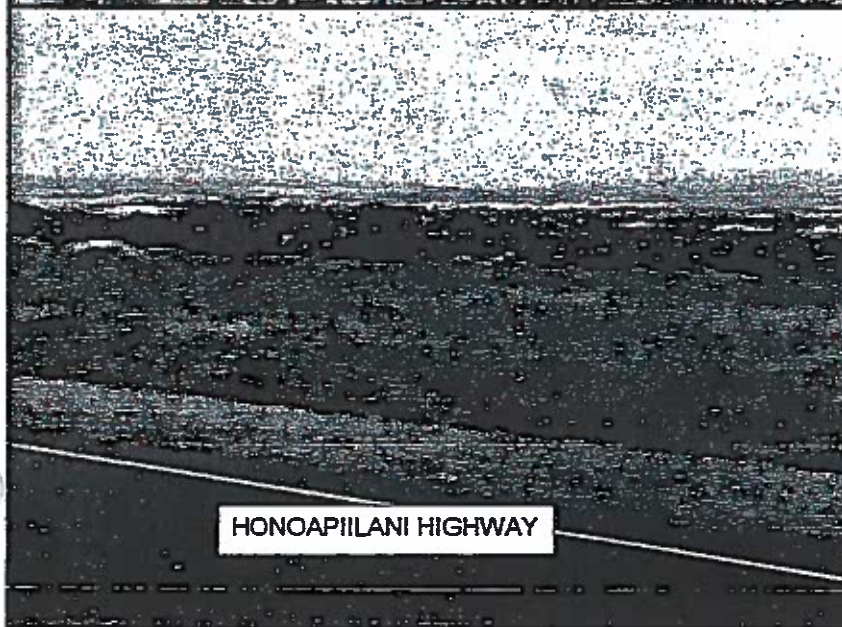
### **PHOTO 1**

Northwesterly view of the central portion of Lot 1 of the subject property from the eastern property line.



### **PHOTO 2**

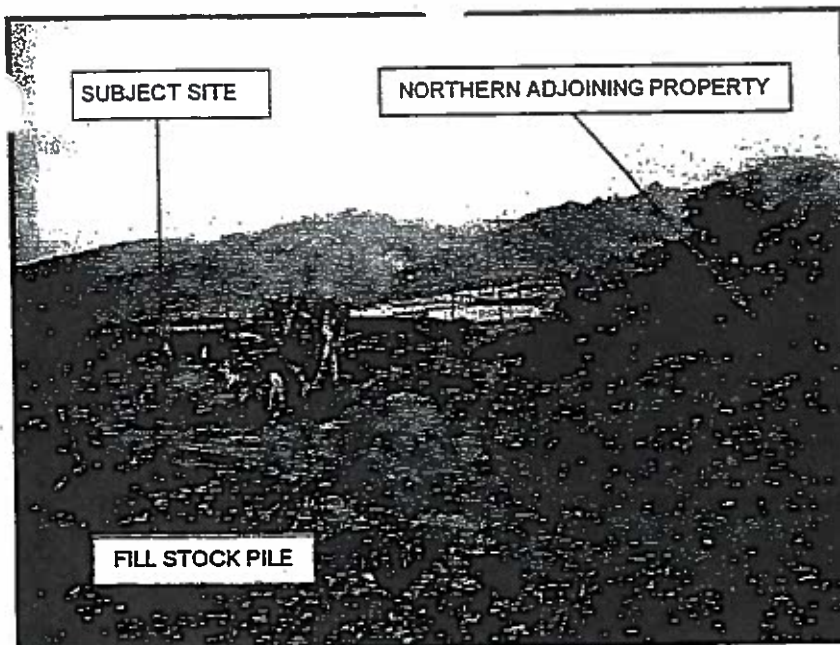
Westerly view of the eastern portion of Lot 2 from the eastern property line.



### **PHOTO 3**

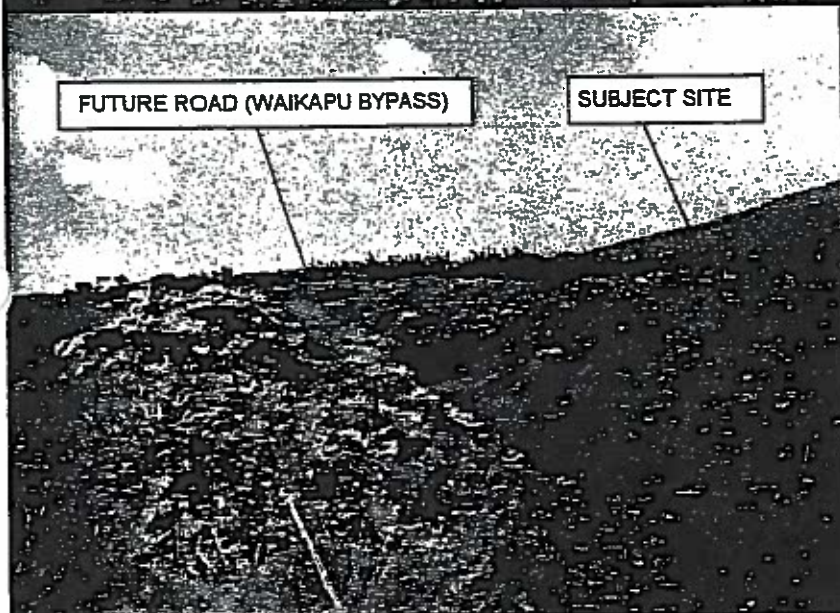
Northeasterly view of the south-western portion of Lot 2 of the subject property. The picture was taken from the southern portion of the western property line.





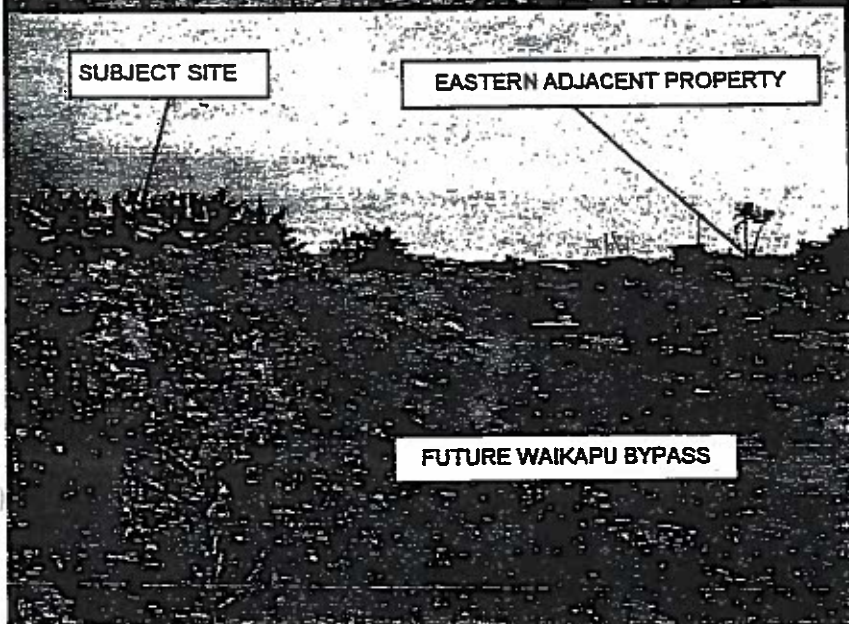
**PHOTO 4**

Westerly view of Lot 1's northern boundary line from the northeast property corner.



**PHOTO 5**

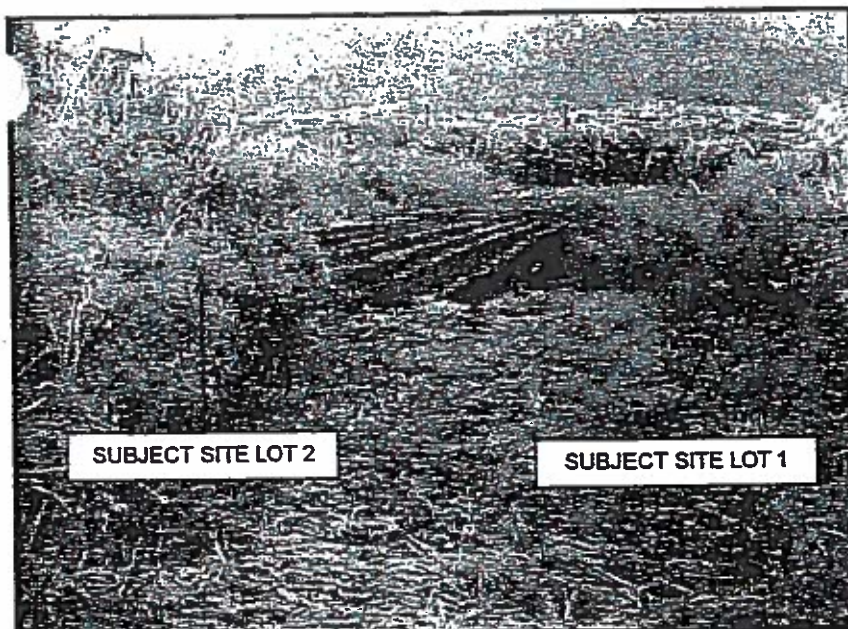
Southerly view of Lot 1's eastern property line from the northeast property corner.



**PHOTO 6**

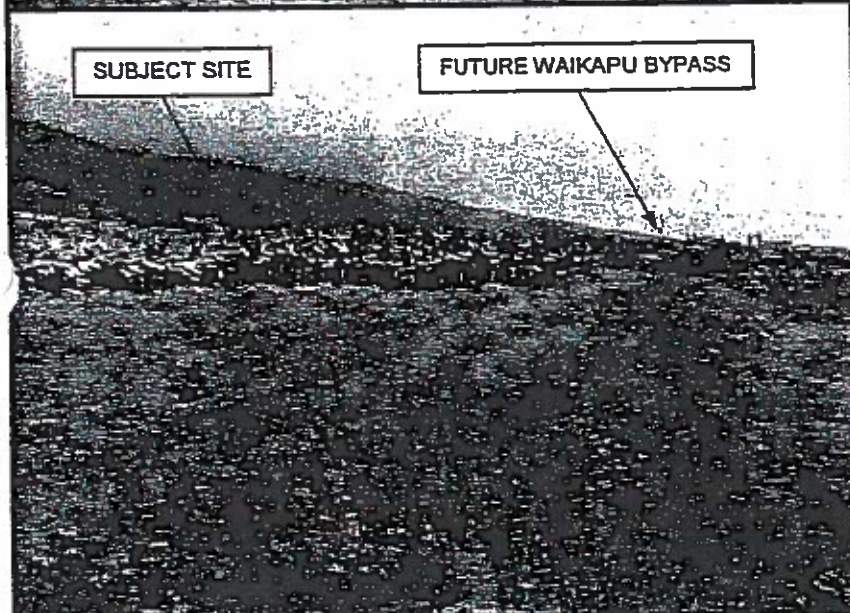
Northerly view of Lot 1's eastern property line from near the intersection of Lot 1 and Lot 2 on the eastern property line.





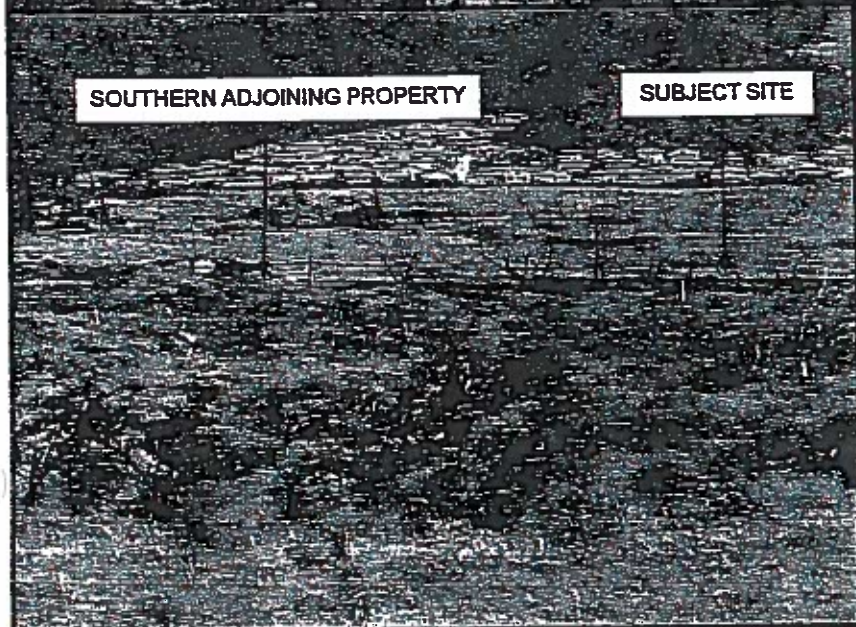
**PHOTO 7**

Easterly view along Lot 1's southern property line from the intersection of Lot 1 and Lot 2 on the eastern property line.



**PHOTO 8**

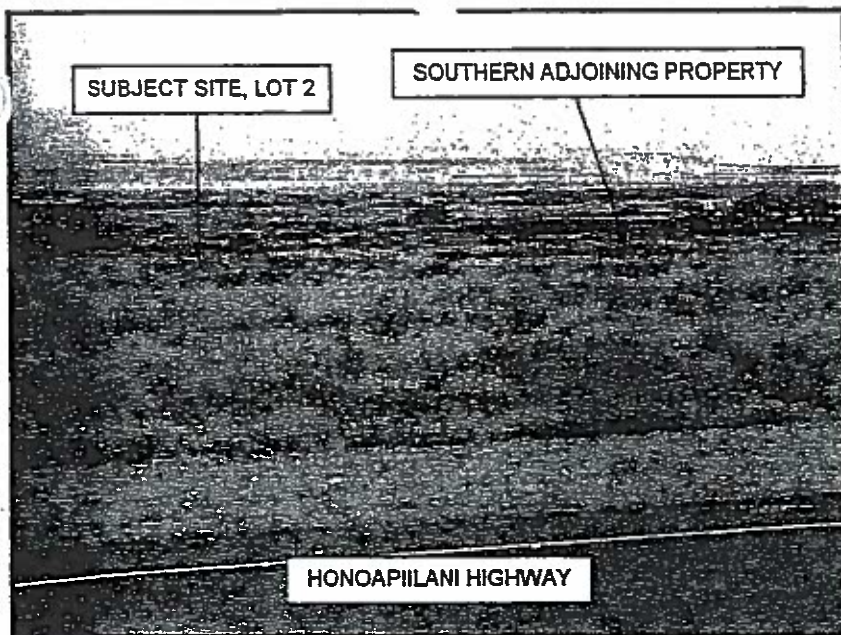
Northerly view of Lot 2's eastern property line from the southeast property corner.



**PHOTO 9**

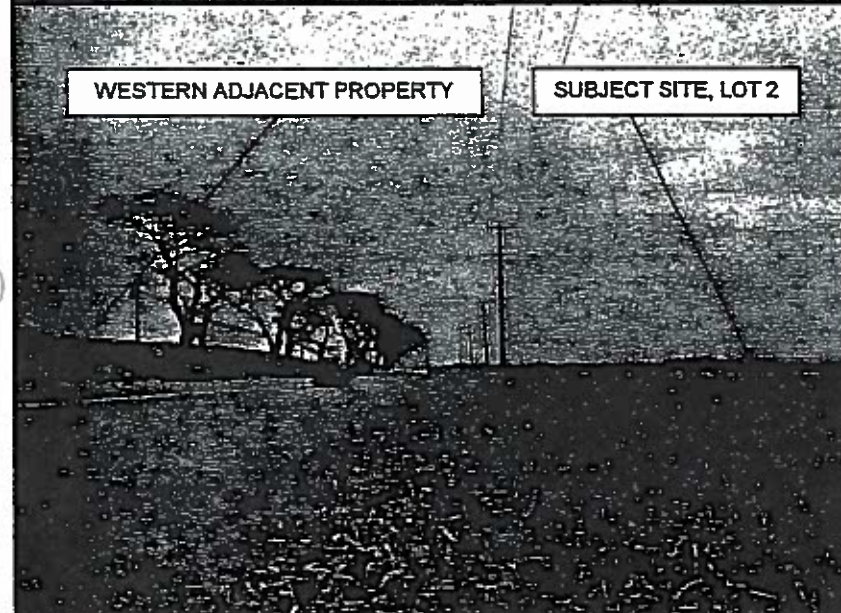
Easterly view along Lot 2's southern property line from the southeast property corner.





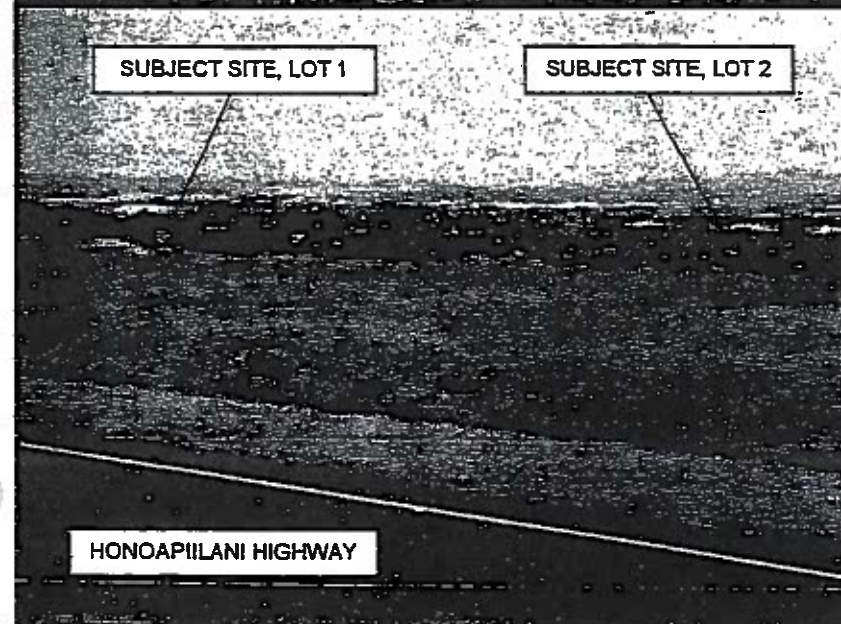
**PHOTO 10**

Easterly view of Lot 2's southern property line from the southwest property corner.



**PHOTO 11**

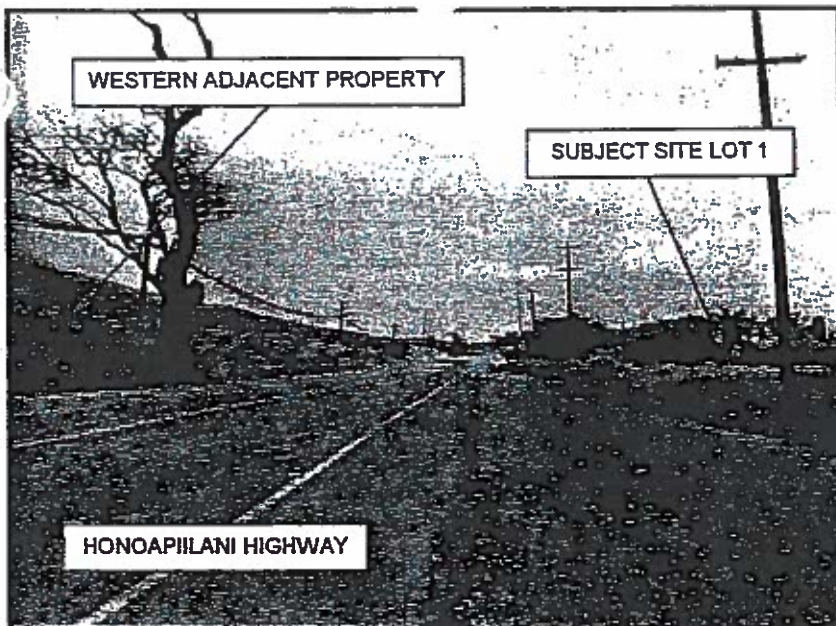
Northerly view of Lot 2's western boundary line from the southwest property corner.



**PHOTO 12**

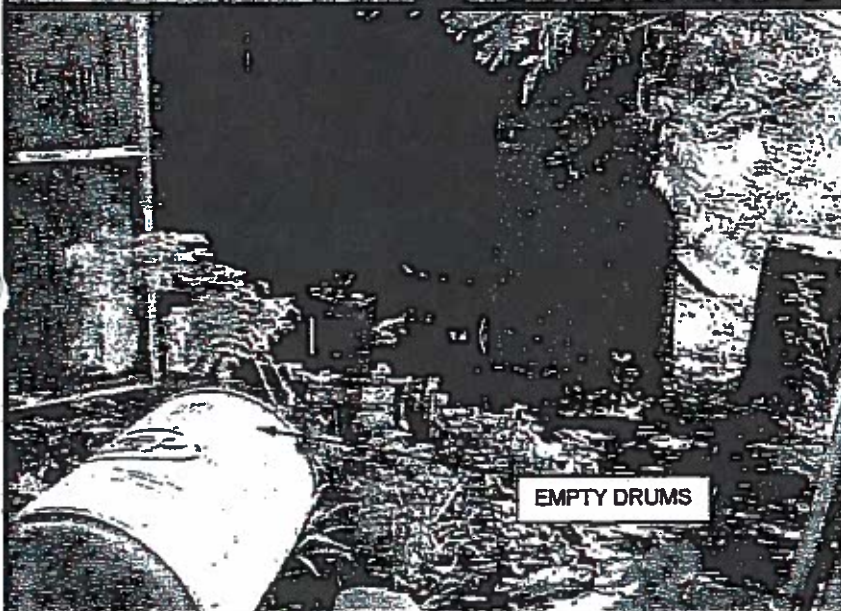
Easterly view along Lot 2's northern property line from near the intersection of Lot 1 and Lot 2 on the western property line.





**PHOTO 13**

Northerly view along Lot 1's western property line from near the intersection of Lot 1 and Lot 2's western property line.



**PHOTO 14**

Agricultural shed located on the eastern portion of Lot 1. See Figure 2, Appendix A.



**PHOTO 15**

Typical small agricultural field located on Lot 1 and Lot 2 of the subject property.





**PHOTO 16**

Typical banana shack located on Lot 2 of the subject site.



**PHOTO 17**

Fill stockpile of tarmac material located on Lot 2. See Figure 2, Appendix A.



**PHOTO 18**

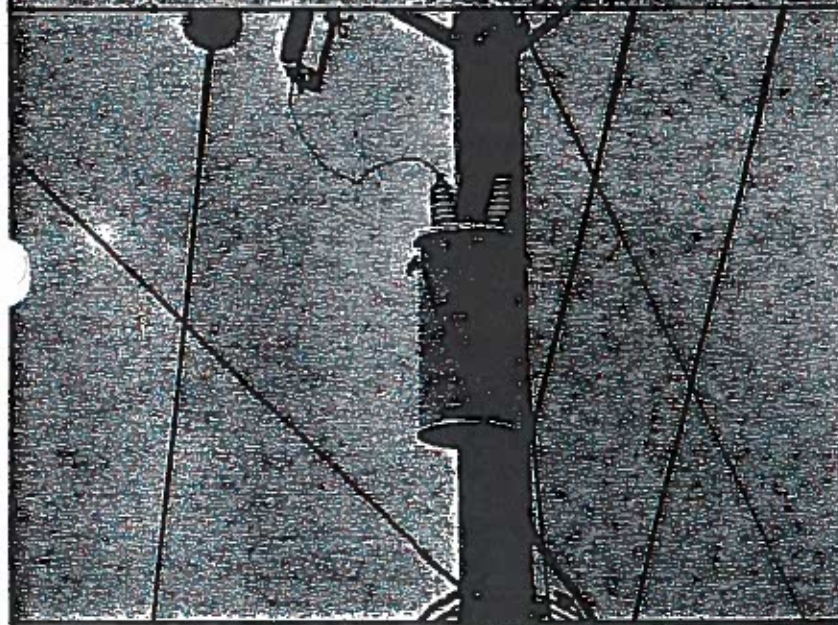
Derelict vehicles located on the southern portion of Lot 2.





**PHOTO 19**

Derelict vehicles located on the central southern portion of Lot 1 of the subject property.



**PHOTO 20**

Pole-mounted transformer located at the northeast corner of Lot 1 of the subject property.



**PHOTO 21**

Miscellaneous debris located on the southeastern portion of Lot 1.

# **Appendix B:**

## **Regulatory Records Documentation Site Specific Documentation**





## Preliminary Environmental Investigation

According to ASTM Standard 1527-00, the user's (or client's) responsibility in this investigation is to help identify the possibility of recognized environmental conditions in connection with the property. Please assist us by responding to the following request for data and information you may have, or of which you may have some specialized knowledge. This questionnaire will be included in the Appendices of the final report as an indication of user assistance.

