



Kīhei High School

State of Hawai'i, Department of Education
Kīhei, Maui, Hawai'i

Draft Environmental Impact Statement

DOE No. Q00017-06



DECEMBER 2011

DRAFT ENVIRONMENTAL IMPACT STATEMENT

KĪHEI HIGH SCHOOL

Kīhei-Mākena Region, Island of Maui
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083

Applicant:

State of Hawai'i
Department of Education
Facilities Development Branch

Accepting Authority:

Governor, State of Hawai'i



Prepared by:

Group 70 International, Inc.
Architecture • Planning • Interior Design • Environmental Services
925 Bethel Street, 5th Floor, Honolulu, Hawai'i 96813 (808) 523-5866

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This Document is prepared pursuant to Chapter 343, Hawai'i Revised Statutes, as amended, and Chapter 200 of Title 11, State of Hawai'i Department of Health Administrative Rules, Environmental Impact Statement

This document and all other ancillary documents were prepared under my direction.

Responsible Official: *Tom Kashi* Date: November 29, 2011
Duane Y. Kashiwai, Administrator
State of Hawai'i, Department of Education
Facilities Development Branch

Prepared By:



Group 70 International, Inc.
Architecture • Planning • Interior Design • Environmental Services
925 Bethel Street, Fifth Floor, Honolulu, HI 96813

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AAI	All Appropriate Inquiry
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawai'i
AMSL	Above Mean Sea Level
ASTM	American Standard for Testing and Materials
BMPs	Best Management Practices
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
CIA	Cultural Impact Assessment
CML	Central Maui Landfill
CWRM	State of Hawai'i Commission on Water Resource Management
CY	Calendar Year
CZM	Coastal Zone Management
DB	Design-Build
DEM	County of Maui Department of Environmental Management
DLNR	State of Hawai'i Department of Land and Natural Resources
DNL	Day-Night Average Sound Level
DOA	State of Hawai'i Department of Agriculture
DOE	State of Hawai'i Department of Education
DOH	State of Hawai'i Department of Health
DOT	State of Hawai'i Department of Transportation
DWS	County of Maui Department of Water Supply
EDSPECS	Education Specifications
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparatory Notice
ESA	Environmental Site Assessment
F	Fahrenheit
FADS	Facilities Assessment Development Schedule
FIRM	Flood Insurance Rate Map
FTE	Full-time Equivalent
GPD	Gallons Per Day
GPCD	Gallons per Capita Day
GPM	Gallons per Minute
gsf	Gross Square Footage/Feet
HAR	Hawai'i Administrative Rules
HCM	Highway Capacity Manual
HRS	Hawai'i Revised Statutes
HTel	Hawaiian Tel
KCA	Kihei Community Association
LCA	Land Commission Award
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
LSB	Land Study Board
LUC	Land Use Commission
m	meters

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MECo	Maui Electric Company
MGD	Millions of Gallon per Day
Mg/L	Milligrams per Liter
MIP	Maui Island Plan
mph	Miles per Hour
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
NRHP	National Register of Historic Places
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
PSI	Pounds per Square Inch
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
SCS	Scientific Consultant Services, Inc.
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
SMA	Special Management Area
SSS	Site Selection Study
TIR	Traffic Impact Report
TMK	Tax Map Key
UH	University of Hawai'i
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
WWRF	Wastewater Reclamation Facility

1.2 PROJECT LOCATION AND SITE

The proposed Kīhei High School project site encompasses 77.2 acres of undeveloped land on the mauka side of Pi'ilani Highway across from the Pi'ilani Village residential subdivision in the Kīhei-Mākena region, Kīhei, Maui, Hawai'i (Figure 1-2). The site is bordered on the south by the Waipu'ilani Gulch and on the north by the Kūlanihāko'i Gulch. The site slopes from east to the west/southwest, at an elevation of about 110 feet above mean sea level (AMSL) at the northeastern boundary to approximately 30 feet AMSL at the southwestern boundary bordering Pi'ilani Highway. The affected TMK parcels are listed in Table 1-1, and shown in Figure 1-3.

Table 1-1 PROJECT AREA TMK PARCELS, LANDOWNER AND ACREAGE		
TMK Parcels	Landowner	Acres
2-2-2-002:081	Ka'ono'ulu Ranch LLLP	29.2
2-2-2-002:083	Haleakala Ranch Company	48.0
Total Project Area		77.2

Figure 1-4 through Figure 1-6 illustrate State Land Use, Special Management Area, and County zoning designations in the area. While all the subject land is presently designated and zoned Agricultural by the State and County, the Kīhei-Mākena Community Plan designates the land underlying the project site as Agriculture and Public/Quasi-Public (Figure 1-7).

The project area has been assessed by the Land Study Bureau and Agricultural Lands of Importance to the State of Hawai'i (ALISH). The Kīhei High School project site does not have high capacity for agricultural production. The entire 77.2 acres of the Kīhei High School project site has been given a land classification of "E" (Lowest Rating) by the Land Study Bureau. The ALISH identifies 1.70 acres in the northwest corner of the project site (2% of the total site area), as "Prime" agricultural land (refer to Figure 1-9).

1.3 APPLICANT AND LANDOWNER

Ka'ono'ulu Ranch LLLP (TMK 2-2-2-002:081, totaling 29.2 acres), and Haleakala Ranch Company (TMK 2-2-2-002:083, totaling 48 acres) are the current landowners of the project site. The lands were historically used for ranching. The landowners are presently engaged in a master planning process for their adjacent properties. Discussion with DOE regarding location and siting of the proposed high school has been part of the landowners' master planning efforts. The State is in the process of acquiring the two (2) parcels and consolidating them into a single lot for development of the high school.

Chapter 1

Project Summary

1.0 PROJECT SUMMARY

1.1 PROJECT SUMMARY

Project Name:	Kihei High School
Applicant:	State of Hawai'i Department of Education (DOE) Facilities Development Branch P.O. Box 2360 Honolulu, Hawai'i 96804 Contact: Robert Purdie, Jr., Project Manager Phone: (808) 586-0408
Accepting Authority:	Governor, State of Hawai'i
Planning/Environmental Consultant:	Group 70 International, Inc. 925 Bethel Street, 5 th Floor Honolulu, Hawai'i 96813 Contact: Christine Mendes Ruotola, AICP, LEED AP Phone: (808) 523-5866 ext. 121
Project Area:	77.2 acres
Project Location:	Island of Maui, Makawao District, Kihei-Mākena region, Kihei, east of Pi'ilani Highway, between the Kūlanihāko'i and the Waipu'ilani gulches, adjacent to and mauka of the intersection of Pi'ilani Highway and Kūlanihāko'i Road <i>(Figure 1-1, Figure 1-2)</i>
Tax Map Key (TMK):	TMK 2-2-2-002:081 and TMK 2-2-2-002:083 <i>(Figure 1-3)</i>
Landowner(s):	Parcel 081: Ka'ono'ulu Ranch LLLP Parcel 083: Haleakala Ranch Company (Note: Land in process of being acquired by the State of Hawai'i)
Existing Use(s):	Undeveloped land that has been used as pasture land for domestic cattle
Proposed Use(s):	High School
State Land Use District:	Agricultural <i>(Figure 1-4)</i>
Special Management Area:	Not in Special Management Area or Shoreline Setback Area <i>(Figure 1-5)</i>
Maui Island Plan (MIP) General Plan 2030 Draft:	Proposed Public High School
County of Maui Zoning:	Agricultural <i>(Figure 1-6)</i>
Kihei-Mākena Community Plan:	Public/Quasi-Public; Agriculture <i>(Figure 1-7)</i>
Permits Required:	State Land Use District Boundary Amendment, Change in Zone, Community Plan Amendment, Final Subdivision and Consolidation Approval, National Pollutant Discharge Elimination System (NPDES), Grading and Grubbing Permit, Driveway Permit, Building Permit, Wastewater Discharge Permit
Flood Zone:	Flood Insurance Rate Maps (FIRM) Zone X (outside of 100 year flood plain) <i>(Figure 1-8)</i>
Environmental Impact Statement (EIS) Trigger:	Use of State Funds will allow purchase of lands for educational purposes.
Proposed Project:	The DOE proposes to develop a new high school in Kihei on approximately 77 acres mauka of Pi'ilani Highway between Kūlanihāko'i and Waipu'ilani Gulches. The high school will be designed for 1,650 students and associated staff for grades 9-12.

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Figure 1-1
Regional Map

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Figure 1-2
Location Map

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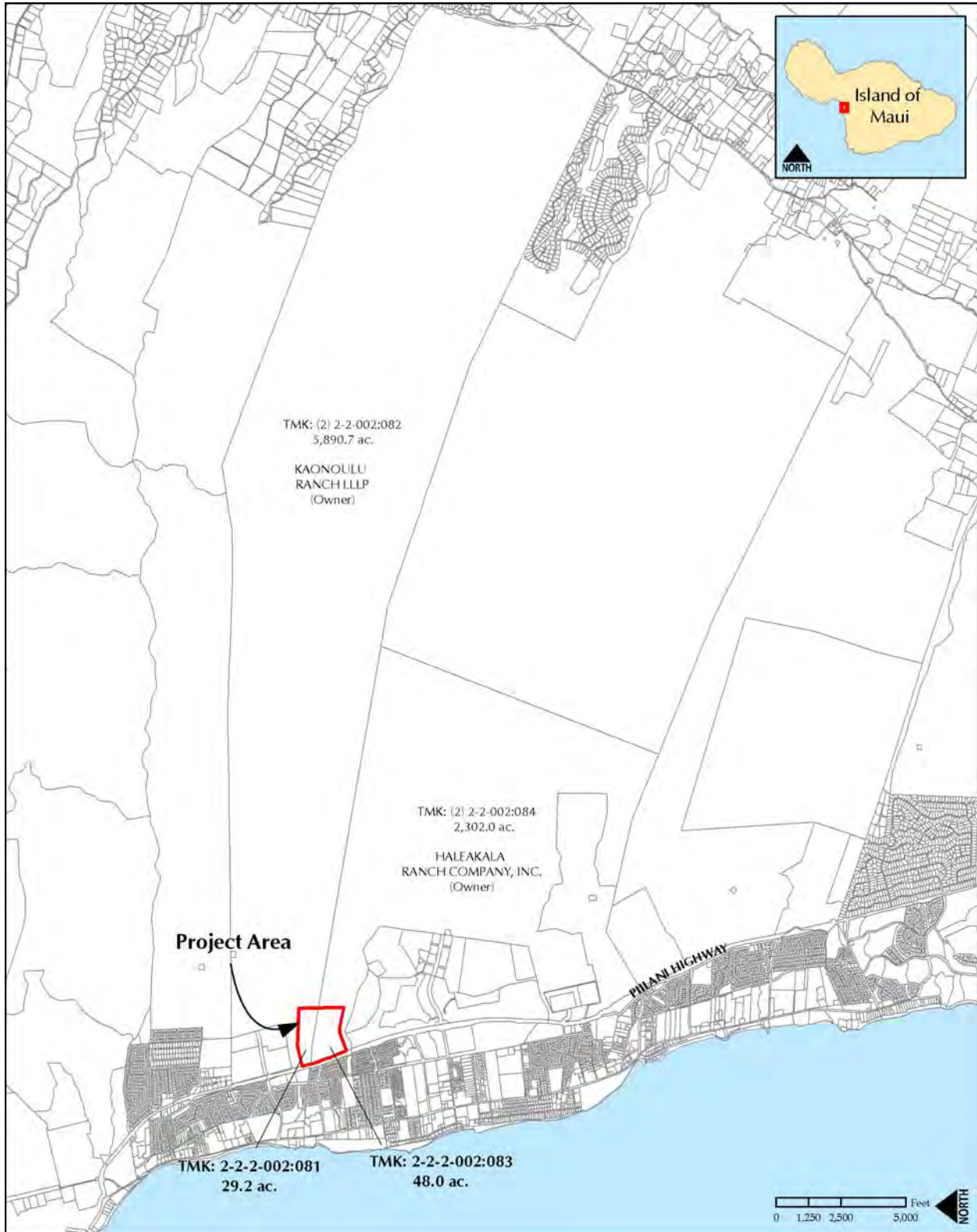