*Please Supply As Many of the Following Documents As Possible*

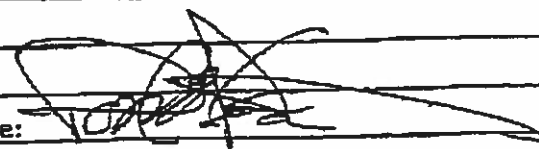
- A. ☐ Tax Map Key Number/Tax Code Number 3-5-02-1(2)
- B. ☐ Title Information (Current, and any previous ownership.) TITLE IS GOOD
- C. ☐ Property Legal Description (If Title Information is not available) DO NOT HAVE
- D. ☐ Tax Map and/or Site Development Drawing/Plat MAPS ENCLOSED
- E. ☐ Special Property Information (Well-development data, endangered NONE  
species listings, historical registration or environmental deed restrictions.)
- F. ☐ Real Estate Appraisal Report NONE
- G. ☐ Special Management Area Permit Report (SMA) NOT NECESSARY

*Please Provide the Following Information to The Best Of Your Ability*

1. **Environmental Site Assessments (ESA):** Are you aware of any previous assessments: Cleanup Closure Reports, Permit Characterization Reports, etc. conducted on the subject site or within the immediate area? If yes, please supply details. NO
2. **Local-State-Federal Inspections:** Are you aware of any environmental inspections conducted by any regulatory agency, i.e., Hawaii Dept. of Health (Environmental Health Services), OSHA, U.S. Army Corps of Engineers, Department of Land & Natural Resources, Fish & Wildlife Services, HUD, EPA, or County Wastewater or Solid Waste Division of the Public Works/Waste Management Department etc.? If yes, please supply details. NO
- 3a. **Structures/Buildings:** Are there any as-built or other construction drawings available for review? Contact Name and Telephone Number: NO
- 3b. **Site improvements?** (Renovation Date & Extent) BANANA SHACKS ONLY
4. **Purchase Price:** Is the property's purchase price within a normal market range or significantly lower? If lower, please supply details.  
PURCHASE PRICE IS \$675,000 / \$27,000 per acre - is below marker  
Buyer is a non-profit church and school

5. Name of Current Owner: WAILUKU AGRIBUSINESS
6. Name of former Owner: \_\_\_\_\_
7. Proceedings Against the Property: Are you aware of any administrative or legal proceedings against the property for environmental concerns i.e., Compliance Orders, Notices of Violation? If yes, please supply details. NO
8. Property Liens: Are there any recorded liens or consent decrees on the property that is environmentally related, i.e., property clean-up, waste removal, asbestos abatement, wastewater issues, etc.? If yes please supply details. NONE THAT WE KNOW ABOUT
9. Specialized Historic Information: Are you aware of any previous owner, neighbor, business affiliate or other individual who might have knowledge of any special or unusual historic use of, and/or previous operations conducted on the subject property? Contact Name and Telephone Number: KNOW OF NONE
10. Manufacturing or Processing: If there are manufacturing or processing activities conducted on-site, is there an operation flow chart, diagram or procedures manual available for review? Contact Name and Telephone Number LAND WAS IN SUGAR CANE
11. This Report is Prepared For: (Please Print)  
 Attention: EMMANUEL LUTHERAN CHURCH (north) VALLEY ISLE FELLOWSHIP (south)  
 Organization: TO TOM LEUTENEKER  
 Address: POBOX 1086 Wailuku Maui HI 96790  
 Phone no.: 242-4535 Fax no.: 244-4974
12. Please List Other Organizations (Lenders) Who Will Require a Listing as "Also Prepared For:" on the report cover and signature page. NONE
- (a) Attention: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Address: \_\_\_\_\_
- (b) Attention: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Address: \_\_\_\_\_
- We will submit 2 signed reports for each project. If additional copies are required, an additional fee will be charged for processing.*

### Who Prepared This Starter Package Information?

Name: (Please Print)	<u>TOM LEUTENEKER</u>	Title:	
Company/Organization:			
Address:			
Tel. No.:		Fax No.:	
Signature:		Date:	<u>4/7/2004</u>

DA LINGLE  
OR OF HAWAII



CHIYOME L. FUKINO, M.D.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3378  
HONOLULU, HAWAII 96801-3378

In reply, please refer to:  
EMD / CWB

04059ESM.04

April 21, 2004

Ms. Massy Cashen  
Vuich Environmental Consultants, Inc.  
1498 Lower Main Street, Suite C  
Wailuku, Hawaii 96793

Dear Ms. Cashen:

**Subject: Request for Public Records**

The Department of Health, Clean Water Branch ("DOH-CWB") received your request for public records dated April 14, 2004. Our staff searched the DOH-CWB database and found a Notice of General Permit Coverage ("NGPC") No. R23A787 that maybe near to your following site(s):

- (1) Address: Vacant Land, Honoapiilani Highway  
TMK: (2)3-5-02:01

Should you have any questions, please contact Mr. Michael Tsuji, Supervisor of the Enforcement Section, for enforcement concerns and Mr. Alec Wong, Supervisor of the Engineering Section, for permitting concerns, Clean Water Branch, at (808) 586-4309.

Sincerely,

A handwritten signature in black ink, appearing to read "Denis R. Lau".

DENIS R. LAU, P.E., CHIEF  
Clean Water Branch

Enclosure: NGPC No. R23A787

R23A787

~~EA 92~~ FILE COPY <sup>up</sup>  
MST ~~10/1~~ <sub>aw</sub>

October 9, 1997

Mr. Fredrick H. Kubota  
Vice President  
Brewer Environmental Industries, LLC  
311 Pacific Street  
Honolulu, Hawaii 96817

Dear Mr. Kubota:

Subject: Notice of General Permit Coverage (NGPC)  
Brewer Environmental Industries Wailuku Facility  
275 East Waiko Road  
Wailuku, Maui, Hawaii 96793  
TMK: (2)5-02-01  
File No. HI R23A787

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. § 1251 et seq.; the "Act") and Chapter 342D, Hawaii Revised Statutes, and Chapters 11-54 and 11-55, Hawaii Administrative Rules ("HAR"), Department of Health, State of Hawaii,

**BREWER ENVIRONMENTAL INDUSTRIES LLC**

(hereinafter "PERMITTEE")

is authorized to discharge storm water runoff associated with industrial activity from its facility located at 275 East Waiko Road, Wailuku, Maui, Hawaii, 96793, TMK: (2)5-02-01, to the receiving waters named the Waikapu Stream, at coordinates Latitude 20°50'55"N, Longitude 156°30'15"W.

This Notice of General Permit Coverage (NGPC) is subject to compliance with the following regulations and conditions:

1. HAR Chapter 11-55, Appendix B, NPDES General Permit Authorizing Discharges of Storm Water Associated With Industrial Activities;
2. HAR Chapter 11-55, Appendix A, Department of Health Standard General Permit Conditions;

Mr. Fredrick H. Kubota  
October 9, 1997  
Page 2

3. HAR Sections 11-55-34.04(a), 11-55-34.07, 11-55-34.11, 11-55-34.12, and any other applicable sections of HAR Chapter 11-55;
4. Plans, reports, specifications and other related materials submitted in and with the Notice of Intent (NOI) dated September 25, 1997, and/or later amendments to the NOI;
5. A copy of this NGPC and its enclosures; and plans, reports, specifications and other related materials submitted in and with the NOI dated September 25, 1997, and/or later amendments to the NOI shall be kept at the facility until termination of subject activities;
6. Discharge quality data as required by NOI Form A shall be collected during the next representative rainfall event and submitted within 30 days of such sampling. Data shall include all parameters listed under Item 2.a and parameters listed under Item 2.b believed to be present in the discharge;
7. In accordance with HAR Chapter 11-55, Appendix B, Table 34.1, the discharge shall be limited and monitored by the Permittee as follows:

Parameter	Discharge Limitation	Control Concentration	Units	Measurement Frequency	Type of Sample
Flow	N/L	N/A	MGD	Annually <sup>1</sup>	Calculated or Estimated
Biochemical Oxygen Demand (5-Day)	N/L	N/A	mg/l	Annually <sup>1</sup>	Composite or Grab
Chemical Oxygen Demand	N/L	N/A	mg/l	Annually <sup>1</sup>	Composite or Grab
Total Suspended Solids	N/L	N/A	mg/l	Annually <sup>1</sup>	Composite or Grab
Total Phosphorus	N/L	2.0	mg/l	Annually <sup>1</sup>	Composite or Grab
Total Nitrogen	N/L	N/A	mg/l	Annually <sup>1</sup>	Composite or Grab
Nitrate + Nitrite Nitrogen	N/L	0.68	mg/l	Annually <sup>1</sup>	Composite or Grab
Oil and Grease	15	N/A	mg/l	Annually <sup>1</sup>	Grab



Mr. Fredrick H. Kubota  
 October 9, 1997  
 Page 3

Parameter	Discharge Limitation	Concentration	Units	Frequency	Type of Sample
pH Range	5.5 to 8.0	N/A	Standard Units	Annually <sup>1</sup>	Grab
Iron	N/L	1.0	mg/l	Annually <sup>1</sup>	Grab
Lead	N/L	0.0816	mg/l	Annually <sup>1</sup>	Grab
Zinc	N/L	0.117	mg/l	Annually <sup>1</sup>	Grab

N/L No Limitation at this time. Only monitoring and reporting required.

N/A Not Applicable.

MGD Million gallons per day

mg/l Milligrams per liter

µg/l Micrograms per liter

<sup>1</sup> The monitoring year shall start on the effective date of this NGPC.

8. Reporting of monitoring results shall be in accordance with HAR Chapter 11-55, Appendix B, Section 9;
9. The Director may specify additional monitoring requirements and limitations, in addition to the monitoring requirements specified in Item 7 of this NGPC;
10. The Permittee shall submit a Storm Water Pollution Control Plan in accordance with HAR Chapter 11-55, Appendix B, Sections 5 and/or 6 within 120 days of issuance of this NGPC;
11. The Permittee shall revise their SWPCP should any discharge limitation or cutoff concentration be exceeded. The revisions shall include measures to reduce the amount of pollutants found to be in exceedance from entering storm water runoff;
12. The Permittee shall notify the Department of Health upon termination of the subject activities; and
13. The Permittee shall be responsible for ensuring that anyone working under this NGPC understands the NGPC's terms and conditions.

This NGPC will take effect on the date of this notice. This NGPC will expire at midnight, September 21, 2002, or when amendments to HAR Chapter 11-55, Appendix B are adopted, whichever occurs first.



Mr. Fredrick H. Kubota

October 9, 1997

Page 4

Should you have any questions regarding this NGPC, please contact Ms. Kris Poentis, Engineering Section of the Clean Water Branch, at (808)586-4309.

Sincerely,

Ann's Room

THOMAS E. ARIZUMI, P.E., CHIEF  
Environmental Management Division

KP\cr

Enclosures: 1. HAR Chapter 11-55, Section 34, Appendices A and B  
2. Discharge Monitoring Report Form  
3. Title 40, Code of Federal Regulations  
Citations as referenced in Chapter 11-55, Appendix A



Consultants, Inc.

April 14, 2004

State of Hawaii Department of Health  
Environmental Management Division  
919 Ala Moana Boulevard, Room 309  
Honolulu, HI 96814  
Phone: (808) 586-4200  
Fax: (808) 586-5800  
*Attn: Clean Air Branch*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

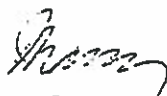
We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

**SITE INFORMATION:**

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,

  
Massy Cashen



Consultants, Inc.

April 14, 2004

State of Hawaii Department of Health  
Environmental Management Division  
919 Ala Moana Boulevard, Room 301  
Honolulu, HI 96814  
Phone: (808) 586-4309  
*Attn: Clean Water Branch*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:


We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

**SITE INFORMATION:**

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,

  
Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health  
Environmental Management Division  
919 Ala Moana Boulevard, Room 206  
Honolulu, HI 96814  
Phone: (808) 586-4249  
*Attn: Office of Hazard Evaluation  
& Emergency Response (HEER)*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:


We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

**SITE INFORMATION:**

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,

  
Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health  
Environmental Management Division  
919 Ala Moana Boulevard, Room 308  
Honolulu, HI 96814  
Phone: (808) 586-4258  
Fax: (808) 586-4370  
*Attn: Safe Drinking Water Branch*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

**SITE INFORMATION:**

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Tax Map Key is enclosed.

Truly yours,

  
Massy Cashen



Consultants, Inc.

4/14/2004

State of Hawaii Department of Health  
Environmental Management Division  
919 Ala Moana Boulevard, Room 212  
Honolulu, HI 96814  
Phone: (808) 586-4226  
*Attn: Solid & Hazardous Waste Branch*

Subject: REQUEST FOR PUBLIC RECORDS

Dear Sir/Madam:

We are requesting a search for any past or pending environmental permits, licenses, citations, or other information pertaining to the site(s) described below.

**SITE INFORMATION:**

Project Number: 0403-760  
Tax Map Key No.: (2) 3-5-02:01  
Address: Vacant Land, Honoapiilani Highway  
Current Owner: Wailuku Agribusiness Company, Inc.  
Former Owner: N. A.  
Current Occupant: Banana farmers  
Type of Business: Agricultural

Tax Map Key is enclosed.

Truly yours,

  
Massy Cashen





Consultants, Inc.

April 14, 2004

Maui County Fire Department  
Fire Prevention Bureau  
21 Kinipopo Street  
Wailuku, Hawaii 96793  
Attn: Capt. Neal Bal  
Via Fax No: 270-7889



**RE: Request for Public Records for Vuich Environmental Consultants (VEC)**

Dear Capt. Bal:

VEC is requesting any past or present information of environmental concern pertaining to the subject site and adjacent sites from the Maui County Fire Department's database. This could include information on environmental releases (spills), permits, citations, inspections, etc.

**SITE INFORMATION:**

Project Number:	0403-760
Tax Map Key No.:	(2) 3-5-02:01
Address:	Vacant Land, Honoapiilani Highway
Current Owner:	Wailuku Agribusiness Company, Inc.
Former Owner:	N. A.
Current Occupant:	Banana farmers
Type of Business:	Agricultural

Thank you for your assistance.

Sincerely yours,

  
Massy Cashen

Attachment: TMK map



April 14, 2004

Maui County Fire Department  
Hazardous Materials Division  
200 Dairy Road  
Kahului, Hawaii 96732  
Attn: Mr. Jeffrey M. Kihune  
Acting Officer  
Via Fax No: 270-7919

**FAXED**

By:   
Date:

**RE: Request for Public Records for Vuich Environmental Consultants (VEC)**

Dear Mr. Kihune:

VEC is requesting any past or present information of environmental concern pertaining to the subject site and adjacent sites from the Maui County Fire Department's database. This could include information on environmental releases (spills), permits, citations, inspections, etc.

**SITE INFORMATION:**

Project Number: 0403-760  
Tax Map Key No.: (2) 3-5-02:01  
Address: Vacant Land, Honoapiilani Highway  
Current Owner: Wailuku Agribusiness Company, Inc.  
Former Owner: N. A.  
Current Occupant: Banana farmers  
Type of Business: Agricultural

Thank you for your assistance.

Sincerely yours,

  
Massy Cashen

Attachment: TMK map

# **EDR FieldCheck™ Report**



**EDR™ Environmental  
Data Resources Inc**

**Emmanuel Lutheran Church  
Honoapiilani Hwy  
Wailuku, HI 96793**

**Inquiry Number: 01189151.1r**

**May 11, 2004**

**The Standard in  
Environmental Risk  
Management Information**

**440 Wheelers Farms Road  
Milford, Connecticut 06460**

**Nationwide Customer Service**

**Telephone: 1-800-352-0050  
Fax: 1-800-231-6802  
Internet: [www.edrnet.com](http://www.edrnet.com)**

## TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
Executive Summary.....	ES1
Overview Map.....	2
Detail Map.....	3
Map Findings Summary.....	4
Map Findings.....	6
Orphan Summary.....	8
Government Records Searched/Data Currency Tracking.....	GR-1

### GEOCHECK ADDENDUM

GeoCheck - Not Requested

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

#### Important information about The EDR FieldCheck(TM) Report

*This is The EDR FieldCheck (TM) Report. Through its continuing emphasis in online technological advancements, EDR has developed the FieldCheck (TM) system, which enables EDR's customers to make certain online modifications to the maps and text contained in EDR Radius Map Reports. With FieldCheck (TM), an EDR customer can relocate and/or delete plotted sites and/or plot or delete orphan sites that would otherwise appear or be noted with an EDR Radius Map Report. Such modifications may be based on site visits, independent data verification and/or other actions taken or decisions made by EDR's customer. As a result, the maps and text contained in The EDR FieldCheck (TM) Report that you receive may have been so modified. Please note: EDR has not taken any action to verify any such modifications, and this report and the findings set forth herein must be read in light of this fact. VUICH ENVIRONMENTAL should be contacted for information concerning all such modifications.*

#### Disclaimer

##### Copyright and Trademark Notice

*This report contains information obtained from a variety of public and other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. IN ADDITION, THIS REPORT HAS BEEN MODIFIED BY VUICH ENVIRONMENTAL WHICH MODIFICATIONS HAVE NOT BEEN VERIFIED BY EDR AND EDR, THEREFORE, ASSUMES NO RESPONSIBILITY FOR SUCH MODIFICATIONS. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL EDR BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.*

*Entire contents copyright 2003 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.*

*EDR and the edr logos are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.*

## EXECUTIVE SUMMARY

At the request of VUICH ENVIRONMENTAL, a search of the environmental records covering the area detailed herein was conducted by Environmental Data Resources, Inc. (EDR). This report was derived from the results of such search, which, as conducted by EDR, met the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances were per ASTM standard or custom distances requested by the user.

NOTE: ALL MAPS AND TEXT INCLUDED HEREIN MAY HAVE BEEN MODIFIED BY VUICH ENVIRONMENTAL BASED ON SITE VISITS, INDEPENDENT DATA VERIFICATION AND/OR OTHER ACTIONS TAKEN OR DECISIONS MADE BY VUICH ENVIRONMENTAL. EDR HAS NOT TAKEN ANY ACTION TO VERIFY ANY OF SUCH MODIFICATIONS, AND THIS REPORT AND THE FINDINGS SET FORTH HEREIN MUST BE READ IN LIGHT OF THIS FACT. VUICH ENVIRONMENTAL SHOULD BE CONTACTED FOR INFORMATION CONCERNING ALL SUCH MODIFICATIONS.

### TARGET PROPERTY INFORMATION

#### ADDRESS

HONOAPIILANI HWY  
WAILUKU, HI 96793

#### COORDINATES

Latitude (North):	20.866800 - 20° 52' 0.5"
Longitude (West):	156.501300 - 156° 30' 4.7"
Universal Transverse Mercator:	Zone 4
UTM X (Meters):	759982.6
UTM Y (Meters):	2309290.0
Elevation:	355 ft. above sea level

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	20156-G5 LAHAINA, HI
Source:	USGS 7.5 min quad index

### TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

### DATABASES WITH NO MAPPED SITES

No sites were found in an online review and analysis by VUICH ENVIRONMENTAL of EDR's search of available ("reasonably ascertainable") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

### FEDERAL ASTM STANDARD

NPL.....	National Priority List
Proposed NPL.....	Proposed National Priority List Sites
CERCLIS.....	Comprehensive Environmental Response, Compensation, and Liability Information System

## EXECUTIVE SUMMARY

CERC-NFRAP.....	CERCLIS No Further Remedial Action Planned
CORRACTS.....	Corrective Action Report
RCRIS-TSD.....	Resource Conservation and Recovery Information System
RCRIS-LQG.....	Resource Conservation and Recovery Information System
RCRIS-SQG.....	Resource Conservation and Recovery Information System
ERNS.....	Emergency Response Notification System

### STATE ASTM STANDARD

SWF/LF.....	Permitted Landfills in the State of Hawaii
LUST.....	Leaking Underground Storage Tank Database
UST.....	Underground Storage Tank Database
VCP.....	Voluntary Response Program Sites

### FEDERAL ASTM SUPPLEMENTAL

CONSENT.....	Superfund (CERCLA) Consent Decrees
ROD.....	Records Of Decision
Delisted NPL.....	National Priority List Deletions
FINDS.....	Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS.....	Hazardous Materials Information Reporting System
MLTS.....	Material Licensing Tracking System
MINES.....	Mines Master Index File
NPL Liens.....	Federal Superfund Liens
PADS.....	PCB Activity Database System
FUDS.....	Formerly Used Defense Sites
INDIAN RESERV.....	Indian Reservations
US BROWNFIELDS.....	A Listing of Brownfields Sites
DOD.....	Department of Defense Sites
RAATS.....	RCRA Administrative Action Tracking System
TRIS.....	Toxic Chemical Release Inventory System
TSCA.....	Toxic Substances Control Act
SSTS.....	Section 7 Tracking Systems
FTTS INSP.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

### STATE OR LOCAL ASTM SUPPLEMENTAL

SPILLS.....	Release Notifications
-------------	-----------------------

### EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas.....	Former Manufactured Gas (Coal Gas) Sites
---------------	--

### BROWNFIELDS DATABASES

US BROWNFIELDS.....	A Listing of Brownfields Sites
BROWNFIELDS.....	Brownfields Sites
VCP.....	Voluntary Response Program Sites

### SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.



## EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property. Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in *bold italics* are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

### STATE ASTM STANDARD

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

An online review and analysis by VUICH ENVIRONMENTAL of the SHWS list, as provided by EDR, and dated 07/12/2001 has revealed that there is 1 SHWS site within approximately 1 mile of the target property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
WAIALE ASH PILE	WAIALE STREET	1/2 - 1 NNE	1	6

# OVERVIEW IAP - 01189151.1r - Vuich Environmental



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

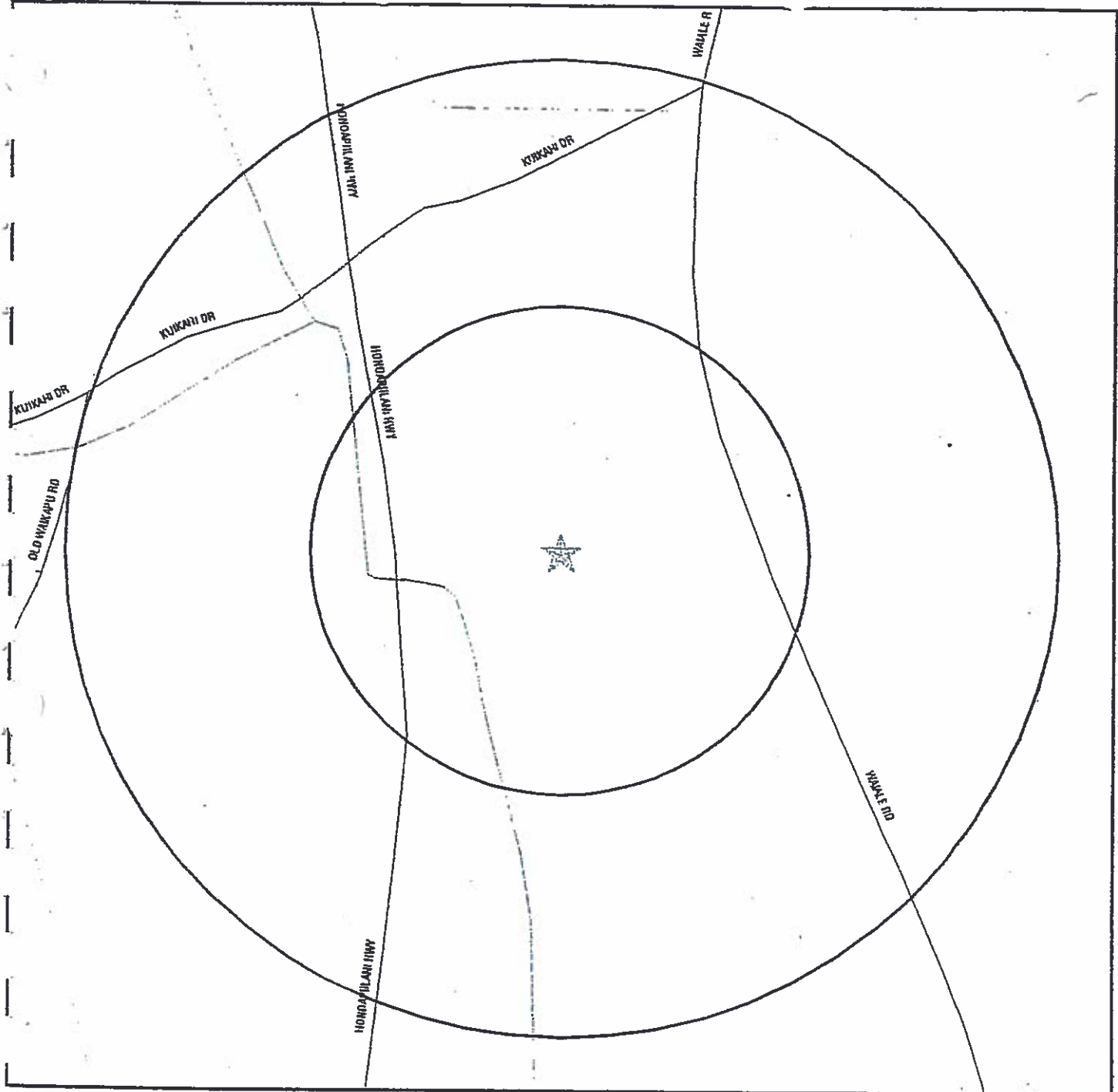
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands

0 1/4 1/2 1 Miles

**TARGET PROPERTY:** Emmanuel Lutheran Church  
**ADDRESS:** Honoapiilani Hwy  
**CITY/STATE/ZIP:** Wailuku HI 96793  
**LAT/LONG:** 20.8668 / 156.5013

**CUSTOMER:** Vuich Environmental  
**CONTACT:** Massy Cashen  
**INQUIRY #:** 01189151.1r  
**DATE:** May 11, 2004 5:58 pm

# DETAIL P - 01189151.1r - Vuich Environmental



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

0 1/16 1/8 1/4 Miles

TARGET PROPERTY: Emmanuel Lutheran Church  
 ADDRESS: Honoapilani Hwy  
 CITY/STATE/ZIP: Wailuku HI 96793  
 LAT/LONG: 20.8668 / 156.5013

CUSTOMER: Vuich Environmental  
 CONTACT: Massy Cashen  
 INQUIRY #: 01189151.1r  
 DATE: May 11, 2004 5:59 pm

## EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

<u>Site Name</u>	<u>Database(s)</u>
SMILE'S AUTO SPECIALISTS	SHWS
KANAHU POND EAST	CERC-NFRAP, SHWS
RAINBOW HAULING	SHWS
E & E BLACK CONTRACTORS	SHWS
HOBROU AVENUE AREA	SHWS, SPILLS
MAUI PALMS HOTEL UST	SHWS
ALEXANDER AND BALDWIN DUMP SITE	SHWS
MAUI MEAT FACILITY-FORMER	SHWS
KALAMAULA LANDFILL	SHWS
KAHOOLAWE ISLAND	SHWS
BEN FRANKLIN STORES PROPERTY	SHWS
OLOWALU TRANSFER STATION	SHWS
PICRIC ACID AT MAUI COMMUNITY COLLEGE	SHWS
PICRIC ACID AT MAUI MEMORIAL HOSPITAL	SHWS
MAALAE	SWF/LF
KAKAMAULA LANDFILL	SWF/LF
KALUAKOI LANDFILL	SWF/LF
MAUNALOHA LANDFILL	SWF/LF
CENTRAL MAUI LF, PHASE I&II LF-0034-95)	SWF/LF
DAVID PICO CESSPOOL DIGGING	LUST, UST
PAIA SEWER PUMP STATION	UST

## MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<u>FEDERAL ASTM STANDARD</u>								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.500	0	0	0	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
<u>STATE ASTM STANDARD</u>								
SHWS		1.000	0	0	0	1	NR	1
State Landfill		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
<u>FEDERAL ASTM SUPPLEMENTAL</u>								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
FUDS		1.000	0	0	0	0	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
<u>STATE OR LOCAL ASTM SUPPLEMENTAL</u>								
SPILLS		TP	NR	NR	NR	NR	NR	0
<u>EDR PROPRIETARY HISTORICAL DATABASES</u>								
Coal Gas		1.000	0	0	0	0	NR	0

## MAP FINDINGS SUMMARY

<u>Database</u>	<u>Target Property</u>	<u>Search Distance (Miles)</u>	<u>&lt; 1/8</u>	<u>1/8 - 1/4</u>	<u>1/4 - 1/2</u>	<u>1/2 - 1</u>	<u>&gt; 1</u>	<u>Total Plotted</u>
<b><u>BROWNFIELDS DATABASES</u></b>								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
BROWNFIELDS		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0

**NOTES:**

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database



Map ID  
Direction  
Distance  
Distance (ft.)  
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number  
EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

1  
NNE  
1/2-1  
5190 ft.

WAI'ALE ASH PILE  
WAI'ALE STREET  
WAILUKU, HI

SHWS S104657531  
N/A

Relative:  
Lower

SHWS:

Actual:  
206 ft.