Figure 1-3
Tax Map Key Parcels Map

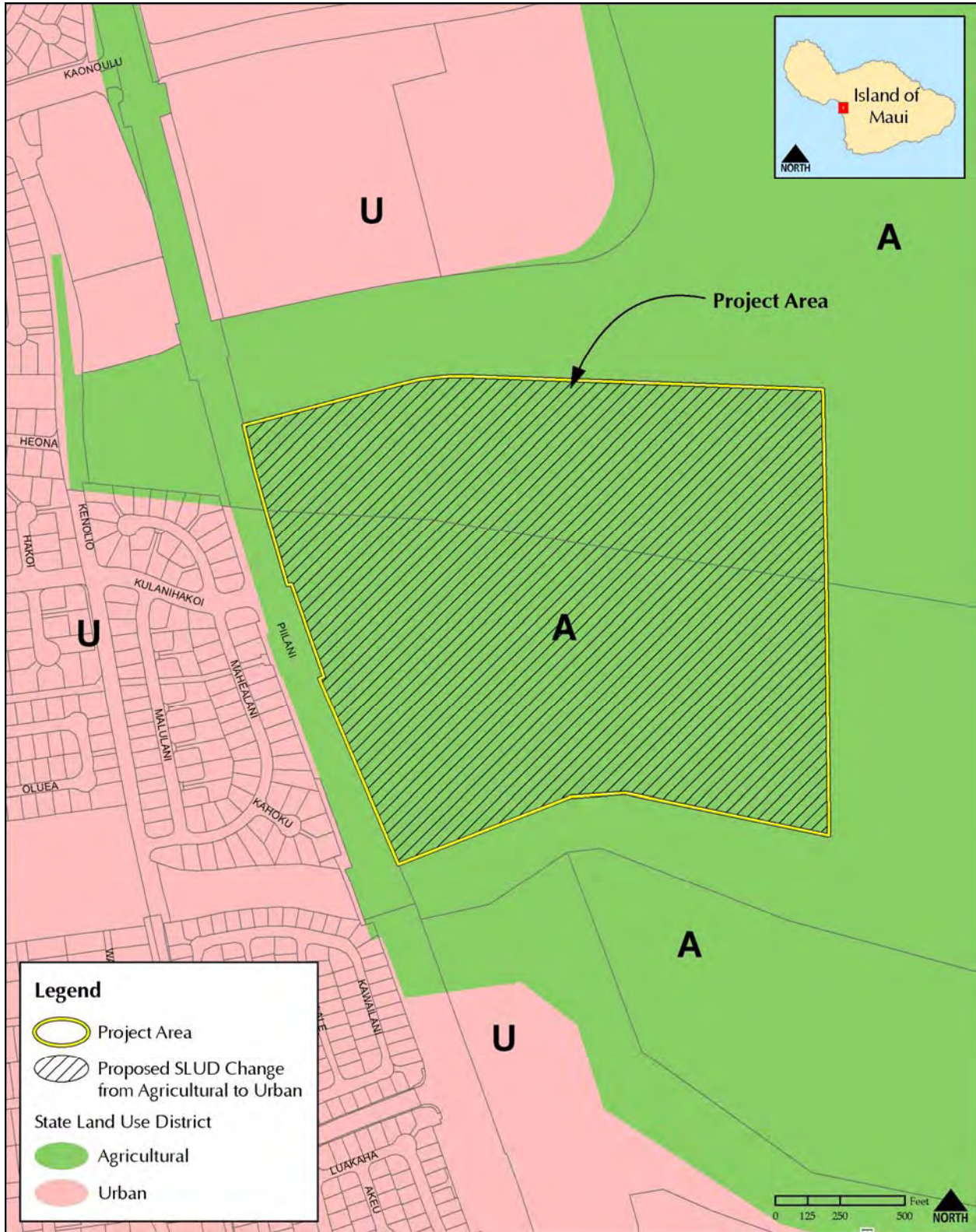


Figure 1-4
State Land Use District Classifications Map

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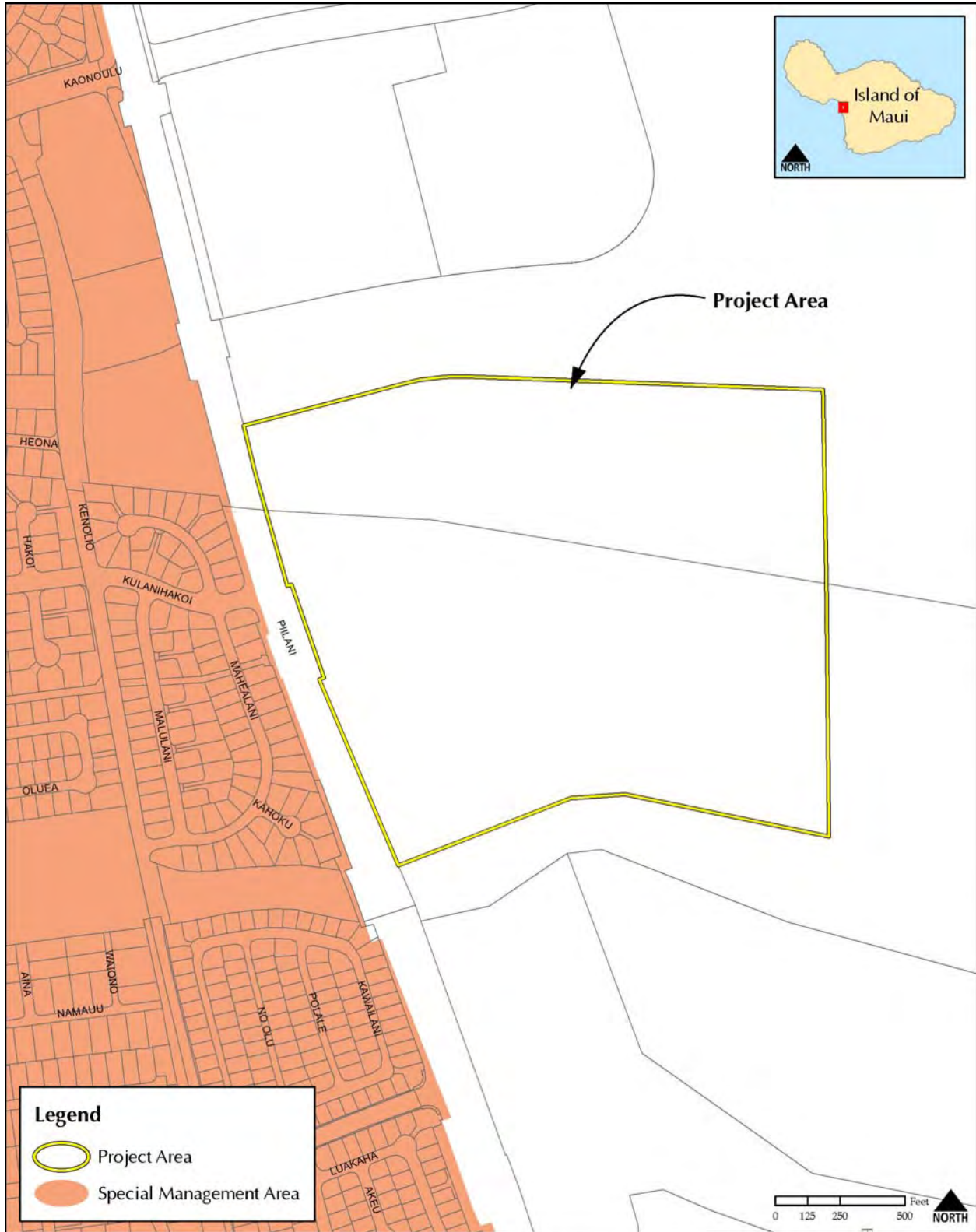


Figure 1-5
Special Management Area Map

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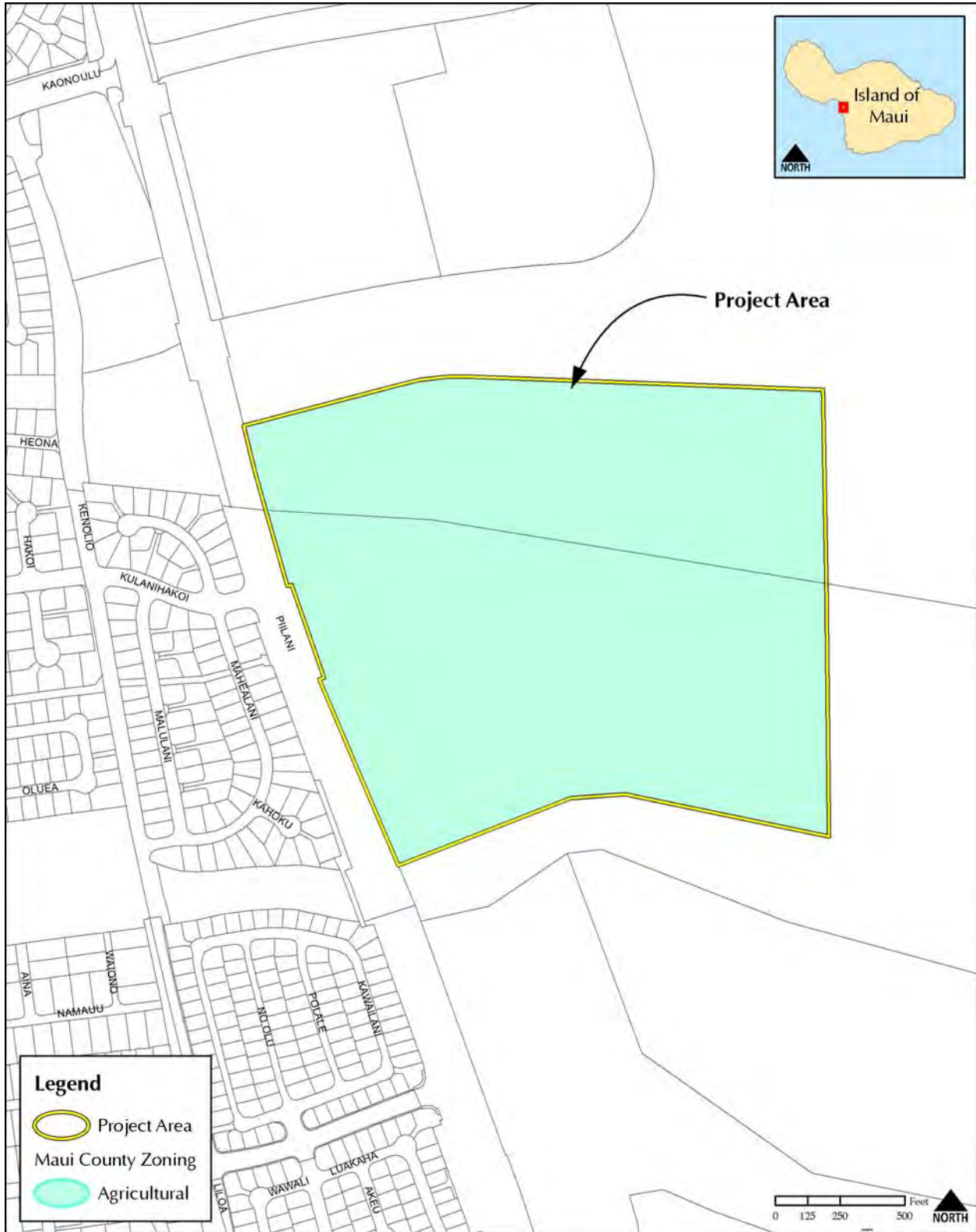


Figure 1-6
County of Maui Zoning Map

1.4 PROPOSED ACTION

The DOE proposes to develop a new high school campus in Kīhei on 77.2 acres of undeveloped land mauka of Pi'ilani Highway between Kūlanihāko'i and Waipu'ilani Gulches on the island of Maui (*Figure 1-1*). The proposed school will serve grades 9-12 in the South Maui Region. Site improvements would include construction of approximately 215,000 SF of buildings to support an enrollment capacity of 1,650 students and approximately 206 supporting faculty and staff. The high school will be constructed to meet or exceed the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification, or comparable rating system. The campus also will include athletic fields (e.g., tennis, track and field, football, soccer, baseball and softball fields, and swimming pool) and associated infrastructure improvements (e.g., new roadways, utilities, drainage, wastewater and water systems). An extension of Kūlanihāko'i Street mauka of Pi'ilani Highway will serve as the main campus access road.