File Section :	Central
Type :	Not reported
Department 1 :	Not reported
Department 2 :	Not reported
Department 3 :	Not reported
Table :	Sitelist
Island :	Mau'i
Zip :	Not reported
Discovery Assessment and Remediation :	6/14/99
Initial Site Screening Team Lead :	Laura Young
ISST Assigned :	3/9/00
ISST Date :	8/10/00
ISST Priority :	High
ISST Letter :	Not reported
Env Justice Eligible :	Not reported
Preliminary Assessment :	No
PA Lead :	Not reported
PA Date :	Not reported
PA Result :	Not reported
Site Investigation :	No
SI Lead :	Not reported
SI Date :	Not reported
SI Result :	Not reported
Remediation Action Planned :	Not reported
VRP :	Not reported
Brownfields :	Not reported
Agreement :	Not reported
Remedial Investigation :	Not reported
RAA :	Not reported
Response Action Memo :	Not reported
REM Lead :	Not reported
REM Date :	Not reported
REM Last Update :	8/14/00
Input By :	Bryce
Case :	Not reported
Fed Id :	Not reported
UST :	Not reported
Permits :	Not reported
RCRA :	Not reported
Program :	Not reported
Priority :	Not reported
Lat/Long :	Not reported
Cost :	Not reported
CU QNTY Site :	Not reported
Enforcement :	Not reported
CU Method :	Not reported
Ownership :	Not reported
Tax Map Key :	Not reported
Form :	Not reported

Map ID  
Direction  
Distance  
Distance (ft.)  
Elevation

MAP FINDINGS

WAIALE ASH PILE (Continued)

EDR ID Number  
EPA ID Number

Database(s)

S104657531

EPCRA :	Not reported
EPCRA FIL :	Not reported
Pathways :	Not reported
Targets :	Not reported
Manager :	Not reported
REM Result :	Not reported
Identifier :	Not reported
Site Code :	Not reported
Event :	Not reported
Event Type :	Not reported
Notes :	Not reported
Site :	Not reported
Site_ :	Not reported
Operator :	Not reported
Current :	Not reported
Compounds :	Dioxins, heavy metals
Oname :	Not reported

# ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
KAHULUI	1000818963	SMILE'S AUTO SPECIALISTS	AMALA PLACE	98732	SHWS
KAHULUI	1001475719	KANAHU POND EAST	AMALA PLACE	98732	CERC-NFRAP, SHWS
KAHULUI	1000855952	RAINBOW HAULING	AMALA PL	98732	SHWS
KAHULUI	1000818952	E & E BLACK CONTRACTORS	AMALA PL	98732	SHWS
KAHULUI	S104534206	HOBSON AVENUE AREA	HOBSON AVE	98732	SHWS, SPILLS
KAHULUI	S104534280	MAUI PALMS HOTEL UST	150 KAAHUMANU AVE	98732	SHWS
KAHULUI	U001236769	DAVID PICO CESSPOOL DIGGING	OLD HALEAKALA HWY	98732	LUST, UST
KAHULUI	1001032388	ALEXANDER AND BALDWIN DUMP SITE	W PAPA AVE	98732	SHWS
KAHULUI	U003222223	PAIA SEWER PUMP STATION	PUNA ROAD/HANA HWY	98732	UST
KAHULUI	S104534289	MAUI MEAT FACILITY-FORMER	801 2ND ST	98732	SHWS
KALAMAULA	S104534228	KALAMAULA LANDFILL	SOUTH MOLOKAI, KALAMAULA	98783	SHWS
MAUI COUNTY	S106100622	MAALAEA	INTERSECTION OF KIHEI RD AND HONOAPILANI HWY		SWF/IF
MAUI COUNTY	S104534222	KAHOOLAWE ISLAND	KAHOOLAWE ISLAND	98732	SHWS
MAUI COUNTY	S103763853	KAKAMAULA LANDFILL	KALAMAULA MOLOKAI		SWF/IF
MAUI COUNTY	S103763864	KALIAKOI LANDFILL	KALIAKOI ROAD MAUNALO		SWF/IF
MAUI COUNTY	S104534094	BEN FRANKLIN STORES PROPERTY	KAUNAKAKAI, MOLOKAI		SHWS
MAUI COUNTY	S103763656	MAUNALO LANDFILL	MAUNALO MAUI		SWF/IF
MAUI COUNTY	S103763852	CENTRAL MAUI LF, PHASE I&II LF-0034-05	PUNENE, MAUI		SWF/IF
OLOWALU	1000435092	OLOWALU TRANSFER STATION	OLOWALU	98783	SHWS
WAILUKU	S104657488	PICRIC ACID AT MAUI COMMUNITY COLLE	310 KAAHUMANU AVE	98783	SHWS
WAILUKU	S104657489	PICRIC ACID AT MAUI MEMORIAL HOSPIT	MAUI	98783	SHWS

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

### FEDERAL ASTM STANDARD RECORDS

#### **NPL: National Priority List**

Source: EPA

Telephone: N/A

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/29/04

Date Made Active at EDR: 02/27/04

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/04

Elapsed ASTM days: 21

Date of Last EDR Contact: 02/06/04

#### **NPL Site Boundaries**

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)

Telephone: 202-564-7333

EPA Region 1

Telephone 617-918-1143

EPA Region 3

Telephone 215-814-5418

EPA Region 4

Telephone 404-562-8033

EPA Region 6

Telephone: 214-655-6659

EPA Region 8

Telephone: 303-312-6774

#### **Proposed NPL: Proposed National Priority List Sites**

Source: EPA

Telephone: N/A

Date of Government Version: 01/07/04

Date Made Active at EDR: 02/27/04

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/04

Elapsed ASTM days: 21

Date of Last EDR Contact: 02/06/04

#### **CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System**

Source: EPA

Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/26/04

Date Made Active at EDR: 04/02/04

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/04

Elapsed ASTM days: 11

Date of Last EDR Contact: 03/22/04

#### **CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned**

Source: EPA

Telephone: 703-413-0223

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/26/04  
Date Made Active at EDR: 04/02/04  
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/04  
Elapsed ASTM days: 11  
Date of Last EDR Contact: 03/22/04

### **CORRACTS: Corrective Action Report**

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/04  
Date Made Active at EDR: 04/15/04  
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 03/25/04  
Elapsed ASTM days: 21  
Date of Last EDR Contact: 03/08/04

### **RCRIS: Resource Conservation and Recovery Information System**

Source: EPA

Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/04  
Date Made Active at EDR: 04/02/04  
Database Release Frequency: Varies

Date of Data Arrival at EDR: 03/18/04  
Elapsed ASTM days: 15  
Date of Last EDR Contact: 04/20/04

### **ERNS: Emergency Response Notification System**

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/03  
Date Made Active at EDR: 03/12/04  
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/26/04  
Elapsed ASTM days: 46  
Date of Last EDR Contact: 04/26/04

### **FEDERAL ASTM SUPPLEMENTAL RECORDS**

#### **BRS: Biennial Reporting System**

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01  
Database Release Frequency: Biennially

Date of Last EDR Contact: 03/16/04  
Date of Next Scheduled EDR Contact: 06/14/04

#### **CONSENT: Superfund (CERCLA) Consent Decrees**

Source: EPA Regional Offices

Telephone: Varies

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A  
Database Release Frequency: Varies

Date of Last EDR Contact: N/A  
Date of Next Scheduled EDR Contact: N/A

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### ROD: Records Of Decision

Source: EPA

Telephone: 703-416-0223

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/09/04

Database Release Frequency: Annually

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

### DELISTED NPL: National Priority List Deletions

Source: EPA

Telephone: N/A

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/29/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/06/04

Date of Next Scheduled EDR Contact: 05/01/04

### FINDS: Facility Index System/Facility Identification Initiative Program Summary Report

Source: EPA

Telephone: N/A

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

### HMIRS: Hazardous Materials Information Reporting System

Source: U.S. Department of Transportation

Telephone: 202-366-4555

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/18/03

Database Release Frequency: Annually

Date of Last EDR Contact: 04/20/04

Date of Next Scheduled EDR Contact: 07/19/04

### MLTS: Material Licensing Tracking System

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/04

Date of Next Scheduled EDR Contact: 07/05/04

### MINES: Mines Master Index File

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959

Date of Government Version: 03/05/04

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/04

Date of Next Scheduled EDR Contact: 06/28/04

### NPL LIENS: Federal Superfund Liens

Source: EPA

Telephone: 202-564-4267

Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/15/91  
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/12/04  
Date of Next Scheduled EDR Contact: 05/24/04

### PADS: PCB Activity Database System

Source: EPA

Telephone: 202-564-3887

PCB Activity Database. PADS identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/30/03  
Database Release Frequency: Annually

Date of Last EDR Contact: 02/09/04  
Date of Next Scheduled EDR Contact: 05/10/04

### DOD: Department of Defense Sites

Source: USGS

Telephone: 703-692-8801

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 10/01/03  
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/02/04  
Date of Next Scheduled EDR Contact: 05/10/04

### STORMWATER: Storm Water General Permits

Source: Environmental Protection Agency

Telephone: 202 564-0746

A listing of all facilities with Storm Water General Permits.

Date of Government Version: N/A  
Database Release Frequency: Quarterly

Date of Last EDR Contact: N/A  
Date of Next Scheduled EDR Contact: N/A

### INDIAN RESERV: Indian Reservations

Source: USGS

Telephone: 202-206-3710

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03  
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/02/04  
Date of Next Scheduled EDR Contact: 05/10/04

### US BROWNFIELDS: A Listing of Brownfields Sites

Source: Environmental Protection Agency

Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities-especially those without EPA Brownfields Assessment Demonstration Pilots-minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 07/15/03  
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/15/04  
Date of Next Scheduled EDR Contact: 06/14/04

### RMP: Risk Management Plans

Source: Environmental Protection Agency

Telephone: 202-564-8600

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A  
Database Release Frequency: N/A

Date of Last EDR Contact: N/A  
Date of Next Scheduled EDR Contact: N/A

### FUDS: Formerly Used Defense Sites

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 10/01/03  
Database Release Frequency: Varies

Date of Last EDR Contact: 04/26/04  
Date of Next Scheduled EDR Contact: 07/05/04

### RAATS: RCRA Administrative Action Tracking System

Source: EPA  
Telephone: 202-564-4104

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95  
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/08/04  
Date of Next Scheduled EDR Contact: 06/07/04

### TRIS: Toxic Chemical Release Inventory System

Source: EPA  
Telephone: 202-566-0250

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/01  
Database Release Frequency: Annually

Date of Last EDR Contact: 03/23/04  
Date of Next Scheduled EDR Contact: 06/21/04

### TSCA: Toxic Substances Control Act

Source: EPA  
Telephone: 202-260-5521

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/02  
Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 03/05/04  
Date of Next Scheduled EDR Contact: 06/07/04

### FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA  
Telephone: 202-564-2501

Date of Government Version: 01/21/04  
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/04  
Date of Next Scheduled EDR Contact: 06/21/04

### SSTS: Section 7 Tracking Systems

Source: EPA  
Telephone: 202-564-5008

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/01  
Database Release Frequency: Annually

Date of Last EDR Contact: 04/19/04  
Date of Next Scheduled EDR Contact: 07/19/04

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)**

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-564-2501

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA.

TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/04

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/04

Date of Next Scheduled EDR Contact: 06/21/04

### STATE OF HAWAII ASTM STANDARD RECORDS

#### **SHWS: Sites List**

Source: Department of Health

Telephone: 808-586-4249

Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 07/12/01

Date Made Active at EDR: 10/16/01

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/24/01

Elapsed ASTM days: 22

Date of Last EDR Contact: 03/25/04

#### **SWF/LF: Permitted Landfills in the State of Hawaii**

Source: Department of Health

Telephone: 808-586-4245

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/01/03

Date Made Active at EDR: 01/13/04

Database Release Frequency: Varies

Date of Data Arrival at EDR: 11/24/03

Elapsed ASTM days: 50

Date of Last EDR Contact: 04/26/04

#### **LUST: Leaking Underground Storage Tank Database**

Source: Department of Health

Telephone: 808-586-4228

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 08/01/03

Date Made Active at EDR: 09/17/03

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 15

Date of Last EDR Contact: 03/30/04

#### **UST: Underground Storage Tank Database**

Source: Department of Health

Telephone: 808-586-4228

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/01/03

Date Made Active at EDR: 09/11/03

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 9

Date of Last EDR Contact: 03/30/04

#### **VCP: Voluntary Response Program Sites**

Source: Department of Health

Telephone: 808-586-4249

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/10/03  
Date Made Active at EDR: 10/21/03  
Database Release Frequency: Varies

Date of Data Arrival at EDR: 10/13/03  
Elapsed ASTM days: 8  
Date of Last EDR Contact: 03/22/04

### STATE OF HAWAII ASTM SUPPLEMENTAL RECORDS

#### **SPILLS: Release Notifications**

Source: Department of Health  
Telephone: 808-586-4249

Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 09/01/00  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/25/04  
Date of Next Scheduled EDR Contact: 06/21/04

### EDR PROPRIETARY HISTORICAL DATABASES

**Former Manufactured Gas (Coal Gas) Sites:** The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

#### **Disclaimer Provided by Real Property Scan, Inc.**

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

### BROWNFIELDS DATABASES

#### **BROWNFIELDS: Brownfields Sites**

Source: Department of Health  
Telephone: 808-586-4249

Date of Government Version: 10/10/03  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/04  
Date of Next Scheduled EDR Contact: 06/21/04

#### **VCP: Voluntary Response Program Sites**

Source: Department of Health  
Telephone: 808-586-4249

Date of Government Version: 10/04/03  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/04  
Date of Next Scheduled EDR Contact: 06/21/04

#### **US BROWNFIELDS: A Listing of Brownfields Sites**

Source: Environmental Protection Agency  
Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities—especially those without EPA Brownfields Assessment Demonstration Pilots—minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients—States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A  
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A  
Date of Next Scheduled EDR Contact: N/A

### OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

**Oil/Gas Pipelines:** This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

#### **Electric Power Transmission Line Data**

Source: PennWell Corporation  
Telephone: (800) 823-6277

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

#### **AHA Hospitals:**

Source: American Hospital Association, Inc.  
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

#### **Medical Centers: Provider of Services Listing**

Source: Centers for Medicare & Medicaid Services  
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

#### **Nursing Homes**

Source: National Institutes of Health  
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

#### **Public Schools**

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

#### **Private Schools**

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### STREET AND ADDRESS INFORMATION

© 2003 Geographic Data Technology, Inc., Rel. 07/2003. This product contains proprietary and confidential property of Geographic Data Technology, Inc. Unauthorized use, including copying for other than testing and standard backup procedures, of this product is expressly prohibited.





**EDR®** Environmental  
Data Resources Inc

## **EDR Site Report™**

**WAIKAPU DUMP-MAUI COUNTY DUMP  
CENTRAL MAUI  
KAHULUI, HI 96732**

**Inquiry Number:**

**May 11, 2004**

**The Standard in  
Environmental Risk  
Management Information**

440 Wheelers Farms Road  
Milford, Connecticut 06460

**Nationwide Customer Service**

Telephone: 1-800-352-0050  
Fax: 1-800-231-6802  
Internet: [www.edrnet.com](http://www.edrnet.com)

## TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of over 4 million government records from more than 600 federal, state and local environmental databases. The report is divided into three sections:

**Section 1: Facility Summary ..... Page 3**

Summary of facility filings including a review of the following areas: waste management, waste disposal, multi-media issues, and Superfund liability.

**Section 2: Facility Detail Reports ..... Page 4**

All available detailed information from databases where sites are identified.

**Section 3: Databases Searched and Update Information. .... Page 5**

Name, source, update dates, contact phone number and description of each of the databases searched for this report.

*Thank you for your business.*  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

### Disclaimer - Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL EDR BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. It can not be concluded from this report that coverage information for the target and surrounding properties does not exist from other sources. Any analyses, estimates, ratings or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Any liability on the part of EDR is strictly limited to a refund of the amount paid for this report.

Copyright 2004 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

## SECTION 1: FACILITY SUMMARY

FACILITY	FACILITY 1 WAIKAPU DUMP-MAUI COUNTY DUMP CENTRAL MAUI KAHULUI, HI 96732 EDR ID #1003879111 EPA #HID050340843
AREA	
<b>WASTE MANAGEMENT</b> Facility generates hazardous waste (RCRIS)	NO
Facility treats, stores, or disposes of hazardous waste on-site (RCRIS/TSD)	NO
Facility has received Notices of Violations (RCRIS/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	NO
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
<b>WASTE DISPOSAL</b> Facility is a Superfund Site (NPL)	NO
Facility has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	YES - p4 (NFRAP)
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
<b>MULTIMEDIA</b> Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility produces pesticides and has notified EPA under Section 7 of FIFRA (SSTS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has inspections under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	NO
Facility is listed in a county/local unique database (LOCAL)	NO
<b>POTENTIAL SUPERFUND LIABILITY</b> Facility has a list of potentially responsible parties PRP	NO
<b>TOTAL (YES)</b>	1

## SECTION 2: FACILITY DETAIL REPORTS

### WASTE DISPOSAL

DATABASE: No Further Remedial Action Planned (CERCLIS/NFRAP)

WAIKAPU DUMP-MAUI COUNTY DUMP  
CENTRAL MAUI  
KAHULUI, HI 96732  
EDR ID #1003879111

CERC-NFRAP Name: WAIKAPU DUMP-MAUI COUNTY DUMP  
CENTRAL MAUI  
KAHULUI, HI 96732  
MAUI County

Congressional Dist:	Not reported	RCRA Facility:	Not reported
IFMS ID:	Not reported	SMSA Num:	Not reported
USGS Hydro Unit:	20020000	Federal Facility:	Not a Federal Facility
Non NPL Status:	NFRAP		
NPL Update Num:	Not Reported	Federal Register Date:	Not Reported
Fed Haz Waste:	No	Site Incident:	Not reported
EPA-ID:	HID050340843		
EPA Region:	Region 9 r9cerc01.r09tok.epa.gov 204.47.91.37 75 Hawthorne St. 94		
NPL Status:	Not on the NPL	Ownership Status:	Unknown
Classification:	Not Reported		
Site Description:	Not Reported		

### ENFORCEMENT ACTIVITY

Action Type: DISCOVERY  
Action Anomaly: Not reported  
Planning Status: Not reported  
Priority Level: Not reported  
Operable Unit: SITEWIDE  
Urgency: Not reported  
Actual Start Date: Not reported  
Actual Complete Date: 19791101  
Primary Responsibility: EPA Fund-Financed

Action Type: ARCHIVE SITE  
Action Anomaly: Not reported  
Planning Status: Not reported  
Priority Level: Not reported  
Operable Unit: SITEWIDE  
Urgency: Not reported  
Actual Start Date: Not reported  
Actual Complete Date: 19850101  
Primary Responsibility: EPA In-House

Action Type: PRELIMINARY ASSESSMENT  
Action Anomaly: Not reported  
Planning Status: Not reported  
Priority Level: NFRAP (No Further Remedial Action Planned)  
Operable Unit: SITEWIDE  
Urgency: Not reported  
Actual Start Date: 19841001  
Actual Complete Date: 19850101  
Primary Responsibility: State, Fund Financed

## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

**Elapsed ASTM days:** Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

### WASTE MANAGEMENT

#### RCRIS: Resource Conservation and Recovery Information System

Source: EPA

Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/09/2004  
Database Release Frequency: Varies

Date of Last EDR Contact: 04/20/2004  
Date of Next Scheduled Update: 06/21/2004

#### BRS: Biennial Reporting System

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/2001  
Database Release Frequency: Biennially

Date of Last EDR Contact: 03/16/2004  
Date of Next Scheduled Update: 06/14/2004

#### RAATS: RCRA Administrative Action Tracking System

Source: EPA

Telephone: 202-564-4104

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995  
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 03/08/2004  
Date of Next Scheduled Update: 06/07/2004

#### CORRACTS: Corrective Action Report

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2004  
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/08/2004  
Date of Next Scheduled Update: 06/07/2004

#### PADS: PCB Activity Database System

Source: EPA

Telephone: 202-564-3887

PCB Activity Database. PADS identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/30/2003  
Database Release Frequency: Annually

Date of Last EDR Contact: 02/09/2004  
Date of Next Scheduled Update: 05/10/2004

## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

### MLTS: Material Licensing Tracking System

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/15/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/2004

Date of Next Scheduled Update: 07/05/2004

### HI UST: Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/01/2003

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/2004

Date of Next Scheduled Update: 06/28/2004

### HI LUST: Leaking Underground Storage Tank Database

Source: Department of Health

Telephone: 808-586-4228

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 08/01/2003

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/30/2004

Date of Next Scheduled Update: 06/28/2004

### ERNS: Emergency Response Notification System

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2003

Database Release Frequency: Annually

Date of Last EDR Contact: 04/26/2004

Date of Next Scheduled Update: 07/26/2004

### HMIRS: Hazardous Materials Information Reporting System

Source: U.S. Department of Transportation

Telephone: 202-366-4555

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/18/2003

Database Release Frequency: Annually

Date of Last EDR Contact: 04/20/2004

Date of Next Scheduled Update: 07/19/2004

## WASTE DISPOSAL

### NPL: National Priority List

Source: EPA

Telephone: Not reported

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/29/2004

Date Made Active at EDR: 02/27/2004

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/2004

Elapsed ASTM Days: 21

Date of Last EDR Contact: 02/06/2004

### PROPOSED NPL: Proposed National Priority List Sites

Source: EPA

Telephone: Not reported

Date of Government Version: 01/07/2004

Date Made Active at EDR: 02/27/2004

Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/06/2004

Elapsed ASTM Days: 21

Date of Last EDR Contact: 02/06/2004



## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

### DELISTED NPL: National Priority List Deletions

Source: EPA

Telephone: Not reported

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/29/2004

Date Made Active at EDR: 02/27/2004

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 02/06/2004

Elapsed ASTM Days: 21

Date of Last EDR Contact: 02/06/2004

### CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

Source: EPA

Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/26/2004

Date Made Active at EDR: 04/02/2004

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/22/2004

Elapsed ASTM Days: 11

Date of Last EDR Contact: 03/22/2004

### CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Source: EPA

Telephone: 703-413-0223

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 02/26/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

### NPL LIENS: Federal Superfund Liens

Source: EPA

Telephone: 202-564-4267

Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991

Date Made Active at EDR: 03/30/1994

Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 02/02/1994

Elapsed ASTM Days: 56

Date of Last EDR Contact: 03/12/2004

### HI SHWS:

#### HI SWF/LF: Permitted Landfills in the State of Hawaii

Source: Department of Health

Telephone: 808-586-4245

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/01/2003

Database Release Frequency: Varies

Date of Last EDR Contact: 04/26/2004

Date of Next Scheduled Update: 07/26/2004

## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

### MULTIMEDIA

#### TRIS: Toxic Chemical Release Inventory System

Source: EPA

Telephone: 202-566-0250

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2001

Database Release Frequency: Annually

Date of Last EDR Contact: 03/23/2004

Date of Next Scheduled Update: 06/21/2004

#### SSTS: Section 7 Tracking Systems

Source: EPA

Telephone: 202-564-5008

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2001

Database Release Frequency: Annually

Date of Last EDR Contact: 04/19/2004

Date of Next Scheduled Update: 07/19/2004

#### TSCA: Toxic Substances Control Act

Source: EPA

Telephone: 202-260-5521

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002

Database Release Frequency: N/A

Date of Last EDR Contact: 03/05/2004

Date of Next Scheduled Update: 06/07/2004

#### FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-564-2501

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

#### FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA

Telephone: 202-564-2501

Date of Government Version: 01/21/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/22/2004

Date of Next Scheduled Update: 06/21/2004

#### FINDS: Facility Index System/Facility Identification Initiative Program Summary Report

Source: EPA

Telephone: Not reported

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/08/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/05/2004

Date of Next Scheduled Update: 07/05/2004

## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

### HI SPILLS: Release Notifications

Source: Department of Health

Telephone: 808-586-4249

Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 09/01/2000  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/25/2004  
Date of Next Scheduled Update: 06/21/2004

### HI BROWNFIELDS: Brownfields Sites

Source: Department of Health

Telephone: 808-586-4249

Date of Government Version: 10/10/2003  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/2004  
Date of Next Scheduled Update: 06/21/2004

### HI VCP: Voluntary Response Program Sites

Source: Department of Health

Telephone: 808-586-4249

Date of Government Version: 10/10/2003  
Database Release Frequency: Varies

Date of Last EDR Contact: 03/22/2004  
Date of Next Scheduled Update: 06/21/2004

### GA SPILLS: Spills Information

Source: Department of Natural Resources

Telephone: 404-656-6905

Oil or Hazardous Material Spills or Releases.

Date of Government Version: 02/11/2004  
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/26/2004  
Date of Next Scheduled Update: 07/26/2004

### GA HIST LF:

### GA NON-HSI: Non-Hazardous Site Inventory

Source: Rindt-McDuff Associates, Inc.

Telephone: Not reported

This list was obtained by EDR in 1998 and contains property listings that have reported contamination of soil or groundwater under the Georgia Hazardous Site Response Act (HSRA). These sites were not placed on the Georgia Priority list (Hazardous Site Inventory or HSI) because their hazard evaluation scores did not exceed the threshold levels established for sites posing an imminent threat to health or the environment. Disclaimer provided by Rindt-McDuff Associates - the database information has been obtained from publicly available sources produced by other entities. While reasonable steps have been taken to insure the accuracy of the data, RMA does not guarantee the accuracy of the data. No claim is made for the actual existence of pollution at any site. This data does not constitute a legal opinion.

Date of Government Version: 01/20/2004  
Database Release Frequency: Annually

Date of Last EDR Contact: 04/05/2004  
Date of Next Scheduled Update: 07/05/2004

**Former Manufactured Gas (Coal Gas) Sites:** The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. (C) Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

#### Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

## SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

### POTENTIAL SUPERFUND LIABILITY

PRP: Potentially Responsible Parties

Source: EPA

Telephone: 202-564-6064

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/22/2004

Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/23/2004

Date of Next Scheduled Update: 07/05/2004

# CARLSMITH BALL LLP

A LIMITED LIABILITY LAW PARTNERSHIP

ONE MAIN PLAZA, SUITE 400  
2200 MAIN STREET, P O BOX 1086  
WAILUKU, MAUI, HAWAII 96793-1086  
TELEPHONE 808 242-4535 FAX 808 244 4974  
WWW.CARLSMITH.COM

## FACSIMILE TRANSMISSION

UNLESS OTHERWISE INDICATED OR OBVIOUS FROM THE NATURE OF THE TRANSMITTAL, THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE IS ATTORNEY PRIVILEGED AND CONFIDENTIAL INFORMATION INTENDED FOR THE USE OF THE INDIVIDUAL OR ENTITY NAMED BELOW. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, OR THE EMPLOYEE OR AGENT RESPONSIBLE FOR DELIVERING IT TO THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPYING OF THIS COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR OR ARE NOT SURE WHETHER IT IS PRIVILEGED, PLEASE IMMEDIATELY NOTIFY US BY COLLECT TELEPHONE AND RETURN THE ORIGINAL MESSAGE TO US AT THE ABOVE ADDRESS VIA THE U.S. POSTAL SERVICE AT OUR EXPENSE. THANK YOU.

DATE: April 20, 2004

TO:	Name	Fax No.	Phone No.
Joe @Vuich		249-2778	

FROM: Tom C. Leuteneker

NUMBER OF PAGES INCLUDING THIS COVER SHEET: 2

CASE NAME: Emmanuel Lutheran Church

CASE NUMBER:

☐ ORIGINAL/COPY WILL BE MAILED ☐ ORIGINAL/COPY WILL NOT BE MAILED

MESSAGE: Attached is list showing chemicals and fertilizers that may have been used on TMK 3-5-02:01.



April 15, 2004

To: Tom Leuteneker, via fax  
From: Clayton Suzuki

Subject: Tax Map Key: 3-5-02:01

The following chemicals may have been used during the cultivation of sugarcane on Tax Map Key: 3-5-02:01 in Waikapu.

Active Ingredient:

Atrazine  
Ametryn  
2, 4-D  
Diuron  
Glyphosate  
Mestibuzin  
Hexazinone  
Glyphosate  
Polado

Brand Name:

Aatrex Nine-O  
Evik 80W  
Formula 40  
Karmex DF  
Roundup  
Sinbar  
Velpar  
Polado

The following fertilizers were used in the cultivation of sugarcane.

Nitrogen  
Potassium  
Phosphorus  
Calcium carbonate

The following chemicals may have been used during the cultivation of pineapple in the Waikapu fields.

Allicto  
Andro  
Diazinon  
Karmex (Diuron)  
Roundup (non crop area)  
Fruitione  
Ethrel  
Evik  
Hyvar X  
Velpar DF  
Atrazine  
Nemcur 3

The following fertilizers were used in the cultivation of pineapple.

Nitrogen  
Iron Sulfate  
Zinc Sulfate  
Sulfate of Potash  
Magnesium Sulfate  
Sulfate of Ammonia



# **Appendix C:**

## **Qualifications of Environmental Professionals**



---

## STATEMENT OF QUALIFICATIONS

*for*  
*Joseph W. Beaulieu, B.A.*

---

**Company Position**      Environmental Technician

**Responsibilities  
and Duties:**

- Phase I & II Environmental Site Assessments/Investigations
- Phase III Environmental Remediation Projects
- Underground Storage Tank (UST) Closures
- Erosion Control Management
- Indoor Air Quality Investigations
- Erosion Control Plan (BMP) Development
- Hazardous/Regulated Waste Management

**Experience:**

- Environmental Site Assessments
- Disaster Preparedness drills - GIS
- Cartographer – American Automobile Association
- 14 years with the State of New York Mapping and GIS program

**Training &  
Education**

- Bachelor of Arts, Environmental Science and Geography (double major), Planning (minor), Mapping Science (minor), Plattsburgh State University College, Plattsburgh, New York. 1986
- GIS Graduate course work, State University at Albany, New York
- GPS training



Consultants, Inc.

## STATEMENT OF QUALIFICATIONS

for

*Jeffrey E. Kermode, B.A., B. Tech.*

### **Company Position**

Vice President / Environmental Projects Manager

### **Responsibilities and Duties:**

- Phase I & II Environmental Site Assessments/Investigations
- Phase III Remediation Projects
- Underground Storage Tank (UST) Closures
- Asbestos Inspections, Air Monitoring and Supervision of Removal
- Lead-Based Paint Inspections, Risk Assessments and Supervision of Removal
- Indoor Air Quality Investigations and Mold Remediation Project Management
- Erosion Control Plan (BMP) Development
- Site Safety Officer for Sampling/Remediation Projects

### **Experience:**

- Soil and Groundwater Investigations/Remediation
- UST Removal and Closure
- Hazardous Materials Management
- Asbestos and Lead-Based Paint Projects (Inspections, Monitoring, Removal)
- Air Quality Sampling for Particulate and Microbiological Contaminants
- Wetland Delineation
- Erosion Control and Pollution Prevention Planning and Implementation for Large Scale Construction Projects
- Underground Injection Control (UIC) Permitting
- Environmental Report Writing and Compilation
- Conducted On-Site Oil Spill Response Training Courses, Assessed Clients' Response Preparedness, and Assisted in the Development of Oil Spill Contingency Plans
- Oil Spill Clean-Up Operations
- Pelagic and Coastal Fisheries Research as a Scientific Observer

### **Training & Education**

- Bachelor of Technology, Environmental Engineering, B.C.I.T. Burnaby, B.C., 1999
- Bachelor of Arts, Geography, University of B.C., Vancouver, Canada, 1989
- AHERA (Asbestos Hazard Emergency Response Act) Inspector for Asbestos, US EPA Certified
- AHERA Asbestos Contractor Supervisor, US EPA Certified
- AHERA Project Monitor for Asbestos, US EPA Certified
- OSHA HAZWOPER Certification (40 Hr)
- On-Scene Incident Commander Certification (24 Hr), US EPA Certified
- Lead-Based Paint Inspector, US EPA Certified
- Lead-Based Paint Risk Assessor, US EPA Certified
- Lead-Based Paint Contractor Supervisor, US EPA Certified



Consultants, Inc.

**JOHN S. VUICH**  
President & CEO

## STATEMENT OF QUALIFICATIONS:

*M. S. Geological Engineering, University of Arizona*  
*B. S. Geological Engineering, University of Arizona*  
*Registered Geologist (California)*  
*Registered Environmental Assessor (California)*  
*Certified Environmental Manager (Nevada)*

### AREAS OF EXPERTISE

#### ENVIRONMENTAL

- ▼ Site Assessments, Phase I, II, III Investigations
- ▼ Underground Storage Tank Closure
- ▼ Asbestos Inspection and Monitoring, Management Planning, and Abatement Project Design and Removal
- ▼ Lead-Containing Paint Surveys and Inspections, and Disturbance Design and Removal
- ▼ Site Characterization for Remedial Investigations
- ▼ Facility Operation Compliance Audits-ISO 14000 Audits
- ▼ Soils/Groundwater Remediation
- ▼ Hazardous Waste Management
- ▼ Risk Assessment Investigations
- ▼ RCRA Compliance and Closure Projects
- ▼ Expert Witness/Litigation Support
- ▼ Industrial Hygiene Qualified/Competent Person
- ▼ Mold/Fungi Sampling, Remediation and Abatement Design and Removal

#### GEOLOGICAL

- ▼ Hydrogeology
- ▼ Geologic Hazards Analysis
- ▼ Landuse Planning
- ▼ Subsurface Excavations and Drilling Investigations and Sampling

#### MANAGEMENT

- ▼ Program Director - Project Management
- ▼ Client - Agency Liaison
- ▼ Field Supervision - Administrative Supervisor

Rev. 6/03

**Maui (Main) Office:** 1498 Lower Main Street, Suite C, Wailuku, Maui, Hawaii 96793 • (808) 249-2777 Phone (808) 249-2778 Fax  
**Oahu Office:** Hanua Industrial Complex, 91-110 Hanua Street, Unit 317, Kapolei, Oahu, Hawaii 96707  
(808) 682-1611 Phone • (808) 682-1616 Fax • Inter-Island: (800) 572-1165 • [www.vuichenvironmental.com](http://www.vuichenvironmental.com)

**RELEVANT EXPERIENCE**

**Owner-President • Vuich Environmental Consultants, Inc.**

**Wailuku, Maui, and Honolulu, Oahu • (March, 1994 - Present)**

Consulting services and project management for Abatement / Remediation Projects property transfers, sampling and site characterization plans, hazardous and toxic waste management, underground storage tanks, regulatory compliance, landfill sites, site remediation and closure plans, permit applications, litigation support, feasibility planning and contingency and emergency response plans.

**Director • CEO Haztech Enviro-Systems**

**Tucson, AZ • July 1988 - February 1994)**

Founder of professional environmental engineering and geological consulting firm. Services included site assessments, site contamination characterizations, facility audits, RCRA closure investigations and hazardous/regulated waste management, remediation projects, and asbestos surveys. Prepared regulatory documentation and permitting for Federal, State and local regulatory agencies on all projects. Supervised professional, technical, sales and administrative/clerical staff.

**Project Engineer • Hazchem Environmental Services**

**Tucson, AZ • March 1987 - June 1988**

Performed and supervised RCRA remedial projects and waste management projects.

**Independent Consultant Geologist**

**Laguna Hills, CA and Tucson, AZ • 1982 - 1987**

Conducted geological investigations in western United States and Mexico. Performed geochemical sampling and geologic mapping. Prepared technical reports for clients and regulatory agencies.

**Environmental/Geotechnical Section Supervisor • TRW: Systems Engineering**

**Redondo Beach, CA • 1978 - 1981**

Directed environmental project management for Department of Defense and Department of Energy related projects in Western U.S. Project, including site selection, planning and environmental impact statements. Supervised staff consisting of geologists and environmental scientists.

**Assistant Geologist • Arizona Geological Survey**

**Tucson, AZ • 1972-1978**

Participated in environmental impact studies, geologic hazards analysis, landuse planning. Author of several landuse planning technical publications.

**Project Geologist and Staff Geologist • Various Geological Consulting & Mining Companies**

**Southwestern United States • 1968-1972**

Performed geochemical sampling, subsurface investigations including drilling, mineral property valuation and geologic mapping. Prepared geologic reports and maps.

**OTHER CERTIFICATIONS, TRAINING AND SECURITY CLEARANCES**

- ▼ Asbestos & Demolition Contractor (C-19, C-24) HI LIC #21212
- ▼ Certified Hazardous Materials First Responder, FEMA and Arizona Division of Emergency Services.
- ▼ OSHA Hazmat Worker and Supervisor
- ▼ Accredited Asbestos Building Inspector, Asbestos Contractor/Supervisor, Project Monitor, and Asbestos Abatement Project Designer.
- ▼ Accredited Lead Inspector and Lead Contractor Supervisor
- ▼ Continuing Education in Hazardous Materials Management, Environmental Studies and Environmental Regulations: 628 Classroom Hours since 1987 - Arizona State University, Tempe, AZ, Pima Community College, Tucson, AZ., & The Environmental Training Center Tucson, AZ.
- ▼ Security Clearance: Department of Defense, TOP SECRET (1980)
- ▼ Licensed Private Pilot - 1400 Hours, Single Engine, Land

Rev. 6/03

---

**Maui (Main) Office:** 1498 Lower Main Street, Suite C, Wailuku, Maui, Hawaii 96793 • (808) 249-2777 Phone (808) 249-2778 Fax  
**Oahu Office:** Hanua Industrial Complex, 91-110 Hanua Street, Unit 317, Kapolei, Oahu, Hawaii 96707  
(808) 682-1611 Phone • (808) 682-1616 Fax • Inter-Island: (800) 572-1165 • [www.vuichenvironmental.com](http://www.vuichenvironmental.com)



# **Appendix D:**

## **Acronyms and Abbreviations**

Abbreviation	Definition
AST	Aboveground Storage Tank
AHERA	(Federal) Asbestos Hazard Emergency Response Act
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BLM	Bureau of Land Management
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAA	Clean Air Act: Regulates Air Quality
CAMU	Corrective Action management Unit
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act: Federal Superfund for Cleanup of Environmental Contamination (1980, 1986)
CERCLIS	CERCLA Information System (data base)
CESQG	Conditionally Exempt SQG: Hazardous Waste Generator less than 100 kg/mo.
C.F.R.	Code of Federal Regulations: National Standard Regulations
COLIWASA	Composite Liquid Waste Sampler
CRC	Chlorofluorocarbon
CMU	Concrete Masonry Unit
CWA	Clean Water Act: Regulates Water Quality (1972, 1987)
CZMA	Coastal Zone Management Act
DLNR	Department of Land and Natural Resources
DOT	Department of Transportation: Administers hazardous Waste Containers-Marking-Labeling-Placarding and Transportation Procedures.
DOH	Department Of Health (State Of Hawaii)
DRASTIC	EPA Standardized System for Evaluating Groundwater Pollution Potential Using Hydrogeologic Settings.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency: Administers CERCLA, RCRA and SARA
FID	Flame Ionization Detector
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act: Regulates Pesticides (1972, 1988)
FSP	Field Sampling Plan
FWPCA	Federal Water Pollution Control Act
HAP	Hazardous Air Pollutant
HCS	(OSHA) Hazard Communication Standard
HSWA	(Federal) Hazardous and Solid Waste Amendments of 1984
LEL	Lower Explosive Limit
LQG	Large Quantity Generators; Hazardous Waste Generator in Excess of 100 kg/mo.
LUST	Leaking Underground Storage Tank.
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MSDS	Material Safety Data Sheets: Hazard Information Required for Chemical Substances by OSHA
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants (Under CAA Regulations)
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operating and Maintenance
OCS	Outer Continental Shelf
OSHA	Occupational Safety and Health Act: Established Hazard Communication Program and Employee Right-to-Know Law (1970)
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyls: Toxic Substance Used in Electric-Device Cooling.
PCU/l	Picocuries Per Liter
PEL	Permissible Airborne Exposure Level
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works

ppb	parts per billion
ppm	parts per million
PWP	Project Work Plan
PRPs	Potentially Responsible Parties
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RBCA	Risk Based Corrective Action and Decision-Making at Sites with Contaminated Soil and Groundwater. (Hawaii DOH)
RCRA	Resource Conservation and Recovery Act: Federal Hazardous Waste Management Law. Regulates Waste Generation, Transportation, Treatment, Storage or Disposal Sites (1976, 1984)
RQ	Reportable Quantity
RUST	Registry of Underground Storage Tanks
SAP	Sampling & Analysis Plan
SARA	Superfund Amendments and Reauthorization Act: Amends CERCLA and includes Community Right to Know Law. Requires facilities report their chemical inventories and emissions (1986).
SDWA	Safe Drinking Water Act: Establishes maximum contaminant levels for drinking water (1974, 1986).
SHSP	Site Health & Safety Plan
SIC	Standard Industrial Classification
SIP	State implementation plan
SPCC	Spill Prevention Control and Countermeasure
SQG	Small Quantity Generator: Hazardous Waste Generator between 100-1000 kg/mo.
TCLP	Toxicity Characteristic Leaching Procedure: A toxicity test for certain substances declared hazardous by the EPA.
TMK	(Hawaii ) Tax Map Key
TPH	Total Petroleum Hydrocarbons
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act: Regulates PCBs in electrical devices and chromium in evaporative cooling towers, asbestos in schools. (1976)
TSD	Treatment, Storage, and Disposal
UEL	Upper Explosive Limit
UIC	Underground Injection Control
USGS	United States Geological Survey
UST	Underground Storage Tank
VOA	Volatile Organic Analyses
VOC	Volatile Organic Compound: EPA listed toxic or carcinogenic organic substances.
Minimal, Minor or Not Significant	1) An unlikely or remote event, i.e., possible, but not anticipated under current conditions and observed features. 2) Insignificant when compared to regulatory acceptance levels, guideline action levels or when compared to background and/or baseline conditions of the local environment. 3) Any potential effect or impact attributed to the subject factor may be considered as the least likely source among a number of potentially responsible factors. 4) Any potential effect may not be measurable or detected by current technology. 5) Education, experience, and background of the investigator were utilized to conclude the situation or condition as trifle.

***VIII. Letters Received and Responses  
To Substantive Comments***



ALAN M. ARAKAWA  
Mayor

WILLIAM R. SPENCE  
Director

MICHELE CHOUTEAU McLEAN  
Deputy Director



COUNTY OF MAUI  
**DEPARTMENT OF PLANNING**

March 3, 2018

Mr. Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

**SUBJECT: PROPOSED 201H WAIKAPU AFFORDABLE WORKFORCE  
HOUSING PROJECT AT TMK: (2) 3-5-002-011(POR.)  
(RFC 2018/0006)**

This correspondence is in response to a request for comments from Carol Reimann, Director of Housing and Human Concerns, on the proposed 201H Waikapu Affordable Workforce Housing Project (Project), prepared for Waikapu Development Venture, LLC, by Bagoyo Development Consulting Group.

The County of Maui Department of Planning (Department) notes that the Project consists of eighty (80) workforce housing residential units, pursuant to the provisions of 201H, Hawaii Revised Statutes. There will be sixty-eight (68) single-family and twelve (12) duplex units. The Department further notes the project will be 100% affordable on 12.5 acres of land (TMK (2) 3-5-002:011(POR.)) to families making 70 percent (70%) to 140 percent (140%) of the County's median family income.

The entire parcel is owned by Emmanuel Lutheran Church and School. However, the Church intends to file a subdivision application, and after completion, will sell 12.5 acres to Waikapu Development Venture.

The Project fits in with the character of surrounding uses. An archaeological survey concluded no significant cultural remains were encountered. In addition, Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) accepted an Archaeological Monitoring Plan on May 22, 2017. As a result, the draft application states "Per archaeology monitoring plan, monitoring will be performed for all disturbing activities associated with the proposed subdivision."

By Ordinance 3686 (2009), the parcel received a Change in Zoning from Agricultural to P-1 Public/Quasi-Public.

The parcel is located in the State Urban District; Public/Quasi-Public Kahului Wailuku Community Plan designation; County Public/Quasi-Public Zoning District. The project is not in the Special Management Area.

The Department recommends the sentence on page 81, "Permitted Uses shall be based on Chapter 19.08, Residential District, and Chapter 19.10, Maui County Code (MCC), Two-Family (Duplex) District," be moved to replace the PERMITTED USES: "Single-family and Two-Family (Duplex) Residential Units." The Department further recommends on page 82 the term "Residential Lots" be replaced with the term "Single-Family Lots."



Mr. Vince Bagoyo  
March 3, 2018  
Page 2

The Maui County Council must approve the following Title 2 and Title 19, MCC exemptions for the Project to move forward:

- An exemption from Chapter 2.80B, MCC, relating to the General Plan and Community Plans, to allow the project to proceed without obtaining a Community Plan Amendment.
- An exemption from Chapter 19.31, MCC, Public/Quasi Public District, to allow for residential construction based on the provisions of Chapter 19.08, MCC, and Chapter 19.10, MCC; provided, the minimum lot size shall be 3,000 sq. ft., with a minimum lot width of forty (40) feet, and a variety of building setbacks.
- An exemption from Sections 19.31.050, MCC, relating to Development Standards.

The Department recommends the Applicant request an exemption from the provisions of Chapter 19.510, MCC.

If Council approves the Project with exemptions, the Department deems it appropriate to proceed with this much needed affordable workforce housing project.

Should you require further clarification, please contact Staff Planner Kimberley Willenbrink by email at [kimberley.willenbrink@mauicounty.gov](mailto:kimberley.willenbrink@mauicounty.gov) or by phone at (808) 270-5570.

Sincerely,



WILLIAM SPENCE  
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)  
John S. Rapacz, Planning Program Administrator (PDF)  
Pam Eaton, Planning Program Administrator (PDF)  
Kathleen Aoki, Administrative Planning Officer (PDF)  
Carol Reimann, Director, Department Housing and Human Concerns (PDF)  
Kimberley C. Willenbrink, Staff Planner (PDF)  
Project File

WRS:KCW:lk

K:\WP\_DOCS\PLANNING\RFC\2018\0006\Waikapu\_Affordable\_Housing\_\Comment Letter.doc



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 15, 2018

Mr. William Spence  
Director  
Maui Planning Department  
2200 Main Street, Suite 315  
Wailuku, HI 96793

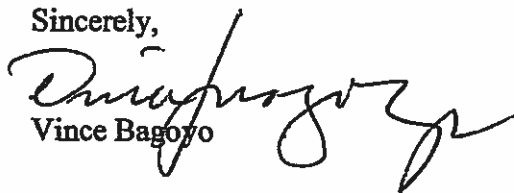
Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por), RFC 2018/0006

Dear Mr. Spence:

This is to acknowledge receipt of your letter dated March 3, 2018 regarding the above subject proposed affordable housing project. We appreciate your comments. As recommended in your letter, appropriate changes will be made on pages 81 and 82 in our final 201H, HRS application. Also, the applicant concurs with your recommendation to seek exemptions from Title 2 and Title 19, Maui County Code pursuant to 210H, HRS for the proposed project.

Thank you again for your kind comments and support for a much-needed affordable housing project for Maui's working families. Should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

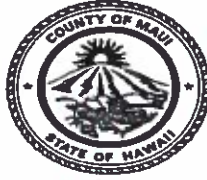
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA  
MAYOR



JEFFREY A. MURRAY  
FIRE CHIEF

LIONEL W. MONTALVO  
DEPUTY CHIEF

**COUNTY OF MAUI**  
**DEPARTMENT OF FIRE AND PUBLIC SAFETY**  
**FIRE PREVENTION BUREAU**

313 MANEA PLACE, WAILUKU, HAWAII 96793  
(808) 876-4690, FAX (808) 244-1363

March 14, 2018

Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, HI 96793

**SUBJECT:** Affordable Workforce Housing Project  
Off Wai'ale Road, Wailuku, HI  
TMK: (2) 3-5-002:011 (por.)

Dear Vince,

Thank you for allowing our office to provide comment on the subject proposed project. As per your request, comments are provided below:

- The proposed paved road widths of 20 feet meet the minimum road widths required by the fire code, but that is assuming that no parking is allowed on the street. The project needs come up with a plan to ensure that permanent parking on the street is prohibited.
- If the proposed water supply for fire protection are in-line with DWS standards, the water supply will meet the current requirements of the fire code.
- Our office does reserve the right to provide further comment on the proposed project during the building permit review process if building permits are routed to our office. At that time, fire department access, water supply for fire protection, and fire and life safety requirements will be addressed for the subject permits.
- Be advised that access and water supply improvements should be in place prior to construction of buildings or alternate provisions need to be provided.

If there are any questions or comments, please feel free to contact me at (808) 876-4693 or by email at paul.haake@mauicounty.gov.

Sincerely,

Paul Haake

A handwritten signature in cursive script that reads "Paul Haake".

Captain - Fire Prevention Bureau



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 15, 2018

Mr. Paul Haake  
Captain-Fire Prevention Bureau  
313 Manea Place  
Wailuku, HI 96793

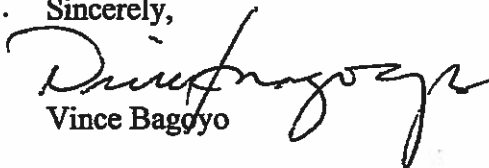
Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Haake:

This is to acknowledge receipt of your letter dated March 14, 2018 regarding the above subject proposed affordable housing project. We appreciate and concur with your comments. As noted in your letter, we are pleased to inform you that the proposed project's homeowners' association CC&R's will include provisions to prohibit permanent parking on the interior (20' wide) streets. Also, the water supply for fire protection for the project is proposed to be dedicated to the County and will be designed and constructed to meet DWS standards and fire code.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bago

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

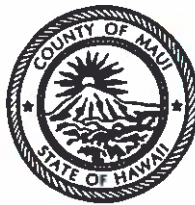
1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA  
Mayor

DAVID C. GOODE  
Director

JWENA M. DAGDAG-ANDAYA  
Deputy Director

Telephone: (808) 270-7845  
Fax: (808) 270-7955



GLEN A. UENO, P.E., P.L.S.  
Development Services Administration

CARY YAMASHITA, P.E.  
Engineering Division

JOHN R. SMITH, P.E.  
Highways Division

COUNTY OF MAUI  
**DEPARTMENT OF PUBLIC WORKS**  
200 SOUTH HIGH STREET, ROOM NO. 434  
WAILUKU, MAUI, HAWAII 96793

March 23, 2018

Mr. Vince Bagoyo, Project Consultant  
WAIKAPU DEVELOPMENT VENTURE LLC  
1500 Kilinoe Place  
Wailuku, Maui, Hawaii 96793

Dear Mr. Bagoyo:

**SUBJECT: DRAFT APPLICATION FOR PROPOSED WORKFORCE  
HOUSING PROJECT PURSUANT TO 201H, HAWAII REVISED  
STATUTES LOCATED AT WAIALE ROAD, WAILUKU, HAWAII  
TMK: (2) 3-5-002:011 (POR.)**

We reviewed the subject application and have the following comments:

Comments from the Highways Division:

1. Section V Exemptions Request

E.5 This would exempt the project from providing infrastructure relating to curbs, gutters, sidewalks along Waiale Road. We have concerns that there should be a safe walkway incorporated into the development on Waiale Road.

F.3 Minimum intersection radii. Restrict street parking and ensure Emergency vehicles' accessibility.

Comments from the Development Services Administration, Plans Review  
Section:

2. Section V, E, 1, on page 80, Exemption from Title 16, Maui County Code (MCC) Building and Construction from the listed MCC chapters, provide a list of fees being requested to be exempt.

Comments from the Engineering Division:

3. Exemption F-2, regarding minimum right-of-way and pavement width would result in non-standard streets for Roads "B", "C", and "D" upon completion. If this exemption is pursued, the Department recommends that these roadways are to remain under private ownership and maintenance.
4. Exemption F2, a pavement width of 20 feet may not provide adequate width for on-street parking and emergency response. The Department recommends consultation with Emergency response agencies. Construction plans shall be designed appropriately.
5. Exemption F7, requests an exemption from constructing sidewalks on both sides of the internal subdivision roadways. The Department does not support this request. Five (5) feet wide sidewalks shall be constructed on Road "A" along both sides of internal roadways for the purpose of safety and accessibility for future residents. This also renders only portions of the subdivision accessible under the Americans with Disabilities Act.
6. Project site plan is not clear whether curb ramps are constructed at roadway intersections as recommended in the Americans with Disabilities Act.
7. Provide Typical Sections for Roads "A", "B", "C", and "D".
8. For each development listed in 3.2 of the Traffic Impact Analysis Report (TIAR), provide a table that shows the volume of traffic contributed to each studied intersection.
9. Page 13 of the TIAR states certain developments are ". . . not explicitly included in this TIAR". Please revise to simply state whether or not these projects are included.
10. For clarity, provide additional exhibits. The first showing additional volumes forecasted through the Maui Regional Transportation Demand Module (MRTDM) and a second only showing volumes generated by the remaining developments that are not included in the MRTDM.
11. Page 22 of the TIAR states that no bike improvement is identified on Waiale Road in the State of Hawaii Department of Transportation (HDOT)



Mr. Vince Bagoyo, Project Consultant  
March 23, 2018  
Page 3

Bike Plan Hawaii. This should not preclude any from being proposed. The project should provide provisions for safe bicycle traffic.