The Kīhei High School project requires land use entitlements including a State Land Use District Boundary Amendment from Agricultural to Urban, an amendment to the County of Maui's Kīhei-Mākena Community Plan from Agriculture and Public/Quasi-Public to Public/Quasi-Public, a change in Maui County Zoning from Agricultural to P-1 Public/Quasi-Public, and final subdivision and consolidation approval to allow for the development of the 77.2-acre high school campus. It is a goal of the proposed development that the school will not only serve the enrolled youth, but be a center for the Kīhei community. Kīhei High School will provide opportunities for employment (both short and long-term) within the Kīhei-Mākena area.

1.5 REASONS FOR PREPARING THE EIS

The Kīhei High School project requires use of State funds to purchase the project site and develop the proposed high school, which triggers the environmental review process mandated under Hawai'i Revised Statutes (HRS) Chapter 343. This EIS is being prepared pursuant to Chapter 343, HRS and Chapter 11-200 Hawai'i Administrative Rules (HAR).

An EIS Preparation Notice was published in the Office of Environmental Quality Control's (OEQC) Environmental Notice on November 8, 2009. This Draft EIS was filed with OEQC, and copies have been distributed to interested parties (*Section 8.0*). Briefly, the purpose of the EIS is to disclose the probable environmental effects of the proposed development; describe measures to minimize adverse effects; and discuss alternatives to the proposed development.

This document is organized into nine (9) sections.

- *Section 1.0* contains a project summary.
- *Section 2.0* contains the project description with site attributes and project elements.
- *Section 3.0* describes the purpose and need for the change in zoning.
- *Section 4.0* describes existing conditions, probable impacts and mitigative measures.
- *Section 5.0* identifies the consistency with applicable public plans and policies.
- *Section 6.0* considers project alternatives.
- *Section 7.0* identifies references.
- *Section 8.0* identifies the agencies and parties consulted.
- *Section 9.0* identifies the preparers of the EIS.

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Figure 1-7
Kīhei-Mākena Community Plan Map

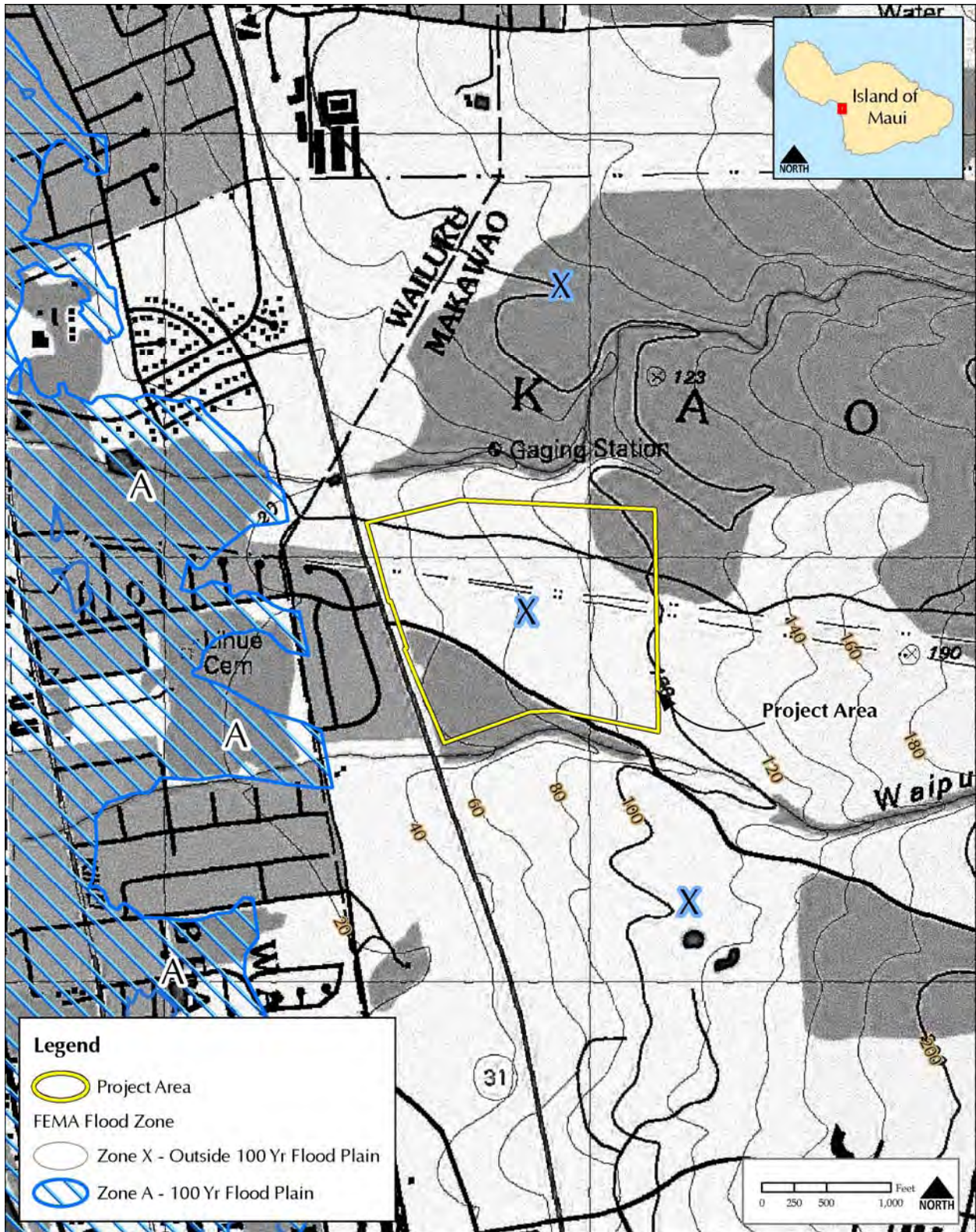


Figure 1-8
Flood Insurance Rate Map

The following technical appendices are also provided:

- *Appendix A* Preliminary Geotechnical Investigation
- *Appendix B* Kīhei High School Impacts on Agriculture
- *Appendix C* Groundwater Resources and Supply
- *Appendix D* Biological Surveys Conducted for the Proposed New Kīhei High School
- *Appendix E* Archaeological Inventory Survey
- *Appendix F* Cultural Impact Assessment
- *Appendix G* Traffic Impact Report and Traffic Signal Warrant Study
- *Appendix H* Air Quality Study
- *Appendix I* Acoustic Study
- *Appendix J* Phase I Environmental Site Assessment
- *Appendix K* Preliminary Civil Engineering Report
- *Appendix L* Kīhei High School Economic and Fiscal Impacts

1.6 SUMMARY OF ANTICIPATED IMPACTS

Anticipated beneficial and adverse impacts of the Kīhei High School project are briefly discussed below. Detailed analysis of beneficial and adverse impacts is provided in *Section 4.0* of this EIS.

1.6.1 Potential Beneficial Impacts

Education

Construction of the proposed Kīhei High School is a long-envisioned community goal which will decrease travel distances for students who must now travel to other schools in the region, and will help to address overcrowding at other Maui high schools.

Land Use

Completion of the project will fulfill the goals and objectives of the Countywide Policy Plan, Draft MIP (December 2009), and the Kīhei-Mākena Community Plan, to provide a high school educational facility in the Kīhei region.

Economic Factors

In the short-term, build-out of the Kīhei High School campus will boost the economy by providing design and construction-related employment during the phases of campus construction. The project is anticipated to provide approximately 120 permanent jobs at full build-out and occupancy. The jobs will include teachers, librarians, counselors, grounds maintenance staff, and administrators. The project will also result in indirect jobs supplying goods and services to construction companies and their employees and families. Construction of the project will provide considerable tax revenues for the County and State.

1.6.2 Potential Adverse Impacts

The following is a summary of potential adverse impacts that may result from the implementation of the project. Mitigation measures are discussed in *Section 4.0* of the EIS.

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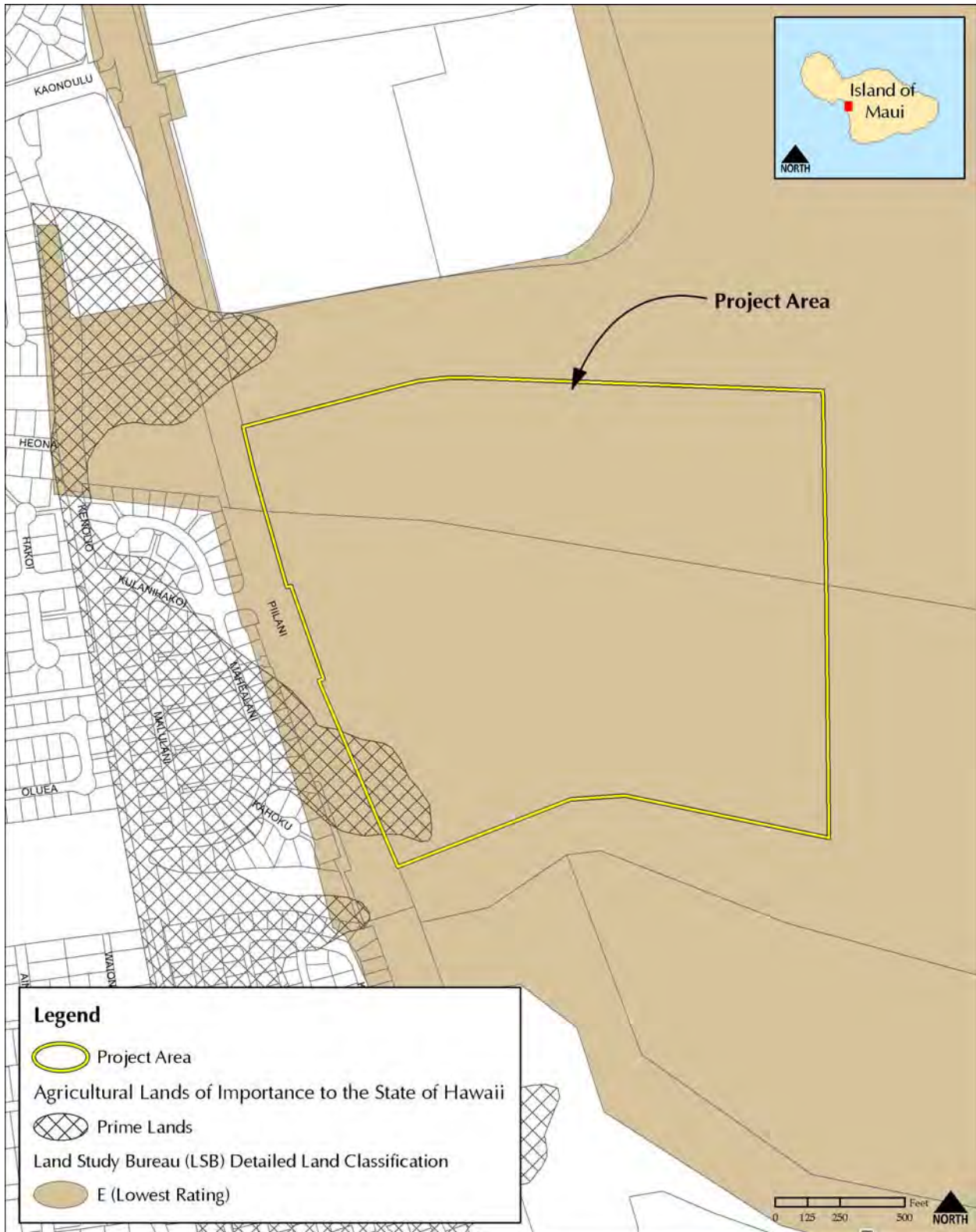


Figure 1-9
Agricultural Lands of Importance to the State of Hawai'i and Land Study Bureau Map

Topography and Soils

The project will involve land disturbance, such as grading and grubbing, to develop the infrastructure and high school campus. There will be a short-term impact on soils, with the potential for erosion during construction.