12. Provide an exhibit showing Year 2020 traffic without the project.
13. Provide an exhibit or table showing the effects to Level of Service (LOS) and delay of the project with only background growth, without surrounding developments.
14. Remove Sections 5.1 and 5.2 from Part 5. Conclusions and move them to their respective sections in the body of the report.
15. Part 5. Conclusions should detail all recommendations as a result of this report and identify which entity is responsible for implementation.

Please call Rowena M. Dagdag-Andaya at 270-7845 to schedule a meeting regarding the contents of this letter.

Sincerely,

  
✓ DAVID C. GOODE  
Director of Public Works

DCG:RMDA:da

Enclosure

xc: Highways Division  
Engineering Division

S:\DSA\Eng\CZM\Draft Comments\35002011\_prop\_wkfrce\_hsng.rtf



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

May 7, 2018

Mr. David C. Goode  
Director  
Department of Public Works  
200 So. High Street  
Wailuku, HI 96793

**Subject:** Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Gentlemen:

Thank you for your letter of March 23, 2018, and we appreciate your time reviewing and commenting on the draft application. The following is in response to your comments in the order as noted in your letter:

1. E.5: A sidewalk is proposed along Waiale Road fronting the subject site (see attached typical section).  
F.3: The proposed Homeowners association's CC&R's will include provisions to prohibit permanent parking on the interior (20' wide) streets to ensure emergency vehicles' accessibility.
2. Comment acknowledged.
3. We respectfully request the Council to allow for the dedication of the interior streets.
4. Please refer to item 1(F.3) response.
5. The applicant will request an exemption to allow sidewalks to be constructed on one side of the internal roadways.
6. Curb ramps will be constructed at intersections where appropriate and will meet ADA standards.
7. Refer to attached typical sections for Roads "A", "B", "C", and "D".
8. TIAR has been updated to include the information as requested.
9. TIAR has been updated and removed mention of Puunani Residences and Waiale as requested.
10. TIAR has been updated to include the information you have requested.
11. Comment acknowledged. A statement has been added in the revised TIAR, that "along Waiale Road between Waiko Road and Kuikahi Drive, paved shoulders are currently provided for pedestrian and bike use. In the Central Maui Pedestrian and Bicycle Master

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808)357-3842

VBAGOYO-DEVGROU@HAWAII.RR.COM



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

- Plan for 2030, the County has identified the potential implementation of bike paths or bike lanes along this stretch for future consideration.”
12. TIAR has been updated to show exhibit for Year 2020 traffic with Project, with ambient growth, without background projects, as clarified with Department of Public Works by project's traffic consultant, ATA, Inc.
  13. TIAR has been updated by project's traffic consultant to show LOS for Year 2020 traffic with Project, with ambient growth, without background projects, as clarified with Department of Public Works by the project's traffic engineer consultant.
  14. Comment acknowledged.
  15. Comment acknowledged.

Thank you again for your comments and should you have any further questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbagoyno-devgroup@hawaii.rr.com](mailto:vbagoyno-devgroup@hawaii.rr.com).

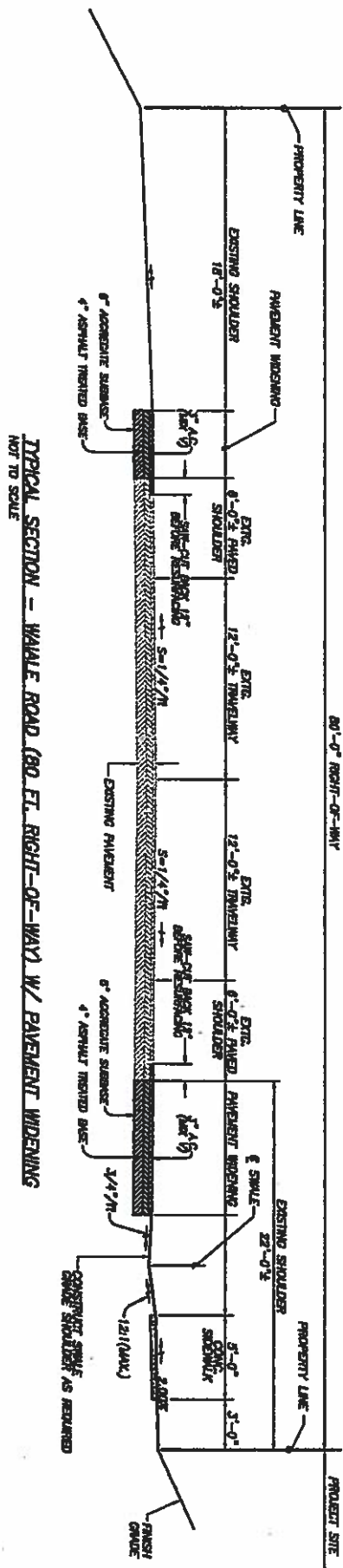
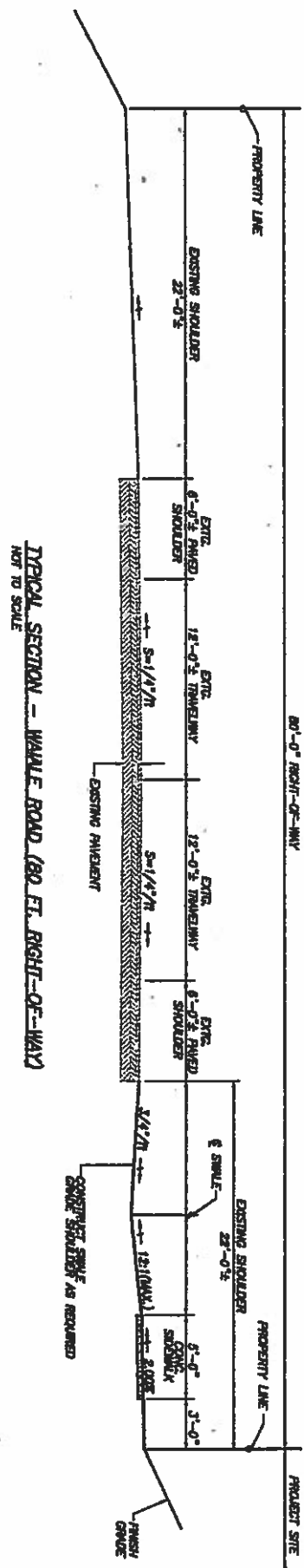
Sincerely,

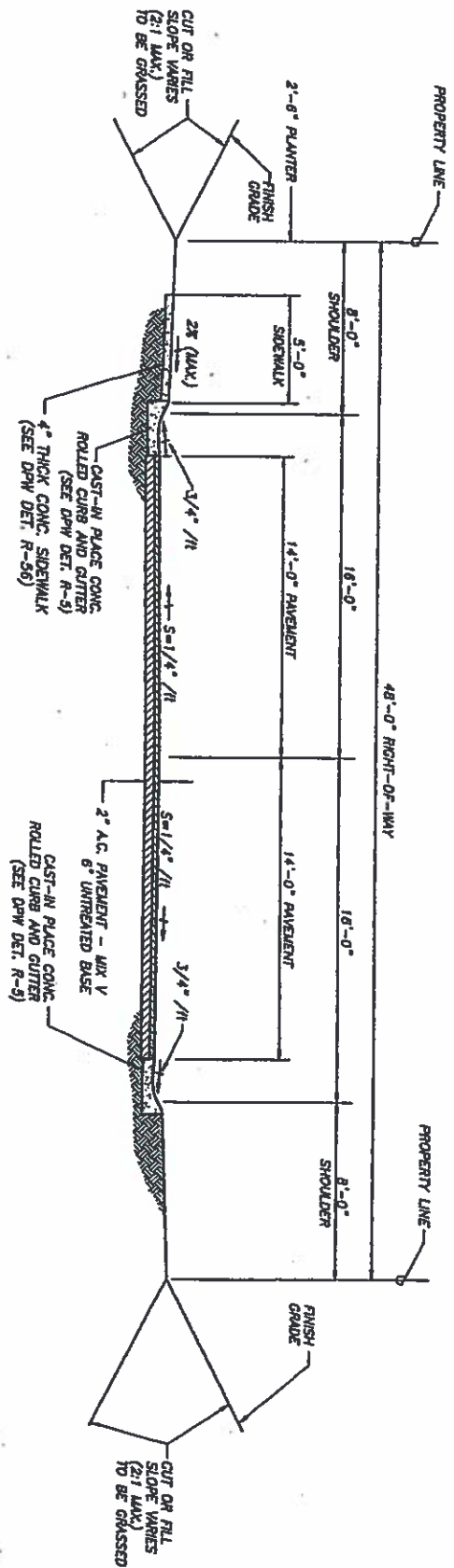


Vince Bagoyo

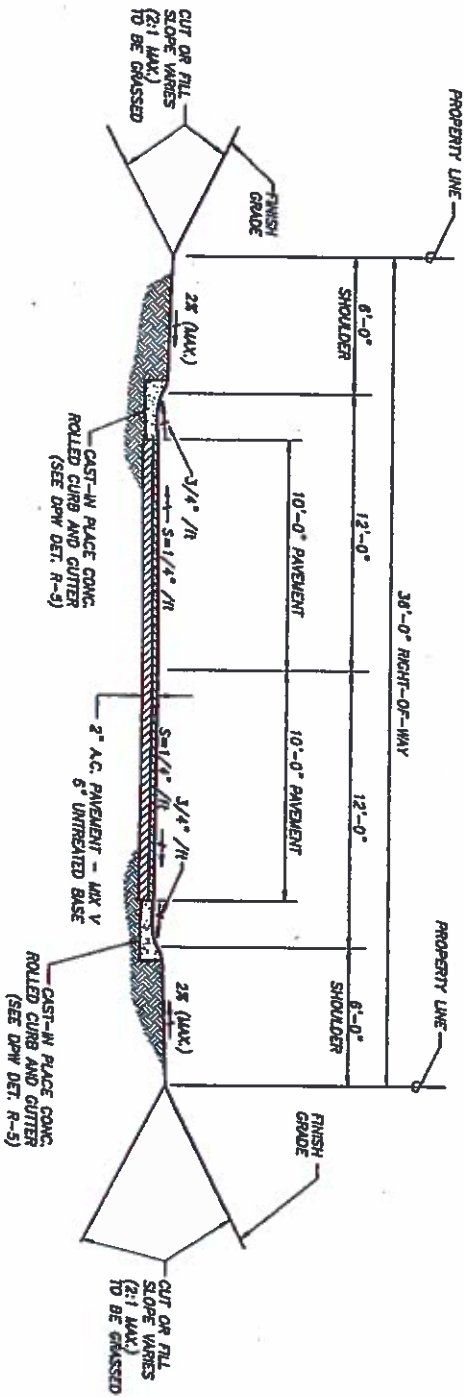
**Attachments**

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC





TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "A" (48 FT. RIGHT-OF-WAY)  
NOT TO SCALE



- NOTES:
1. ROAD "B" ROW SHALL INCLUDE ON STREET PARALLEL PARKING STALLS, WHERE OCCURS.

TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "B" (36 FT. RIGHT-OF-WAY)  
NOT TO SCALE

DAVID Y. IGE  
GOVERNOR



MAJOR GENERAL ARTHUR J. LOGAN  
DIRECTOR OF EMERGENCY MANAGEMENT

BRIGADIER GENERAL MOSES KAOIWI, JR.  
INTERIM ADMINISTRATOR OF EMERGENCY MANAGEMENT

PHONE (808) 733-4300  
FAX (808) 733-4287

**STATE OF HAWAII**  
**DEPARTMENT OF DEFENSE**  
**OFFICE OF THE DIRECTOR OF EMERGENCY MANAGEMENT / CIVIL DEFENSE**  
3949 DIAMOND HEAD ROAD  
HONOLULU, HAWAII 96816-4495

February 7, 2018

Mr. Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes (HRS)  
Waiale Road, Wailuku, Hawaii TMK: (2) 3-5-02:11 (por)

Thank you for the opportunity to comment on this draft application.

After review of the documents provided for the subject project, we have determined that the proposed project area falls within coverage arcs of planned warning sirens.

We strongly recommend hardening of proposed units to be used as shelter space in an area with limited existing shelter space.

If you have any questions, please call Ms. Havinne Okamura, Hazard Mitigation Planner, at 733-4300, extension 556.

Sincerely,

A handwritten signature in black ink, appearing to read "Moses KAOIWI, JR.", written over the printed name and title.

MOSES KAOIWI, JR.  
Brigadier General  
Interim Administrator of Emergency Management





**BAGOYO**

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Mr. Moses Kaouiwi, Jr., Brigadier General  
Interim Administrator of Emergency Management  
State of Hawaii Department of Defense  
3949 Diamond Road  
Honolulu, HI 96816-4495

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Kaouiwi:

This is to acknowledge receipt of your letter dated March 7, 2018 commenting on the above subject project. Thank you for confirming that the proposed workforce housing project falls within the coverage area of planned warning systems.

Should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

**Attachment**

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
869 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5097

JADE T. BUTAY  
INTERIM DIRECTOR

Deputy Directors  
ROY CATALANI  
ROSS M. HIGASHI  
EDWIN H. SNIFFEN  
DARRELL T. YOUNG

IN REPLY REFER TO:  
DIR 0049  
STP 8.2304

February 6, 2018

Mr. Vince Bagoyo  
Bagoyo Development Consultant Group  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: Waikapu Development Venture, LLC  
Draft 201H Application for Proposed Workforce Housing Project  
Wailuku, Hawaii  
TMK: (2) 3-5-002:011 (por.)

The Department of Transportation has reviewed the subject draft 201H application for Waikapu Development Venture, LLC's proposed development of 80 affordable workforce residential housing units on a 12.5-acre site in the Waikapu area.

Comments on the subject project are as follows:

Highways Division

In reviewing the provided Traffic Impact Analysis Report dated August 11, 2017, it was determined that the project appears to have no significant impacts to State highway intersections.

Airports Division

1. The proposed project site is located approximately four miles from Runway 2 of the Kahului Airport. Any proposed development within five miles of an airport is subject to the State of Hawaii, Office of Planning, Technical Assistance Memorandum.

You can find out more details through this link:

[http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports\\_08-01-2016.pdf](http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf)

If any of the project features attract hazardous wildlife, create glint and glare hazard, or create an aerial obstruction hazard to flight operations, the Applicant/Property Owner must coordinate with proper officials and agencies and must implement appropriate mitigation to address the hazards.

2. The drainage basin design shall mitigate potentially hazardous wildlife attraction by minimizing landscape that may be used for nesting and foraging. Stranding water shall be eliminated and water must be drained or pumped out within 48 hours of peak weather events.

It is strongly recommended that you consult the Federal Aviation Administration Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports* for guidance.

3. Although the project is located outside of the 55 Day-Night Sound Level noise contours on the 2008 Noise Exposure Map, the applicant and future residents should be aware of the proximity of the airport and potential single event noise from aircraft operations.

If there are any questions, please contact Mr. Norren Kato of the Department of Transportation, Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,



JADE T. BUTAY  
Interim Director of Transportation



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 13, 2018

Mr. Jade T. Butay  
Director  
State Department of Transportation  
869 Punchbowl Street  
Honolulu, HI 96813-5097

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Butay:

This is to acknowledge receipt of your letter dated February 6, 2018 regarding the above subject proposed affordable housing project. As noted in your letter, SDOT Highways Division has determined that the proposed project have no significant impacts to the State highways intersections. In response to items 1 and 2 of your comment letter, we are pleased to inform you you're the drainage retention basins for the proposed project will be grassed and properly maintained to minimize attracting wildlife for nesting and foraging. Standing water will be allowed to evaporate and infiltrate into the ground. A maintenance plan will be in place to pump any standing water within 48 hours of a peak weather event to ensure the basin remains dry between storms. With regards to item 3 of your letter, please be assured that future residents of the project will be advised of the proximity of the airport and potential single event noise from aircraft operations.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808)357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA  
Mayor



DON MEDEIROS  
Director  
MARC I. TAKAMORI  
Deputy Director  
(808) 270-7511

## DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI  
2145 Kaohu Street, Suite 102  
Wailuku, Hawaii, USA 96793

February 5, 2018

Mr. Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project Located at Waiale Road, Wailuku

Dear Mr. Bagoyo,

We appreciate the opportunity to provide comments on your draft application for proposed workforce housing project located at Waiale Road, Wailuku.

Three bus routes operate within the vicinity of the proposed project on Waiale Road in Wailuku, HI. The first two routes are the Wailuku Loop Route #1 and the Wailuku Loop Reverse Route #2. Both of these routes start and end at Queen Ka'ahumanu Center and circulate within Wailuku. The two stops nearest to this project are at Ka Hale A Ke Ola on Waiale Road and the other is on Kamole Street in the Kehalani Subdivision. The third route is the Lahaina Islander Route #20, which travels between Central Maui and Lahaina Town hourly. It does not stop near the development, but does pass the area as it travels along Honoapi'ilani Highway. Transit was not referenced within the application, but we wanted to share a little more detailed description of transit options near the proposed project.

While a bus stop isn't currently provided right next to the proposed project, providing interconnecting sidewalks between developments along Waiale Road and ample lighting in the evening is necessary for walkable communities and for the safety of potential public transit riders.

Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Medeiros", is written over a faint, circular official stamp.

Don Medeiros  
Director



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Mr. Don Medeiros  
Director  
Maui Department of Transportation  
2145 Kaohu Street, Suite 102  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Medeiros:

This is to acknowledge receipt of your letter dated February 5, 2018 commenting on the above subject workforce housing project. We appreciate your comments on the draft 201H application and we will incorporate in the final draft your comments regarding the bus routes within the vicinity of the proposed project. With regards to your comment on interconnecting sidewalks, we are pleased to inform you that the proposed project will provide at grade sidewalk on Waiale fronting the proposed project (refer to attached typical section of a. Also, lightings will be provided within the two access entrances along Waiale Road to the project site.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

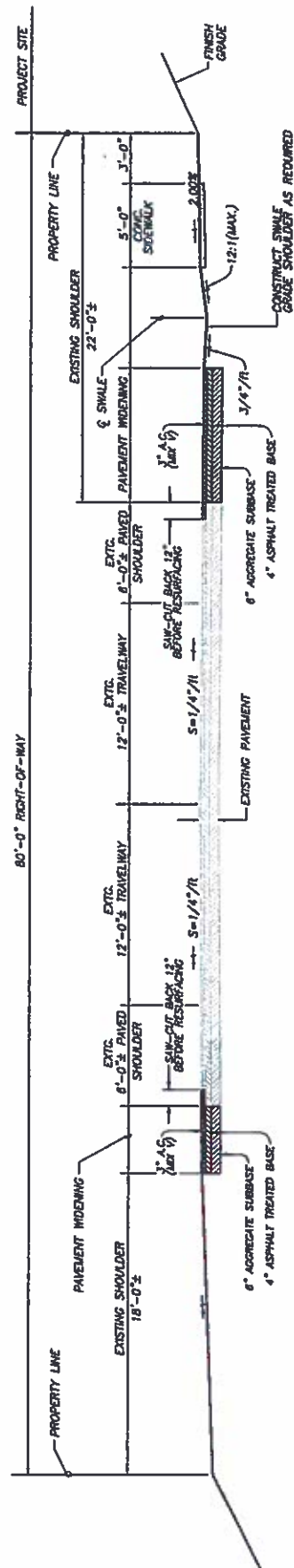
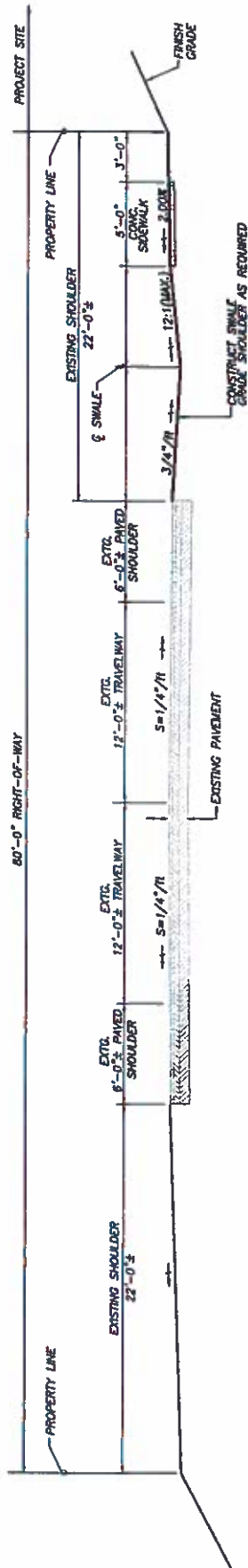
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808)357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

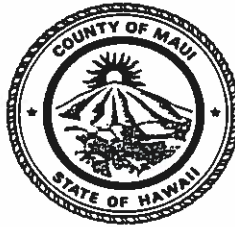




ALAN M. ARAKAWA  
Mayor

STEWART STANT  
Director

MICHAEL M. MIYAMOTO  
Deputy Director



MICHAEL RATTE  
Solid Waste Division

ERIC NAKAGAWA, P.E.  
Wastewater Reclamation Division

**COUNTY OF MAUI  
DEPARTMENT OF  
ENVIRONMENTAL MANAGEMENT**  
2050 MAIN STREET, SUITE 2B  
WAILUKU, MAUI, HAWAII 96793

January 18, 2018

Mr. Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

**SUBJECT: WAIKAPU DEVELOPMENT VENTURE LLC  
AFFORDABLE WORKFORCE HOUSING SUBDIVISION  
DRAFT APPLICATION  
TMK (2) 3-5-002:011 (POR.), WAILUKU**

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:
  - a. Refuse collection services cannot be ensured to be available when project is completed.
  - b. Developer must apply to the Central Maui Landfill to dispose of construction waste.
2. Wastewater Reclamation Division (WWRD) comments:
  - a. Although wastewater system capacity is currently available as of the date of this letter, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
  - b. Wastewater contribution calculations are required before building permit is issued.
  - c. Developer is not required to pay assessment fees for this area at the current time.
  - d. Show or list minimum slope of new sewer laterals.
  - e. Plans should show the installation of a single service lateral and advanced riser for each lot. Any request for waiver of this requirement shall be made submitted in writing for approval by WWRD.
  - f. A single service lateral with property line cleanout shall be provided for each dwelling unit.

Mr. Vince Bagoyo  
January 18, 2018  
Page 2

- g. Sewerlines shall only be considered for dedication to the County if constructed in roadways and said roadways are accepted for maintenance by the County.
- h. Any sewer within or upstream of a new sewer easement will remain privately owned and maintained.
- i. No trees, structures, building overhangs or walls shall be planted/constructed in the existing sewer easement.
- j. Level vehicular access to all sewerlines and manholes (including those in easements) shall be provided for future maintenance and construction purposes.
- k. Existing sewerline shall be inspected with a CCTV camera prior to grading and at the completion of construction to verify no damage has occurred. CCTV files shall be provided to WWRD within ten (10) days of video work. Identified damage shall be corrected by the developer.
- l. Non-contact cooling water and condensate should not drain to the wastewater system.

If you have any questions regarding this letter, please contact Michael Miyamoto at 270-8230.

Sincerely,



MICHAEL M. MIYAMOTO  
Deputy Director of Environmental Management



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 13, 2018

Mr. Michael M. Miyamoto  
Deputy Director  
Maui Department of Environmental Management  
2050 Main Street, Suite 2B  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Miyamoto:

This is to acknowledge receipt of your letter dated January 18, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. We do concur with your comments and recommendations as noted in your letter. A detailed construction plans for the proposed project will be provided for your review upon receipt of approval by the County Council of 201H, HRS application for the project.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P.O. BOX 2360  
HONOLULU, HAWAII 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

January 25, 2018

Mr. Vince Bagoyo  
Bagoyo Development Consulting Group  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Re: Draft Application for Waikapu Development Venture LLC Affordable  
Workforce Housing Project  
Wailuku, Maui, Hawaii, TMK: 3-5-02: por. 11

Dear Mr. Bagoyo:

The Department of Education (DOE) has the following comments on the draft application for the proposed Waikapu Development Venture LLC Affordable Workforce Housing Project (Project). According to the draft application, the proposed project is for the development of 80 workforce housing units comprised of 68 single-family units and 12 duplex units on approximately 12.5 acres of land located at Wailuku, Maui, Hawaii, TMK: 3-5-02: por. 11.

When the Project is mature and unit turnover is stabilized, we would expect roughly 40 DOE students will reside there.

The DOE schools currently serving the proposed project are Puu Kukui Elementary, Maui Waena Intermediate, and Maui High School. Puu Kukui Elementary is currently over capacity by approximately 100 students. This over capacity condition is expected to remain over the next five years. Maui Waena Intermediate is over capacity by approximately 250 students. This over capacity condition is expected to remain over the next five years. Maui High School is over capacity by approximately 300 students. This over capacity condition is expected to increase to approximately 400 students over the next five years.

Waikapu Development Venture LLC acknowledges that the proposed Project is located within the Central Maui School Impact Fee District (District). This District and impact fee amounts were adopted by the Board of Education on November 18, 2010. The Project is located in the Wailuku Cost Area in which fee amounts are \$5,373 for single-family units and \$2,371 for multi-family units. Chapter 302A-1606, Hawaii Revised Statutes, requires that residential units with 50 or more units execute an agreement with the DOE. Waikapu Development Venture LLC is encouraged to meet with the DOE as early as possible to execute an Educational Contribution Agreement.

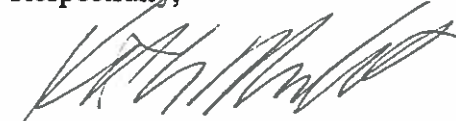
Mr. Vince Bagoyo

January 25, 2018

Page 2

Thank you for the opportunity to comment. Should you have any questions, please contact Heidi Meeker of the Planning Section, Facilities Development Branch, at 784-5094.

Respectfully,



Kenneth G. Masden II  
Public Works Manager  
Planning Section

KGM:jmb





BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Mr. Kenneth G. Masden II  
Public Works Manager – Planning Section  
State Department of Education  
P.O. Box 2360  
Honolulu, HI 96804

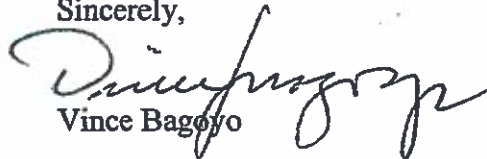
Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Masden:

This is to acknowledge receipt of your letter dated January 25, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. The applicant for proposed workforce housing project will pay the appropriate DOE school impact fee pursuant to Chapter 302A, HRS. As noted in your letter, the applicant will execute an Educational Contribution Agreement with DOE upon approval of the applicant's 201H, HRS application for the proposed housing project.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

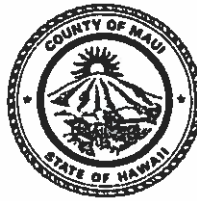
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA  
Mayor



KA'ALA BUENCONSEJO  
Director

BRIANNE L. SAVAGE  
Deputy Director

**DEPARTMENT OF PARKS & RECREATION**

700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

(808) 270-7230  
FAX (808) 270-7934

January 10, 2018

Mr. Vince Bagoyo  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

**SUBJECT: DRAFT APPLICATION FOR PROPOSED WORKFORCE HOUSING PROJECT  
PURSUANT TO 201H, HAWAII REVISED STATUTES ("HRS") LOCATED  
WAIALE ROAD, WAILUKU, HAWAII, TMK: (2) 3-5-002:011 (POR)**

The Department of Parks and Recreation (DPR) does not have any comments or objections to the project.