Water Resources

The new community at Kīhei High School will generate demand for potable water and require expansion of the existing potable water system. Development of the new project will increase potable demand in the region by 37,450 gallons per day (GPD). There will also be demand for approximately 185,000 GPD of non-potable water for landscape irrigation throughout the campus. Although the project will create demand for additional water resources, it is estimated that 11 millions of gallons per day (MGD) of groundwater can be developed within the Kama'ole Aquifer System on a sustainable basis, and the project would not impact the sustainable yield of the aquifer.

Wastewater

There are no existing wastewater facilities currently within the project site. The project will generate an estimated average of 0.05 MGD of wastewater by 2025. Wastewater management facilities will include an on-site sewage collection system to convey wastewater to off-site transmission facilities leading to the Kīhei Wastewater Reclamation Facility (WWRF). The Kīhei WWRF is anticipated to have adequate capacity for flows generated by the project site.

Roadways and Traffic

Construction activities will create some short-term impacts primarily from trucks, heavy equipment and other vehicles that will use existing roads - primarily Pi'ilani Highway - in the vicinity of the project site. While construction vehicles are relatively slow and difficult to maneuver, it is anticipated that they will only marginally affect overall traffic flow. Commuting construction workers will slightly increase traffic levels, although their effect is anticipated to be negligible.

The project will have long-term impacts on surrounding areas resulting from new traffic circulation patterns, increases in traffic volumes, and installation of a traffic signal at Pi'ilani Highway and Kūlanihāko'i Street.

Archaeological Resources

An archaeological site consisting of a mound complex will be adversely impacted through project construction. Although designated eligible under Criterion D for the National Register of Historic Places (NRHP), it is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history.

Visual Resources

A majority of the project site is currently open space and there are broad panoramic views across the site and from makai locations. The construction of a high school campus will introduce low-

rise structures into the landscape and will affect some existing view planes from Pi'ilani Highway. Views of the site from shoreline areas are currently limited by existing residential developments makai of Pi'ilani Highway. Panoramic views of Haleakala may be impacted but will not be obscured by the project.

Air Quality

Short-term impacts from fugitive dust may occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles, may also affect air quality during the period of construction.

After the proposed project is fully occupied, carbon monoxide concentrations in the project area will likely increase due to emissions from project-related motor vehicle traffic, but worst-case concentrations are projected to remain within both the State and the National ambient air quality standards.

Noise

Construction activities at the project site will generate noise impacts that are temporary in nature. Other than the construction workers, who must abide by occupational health and safety standards for hearing protection, the nearest receptors will be residential areas located well away from the property boundary. The noise generated during construction will not be a health risk but could be a nuisance. Long-term property maintenance activities and traffic noise are anticipated to have minimal adverse noise impacts to the neighboring residential areas.

Agriculture

Utilization of this land for a high school forecloses the land's future option for agriculture. This school, however, supports existing growth policies of the MIP General Plan 2030 Draft and the Kīhei-Mākena Community Plan. The majority of the soils in the project area are considered poor by the U.S. Soil Conservation Service's ALISH map series. Only two (2) percent of the project area is designated as Prime soils for agricultural use.

Solid Waste

Solid waste will be generated during the construction phases. No significant short-term or long-term impacts on the existing solid waste collection and disposal system are anticipated as a result of the proposed development.

1.7 SUMMARY OF MITIGATIVE MEASURES

Topography and Soils

The project grading operations will be conducted in compliance with the dust and erosion control requirements of the County. A grading permit will be obtained from the County for all related construction activities. During construction, soils erosion control measures will follow NPDES permit requirements. Long-term soil erosion protection and Best Management Practices (BMPs) will be established at Kīhei High School with extensive planting and slope management measures.

Specific attention will be made to avoid disturbance to steep slope areas. The existing topography will be altered only to the extent necessary for the construction of the proposed improvements.

Water Resources

In order to mitigate impacts to the island's potable water supply, the school's non-potable water requirement of 185,000 GPD is proposed to be met by two new on-site brackish wells, which will provide a long-term basal groundwater source from the underlying Kama'ole Aquifer System. To further reduce impacts on potable water, the project will incorporate sustainable design features for water efficiency throughout the facilities such as low-flow plumbing fixtures. Potable water is to be provided by the County of Maui Department of Water Supply.

Wastewater

The Kīhei High School project area will be served by a new sewage collection system. Wastewater from the project areas will be conveyed to the Kīhei WWRF. The project will be responsible for its fair share of facilities improvements related to the additional wastewater flows of the new high school.

Drainage

There are no existing drainage improvements in the project area. Drainage improvements are planned for the project area that will manage storm water runoff on the project site. These improvements will include an on-site drainage system of grassed swales, roadway catch basins/manholes and pipe culverts. Surface runoff will be conveyed to the gulches through a series of on-site drainage channels and detention features. Runoff will be managed on-site to avoid adverse off-site drainage conditions.

Roadways and Traffic

Construction and operation of Kīhei High School will modify circulation patterns in the vicinity of the project. The actions proposed to mitigate project traffic impacts include the addition of a driveway off Pi'ilani Highway (extension of Kūlanihāko'i Street), internal campus circulation roadways, turning lanes and installation of a traffic signal at Pi'ilani Highway and Kūlanihāko'i Street.

Visual Resources

To mitigate adverse visual effects, the planning for Kīhei High School considered the project area's topography and panoramic views. The project design will maintain visual standards of the area by meeting County height and design requirements. To mitigate potential visual impacts, the campus will include open space and landscaped areas throughout the development. Landscaping and playing fields are planned fronting Pi'ilani Highway to maintain a setback for reduction of visual and noise impacts and maintain a park-like open visual corridor.

Air Quality

Implementing any air quality mitigation measures for long-term traffic-related impacts is unnecessary and unwarranted since worst-case carbon monoxide concentrations are projected to

remain well within air quality standards. The impact of construction activities on air quality will be mitigated by conforming to dust control measures which must be implemented to ensure compliance with State regulations. Fugitive dust emissions will be controlled by watering active work areas, using wind screens, keeping adjacent paved roads clean, and covering open-bodied trucks. Other dust control measures include limiting the area that can be disturbed at any given time and stabilizing inactive areas. Paving and landscaping of project areas will reduce dust emissions. Exhaust emissions will be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

Noise

Construction activities will meet State Department of Health (DOH) standards for noise. Equipment mufflers and construction curfew periods will mitigate noise impacts. Particular attention will be given to noise mitigation in areas closest to nearby existing residential areas. Construction activities will be limited to daytime hours. A Community Noise Permit will also be obtained for the project.

Solid Waste

Waste reduction and recycling will be integrated into the construction and operation phases of the Kīhei High School project. During the construction of the proposed project, cleared vegetation will be transported to the County's green waste recycling facility at the Central Maui Landfill for disposal. There will be no demolition waste, as the property is currently undeveloped. During school operation, recycling programs will be emphasized to reduce waste collected and disposed of in landfills. Additionally, in order to achieve LEED or similar certification, one of the requirements of the project will be to divert a certain percentage of construction waste.

1.8 COMPATIBILITY WITH LAND USE POLICIES AND PLANS

The proposed action is compatible with existing State policy documents (i.e. Hawai'i State Plan and Functional Plans). The proposed action is also compatible with the Kīhei-Mākena Community Plan and County of Maui General Plan 2030 which consists of the recently adopted Countywide Policy Plan and MIP General Plan 2030 Draft (December 2009). In planning for future facilities, the DOE and the County have recognized the need for Kīhei High School to meet the needs of the expanding Kīhei region and to provide a balanced city range of urban services, including jobs and public facilities.

1.9 SUMMARY OF ALTERNATIVES TO THE PROPOSED PROJECT

The potential benefits and impacts of three (3) alternative development schemes for a new Kīhei High School were evaluated, including a no-action alternative. These analyses and summaries are provided in *Section 6.0* of this document.

1.9.1 No-Action Alternative

The no-action alternative would involve no changes to the existing site. This alternative assumes the development of the land in accordance with the current agricultural zoning of the site. Under this alternative, the land would probably remain undeveloped, and be used for cattle grazing, or possibly go unused.

1.9.2 Alternative Sites

Two (2) sites in addition to the project site were explored for development of the high school campus in Kīhei. These sites were evaluated in the Site Selection Study (Munekiyo and Hiraga, 2008) to determine their suitability for development. All three (3) finalist sites, including the project site, would have a similar level of environmental impact as they all involve the conversion of undeveloped land. In comparison, the Kīhei High School project site received the most points and therefore determined to be the best location for development and to have the least anticipated environmental impacts.

1.9.3 Reduced Campus Size

Under this alternative, a 50-acre campus was evaluated at the selected project site. Due to site configuration constraints and land requirements to provide facilities to support a design enrollment of 1,650 students, the 50-acre alternative would not support the objectives of the proposed project.

1.10 SUMMARY OF UNRESOLVED ISSUES

At the time of publication of this document, there are several unresolved issues for this project. Final parking requirements must be determined in collaboration with the County. Continued discussions with County authorities are also necessary regarding provision of potable water to the project site. Finally, detailed project design information, such as the specific architectural and landscape design for the campus, has not been completed. Final project design will be determined by the project developer during the Design-Build (DB) process.

A further discussion of unresolved issues is provided in *Section 4.4.5*.

1.11 SUMMARY OF REQUIRED APPROVALS, PERMITS AND PLANS

Development of the Kīhei High School project requires a number of permits and approvals from State and County agencies. All permits and approvals, including ministerial permits, such as grading and building, will be obtained in the appropriate sequence as required for planning, site development, infrastructure and the construction of project elements. See *Table 2-4* for a detailed list of approvals and permits.

Chapter 2

Project Description

2.0 PROJECT DESCRIPTION

The project description section will discuss the Kīhei High School’s conceptual site plan and program, as well as open space, parking, infrastructure, sustainable concepts, phasing, permits, schedule and cost.