Once the applicant provides DPR with a copy of the fully executed 201H HRS affordable housing agreement with the Department of Housing and Human Concerns, DPR will provide exemption. As stated in Maui County Code Section 18.16.320 Parks and Playgrounds, *"Subdivisions in which one hundred per cent of the lots or units resulting from the subdivision qualify as residential workforce housing units, as defined in section 2.96.020 of this code, shall be exempt from this section."*

Should you have any questions or concerns, please feel free to contact me or Robert Halvorson, Chief of Planning and Development, at (808) 270-7931.

Sincerely,

A handwritten signature in black ink, appearing to read "Ka'ala Buenconsejo", is written over the printed name and title.

KA'ALA BUENCONSEJO  
Director of Parks & Recreation

c: Robert Halvorson, Chief of Planning and Development

KB:RH:do



BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 13, 2018

Mr. Ka'ala Buenconsejo  
Director  
Maui Department of Parks and Recreation  
700 Hali'a Nakoa St., Unit 2  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Mr. Buenconsejo:

This is to acknowledge receipt of your letter dated January 10, 2018 regarding the above subject proposed affordable housing project. As noted in your letter that your department does not have any comments or objections to the proposed project. Also, thank you for affirming that since the proposed 201H, HRS project is one hundred percent affordable as defined in MCC 2.96.020 will be exempt from Section 18.16.320, MCC.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,



Vince Bagoyo

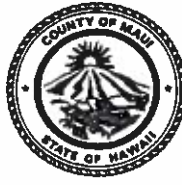
Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808)357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM

ALAN M. ARAKAWA  
Mayor



DAVID TAYLOR, P.E.  
Director

GLADYS C. BAISA  
Deputy Director

**DEPARTMENT OF WATER SUPPLY  
COUNTY OF MAUI  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793-2155  
www.mauewater.org**

January 24, 2018

Mr. Vince Bagoyo  
Wailuku Development Venture LLC  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: DRAFT APPLICATION FOR AFFORDABLE WORKFORCE HOUSING  
SUBDIVISION  
TMK: (2) 3-5-002:011, Wailuku, Maui, Hawaii

We received a copy of the draft application for the proposed workforce housing project consisting of 68 single family residential units and 12 duplex residential units. According to Appendix G – Preliminary Engineering Report, in addition to these residential units, a neighborhood green lot and open space/retention basin will also be developed. Maui County Code, Chapter 14.12.030 allows residential development projects with one hundred percent affordable housing units an exemption from the County's "water availability policy." For the neighborhood green lot and open space/retention basin, the department requires documentation that those parcels shall remain in perpetuity for those specific uses.

If you have any questions, please feel free to contact Tammy Yeh at 270-7835.

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy Taomoto".

WENDY TAOMOTO, P.E.  
Engineering Program Manager

TY/smb

cc: Carol Reimann, Director; Department of Housing and Human Concerns

*"By Water All Things Find Life"*



BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Ms. Wendy Taomoto, P.E.  
Engineering Program Manager  
Maui Department of Water Supply  
200 So. High Street  
Wailuku, HI 96793-2155

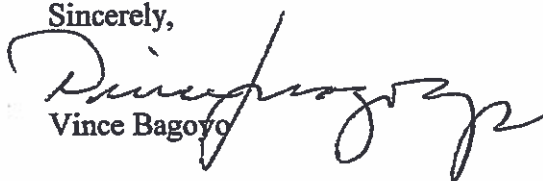
Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Ms. Taomoto:

This is to acknowledge receipt of your letter dated January 24, 2018 commenting on the above subject workforce housing project. We appreciate your comments and for confirming that the proposed one hundred percent affordable housing project is exempt from the County's "water availability policy" per Chapter 14.12.030, Maui County Code. With regards to the open space/retention basin on the project site, we are pleased to affirm that the basin will remain in perpetuity and documentation will be provided within a deed restriction upon the subdivision of the project site.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,

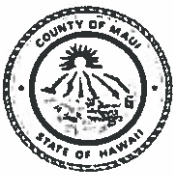
  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808)357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM



ALAN M. ARAKAWA  
MAYOR

OUR REFERENCE

YOUR REFERENCE

# POLICE DEPARTMENT

## COUNTY OF MAUI

55 MAHALANI STREET  
WAILUKU, HAWAII 96793  
(808) 244-6400  
FAX (808) 244-6411

January 24, 2018



TIVOLI S. FAAUMU  
CHIEF OF POLICE

DEAN M. RICKARD  
DEPUTY CHIEF OF POLICE

Mr. Vince Bagoyo  
Project Consultant  
Waikapu Development Venture LLC  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Re: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located Waiale Road, Wailuku, Hawaii  
TMK: (2) 3-5-02:11 (por.)

Dear Mr. Bagoyo:

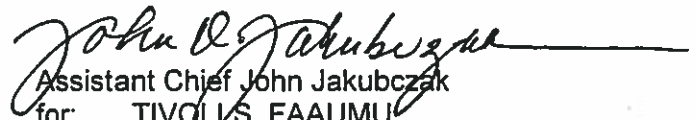
This is in response to Ms. Carol Reimann's memorandum dated January 5, 2018 requesting comments to the draft application.

In review of the submitted documents, concerns from the police perspective are upon the safety of pedestrians and vehicular movement. The project will run between Waiale Road and Honoapi'ilani Highway in Wailuku. The project location is approximately 25 acres, which will have the entry/exit on Waiale Road.

Currently the traffic flow has been increasing from the Spencer Home Development and will increase upon the completion of this development. Also, there will be an increase in calls for service for the Wailuku Patrol District with the increasing community members in the area, however, Maui is in need of affordable housing. As long as this development is off the roadway, traffic control will not be needed by police.

Thank you for giving us the opportunity to comment on this project.

Sincerely,

  
Assistant Chief John Jakubczak  
for: TIVOLI S. FAAUMU  
Chief of Police

c: Director Carol Reimann, DHHC  
Mr. Buddy Almeida, Housing Administrator





**BAGOYO**

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Mr. Tivoli S. Faaumu  
Chief of Police  
Maui Police Department  
55 Mahalani Street  
Wailuku, HI 96793

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Chief Faaumu:

This is to acknowledge receipt of your letter dated January 24, 2018 regarding the above subject affordable housing project and thank you for your comments. As noted in our Traffic Impact Analysis Report (TIAR) prepared by Austin Tsutsumi and Associates, northbound through traffic on Waiale Road will continue to spill back to Waiale Road/Kuikahi Drive intersection in the AM peak hour. Based on the forecast trips, the Project will increase traffic at the intersection by approximately 1.5%. The more critical AM peak hour of traffic, the Project is forecast to add only 18 northbound through vehicles and 11 northbound left-turn vehicles along Waiale Road through the intersection. To mitigate this potential impact, the TIAR recommends installing two northbound left-turn storage lanes along Waiale Road for entrance into the two proposed Project accesses.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
MAUI DISTRICT HEALTH OFFICE  
54 HIGH STREET  
WAILUKU, HAWAII 96793-3378

LORRIN W. PANG, M.D., M.P.H.  
DISTRICT HEALTH OFFICER

January 31, 2018

Mr. Vince Bagoyo  
Bagoyo Development Consulting Group  
1500 Kilinoe Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: Proposed Workforce Housing Project  
Applicant: Waikapu Development Venture  
TMK: (2) 3-5-02:11 (por.)  
Address: Waiale Road, Wailuku, Hawaii  
Description: 80 Affordable Workforce Residential Housing Units

Thank you for the opportunity to review this project. We have the following comments to offer:

This land was formerly in the production of pineapple and/or sugarcane. Chemicals associated with the pineapple or sugar industry persists in soil today and may be a threat to public health and the environment. Please contact the Department of Health, Hazard Evaluation and Emergency Response Office at 808 586-4249.

It is strongly recommended that the Standard Comments found at the Department's website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/> be reviewed and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please contact me at 808 984-8230 or email me at [patricia.kitkowski@doh.hawaii.gov](mailto:patricia.kitkowski@doh.hawaii.gov).

Sincerely,

A handwritten signature in cursive script that reads "Patti Kitkowski".

Patti Kitkowski  
District Environmental Health Program Chief



BAGOYO

DEVELOPMENT  
CONSULTING GROUP

March 12, 2018

Ms. Patti Kitkowski  
District Environmental Health Program Chief  
State Department of Health  
54 High Street  
Wailuku, HI 96793-3378

Subject: Draft Application for Proposed Workforce Housing Project  
Pursuant to 201H, Hawaii Revised Statutes ("HRS")  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Ms. Kitkowski:

This is to acknowledge receipt of your letter dated January 31, 2018 regarding the above subject proposed affordable housing project and thank you for your comments. As noted in the draft 201H application, Phase I Environmental Site Assessment was conducted for the subject property by Vuich Environmental Consultants, Inc. According to the environmental site assessment has revealed no evidence of recognized environmental conditions in connection with the property. Per your recommendation, the applicant will further contact the Department of Health, Hazard Evaluation and Emergency Response office prior to any development of the subject property to ensure compliance with all applicable rules and regulations.

Thank you again for your kind comments and should you have further questions or require additional information regarding the proposed project, please contact me at (808) 357-3842.

Sincerely,

  
Vince Bagoyo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P. O. BOX 3378  
HONOLULU, HI 96801-3378

In reply, please refer to:  
File:

EPO 18-023

January 31, 2018

Mr. Vince Bagoyo  
Bagoyo Development Consulting Group  
1500 Kilinoe Place  
Wailuku, Hawaii 96793  
Email: [VBAGOYO-DEVGROUP@hawaii.rr.com](mailto:VBAGOYO-DEVGROUP@hawaii.rr.com)

Dear Mr. Bagoyo:

**SUBJECT: Draft Application (DA) for Proposed Workforce Housing Project, Wailuku, Maui, Hawaii**  
**TMK: (2) 3-5-02:11 (por)**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your January 8, 2018 letter and DA to our office on January 30, 2018. We understand from the DA preface that Waikapu Development Venture, LLC ("Applicant") is proposing to develop 80 affordable workforce residential housing units pursuant to 201H, Hawaii Revised Statutes (HRS). The proposed project consists of 68 single-family units and 12 duplex units. The subject property consists of 12.5 acres. The project will be developed under the 201H, HRS and the housing units will be affordably-priced to families making 70 percent to 140 percent of Maui County's median family income. The Applicant, in coordination with the County of Maui Department of Housing and Human Concerns, will seek exemptions from certain statutes, ordinances, charter provisions, and rules relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon as provided by Section 201H-38 HRS.

We understand from the DA Preface that "The proposed project does not involve the use of State and County lands or funds, and there are no other triggers for an environmental assessment pursuant Chapter 343 HRS. As noted, the project will be developed pursuant to 201H, HRS".

We understand from page 7, Section D that under Section 201H-38, HRS promotes the development of affordable housing project by providing exemptions from "all statutes, ordinances, charter provisions, and rules of any government agency relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon" provided that the proposed housing project is consistent with the purpose and intent of 201H-38, HRS, and meets minimum requirements of health and safety. This proposed project will be consistent and in compliance with the requirements pursuant to 201H, HRS.

We understand from Section V of the DA that only the following exemptions are requested pursuant to 201H-38, HRS.

- Exemption from Title 2, MCC, Administration and Personnel
- Exemptions from Title 8, MCC, Health and Safety; Chapter 8.04 refuse collection and landfills
- Exemptions from Title 12, MMC, Streets, Sidewalks and Public Places
- Exemptions from Title 14, MCC, Public Services
- Exemptions from Title 16, MCC, Building and Construction
- Exemptions from Title 18, MCC, Subdivisions
- Exemptions from Chapter 19, MCC, Zoning
- Exemptions from MCC regarding projects comprised of 100% residential workforce housing units

Mr. Vince Bagoyo  
Page 2  
January 31, 2018

As you know, Hawaii's environmental review laws require Environmental Assessments (EAs) and Environmental Impact Statements (EISs) to consider health in the discussion and the mitigation measures to reduce negative impacts. In its definition of 'impacts,' §11-200-2, Hawaii Administrative Rules (HAR) includes health effects, whether primary (direct), secondary (indirect), or cumulative. Further, §11-200-12(b)(5), HAR, lists public health as one of the criteria for determining whether an action may have a significant impact on the environment.

We advocate that you consider health from a broad perspective; one that accounts for the social, economic, and environmental determinants of health and wellbeing. Community well-being can be impacted by access to physical activity, health care, feelings of social connectedness and safety. Design solutions that take these factors into consideration positively contribute to the social determinants of health in a community, improving the well-being of those who live there by influencing health promoting behaviors. Social determinants contribute to preventable chronic diseases such as asthma, diabetes, obesity, and cardiovascular disease.

An example of social influences include access to safe pedestrian corridors such as pathways, sidewalks, bike lanes, greenways and open space. §11-200-17(h), HAR, says EISs must discuss how proposed actions may conform or conflict with any policies for the affected area. This includes Hawaii's 2009 Complete Streets law, which requires the state and counties to establish policies to accommodate all users of the road, no matter age, ability, or mode of transportation. In 2015, Hawaii passed Act 97 which amended Hawaii's Renewable Portfolio Standards by setting a goal for Hawaii to become one hundred percent renewable by the year 2045. To reach this goal Hawaii should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is essential that EV charging stations be added to any planned parking areas open to the EV driving public. Plans should strive to encourage the use of personal bicycles through the development of designated bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments to support sustainable healthy design are provided at: <http://health.hawaii.gov/epo/landuse>. Projects are required to adhere to all applicable standard comments.

If you haven't already, EPO recommends that you review the new Healthy Communities Policy Guide: <https://planning-org-uploaded-media.s3.amazonaws.com/document/Healthy-Communities-Policy-Guide.pdf>, Plan4health website: <http://plan4health.us> and the free, on-demand, six-part Plan4Health webinar series available on the American Planning Association website.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: <https://eha-cloud.doh.hawaii.gov>. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules (HAR), Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: <http://health.hawaii.gov/cwb>. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or [cleanwaterbranch@doh.hawaii.gov](mailto:cleanwaterbranch@doh.hawaii.gov). If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting (HAR, Chapter 11-23, "Underground Injection Control (UIC)"). DOH approval must be obtained before any injection well construction commences. A UIC permit must be issued before



Mr. Vince Bagoyo  
Page 3  
January 31, 2018

any injection well operation occurs. For specific questions please email [sdwb@doh.hawaii.gov](mailto:sdwb@doh.hawaii.gov) or call (808) 586-4258.

Please note that all wastewater plans must conform to applicable provisions (HAR, Chapter 11-62, "Wastewater Systems"). We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: <http://health.hawaii.gov/wastewater> and contact the Planning and Design Section of the Wastewater Branch (WWB) at (808) 586-4294.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: [Cab.General@doh.hawaii.gov](mailto:Cab.General@doh.hawaii.gov) or call (808) 586-4200.

Any waste generated by the project (that is not a hazardous waste as defined in state hazardous waste laws and regulations), needs to be disposed of at a solid waste management facility that complies with the applicable provisions (HAR, Chapter 11-58.1 "Solid Waste Management Control"). The open burning of any of these wastes, on or off site, is strictly prohibited. You may wish you review the Minimizing Construction & Demolition Waste Management Guide at: <http://health.hawaii.gov/shwb/files/2016/05/constdem16.pdf> Additional information is accessible at: <http://health.hawaii.gov/shwb>. For specific questions call (808) 586-4226.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: <http://health.hawaii.gov/irhb/noise> EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

A phase I Environmental Site Assessment (ESA) and site investigation should be conducted for residential development or redevelopment projects in current or formerly used industrial areas and on formerly and currently zoned agricultural land used for growing sugar, pineapple or other agricultural products. If the investigation shows that a release of petroleum, hazardous substance, pollutants or contaminants may have occurred at the site, the site should be properly characterized through an approved Hawaii State Department of Health (DOH)/Hazard Evaluation and Emergency Response Office (HEER) soil and/or groundwater sampling plan. Please refer to Sections 3 and 4 of the HEER Office Technical Guidance Manual <http://www.hawaiidoh.org>.

If the site is found to be contaminated, then all removal and remedial actions to clean up hazardous substance or oil releases by past and present owners/tenants must comply with State Law (HRS, Chapter 128D, "Environmental Response Law", Chapter 451, "State Contingency Plan"). To identify HEER records related to the property, visit <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/public-records>. For information on site assessment and cleanup programs review: <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/site-assessment-and-cleanup-programs>. Any specific questions should be directed to the HEER office at (808) 586-4249.

The property may harbor vectors which may disperse to the surrounding areas when the site is cleared. In accordance with Title 11, HAR, Chapter 11-26, "Vector Control", the applicant shall ascertain the presence or absence of rodents on the property. Should the presence of vectors be determined, the applicant shall eradicate the vectors prior to clearing the site.

The Hawaii Disability and Communication Access Board (DCAB) recommends the inclusion of access for persons with disabilities through all phases of design and construction. New construction and alteration work shall comply with all applicable accessibility requirements. Projects covered by §103-50, Hawaii Revised Statutes, and HAR Title 11 Chapter 216 shall seek advice and recommendations from DCAB on any construction plans prior to commencing with construction. If you have any questions please contact DCAB at (808) 586-8121 or [dcab@doh.hawaii.gov](mailto:dcab@doh.hawaii.gov).



Mr. Vince Bagoyo  
Page 4  
January 31, 2018

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: <http://eha-web.doh.hawaii.gov/oeqc-viewer>. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) (Hawaii Revised Statutes, Chapter 343) documents have been prepared.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed an environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: <http://www.epa.gov/ejscreen>.

We hope this information is helpful. If you have any questions please contact us at [DOH.epo@doh.hawaii.gov](mailto:DOH.epo@doh.hawaii.gov) or call us at (808) 586-4337. Thank you for the opportunity to comment.

Mahalo nui loa,



Laura Lelaloha Phillips McIntyre, AICP  
Environmental Planning Office

LM:nn

c: DOH: DHO M, EMD, CWB, WWB, CAB, SHWB, SDWB, HEER, IRHB, PHP, OEQC (via email only)

Attachment 1: DHO Maui comments

Attachment 2: Office of Environmental Quality Control (OEQC) viewer (of some past EA's, EIS's in area)

Attachment 3: U.S. EPA EJSCREEN Report for Project Area .

DAVID Y. LOE  
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.  
TOLEDO, OHIO

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
MAUI DISTRICT HEALTH OFFICE  
54 HIGH STREET  
WAILUKU, HAWAII 96793-3373

LORDEN FANG, M.D., M.P.H.  
DISTRICT HEALTH OFFICER

January 31, 2018

Mr. Vince Bagoyo  
Bagoyo Development Consulting Group  
1500 Kilinno Place  
Wailuku, Hawaii 96793

Dear Mr. Bagoyo:

Subject: Proposed Workforce Housing Project  
Applicant: Waikapu Development Venture  
TMK: (2) 3-5-02:11 (por.)  
Address: Waiiale Road, Wailuku, Hawaii  
Description: 80 Affordable Workforce Residential Housing Units

Thank you for the opportunity to review this project. We have the following comments to offer:

This land was formerly in the production of pineapple and/or sugarcane. Chemicals associated with the pineapple or sugar industry persists in soil today and may be a threat to public health and the environment. Please contact the Department of Health, Hazard Evaluation and Emergency Response Office at 808 586-4249.

It is strongly recommended that the Standard Comments found at the Department's website: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/> be reviewed and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please contact me at 808 984-8230 or email me at [patricia.kitkowski@doh.hawaii.gov](mailto:patricia.kitkowski@doh.hawaii.gov).

Sincerely,

A handwritten signature in black ink that reads "Patti Kitkowski".

Patti Kitkowski  
District Environmental Health Program Chief

c EPO

Attachment 2: Office of Environmental Quality Control (OEQC) viewer (of some past EA's, EIS's in area)



Attachment 3: U.S. EPA EJSCREEN Report for Project Area



**EJSCREEN Report (Version 2017)**

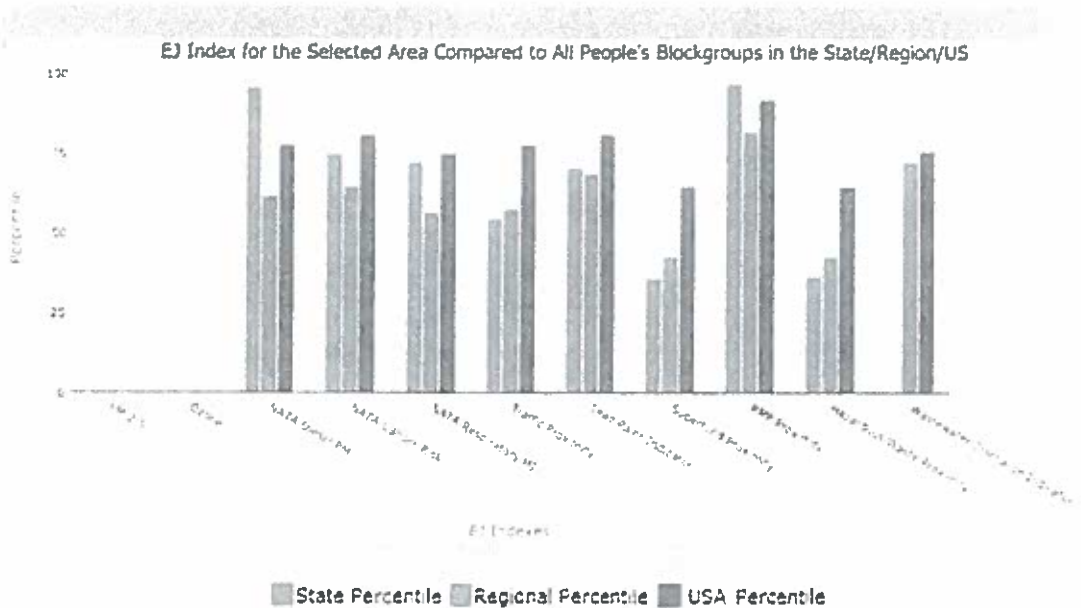


1 mile Ring Centered at 20.866640,-156.501620, HAWAII, EPA Region 9

Approximate Population: 9,475

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
<b>EJ Indexes</b>			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA' Diesel PM	96	62	78
EJ Index for NATA' Air Toxics Cancer Risk	75	65	81
EJ Index for NATA' Respiratory Hazard Index	73	57	75
EJ Index for Traffic Proximity and Volume	55	58	78
EJ Index for Lead Paint Indicator	71	69	81
EJ Index for Superfund Proximity	36	43	65
EJ Index for RMP Proximity	97	82	92
EJ Index for Hazardous Waste Proximity	37	43	65
EJ Index for Wastewater Discharge Indicator	N/A	73	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air) and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screen's general information, so it is essential to understand the limitations and appropriate interpretations and applications of these indicators. Please see EJSCREEN's documentation for discussion of these issues before using reports.



## EJSCREEN Report (Version 2017)



1 mile Ring Centered at 20.866640,-156.501620, HAWAII, EPA Region 9

Approximate Population: 9,475

Input Area (sq. miles): 3.14



January 30 2016

+ Designated Point

1 20 056  
0 0.25 0.5 1.0  
0 200 400 800  
Scale in Feet  
Scale in Miles

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0





## EJSCREEN Report (Version 2017)

1 mile Ring Centered at 20.866640, -156.501620, HAWAII, EPA Region 9

Approximate Population: 9,475

Input Area (sq. miles): 3.14



Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
<b>Environmental Indicators</b>							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$ )	N/A	N/A	N/A	9.9	N/A	9.14	N/A
Ozone (ppb)	N/A	N/A	N/A	41.8	N/A	38.4	N/A
NATA* Diesel PM ( $\mu\text{g}/\text{m}^3$ )	0.424	0.149	92	0.978	<50th	0.938	<50th
NATA* Cancer Risk (lifetime risk per million)	31	34	50	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.88	1	47	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	130	1000	47	1100	39	590	55
Lead Paint Indicator (% Pre-1960 Housing)	0.11	0.16	52	0.24	47	0.29	39
Superfund Proximity (site count/km distance)	0.0061	0.1	22	0.15	5	0.13	1
RMP Proximity (facility count/km distance)	1.6	0.39	96	0.98	81	0.73	86
Hazardous Waste Proximity (facility count/km distance)	0.0063	0.1	25	0.12	2	0.093	2
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	0.04	N/A	13	59	30	40
<b>Demographic Indicators</b>							
Demographic Index	52%	51%	50	47%	58	36%	74
Minority Population	80%	77%	44	59%	70	38%	84
Low Income Population	20%	26%	40	36%	29	34%	29
Linguistically Isolated Population	3%	6%	45	9%	32	5%	60
Population With Less Than High School Education	7%	9%	53	17%	33	13%	38
Population Under 5 years of age	7%	6%	59	7%	54	6%	58
Population over 64 years of age	13%	16%	39	13%	61	14%	51

\* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to estimate air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <http://www.epa.gov/national-air-toxics-assessment>

For additional information, see: [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice)

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration in analysis or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see the EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

January 30, 2018

3/3



PHONE (808) 594-1888

FAX (808) 594-1938



**STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
560 N. NIMITZ HWY., SUITE 200  
HONOLULU, HAWAII 96817**

HRD18-8416

February 20, 2018

Vince Bagoyo  
Bagoyo Development Consulting Group  
1500 Kilinoe Place  
Wailuku, HI 96793

Re: Comments on Draft 201H Application for Proposed Workforce Housing Project  
Wailuku Ahupua'a, Pū'ali Komohana Moku, Maui Moku  
Tax Map Key: (2) 3-5-002:011

Aloha e Mr. Bagoyo:

The Office of Hawaiian Affairs (OHA) has received your letter and draft application for an affordable workforce housing subdivision, pursuant to 201H-38, Hawai'i Revised Statutes (HRS). Waikapū Development Venture, LLC (the applicant) is proposing to develop eighty affordable workforce housing residential units on approximately 12.5 acres of a 50-acre parcel.

OHA appreciates the applicant's efforts to provide affordable housing in Hawai'i. OHA is concerned, however, that the proposed project doesn't adequately address the affordable housing needs of our Native Hawaiian beneficiaries, as well as other Maui families.