2.1 SITE PLAN AND PROJECT SUMMARY

2.1.1 Site Plan

The following description of the high school campus is based on the conceptual site plan and does not necessarily reflect the final project design. The high school will be constructed through a Design-Build (DB) process. Detailed project design will be determined by DOE and the Kīhei High School DB developer chosen through the Request for Proposal (RFP) process.

The conceptual site plan (*Figure 2-1*) was conceived to respond to DOE space program requirements, preferred school design strategies, desired functional relationships for campus facilities, site topography and climate. The gently sloping 77-acre Kīhei High School campus site will be graded with several tiers. As shown in *Figure 2-1*, academic buildings are clustered on the upper-level; the stadium, athletics and physical education facilities are located on the mid-level; and the lower-level adjacent to Pi’ilani Highway features athletics fields, landscaping and open space.

The upper campus is the area mauka of the stadium and is conceived to include two (2) primary zones, the Campus Green and Academy Mall. The Campus Green, with support buildings such as the Administration/Student Center, Cafeteria and possible future Auditorium, is envisioned as the more “public” part of the upper campus, accessible to parents and the community. The Academy Mall focuses on instruction and will potentially include classroom buildings, the Tech/Electives Center and Library.

The lower campus will potentially accommodate indoor and outdoor physical education and athletics facilities. The Physical Education Locker Building, grassed playfield, outdoor basketball courts, and tennis courts would support the physical education program. The Athletics Locker Facility, Gymnasium, sports stadium, softball, baseball, practice fields, and space for a possible future pool also support the physical education program and the athletics program.

As shown on the conceptual site plan, the softball, practice and baseball fields are situated on the lowest part of the gently sloping lower campus. The sports stadium, bleachers, and Athletic Locker Facility are shown at the center of the lower campus at a slightly higher elevation than the practice fields. To the north of the stadium is the Gymnasium and Events Plaza.

The Kīhei High School campus is envisioned as a place for the community to gather. Athletic fields on the lower campus will potentially be accessible for public use during non-school hours. For example, local sports teams could use the fields for practice and games, or local organizations could use the open space for meetings and picnics.

KĪHEI HIGH SCHOOL
Draft Environmental Impact Statement



Figure 2-1
Conceptual Site Plan

KĪHEI HIGH SCHOOL

Draft Environmental Impact Statement

2.1.2 Space Program

The design of each new DOE high school is based on educational criteria and floor areas described in the DOE’s Facilities Assessment Development Schedule (FADS), which provides consistent space standards for all public school facilities.

Based on the FADS analysis prepared for Kīhei High School, the total school program includes 212,955 net square feet of building area. The FADS analysis also indicates approximately 575,660 SF of outdoor PE and Athletic facilities components to be provided on campus.

Table 2-1 CAMPUS COMPONENT AREAS	
Instructional and Support Components	
Classroom houses	85,640 SF
Technology/Electives	21,820 SF
Music Building	7,830 SF
Administrative Center	5,675 SF
Student Center	6,130 SF
Cafeteria/Kitchen/Custodial	18,510 SF
Library Media Center	9,790 SF
Physical Education/Locker Shower	11,140 SF
Junior Reserve Officer Training Corps	2,840 SF
Athletic Locker/Shower	10,340 SF
Gymnasium	22,520 SF
Future Auditorium	TBD
Total Instructional and Support	212,955 SF
Outdoor Athletics Facilities	
Grassed Playfield	75,000 SF
Tennis Courts	28,800 SF
Paved Playcourt	20,736 SF
Track and Field, Bleachers	161,400 SF
Practice Field	57,600 SF
Baseball Field	144,400 SF
Softball Field	70,230 SF
Misc. Athletics	4,995 SF
Future Swimming Pool and Headhouse	12,499 SF
Total Athletics Facilities	575,660 SF

2.1.3 Phasing

The Kīhei High School project is anticipated to be constructed in two (2) phases. Phase I is anticipated to take approximately two (2) years to complete prior to school opening projected for 2016. Construction of Phase I would allow for a student capacity of approximately 800 students. Current plans for Phase I include two (2) classroom houses, administrative/student center, library, cafeteria, selected elective buildings and selected athletics facilities. Phase I would also include on-site and off-site infrastructure improvements for the entire site, including the Kūlanihākoʻi Street extension, campus driveways, fire lanes, parking and walkways, and Piʻilani Highway improvements including traffic signalization, grading, drainage and utilities.

Phase II would be developed when enrollment increases justify the improvements and based on availability of State funding. Anticipated completion of Phase II construction would be approximately 10 years after the completion of Phase I. The design and construction schedule will be subject to approval of the Legislature and release of funds by the Governor. Phase II includes construction of the final two (2) classroom houses, remaining electives buildings and remaining athletics facilities. Construction of Phase II would increase the school to its maximum student capacity of 1,650 students.

Potential future plans include construction of an auditorium and swimming pool. There is no set timeframe for construction of these buildings.

Although the Project may be constructed in Phases, the buildings scheduled to be constructed in Phase II and the potential future facilities are integrated in the campus master plan, without regard to locating all of Phase II and future improvements in a single contiguous area. Thus it would not be appropriate for the Land Use Commission or the County of Maui Project to approve this school project in increments.

The anticipated phasing is depicted graphically in *Figure 2-2* below.

2.1.4 Staff, Student and Visitor Population

Approximately 930 people are anticipated on campus at the end of Phase I, including 800 students, 120 staff and 10 visitors per day. With the construction of Phase II, the campus population is expected to total 1,941 people, including 1,650 students, 206 staff and 85 visitors.

Table 2-2 PROJECT POPULATION DURING PHASES		
	Phase I (2016)	Phase II (2025)
Students	800	1,650
Staff	120	180-206
Visitors	10	85
Total Students, Staff and Visitors	930	1,941

Estimates provided for planning purposes only.

KĪHEI HIGH SCHOOL
Draft Environmental Impact Statement

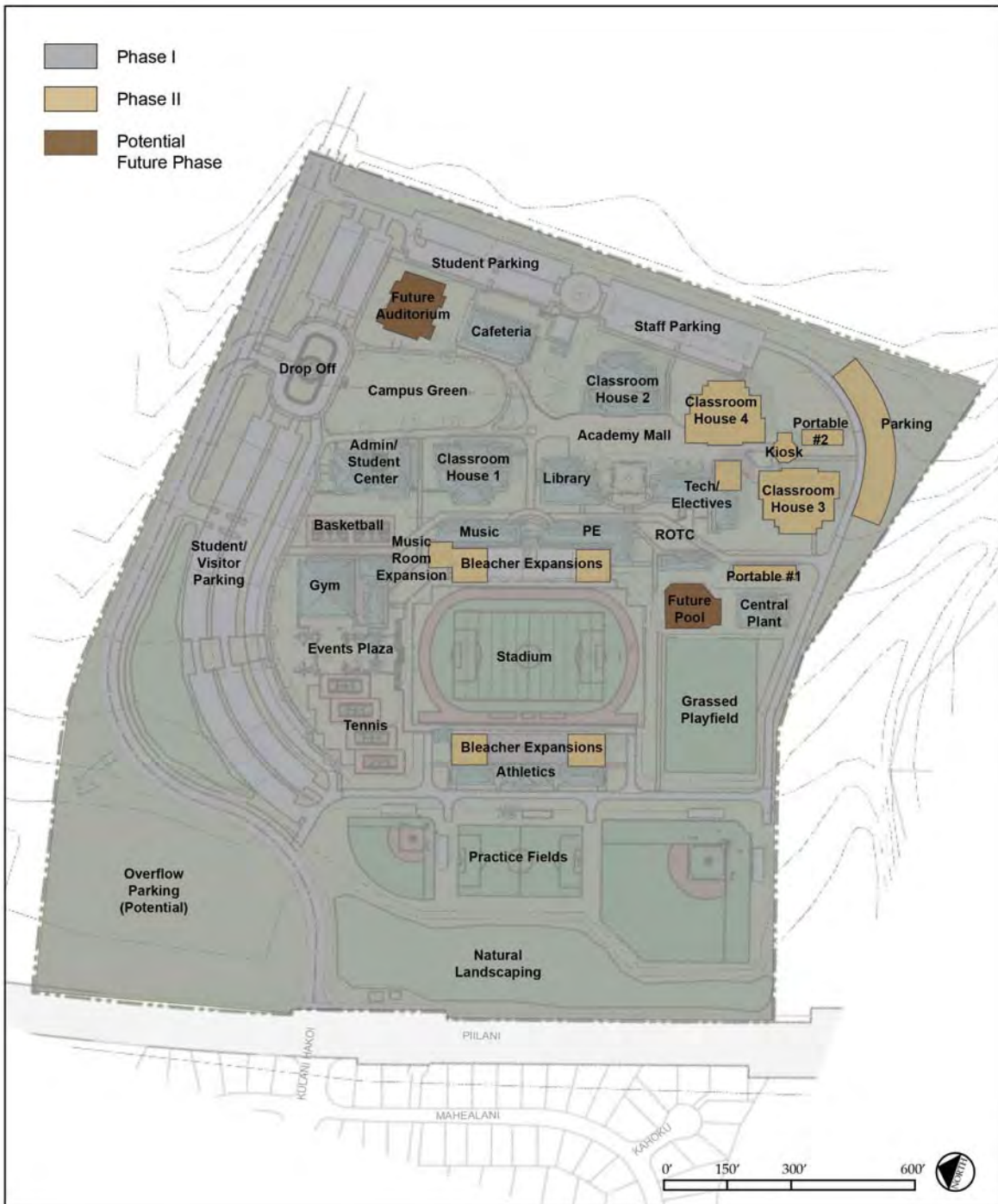


Figure 2-2
Conceptual Phasing Plan

2.2 OPEN SPACE

The proposed Kīhei High School conceptual campus plan offers extensive and diverse open spaces for student use, landscaping, outdoor physical education, athletics, circulation and infrastructure requirements. Each individual campus area has an open or green space as a focal point. Two (2) prominent open spaces, an open lawn and a central plaza, are planned in the upper campus. The lower campus is dominated by programmed and natural open space. The “Events Plaza” is a proposed open space located near the entrance to the sports complex. As open space, the Events Plaza serves as the iconic entrance and courtyard area to the Stadium. Another potential function for the plaza is an outdoor venue and gathering place for community events. The athletic fields, overflow parking and landscaping areas adjacent to Pi’ilani Highway comprise the majority of open space on the lower campus. These open areas reveal mauka-makai views to and from the highway, stadium and the upper campus buildings.

In the conceptual site plan, approximately 68% of the campus is planned for open space.

Table 2-3 PRELIMINARY OPEN SPACE CALCULATION	
Instructional Spaces (all phases)	281,245 GSF
Outdoor Facilities (athletics and physical education)	144,680 GSF
Paved Vehicular Areas	658,300 GSF
Total Obstructed Space	1,084,225 GSF
Project Site Area (77.2 acres)	3,362,832 SF
Total Obstructed Space	(1,084,225) SF
Total Open Space	2,278,607 SF
Percent Open Space	68%

2.3 ACCESS, INTERNAL CIRCULATION, EMERGENCY ACCESS AND PARKING

Access

As depicted in the conceptual site plan (*Figure 2-1*), access to the campus will be provided by an extension of the existing Kūlanihāko’i Street across Pi’ilani Highway. The street extension will be located between Kūlanihāko’i Gulch and the north boundary of the campus. Driveways along the new Kūlanihāko’i extension will allow ingress to the campus. Installation of a traffic signal at Pi’ilani Highway and Kūlanihāko’i Street is to be constructed by the year the school opens.

Internal Vehicular Circulation

The access roadway for the proposed Kīhei High School will connect to the east side of the intersection of Pi’ilani Highway and Kūlanihāko’i Street, creating a four (4) way intersection. After the connection is completed, the westbound approach of the access road is expected to have two (2) westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition,

northbound deceleration and acceleration lanes are expected to be constructed along Pi'ilani Highway to facilitate entering and exiting traffic at the school's access. The access driveway will connect with internal circulation roads, a drop off area, and parking areas. As shown on the conceptual site plan, internal circulation consists of a looped road and parking areas that wrap the perimeter of the campus.

Emergency Access

Emergency access to the main portions of the campus (upper and mid-level) is shown on the conceptual site plan as a perimeter fire lane/walkway. An interior fire lane/walkway crosses through the upper-level campus. Wide landscaped pedestrian malls through the campus could also potentially function as service access and fire lanes for emergency vehicles.

Parking

Parking requirements are to be determined in consultation with the County. Parking for students, staff and visitors will be provided in parking lots adjacent to the campus. Core parking lots will support the school functions during the day and extra-curricular functions during non-school hours. Overflow parking for events will potentially be accommodated on a seven-acre portion of the campus located across the Kūlanihāko'i Street extension.

2.4 INFRASTRUCTURE

2.4.1 Water

Preliminary water demands are based on the conceptual site plan and DOE's anticipated growth in enrollment for the proposed school. In recognition of Maui's water shortage, dual water systems are being planned for the proposed Kīhei High School. It is anticipated that potable water will be supplied by the County's Central Maui Water System and that brackish water wells to be located at the school site would serve as the non-potable source of irrigation water.

The nearest water facility to the project site is the 8-inch water line at the intersection of Kūlanihāko'i and Mahealani Street in the Pi'ilani Village Subdivision. Further down Kūlanihāko'i Street at the intersection with Līloa Drive is a 36-inch concrete pipe transmission main and 18-inch ductile iron distribution main. The 18-inch distribution main is connected to both reservoirs in the area but is primarily served by the Hale Kīhei Reservoir at elevation 220 feet AMSL. Construction of a booster pump station will be necessary to maintain adequate fire flow pressures.

Potable water demand projections were developed based on use of low-flow and other water conservation fixtures throughout the various buildings. Project sustainability practices will address water efficiency criteria in accordance with the LEED rating system.

2.4.2 Wastewater

It is anticipated that sewer service will be provided by the extension of the County system from an existing drop manhole in the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village subdivision approximately 300 feet from the proposed Kīhei High School. The proposed sewer line would extend across Pi'ilani Highway to an on-site property sewer service manhole. Wastewater would ultimately be conveyed to the Kīhei WWRF.

2.4.3 Drainage

The Kīhei High School project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakalā. Because the property is vacant there is no existing drainage system serving the site except for drainage infrastructure in Pi'ilani Highway, which is owned and maintained by the State of Hawai'i Department of Transportation (DOT). The majority of the existing runoff at the site drains towards a 72-inch diameter culvert under Pi'ilani Highway. The remainder of the runoff drains into either Kūlanihāko'i Gulch or Waipu'ilani Gulch. Both gulches cross under Pi'ilani Highway. These gulches are generally dry except after significant rainfall events.

Development of the Kīhei High School project will replace undeveloped land with pervious and impervious surfaces. The proposed conceptual drainage plan will consist of on-site and off-site improvements. The off-site drainage improvements will divert runoff generated above the proposed Kīhei High School into the neighboring Waipu'ilani Gulch. The on-site drainage system will be designed to safely convey on-site runoff into a basin and prevent runoff from entering Pi'ilani Highway. The basin should be designed to reduce post-development flow rates and quantity to below pre-development levels.

2.5 SUSTAINABLE DESIGN

Kīhei High School will achieve a minimum of Silver certification under the LEED program developed by the USGBC, or a comparable rating system.

Sustainable design strategies that will be considered in the design process are summarized in this section.

- **Sustainable Sites:** The Kīhei High School project design may support alternative modes of transportation, low-emitting and fuel efficient vehicles, reduction of heat island effect, reduction of light pollution, joint-use of facilities, maximizing open space, and on-site storm water retention and treatment for storm water quantity and quality control.
- **Water Efficiency:** The project design may incorporate water efficient plumbing fixtures, such as high efficiency or drip irrigation systems, and drought tolerant landscaping.
- **Energy and Atmosphere:** The Kīhei High School project plans to gain credits in this category through optimizing energy performance, providing on-site renewable energy, commissioning energy audits and by using ozone-friendly refrigerants.
- **Materials and Resources:** Credits in this area may be achieved through construction waste management and selection of materials with high recycled content.
- **Indoor Environmental Quality:** Credits in this area may be achieved through managing indoor air quality during construction and before occupancy, using low-emitting materials, controlling indoor chemicals and pollutants, providing lighting control, meeting thermal comfort criteria, and providing day-lit areas and outside views.

During an eco-charrette for the concept plan, participants identified 65 possible points under the LEED for Schools v3.0 scoring system. Achieving all of these points would earn the project a Gold certification and exceed DOE's minimum standard of achieving Silver. Credits will need to be vetted through studies, computer modeling, cost assessment and collaboration with the

developer’s design team. The formal LEED accreditation process or certification under a comparable system will occur during the design-build process.

2.6 REQUIRED PERMITS, APPROVALS AND PLANS

Development of the proposed project will require a number of permits and approvals from State and County agencies. All permits and approvals, including ministerial permits such as grading and building, will be obtained prior to construction. The following is a preliminary list of required approvals, which is subject to change. Additional permit requirements are provided in *Appendix K* will be disclosed in the Final EIS if needed.

Table 2-4 REQUIRED PERMITS, APPROVALS AND PLANS	
Permit or Approval Required	Authority
Section 404 Clean Water Act Permit	Department of the Army
Final EIS	State of Hawai’i, DOE
State Land Use District Boundary Amendment	State of Hawai’i, Land Use Commission
Air Pollution Control Permit	State of Hawai’i, DOH
Community Noise Permit	State of Hawai’i, DOH
NPDES Permit	State of Hawai’i, DOH
Section 401 Clean Water Act	State of Hawai’i, DOH
Well Construction and Pump Installation Permit	State of Hawai’i, DLNR-CWRM
Stream Channel Alteration Permit	State of Hawai’i, DLNR-CWRM
Permit to Perform Work within a State ROW	State of Hawai’i, DOT
Community Plan Amendment	Maui County Planning Commission and County Council
Change in Zone	Maui County Planning Commission and County Council
Final Subdivision Approval	Maui County, Public Works, Development Services Administration Department
Grading and Grubbing Permit	Maui County, Public Works, Development Services Administration Department
Driveway Permit	Maui County, Public Works, Development Services Administration Department
Building Permit	Maui County, Public Works, Development Services Administration Department
Wastewater Discharge Permit	Maui County, Department of Environmental Management, Wastewater Division
Drainage Approval	Maui Department of Public Works
Easements as required for Utilities and Roadways	Various

3.0 PURPOSE AND NEED FOR THE PROJECT

Significant population growth in the Kīhei-Mākena region, coupled with the geographical separation from existing crowded central Maui high schools, has created the need for the proposed Kīhei High School. The proposed high school has been planned for in County planning documents such as the adopted Kīhei-Mākena Community Plan (1998), adopted Countywide Policy Plan (March 2010) and the MIP General Plan 2030 Draft (December 2009).

3.1 POPULATION GROWTH

From April 1, 1990 to April 1, 2000, the residential population on the County of Maui grew from 100,504 to 128,241, a 29 percent change over the span of a decade. The resident population of the Kīhei-Mākena region in particular experienced significant growth in the same decade from 15,365 to 22,870, a 49 percent increase. The 2025 population estimate for the Kīhei-Mākena region is 35,962 persons, or a 57 percent increase from 2000 (County Planning Department, June 2006).

3.2 EXISTING SCHOOLS AND CAPACITY

Central Maui schools currently serve students from the South Maui region with Kīhei students traveling long distances to attend high school. These central schools are Maui High School in Kahului which serves eastern Maui communities including Kīhei, Mākena and Wailea, and Baldwin High School in Wailuku, which serves Wailuku, Waiehu, Waikapū, Waihe'e and Mā'alaea communities. *Table 3-1* below provides design capacity, existing enrollment, and enrollment projections for each Central Maui high school.

Table 3-1 CAPACITY AND PROJECTED ENROLLMENTS OF CENTRAL MAUI HIGH SCHOOLS		
	Maui High	Baldwin High
Design Capacity	1,580	1,669
School Year		
2011 Projected	1,719	1,641
2011 Actual	1,826	1,612
2012	1,744	1,659
2013	1,743	1,672
2014	1,757	1,690
2015	1,764	1,670
2016	1,755	1,677

Source: DOE Facilities Branch, 2011

2.7 ANTICIPATED DEVELOPMENT SCHEDULE AND EXPENDITURES

Project development and implementation is scheduled to begin immediately following approvals of necessary land use permits, selection of a project developer through the RFP process, and available funding.

Construction of Phase I improvements is expected to occur between 2014 and 2016, with school opening anticipated in 2016. The DOE expects the school to open with a capacity for approximately 800 students. Timing for construction of Phase II improvements will be based on student population. For the purposes of the EIS and the traffic study analysis, horizon years were established for completion of Phase II construction in 2025. The timeframe for the “future” projects phase is unknown at this time.

The preliminary project budget for Phase I improvements is \$120,000,000. The preliminary construction cost estimate for Phase II is \$30 million. Cost estimates for the potential future improvements have not been developed.

Chapter 3

Purpose and Need for the Project

In 2011 Maui High exceeded its design capacity by over 200 students and Baldwin had capacity for an additional 50 students. At this time, South Maui students may apply for a Geographic Exemption to attend Baldwin High School.

The only school in South Maui that serves students in grades 9 through 12 is Kīhei Charter School. In the 2011-2012 school year, Kīhei Charter School had 248 students in grades 9 through 12. Kīhei Charter School does not meet regional needs for a high school complex (DOE, Facilities Branch, 2011).

3.3 KĪHEI-MĀKENA COMMUNITY PLAN (1998)

The Kīhei High School site is located within the boundary of the County's Kīhei-Mākena Community Plan (1998) region. This County plan identifies a shortage of existing educational facilities and the long-term need for a new high school to serve the Kīhei-Mākena region. The Community Plan identifies the lack of a high school in the region as a major problem. An Education Objective of the Community Plan is to build a high school to accommodate growth in the Kīhei-Mākena region. An Education Implementing Action is to plan and locate a site for a high school to serve the Kīhei-Mākena region. The project meets this objective and implements the action.

3.4 COUNTY OF MAUI 2030 GENERAL PLAN

Countywide Policy Plan (March 2010)

The Countywide Policy Plan, the first component of the Maui County General Plan update, was adopted in March 2010 as a comprehensive policy framework for the islands of Maui County to the year 2030. The Countywide Policy Plan provides broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future, including the goal to provide residents with access to lifelong formal and informal educational options (Part C). The project will meet the goals of the County to provide quality education opportunities for the people of Maui.