According to the application, the project will be 100 percent affordable and will be sold to qualified individuals/families earning 70% to 140% of Maui area median income (AMI) as set forth by Maui County Department of Housing and Human Concerns' Affordable Sales Price Guidelines. The application states that sixty-eight single family, three-bedroom/two-bath units and twelve duplex, two-bedroom/one-bathroom units will be constructed. The twelve duplex units will be reserved for families earning 70% to 80% AMI. According to the application, the single-family units will be reserved as follows: twelve units (15%) will be reserved for the 81% to 100% AMI level, forty units (50%) will be reserved for families earning 101% to 120% AMI, and twenty-four units (20%) will be reserved for families earning 121% to 140%. Please clarify the exact number of units that will be constructed. According to the allocation breakdown, a total of 88 units will be constructed.

### **Applicability of Hawai'i Revised Statutes § 201H-38**

HRS § 201H-38(a) states, that the Hawai'i Housing Finance and Development Corporation (HHFDC)

may develop on behalf of the State or with an eligible developer, or may assist under a government assistance program in the development of, housing projects that shall be exempt from all statutes, ordinances, charter provisions, and rules of any government agency related to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction of dwelling units thereon . . . .

Pursuant to HRS § 201H-38(b), a government assistance program is defined as "a housing program qualified by the corporation and administered or operated by the corporation or the United States or any of their political subdivisions, agencies, or instrumentalities, corporate or otherwise.

OHA is concerned that the exemptions under HRS § 201H-38(a) may not apply to the proposed project. The application states that the applicant, in coordination with County of Maui Department of Housing and Human Concerns will seek exemptions as provide by HRS § 201H-38 and that these exemptions will be processed through the County of Maui. Please clarify the applicability of HRS § 201H-38 to the proposed project. Please provide additional information as to how the applicant is an "eligible developer" or a "government assistance program" in accordance with HRS § 201H-38 and HHFDC's involvement in the proposed project.

### **Incomplete HRS § 201H-38 Application**

HRS § 201H-38 application is missing critical information required for the HRS § 201H-38 application.<sup>1</sup> The application is missing information such as the number of years the project will commit to maintaining the project as affordable; an acknowledgement that the affordable units will be subject to HHFDC buyback and shared appreciation; and an indication of the number of units allotted for family, elderly, homeless, and tenants with special housing needs. Please include this and any information required for the HRS § 201H-38 application.

HHFDC requires that the developer conduct at least one public meeting to solicit community input on the proposed project.<sup>2</sup> Please include in the application information about the public meeting, including a summary of community input and the developers proposed mitigation for community concerns.

---

<sup>1</sup> See HHFDC 201H Application, available at <http://dbedt.hawaii.gov/hhfdc/201h-development-assistance/>.

<sup>2</sup> *Id.*

## **Affordable Housing**

Maui's affordable housing crisis requires land use planning that prioritizes and maximizes affordable housing opportunities for local residents.<sup>3</sup>

Hawai'i families are in particular need of affordable housing units at or below low-moderate income levels. Notably, recent research shows that 32 percent of the single-family ownership housing demand in Maui is for units at or below 80% AMI. 21 percent of the housing demand is at 60% or below AMI. 36 percent of the Maui housing demand is for units that are at 80% AMI to 140% AMI, with only 16 percent of the demand at 120% AMI to 140% AMI.<sup>4</sup> For Native Hawaiians, 51 percent of the housing demand for single-family ownership units on Maui is at 80% AMI or below.<sup>5</sup> As such, OHA is concerned that the proposed project does not adequately address the need for affordable housing. As proposed, income levels of all of the units, while still deemed 'affordable', do not proportionately address of Maui residents.

The applicant is seeking numerous exemptions under HRS § 201H-38, including exemptions from permit, assessment and inspection fees. OHA seeks to ensure that the proposed project will truly meet the affordable housing needs of our Native Hawaiian beneficiaries, as well as families in Maui, before the exemptions are granted. OHA recommends that the developer consider funding alternatives (e.g. government grants or subsidies) that would allow the project to meet the needs of the community and offer single-family units to families/individuals below 80% AMI.

## **Impacts to Cultural Resources and Iwi Kūpuna**

According to the application, soils within the project area are classified as Pu'uone sand and Iao silty clay. OHA is concerned about the project impacts to iwi kūpuna (human remains/burials) and cultural resources that may be located in the project area. OHA notes that it is common knowledge that there is a high likelihood of encountering iwi kūpuna when doing ground disturbing activities in and around sand deposits and dunes. For example, hundreds of iwi kūpuna have been disturbed by development activities related to Maui Lani east of the proposed project area, which is also underlain with Pu'uone sand.

An archaeological inventory survey (AIS) was conducted of the 50-acre parcel in 2004 by Archaeological Services Hawaii, LLC (ASH). According to the application, the AIS was updated in May 2016. Please clarify if additional survey was conducted in 2016 or if only the AIS report was updated. During the 2004 survey, a total of twenty-five trenches were excavated to depths ranging from 1.3 meters to 3.5 meters. According to the AIS report, subsurface testing was not conducted in areas of the parcel where active farming was occurring. Only one site, a historic ditch, was identified during the AIS. According to the report, archaeological monitoring

---

<sup>3</sup> The 2016 Hawai'i Housing Planning Study shows very limited demand for market-rate housing. Instead, the majority of demand for Native Hawaiians, the State, as well as Maui County, is almost entirely for units that are affordable. See SMS, HAWAII HOUSING PLANNING STUDY 34 (2016), available at [https://dbedt.hawaii.gov/hhfdc/files/2017/03/State\\_HHPS2016\\_Report\\_031317\\_final.pdf](https://dbedt.hawaii.gov/hhfdc/files/2017/03/State_HHPS2016_Report_031317_final.pdf).

<sup>4</sup> *Id.*

<sup>5</sup> *Id.* at 75.

of all ground disturbing activities is proposed during the project development because of the "presence of numerous archaeological sites and native Hawaiian burials in neighboring parcels." Given that cultural resources and iwi kūpuna have been identified in the vicinity of the project area, OHA is concerned that the subsurface testing conducted did not adequately attempt to identify iwi kūpuna in the project area.

Of the twenty-five test trenches, only two terminated at bedrock. The remaining trenches terminated at lithified sand or sterile subsoil. Eighteen test trenches were terminated at a depth of 1.8 meters or less. In 2008, an ASH archaeologist stated that burials identified in the Maui Lani area were identified as deep as approximately 5.5 meters below the surface and that the average depth of a burial was 1.82 meters to 2.4 meters.<sup>6</sup> For example, one burial feature and one possible burial feature were identified in lithified sand 2.4 meters below the surface.<sup>7</sup> OHA is concerned that iwi kūpuna could be located in the project area deeper than the excavated test trenches. OHA recommends conducting an addendum AIS with test trenches to adequately ensure that iwi kūpuna and cultural resources will not be disturbed by the proposed project.

Thank you for providing the opportunity to comment. We look forward to continuing consultation. Should you have any questions, please contact Teresa Kaneakua, OHA Lead Compliance Specialist, at (808) 594-0231 or [teresak@oha.org](mailto:teresak@oha.org).

‘O wau iho nō me ka ‘ōia ‘i‘o,



Kamana'opono M. Crabbe, Ph.D.  
Ka Pouhana, Chief Executive Officer

KC:tk

---

<sup>6</sup> July 31, 2008 Maui/Lanai Islands Burial Council Meeting Minutes, at 8.

<sup>7</sup> Jeffrey Pantaleo and Diane Guerro, *Archaeological Inventory Survey Report Maui Lani Development Phase VI, and Maui Lani Parkway*, December 2005, at 56.



# BAGOYO

DEVELOPMENT  
CONSULTING GROUP

May 11, 2018

Mr. Kamana`opono M. Crabbe, Ph.D.  
Chief Executive Officer  
Office of Hawaiian Affairs  
560 N. Nimitz Hwy., Suite 200  
Honolulu, HI 96817

Subject: Comments on Draft 201H Application for Proposed Workforce Housing Project  
Located at Waiale Road, Wailuku, Hawaii; TMK: (2) 3-5-02:11 (por)

Dear Dr. Crabbe:

This is to acknowledge receipt of your letter dated February 20, 2018 and for your comments related to the proposed affordable workforce housing project. Following below is in response to your comments in the order as noted in your letter:

### **Incomplete HRS 201H-38 Application**

As noted in our 201H, HRS application, the accepting and processing agency for the proposed workforce housing project will be the Maui County Department of Housing and Human Concerns (DHHC). The application is in full compliance with DHHC's guidelines in the processing of the 201H, HRS application and fully meets the rules and regulations pursuant to Maui County Code 2.96, Residential Workforce Housing. The approving agency for the 201H application for the proposed project is the Maui County Council and the Council will hold its hearings once the application is filed according its rules and regulations. For your information, the applicant held several community meetings to give an overview of the proposed project and to solicit input from the community and to address community concerns.

### **Affordable Housing**

The applicant shares your concern about making sure that the proposed project is affordable for Maui's working families. As noted in our draft 201H application the proposed workforce housing project will be 100% affordable and will be priced for families earning 70% to 140% of Maui's median income, more than meets the Maui County Affordable Housing Sales Guidelines and Maui County Code 2.96.

---

1500 KILINOE PLACE  
WAILUKU, HI 96793  
(808) 357-3842  
VBAGOYO-DEVGROU@HAWAII.RR.COM



# BAGOYO

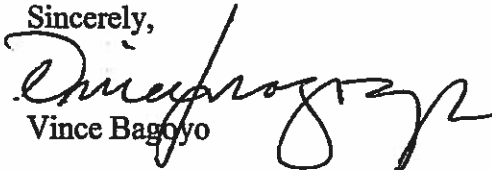
DEVELOPMENT  
CONSULTING GROUP

**Impacts to Cultural Resources and Iwi Kupuna**

Please see attached response from Archaeological Services Hawaii, LLC dated May 8, 2018.

Thank you again for your comments and should you have further questions regarding the proposed project, please contact me at (808) 357-3842 or by email at [vbago-yo-devgroup@hawaii.rr.com](mailto:vbago-yo-devgroup@hawaii.rr.com).

Sincerely,



Vince Bago-yo

Attachment

Cc: Ms. Carol Reimann (Director, Dept. of Housing and Human Concerns)  
Waikapu Development Venture LLC



**ARCHAEOLOGICAL SERVICES HAWAII, LLC**

**POB 1015; Pu'unēnē Hi; 96784**

**808-244-2012; 808-281-3004 (Lisa); 808-781-6603 (Jeff)**

8 May 2018

Office of Hawaiian Affairs (OHA)  
560 N. Nimitz Hwy, Ste. 200  
Honolulu, Hi 96817

**TRANSMITTAL VIA ELECTRONIC MAIL**

**SUBJECT: OHA Comments on Draft 201H Application at TMK (2) 3-5-002:011**

Aloha Ms. Teresa Kaneakua and Dr. Kamana'opono Crabbe:

Thank you for your letter dated 20 February 2018, regarding Draft 201H Application. Below are responses to your comments.

The AIS report was initially submitted in 2004, during the subdivision process for Emmanuel Lutheran Church and Valley Isle Fellowship; however, it was not reviewed until 2016. In 2016, the report was updated with pertinent information but did not include additional testing. The 50-acre parcel was extensively disturbed from agricultural activities (0.60 mbs) including sugarcane, pineapple and independent farming, the construction of the historic Kama Ditch (Site 50-50-04-5474)(1.53 mbs) near the western perimeter, the installation of existing a County sewer line near the eastern perimeter (2.0-3.0 mbs), and former sand mining activities (Figure 1). At the time of the AIS in 2004, sand mining was occurring west of the project area. Prior sand mining in the subject parcel was indicated by a lack of sand dune deposits or disturbed sand dune deposits within the eastern section of the 50-acre parcel, however, the depth of the mining is indeterminate.

The subject parcel is situated in a geographic area (near the base of the West Maui Mountains, and western edge of the isthmus) containing three depositional systems; colluvial (gravity transported or slope wash), alluvial (water transported) and aeolian (wind transported). Colluvium and alluvium deposits (silts, clays, angular and rounded rock) would be anticipated along the western perimeter, and sand dune deposits from aeolian and alluvial (changes in sea level) processes present to the east.

During the AIS in 2004, seven trenches, TR's 1, 2 and 12-16 were located near the western perimeter and comprised of both alluvial and colluvial deposits. In the eastern section, the remaining 18 trenches, TR's 3-11, 17-25 and Sinoto (1996) TR11\* were conducted. Ten trenches (TR's 9, 10, Sinoto (1996) TR11 and 17-23) contained remnant sand dune deposits, some of which exhibited either a disturbed or thin sand stratum. The absence of sand within half of the trenches; coupled with the presence of disturbed sand dune matrices in the central and east portions indicated prior sand mining activities.

\*Aki Sinoto Consulting (1996) conducted an AIS of the proposed retention basin and drainage channel project along Waiale Rd., where Sinoto TR11 was positioned within the former AIS study and current project area under discussion.

Six of the 2004 AIS trenches were located in the current affordable housing project. Two trenches (TR's 15 and 16) were situated along the western portion, and four in the eastern section (TR's 20, 23, 15 and Sinoto (1996) TR11) (see Figure 1). Only two trenches, TR's 23 and Sinoto (1996) TR11, excavated to 3.5 mbs (11.5 ft.) and 3.3 mbs (10.9 ft.), contained sand dune deposits, and TR23 exhibited disturbed sand.

The subject area exhibited prior disturbances (0.60 mbs) from agricultural activities of the entire parcel to a minimum of 2.0mbs, the existing County sewer line in the southeast quadrant between 2.0-3.0 mbs, and former sand mining activities. The proposed grading plan for residential development encompasses the entire parcel and ranges from 0.60 m to 1.20 mbs (2.0 to 4.0 ft.). The deepest proposed excavations for the project area comprise the future sewer and drain lines ranging from approximately 2.1 mbs to 3.05 mbs (7.0 ft. to 10 ft.); however, the development plan is in the early stages of design, and the location of the utility corridors is indeterminate.

The development plan for the residential lots and approximate roadway corridors is complete; however, the infrastructure improvements including sewer, drain, water and electrical is not yet designed. Based on previous disturbances and proposed grading plan, the AIS adequately covered the subject parcel. Portions of the sewer and drain lines, in areas not tested during the AIS, will be tested when the utility corridors are designed. If historic properties, including burials are encountered, consultation with SHPD will be conducted. Archaeological monitoring will be conducted during all ground-altering activities to identify and protect any inadvertent finds encountered during development at the subject parcel.

Thank you for your comments, and we look forward to future consultation with OHA.

Respectfully,

Jeffrey Pantaleo (Principal Investigator/Archaeological Consultant)



Lisa Rotunno-Hazuka (Owner/Archaeological Consultant)



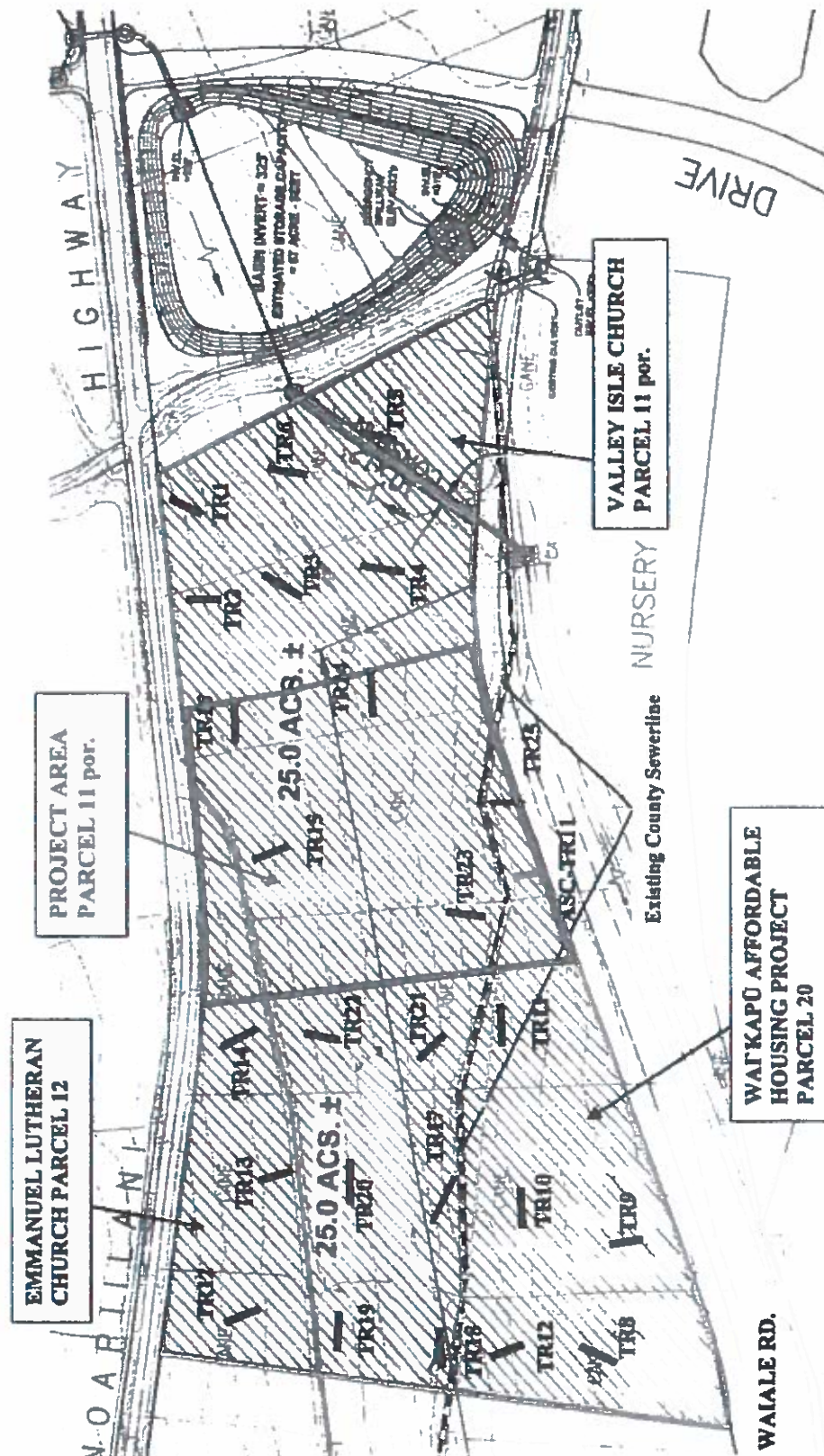
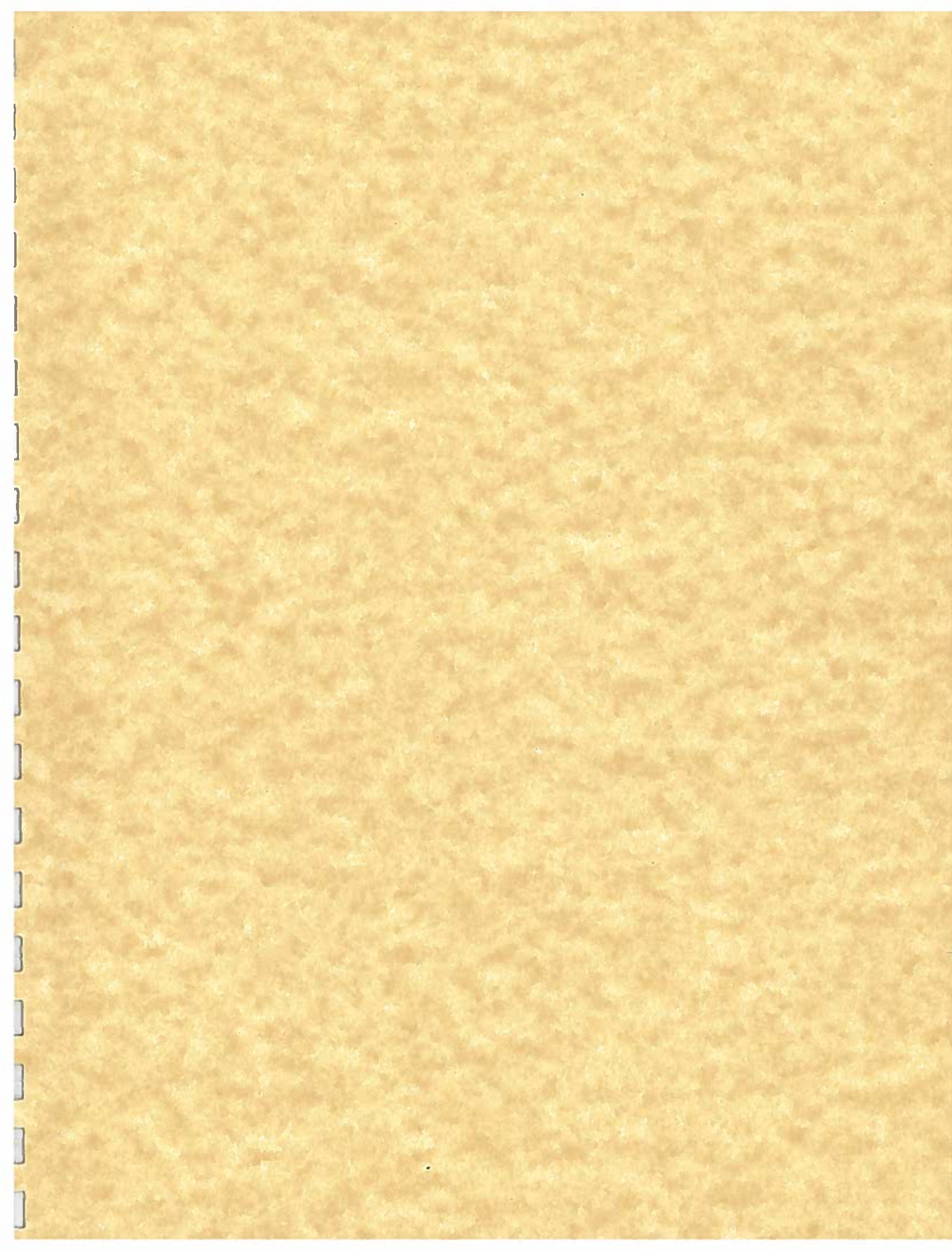
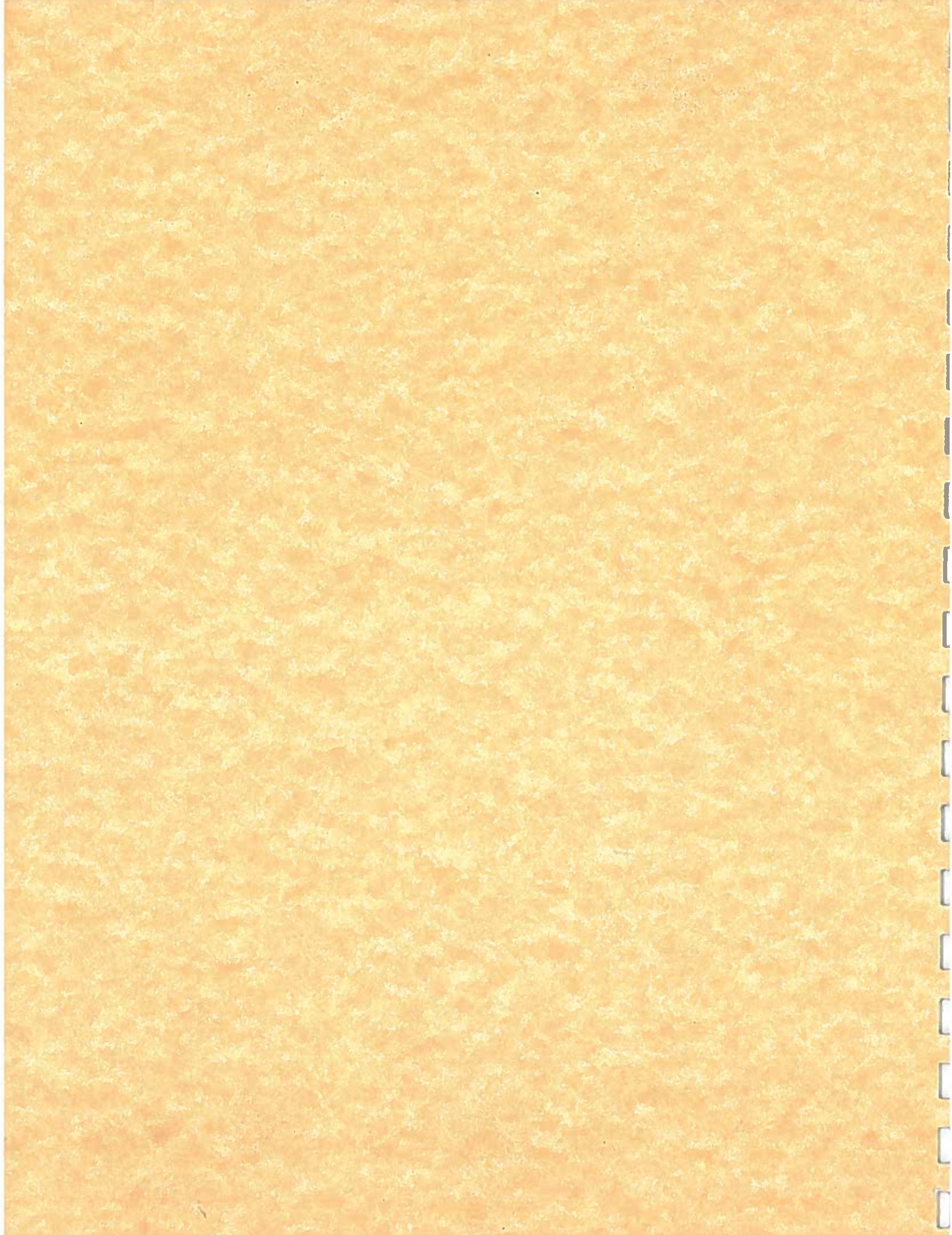


Figure 1. Topographic map from AIS report showing current project area (red), existing sewer line and Sinoto trench 11 (TR11-ASC) from 1996









# EXHIBIT F



DANNY A. MATEO  
County Clerk



JOSIAH K. NISHITA  
Deputy County Clerk

**OFFICE OF THE COUNTY CLERK**

COUNTY OF MAUI  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793  
[www.mauicounty.gov/county/clerk](http://www.mauicounty.gov/county/clerk)

September 10, 2018

Waikapu Development Venture, LLC  
2145 Wells Street, #303  
Wailuku, HI 96793

Dear Sir:

Transmitted herewith is a copy of Resolution No. 18-150, which was adopted by the Council of the County of Maui, State of Hawaii, on September 7, 2018.

Respectfully,

A handwritten signature in black ink, appearing to read "Danny A. Mateo", is written over a horizontal line.