Draft Maui Island Plan (December 2009)

Chapter 8 of the MIP General Plan 2030 Draft (December 2009) presents a Directed Growth Plan for each of the Island's regions. The Directed Growth Plan for South Maui recommends Kīhei High School as a new regional facility and depicts the high school site in *Figure 8-4: Kīhei-Mākena Planned Growth Areas*. The same figure shows the new "Kīhei Mauka" planned growth area adjacent to the proposed Kīhei High School site. "Kīhei Mauka" is approximately 500 acres of existing undeveloped ranch land planned for mixed use development, including approximately 1,500 single-family and multi-family residential units. Features of the project area includes proximity to the highway, the adjacent Maui Research and Technology Park, low agricultural suitability and few infrastructure constraints, making these locations ideal for a future high school and mixed-use community. The high school site is included inside the Planning Department's North Kīhei Directed Growth Map urban growth boundary (MIP General Plan 2030 Draft, Planning Department, Directed Growth Map, North Kīhei S1) and is shown in *Figure 3-1* below. The MIP General Plan 2030 Draft's Public Facility/Infrastructure Improvements Map (MIP General Plan 2030 Draft, Map 6-3) also shows a proposed High School symbol on the project site,

KĪHEI HIGH SCHOOL

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illustrated in *Figure 3-2* below. The proposed Kīhei High School is clearly supported at the County level in the MIP General Plan 2030 Draft.

The purpose of the Kīhei High School project is to meet regional needs for an educational facility. The proposed Kīhei High School has been planned for by the County and will serve growing populations in the Kīhei-Mākena region. The new school will alleviate long travel distance for families driving their children back and forth to school in Central Maui and for students who ride the bus to Central Maui and back. It will also alleviate the current overcrowding experienced at one Central Maui high school and provide opportunities for short and long-term employment within the Kīhei-Mākena region.

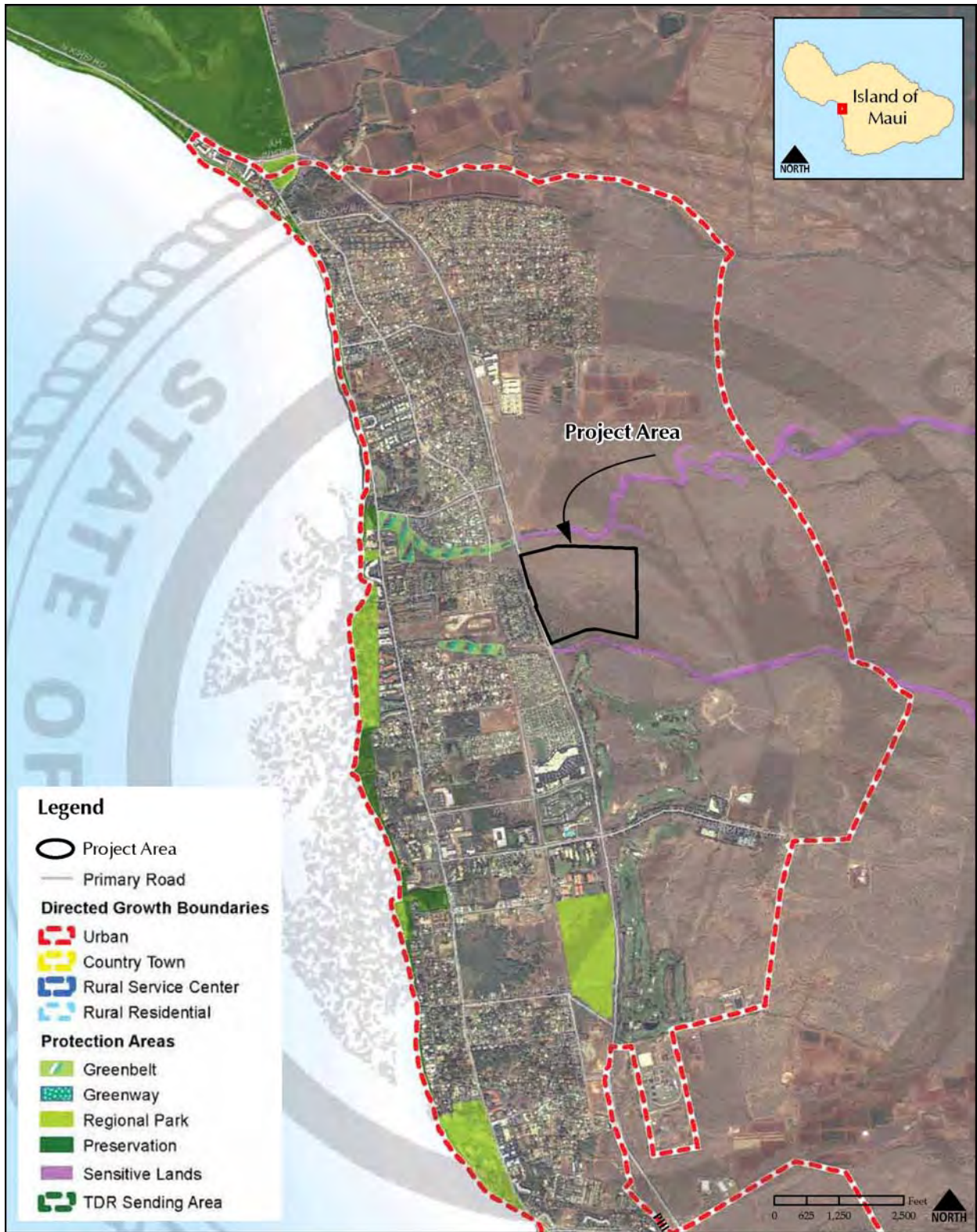


Figure 3-1
Maui Island Plan, Directed Growth Map, North Kihei (Draft)

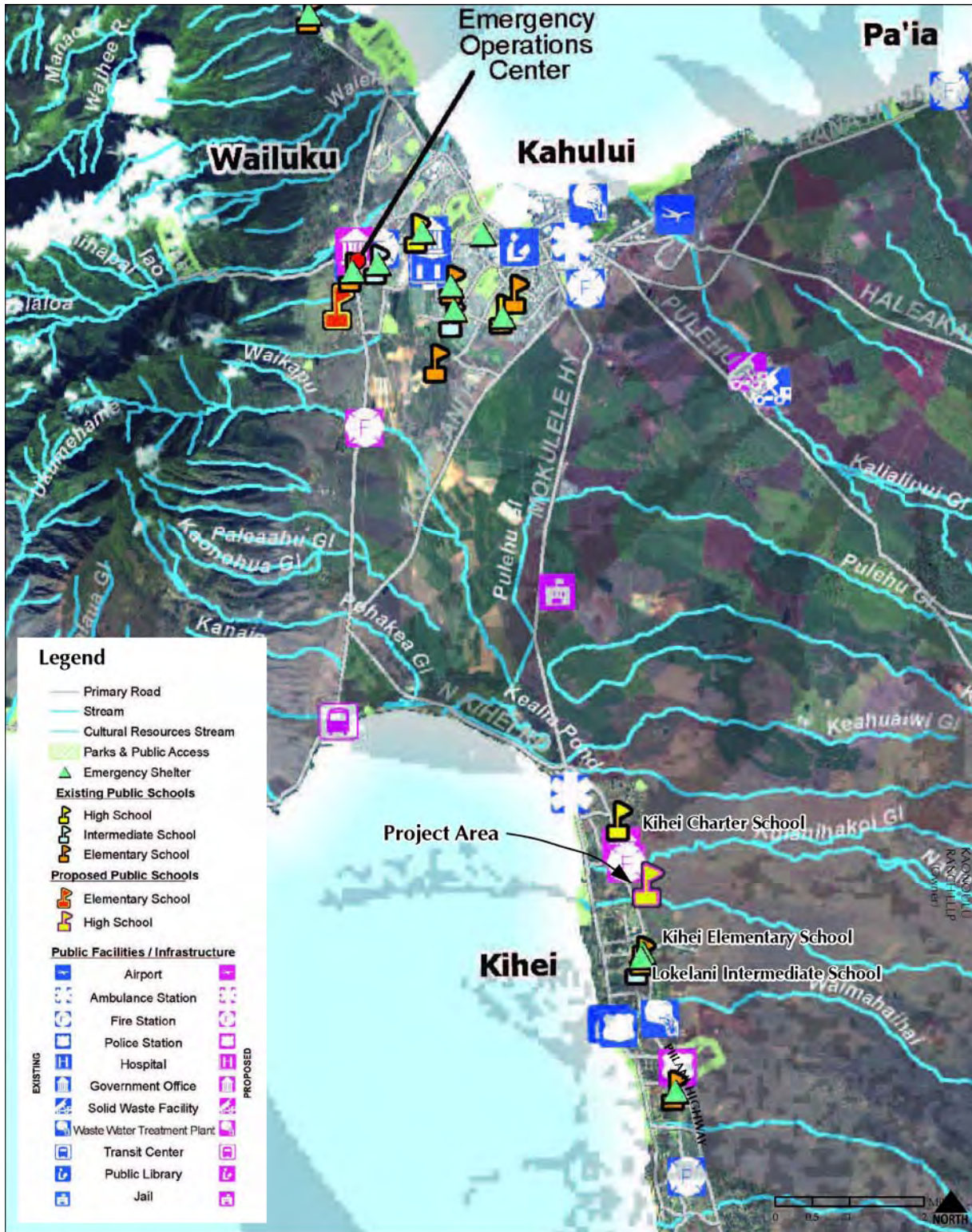


Figure 3-2
 Maui Island Plan, Public Facility/Infrastructure Improvements Map (Draft)

Chapter 4
Existing Conditions, Potential Impacts
and Mitigation Measures

4.0 EXISTING CONDITIONS, POTENTIAL IMPACTS AND MITIGATION MEASURES

Existing conditions and potential impacts associated with the development and operation of the Kīhei High School project are discussed in this section. Also described are mitigation measures that are proposed to minimize anticipated adverse impacts.

4.1 NATURAL ENVIRONMENT

4.1.1 Climate

Maui's climate varies by terrain but is relatively uniform year-round with mild temperatures, moderate humidity, and relatively consistent northeasterly trade winds. Regional topography and climatic conditions attribute to the variety of weather found across the island. The Kīhei High School site is located in the semi-arid Kīhei-Mākena region.

The mean annual temperature of the Island of Maui near sea level is approximately 75 degrees Fahrenheit (°F). The Kīhei coast is known to be sunny, warm, and dry throughout the year. Annual temperatures for the Kīhei region average in the mid to high 70s. During the summer months and dry season, average daily temperatures in Kīhei range from 77.0°F to 77.6°F (Maui County Data Book 2009).

Average rainfall distribution in the Kīhei-Mākena region varies from under 10 inches per year along the coastline to more than 20 inches per year in the higher elevations. Rainfall in the Kīhei-Mākena region is highly seasonal with most precipitation occurring during the winter months between November and March. Annual rainfall in the project area ranges between 8.6 and 13 inches annually and is the lowest on Maui (R.W. Armstrong, 1983). Annual rainfall recorded in the year 2006 for the Kīhei region was 16.5 inches.

Northeast trade winds prevail in the Hawaiian Islands during the spring and summer months; during the fall, trade winds tend to give way to light and variable winds throughout the winter. Trade winds out of the northeast average 10 to 15 miles per hour (mph) in the Kīhei-Mākena region during the afternoon. Typically, lighter winds are felt during the morning and evening. Storms are infrequent and generally occur during the winter months in Hawai'i, although tropical storms and hurricanes occasionally approach the island between June and November.

Potential Impacts and Mitigation Measures

The Kīhei High School project would not involve significant impacts with respect to climate.

4.1.2 Geology, Topography and Erosion

The Island of Maui was formed by the merging of two (2) volcanoes, the East Maui volcano, known as Haleakalā, and the West Maui volcano, Maui Komohana. The merging of these volcanoes created the second largest island in the Hawaiian island chain measuring 48 miles long, 26 miles wide, and comprising 465,920 acres. Maui Komohana is a deeply dissected volcano rising 5,788 feet. Canyons and steep ridges comprise the central area of West Maui making it not easily

accessible. Dominating East Maui, Haleakalā is a dormant volcano rising 10,025 feet AMSL. The last eruption of Haleakalā occurred around 1790. The western and northern slopes are relatively smooth but are sloping to moderately steep. The land is rough and rocky near the summit of Haleakalā Crater and on the eastern and southwestern slopes. The proposed Kīhei High School project site resides on the southernmost slopes of Haleakalā.