DANNY A. MATEO  
County Clerk

/lks

Enclosure



# Resolution

No. 18-150

APPROVING WITH MODIFICATION THE AFFORDABLE WORKFORCE  
HOUSING PROJECT BY WAIKAPU DEVELOPMENT VENTURE LLC, PURSUANT  
TO SECTION 201H-38, HAWAII REVISED STATUTES

WHEREAS, Waikapu Development Venture LLC, a Hawaii Limited Liability Company ("Waikapu Development Venture LLC"), proposes the development of the Affordable Workforce Housing Project ("Project") for qualified residents on approximately 12.5 acres of the 25.263-acre parcel identified for real property tax purposes as tax map key (2) 3-5-002:011; and

WHEREAS, the proposed Project will have a total of sixty-eight (68) single-family units and twelve (12) duplex units for a total of eighty (80) residential workforce housing units; and

WHEREAS, all units in the proposed Project will be sold to income-qualified individuals earning between seventy percent and one hundred forty percent of the County of Maui's area median income; and

WHEREAS, the Project will provide needed residential workforce housing units to meet the current and growing demand for housing; and

WHEREAS, on July 25, 2018, the Department of Housing and Human Concerns ("Department") submitted the preliminary plans and the specifications, and accompanying Application for Affordable Housing Subdivision ("Application") to the Maui County Council ("Council"), recommending approval of the Project pursuant to Section 201H-38, Hawaii Revised Statutes ("HRS"); and

WHEREAS, pursuant to Section 201H-38, HRS, the Council shall approve, approve with modification, or disapprove the Project by resolution within forty-five days after the Department submits the preliminary plans and specifications for the Project to the Council, or the Project shall be deemed approved; and

WHEREAS, pursuant to Section 4-1 of the Revised Charter of the County of Maui (1983), as amended, the Council is authorized to act by resolution; now, therefore,

BE IT RESOLVED by the Council of the County of Maui:

1. That, based upon the transmittals and the representations of the Department and Waikapu Development Venture LLC, the Council approves the Project, with modification, attached hereto as Exhibit "A" and made a part hereof, including the Project's preliminary plans and specifications, as submitted to the Council on July 25, 2018, pursuant to Section 201H-38, HRS; provided that Waikapu Development Venture LLC shall comply with all statutes, ordinances, charter provisions, and rules of governmental agencies relating to planning, zoning, and construction standards for subdivisions, development and improvement of land, and the construction of units thereon, except for the exemptions specified in Exhibit "B" attached hereto and made a part hereof; and

2. That the final plans and specifications for the Project shall be deemed approved by the Council if the final plans and specifications do not substantially deviate, as determined by the Director of Housing and Human Concerns, from the preliminary plans and specifications approved by the Council; and

3. That any substantial deviation from the preliminary plans and specifications shall be submitted to the Council for prior approval; and

4. That the final plans and specifications shall constitute the zoning, building, construction, and subdivision standards for the Project; and

5. That certified copies of this resolution shall be transmitted to the Director of Public Works, the Planning Director, the Director of Housing and Human Concerns, and Waikapu Development Venture LLC.

APPROVED AS TO FORM AND LEGALITY

  
\_\_\_\_\_  
Deputy Corporation Counsel  
County of Maui  
2017-0095  
LU-2(4) 2018-08-16 Modification

## **MODIFICATIONS**

1. Construction of the Waikapu Development Venture LLC Affordable Workforce Housing Project ("Project") shall commence within two years of the effective date of this resolution. Commencement of construction shall mean the visible start of grading, pursuant to a valid grading permit as needed for the development of the 12.5 acres upon which the 80 residential workforce housing units shall be constructed ("Property"). Waikapu Development Venture LLC shall act in good faith and with its reasonable best efforts to complete construction of the 80 residential workforce housing units, with all related roads and infrastructure, no later than four years after the effective date of this resolution.
2. Project approval shall lapse and become void if the State Land Use Commission fails to approve the sale of the Property by Emmanuel Lutheran Church of Maui to Waikapu Development Venture LLC within six months after the effective date of the resolution.

lu:misc:002(4)modifications02

**EXHIBIT "A"**

**WAIKAPU DEVELOPMENT VENTURE AFFORDABLE WORKFORCE HOUSING  
PROJECT EXEMPTIONS PURSUANT TO SECTION 201H-38, HAWAII REVISED  
STATUTES.**

**A. EXEMPTION FROM TITLE 2, MCC, ADMINISTRATION AND PERSONNEL**

1. An exemption from Chapter 2.80B, MCC, General Plan and Community Plans, shall be granted to permit the Project to proceed without obtaining a Community Plan Amendment.

**B. EXEMPTIONS FROM TITLE 8, MCC, HEALTH AND SAFETY**

1. An exemption from Section 8.04.040, MCC, Disposal Permits — Application and suspension, shall be granted to exempt the Project from the requirement of acquiring a *Disposal Permit*.
2. An exemption from Section 8.04.050, MCC, Disposal Charges, shall be granted to exempt the Project from *Disposal Charges*.

**C. EXEMPTIONS FROM TITLE 12, MCC, STREETS, SIDEWALKS, AND  
PUBLIC PLACES**

1. An exemption from Section 12.08.100, MCC, Standards and Specifications, shall be granted to allow driveways within the 15-foot reserve area adjacent to an intersection and allow the maximum driveway width for the duplex units to exceed twenty-two (22) feet. The new maximum driveway width for the duplex units shall be thirty-six (36) feet.
2. An exemption from Chapter 12.24A, MCC, Landscape Planting and Beautification, shall be granted to exempt the Project from compliance with the *Landscape Planting Plan* as it pertains to requiring *One (1) Tree per Residential Lot*. The Project is comprised of seventy-four (74) Residential Lots, and thus, the Landscape Planting Plan will include the planting of no less than 74 Landscape Trees. However, the Project is allowed, through this exemption, flexibility in the precise location of each tree as it may not be feasible to plant a tree in the front area of every single residential lot. Some of the trees may be planted in the Neighborhood Green or along the several pedestrian pathways leading to the Neighborhood Green.

**D. EXEMPTIONS FROM TITLE 14, MCC, PUBLIC SERVICES**

1. An exemption from Section 14.05.090, MCC, Fire Protection, shall be granted to exempt the Project from providing *Fire Protection* for the portions of the Property along Honoapiilani Highway.
2. An exemption from Chapter 14.76, MCC, Impact Fees for Traffic and Roadway Improvements in Wailuku-Kahului, Maui, Hawaii; shall be

granted to exempt the Project from having to pay *Traffic Impact Fees* should such fees be adopted prior to issuance of building permits for the Project.

#### **E. EXEMPTIONS FROM TITLE 16, MCC, BUILDINGS AND CONSTRUCTION**

1. Exemptions from MCC Chapters 16.04C, Fire Code, 16.18B, Electrical Code, 16.20B, Plumbing Code, and 16.26B, Building Code, shall be granted to exempt the Project from *Fire, Electrical, Plumbing, and Building* permit fees, as well as inspection fees.
2. An exemption from Chapter 16.04C.160, MCC, Fire Code, as it pertains to permit fees in Subsection 1.12.8 shall be granted to exempt the Project from permit fees required by the Fire Code.
3. An exemption from Section 16.04C.440, MCC, Fire Code, as it pertains to *dimensions* in Subsection 18.2.3.6.1 shall be granted to exempt the Project from providing an *Unobstructed Width of Twenty (20) feet* for the *Interior Subdivision Roadways* (Roadways C and D) (Please refer to Exhibit 3 — Typical Section of Roadways C and D).
4. An exemption from Section 16.04C.470, MCC, Fire Code, as it pertains to Subsection 18.4.6 shall be granted to exempt the Project from providing fire protection for the portions of the property along Honoapiilani Highway.
5. An exemption from Section 16.26B.3600, MCC, Improvements to Public Streets, as it relates to *Urban Standards for Curbs and Gutters*, shall be granted for the portion of the Project adjacent to *Waiale Road* (Please refer to Exhibit 1— Typical Section of Waiale Road).

#### **F. EXEMPTIONS FROM TITLE 18, MCC, SUBDIVISIONS**

1. Exemptions from Section 18.04.030, MCC, Administration, and Section 18.16.020, MCC, Compliance, shall be granted to exempt the Project from requirements of obtaining a *Change in Zoning, and Community Plan Amendment*.
2. Exemptions from Section 18.16.050, MCC, Minimum Right-of-Way and Pavement Widths, shall be granted to allow the *Internal Subdivision Roadways* (Roadways C and D) to have a *Minimum Right-of-Way Width of Thirty-Six (36) feet and Minimum Pavement Width of Twenty (20) feet* (Please refer to Exhibit 3 — Typical Section for Roadways C and D).
3. An exemption from Section 18.16.070(A), MCC, Intersection Angles, shall be granted to allow the right-of-way lines at intersections to have a minimum corner radii of fifteen (15) feet.
4. An exemption from Section 18.16.220, MCC, Lots Size and Shape, shall be granted to allow *Lot Sizes, Widths, Shapes, and Orientation, and Minimum Building Setback Lines*, within the Project that are not consistent with, and not in conformance with the provisions of Chapter 19.31, MCC, Public/Quasi-Public District.



5. An exemption from Section 18.16.230, MCC, Lots — Minimum Sizes, shall be granted to allow Lot Sizes within the Project that are *not consistent with, and not in conformance with* the provisions of Chapter 19.31, MCC, Public/Quasi-Public District.
6. An exemption from Sections 18.20.040 and 18.20.080, MCC, as they relate to the *Urban Standards for Curbs, Gutters*, shall be granted for the portions of the Project adjacent to Waiale Road (Please refer to Exhibit 1- Typical Section of Waiale Road).
7. An exemption from Section 18.20.070, MCC, Sidewalks, shall be granted to allow the following exemptions as it relates to the *Construction of Sidewalks* along the Internal Subdivision Roadways A, B, C, and D (Please refer to Exhibits 2 and 3 — Typical Sections of proposed Internal Roadways).
  - **Roadway A** — Four (4) foot wide Concrete Sidewalks will be provided on both sides of portions of *Roadway A*; and the *Sidewalks will be in compliance with applicable Americans with Disabilities Act ("ADA ") requirements*.
  - **Roadway B** — Five (5) foot wide Concrete Sidewalks will be provided on one side of portions of *Roadway B*; and the *Sidewalks will be in compliance with all ADA requirements*.
  - **Roadways C and D** — The Project is exempt from constructing *Sidewalks on both sides of the Internal Subdivision Roadways C and D*.
8. An exemption from Chapter 18.40, MCC, Guidelines for Acceptance, shall be granted to allow the County to accept the subdivision roadways and utilities located within the subdivision roadways based on the exemptions granted herein, including but not limited to, exemption C.1 relating to the standards and specifications of driveways.

#### **G. EXEMPTIONS FROM TITLE 19, MCC, ZONING**

1. An exemption from Chapter 19.31, MCC, Public/Quasi-Public District, shall be granted to permit the development and use of the subject parcel for single-family and two-family (duplex) residential purposes. Permitted uses shall be based on Chapter 19.08, MCC, Residential District, and Chapter 19.10, MCC, Two-family (Duplex) District. The Project shall be exempt from all Development Design Standards set forth in Chapter 19.31, MCC. Further, this exemption shall allow the subdivision of the property in the plat configuration as generally shown in the Project Site Plan and Exhibit 4. The following Zoning Standards shall apply to the Project:

**PERMITTED USES:**

*Single-Family and Two-Family (Duplex) Residential Units, as well as accessory buildings located on the same lot, the use of which is customary, incidental, usual, and*

#### **EXHIBIT "B"**

necessary to that of the main building or to the use of the land; provided that Bed and Breakfast Homes, Short-Term Rental Homes, and other rentals for a period of less than 180 days shall not be permitted.

MINIMUM LOT SIZE: 3,000 Square feet

MAXIMUM HEIGHT: No building shall exceed two (2) stories or thirty (30) feet in height.

MINIMUM LOT WIDTH: Forty (40) feet

- YARDS (BUILDING SETBACKS): Yards (building setbacks) to be as follows:
  - SINGLE-FAMILY AND TWO-FAMILY (DUPLEX) DWELLINGS:
    - Front Yard: Ten (10) feet minimum
    - Side Yard: Single-story is six (6) feet minimum; and two-story is ten (10) feet minimum; exterior stairs and landing decks accessing second story duplex units may extend to within (6) feet of the side yard property line on one side only.
    - Rear Yard: Fifteen (15) feet minimum
  - GARAGES AND CARPORTS:
    - Front Yard: Zero (0) feet – lot line
    - Side Yard: Zero (0) feet – lot line
    - Rear Yard: Zero (0) feet – lot line

and as shown in Exhibit 4.

- TOTAL NUMBER OF RESIDENTIAL LOTS IN PROJECT:
  - Single-Family Lots: 68 lots
  - Two-Family (Duplex) Lots: 6 lots
  - Total Lots: 74 lots
- TOTAL NUMBER OF UNITS IN PROJECT:
  - Single-Family Units: 68 units
  - Two-Family (Duplex) Units: 12 units
  - Total Units: 80 units

#### **H. EXEMPTIONS PURSUANT TO MAUI COUNTY CODE REGARDING PROJECTS COMPRISED OF 100 PERCENT RESIDENTIAL WORKFORCE HOUSING UNITS**

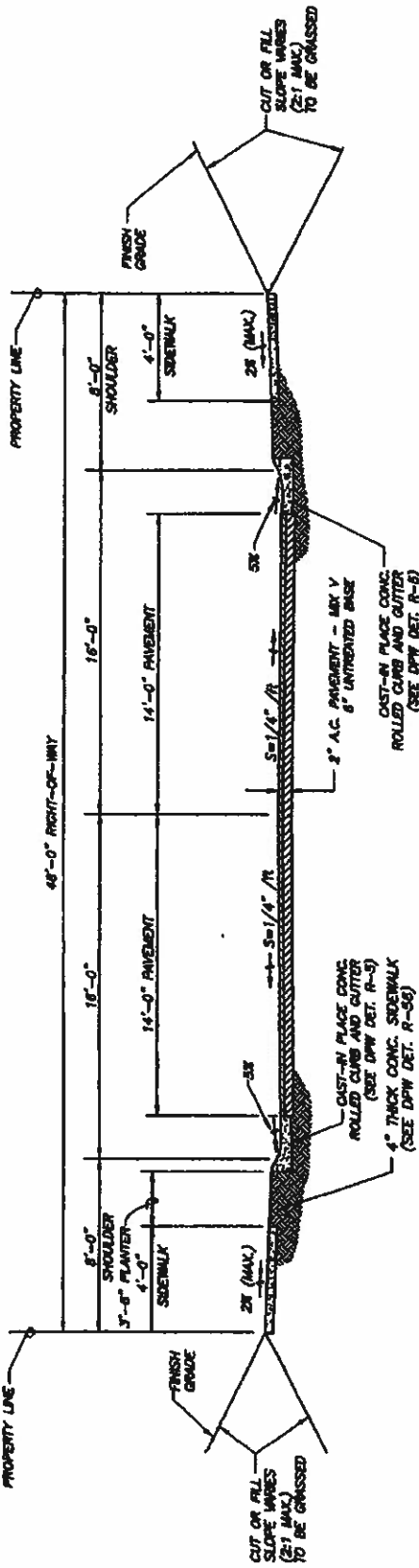
1. Section 12.08.050(D), MCC, as it pertains to *Driveway Permit Fees*.
2. Section 14.12.030, MCC, as it pertains to Water Availability.

3. Section 14.35.080, MCC, as it pertains to wastewater assessment fees for facility expansion for the Wailuku/Kahului Wastewater Treatment System.
4. Section 16.18B.107, MCC, as it pertains to the *Electrical Permit Fee* in Section 107.1C.
5. Section 16.20B.103.4, MCC, as it pertains to the *Plumbing Permit Fee* in Section 103.4.1.3.
6. Section 16.26B.108, MCC, as it pertains to the *Building Permit Fee* in Section 108.2.
7. Section 18.16.320 (I) (5), MCC, as it pertains to the *Park Assessment Fee*.
8. Section 20.08.090(D), MCC, as it pertains to *Grading and Grubbing Permit Fee*.

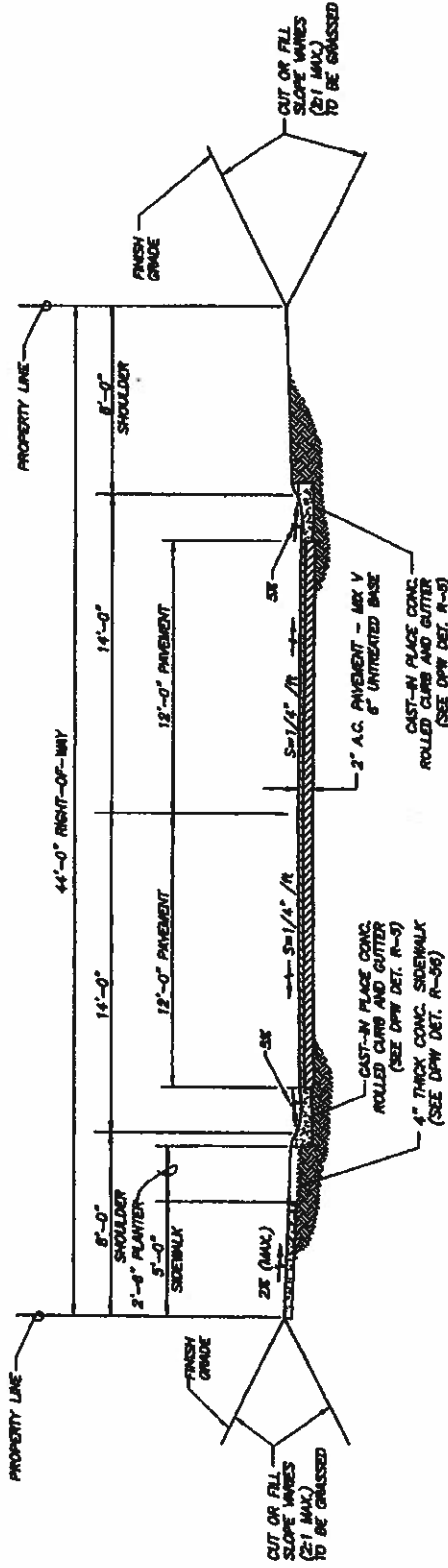
#### **I. EXEMPTION FROM ORDINANCE 3686 (2009)**

1. An exemption from the Conditions of Zoning set forth in Exhibit "B" and Exhibit "2" to Exhibit "C" of Ordinance 3686 (2009) shall be granted to exempt the Project from the conditions imposed therein.



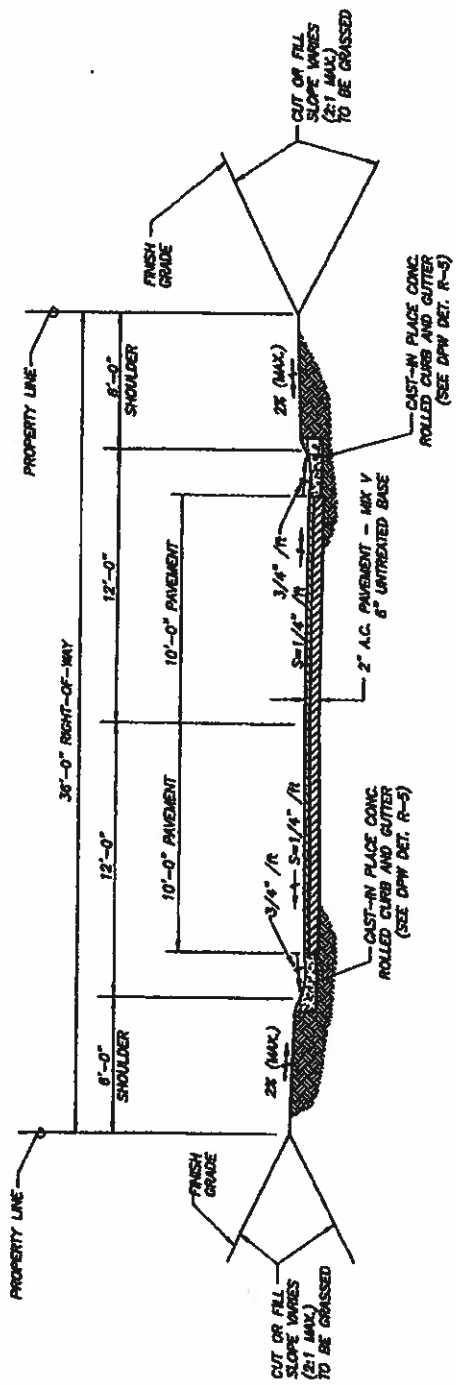


TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "A" (48 FT. RIGHT-OF-WAY)  
NOT TO SCALE



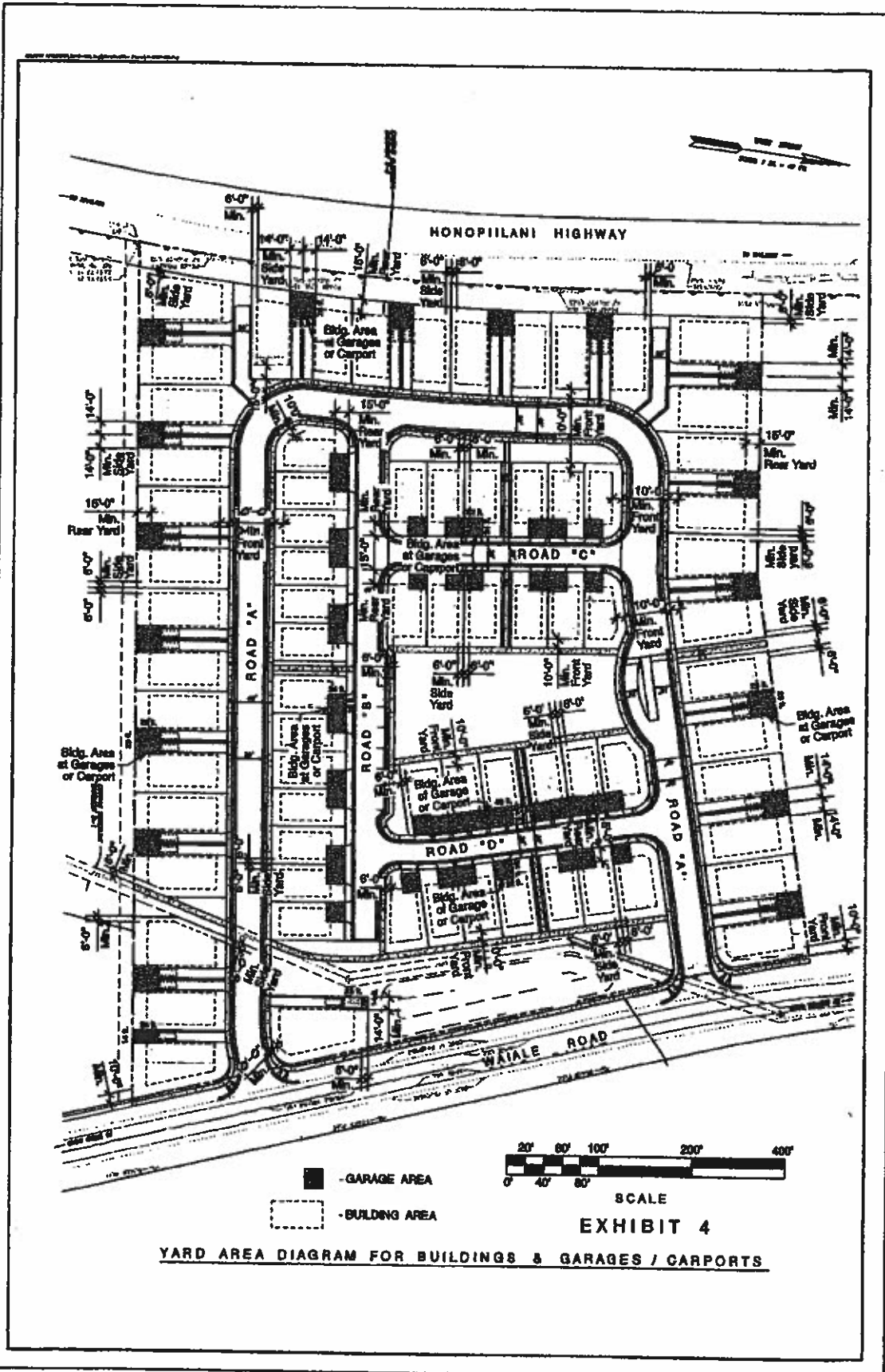
TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "B" (44 FT. RIGHT-OF-WAY)  
NOT TO SCALE

NOTES:  
1. ROAD "B" ROW SHALL INCLUDE ON STREET PARALLEL  
PARKING STALLS, WHERE OCCURS.



TYPICAL SECTION - SUBDIVISION INTERIOR ROAD "C" & "D" (36 FT. RIGHT-OF-WAY)  
NOT TO SCALE





# COUNCIL OF THE COUNTY OF MAUI

WAILUKU, HAWAII 96793

## CERTIFICATION OF ADOPTION

It is HEREBY CERTIFIED that RESOLUTION NO. 18-150 was adopted by the Council of the County of Maui, State of Hawaii, on the 7th day of September, 2018, by the following vote:

MEMBERS	Michael B. WHITE Chair	Robert CARROLL Vice-Chair	Alika ATAY	Eleanora COCHRAN	S. Stacy CRIVELLO	Donald S. GUZMAN	G. Riki HOKAMA	Kelly T. KING	Yuki Lei K. SUGIMURA
ROLL CALL	Aye	Excused	Aye	Aye	Aye	Aye	Aye	Aye	Aye

  
COUNTY CLERK

**BEFORE THE LAND USE COMMISSION**

**OF THE STATE OF HAWAII**

In the Matter of the Petition of:

EMMANUEL LUTHERAN CHURCH OF  
MAUI

To Amend the Land Use District Boundary of  
Certain Lands Situated at Wailuku, Island of  
Maui, State of Hawai'i, Consisting of 25.263  
Acres from the Agriculture District to the  
Urban District, Tax Map Key No. 3-5-002:011.

DOCKET NO. A07-773

CERTIFICATE OF SERVICE

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served upon the following, via United

States mail, postage prepaid, on OCT 22 2018 :

JENNIFER A. LIM, ESQ.  
DEREK A. SIMON, ESQ.  
Carlsmith Ball LLP  
1001 Bishop Street, Suite 2100  
Honolulu, Hawaii 96813

Attorneys for Petitioner  
EMMANUEL LUTHERAN  
CHURCH OF MAUI

PATRICK WONG, ESQ.  
Corporation Counsel  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

MICHAEL HOPPER, ESQ.  
Deputy Corporation Counsel  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

MICHELE CHOUTEAU McLEAN  
Director, Planning Department  
County of Maui  
2200 Main Street, Suite 315  
Wailuku, Hawaii 96793

DAWN T. APUNA, ESQ.  
Office of the Attorney General  
State of Hawaii  
425 Queen Street  
Honolulu, Hawaii 96813

LEO ASUNCION  
Director, Office of Planning  
State of Hawaii  
235 South Beretania Street, 6<sup>th</sup> Floor  
Honolulu, Hawaii 96813

DATED: Wailuku, Maui, Hawaii

OCT 22 2018



PETER A. HOROVITZ  
Attorney for Intervenor  
**WAIKAPU DEVELOPMENT VENTURE,  
LLC**