Topography over the majority of the site is composed of gently sloping smooth terrain with occasional weathered basalt outcrops. The major geomorphic features on the proposed project site are two (2) major gulches, Kūlanihākoʻi Gulch and Waipuʻilani Gulch, which create its northern and southern boundaries. The existing site generally slopes downward to the west and southwest with onsite ground elevations ranging from approximately 40 feet AMSL in the southwest to an elevation of approximately 110 feet AMSL in the northeast boundary with an average slope of approximately 11%. (*Appendix A*)

A preliminary geotechnical investigation was prepared for the proposed project site by Hirata and Associates, Inc. in 2009. Underlying the surface soils, weathered basalt was found to be present ranging from highly to slightly weathered conditions with occasional moderately weathered sections. Boring logs confirmed the presence of weathered basalt to a depth of one-half (0.5) to six and one-half (6.5) feet below existing grade. The preliminary investigation found no significant geological hazards associated with the Kīhei High School project site. Cut depths, excavations, and building foundation recommendations were made based on these findings. A more detailed investigation of the site, including additional exploratory test borings, laboratory testing, and analysis, should be performed in the design phase. Please refer to the Preliminary Geotechnical Investigation included as *Appendix A*.

Potential Impacts and Mitigation Measures

Erosion During Construction

The construction of the project will involve land disturbing activities that result in erosion, such as the removal of existing vegetation (clearing and grubbing) and leveling, removing, and replacing soil.

During construction, erosion will be minimized through compliance with the County's grading ordinance and the applicable provisions of the DOH's Water Quality Standards (Title 11, Chapter 54, HAR) and Water Pollution Control requirements (Title 11, Chapter 55, HAR). Additionally, standard best management practices will be employed to minimize impacts. These BMPs will be detailed in subsequent construction plans and may include limiting site grading to increments of not more than 15 consecutive acres at a time, the use of temporary sprinklers in non-active construction areas, stationing water trucks onsite during construction to provide immediate sprinkling in active construction zones, use of temporary berms and cut-off ditches, use of temporary silt fencing and screens, thorough watering of graded areas after construction activity has ceased for the day and on weekends, and sodding or planting slopes immediately after grading work has been completed. With implementation of BMPs, potentially significant impacts will be mitigated.

Grading

Although moderate earth movement will be required in order to implement the plan, the geology and topography of the area will not be significantly affected. Efforts will be undertaken to balance the earthwork quantities of cut and fill. This will also minimize the amount of construction traffic in the region. Grading operations will be in conformance with the applicable ordinances by the DOH and the County. Mitigation will consist of implementing grading and construction period erosion control BMPs.

Kūlanihākoʻi Gulch and Waipuʻilani Gulch are major drainageways in the Kīhei High School project area and mitigation will be implemented to minimize grading-related erosion infiltration to these natural drainage paths.

To minimize runoff and erosion associated with the topography of the site, the following BMPs will be suggested: constructing of detention basins to capture sedimentation to minimize the quantity of sediment leaving the site; protecting of natural vegetation; using wind erosion controls; intercepting runoff above disturbed slopes; and using seeding and fertilizing or other soil erosion control methods.

Grading and erosion control plans will be prepared in compliance with Chapter 20.08 Soil Erosion and Sedimentation Control of the Maui County Code. An application for a NPDES permit will be submitted to the DOH for review and approval. Further, the contractor will be required to perform all grading and stockpiling operations in conformance with the applicable provisions of Chapter 54 (Water Quality Standards) and Chapter 55 (Water Pollution Control) of Title 11 HAR of the DOH.

4.1.3 Soils and Agriculture

The Kīhei High School: Impacts on Agriculture report (July 2011) was prepared for the Kīhei High School project by Plash Econ Pacific, LLC, to identify and assess potential impacts of the project on agriculture. This report is included as *Appendix B*. Current on-site land uses include grazing and ranching.

Four (4) studies, which describe the physical attributes of soils and evaluate the relative productivity of different soil types for agricultural production purposes, have been prepared for Hawaiʻi: (1) the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey, (2) USDA NRCS Rating - Land Capability Grouping (3) the State Department of Agriculture's (DOA) ALISH, and (4) the University of Hawaiʻi (UH) Land Study Bureau (LSB) Overall Productivity Rating.

The Kīhei High School project site consists of lands having poor agronomic conditions. The area is characterized by site soils belong to the Alae series and the Waiakoa series. Most of the soils have poor agricultural productivity. Rainfall in the area is typically low and water is not available for crop farming. Additionally, there are no existing irrigation improvements. Agricultural activities are not taking place on the project site as the overall site is poorly suitable for growing commercial field crops.

USDA NRCS Soil Survey: The soils on the project site are classified as Waiakoa extremely stony silty clay loam (WID2), and Alae sandy loam (AaB) by the USDA NRCS (*Figure 4-1*).

- **Waiakoa extremely stony silty clay loam (WID2) (76.2 acres).** Waiakoa extremely stony silty clay loam developed from weathered basic igneous rock, with the upper soils influenced by volcanic ash. Although the slopes are generally 7% to 15%, some small areas have steeper slopes. In a representative profile, the surface layer is silty clay loam about two (2) in. thick. The subsoil is about 23 inches thick, and consists of silty clay loam that has a prismatic structure or is massive. The substratum is silty clay loam and hard, basic igneous rock. In places, roots penetrate to bedrock. The soil is eroded and stones cover 3% to 15% of the surface. In most areas about 50% of the surface layer has been removed by erosion. Permeability is moderate, runoff is medium, and the erosion hazard is severe. The soil is neutral in the surface layer and slightly acid to neutral in the subsoil. This soil type is used for pasture and wildlife habitat.
- **Alae sandy loam (AaB) (1.1 acres).** Alae sandy loam occurs on smooth alluvial fans that developed from volcanic ash and basic igneous rock. Although the slopes are generally 3% to 5%, some small areas are nearly level. In a representative profile, the surface layer is about seven (7) in. thick, and consists of sandy loam with a granular structure. There are no cobblestones on the surface. In some places, there are many pebble size rock fragments in the surface layer. The substratum extends to a depth of 48 inches or more, and consists of sandy loam as well as coarse sand. In some places roots penetrate to a depth of 4 feet or more. Permeability is rapid, runoff is slow, and the erosion hazard is slight. The soil is neutral or mildly alkaline in the surface layer and mildly to moderately alkaline in the substratum. Most of this soil type is used for sugarcane and pasture, but some is used for truck crops.

Land Capability Grouping (USDA NRCS Rating): The 1972 Land Capability Grouping by the NRCS rates soils according to eight (8) levels, ranging from the highest classification level "I" to the lowest "VIII."

Soil type WID2 (76.2 acres) has a rating of VII_s. Class VII soils have very severe limitations that make them unsuitable for cultivation and restrict their use largely to pasture or range, woodland, or wildlife habitat. In this case, the sub-classification "s" indicates that the soils have an unfavorable texture, or are extremely rocky or stony.

Soil type AaB (1.1 acres) has a rating of IV_s if irrigated. Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both. The sub-classification "s" indicates that the soils are stony, shallow, have unfavorable texture, or have low water-holding capacity.

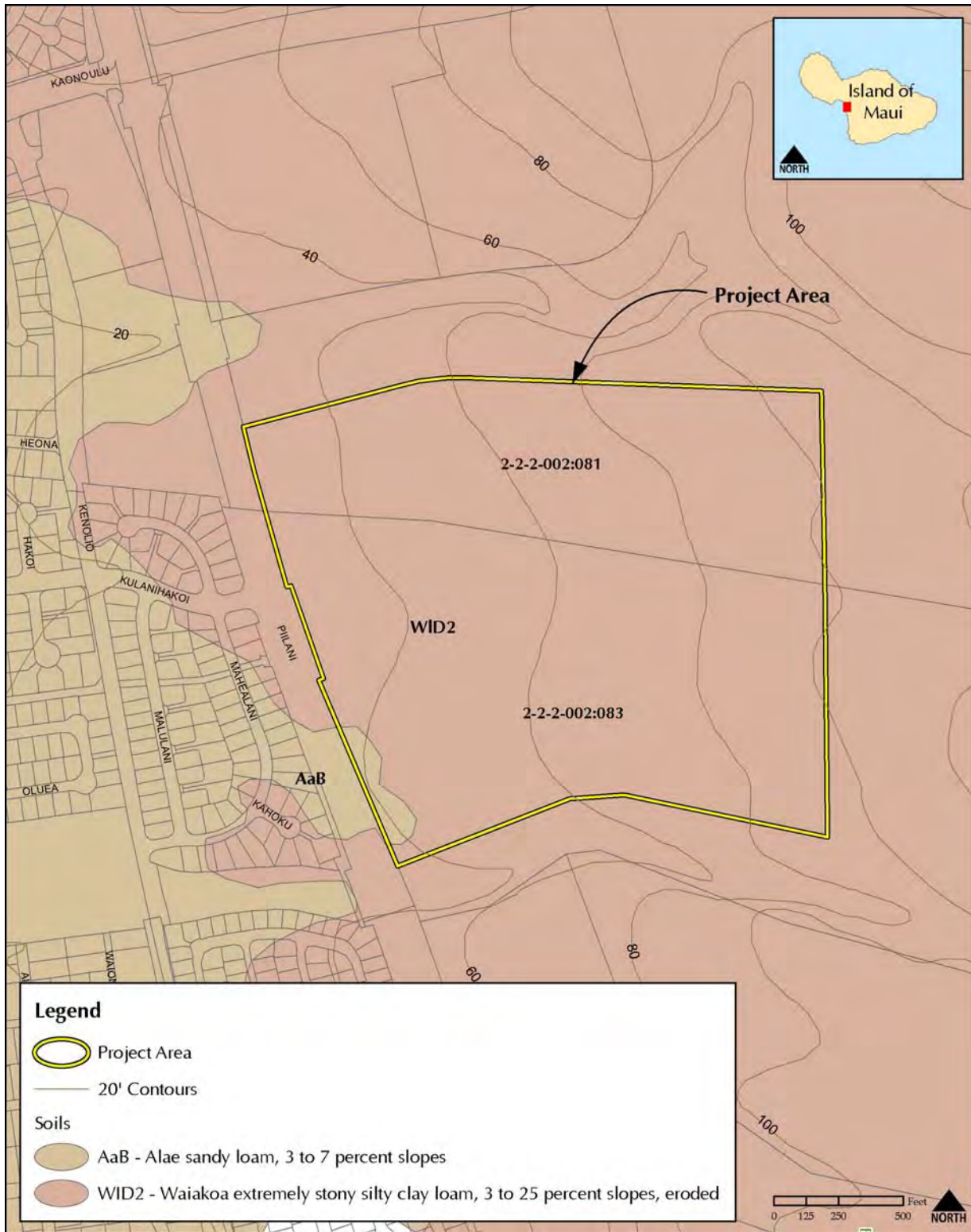


Figure 4-1
Topography and Soils Map

Agricultural Lands of Importance to the State of Hawai'i: The ALISH ratings were developed in 1977 by the NRCS, the UH College of Tropical Agriculture and Human Resources, and the State DOA. The ALISH rating characterized the Agricultural lands in the State of Hawai'i according to their importance as follows:

- **Prime Agricultural Land** - Best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment;
- **Unique Agricultural Land** - Non-Prime agricultural land used for the production of specific high-value crops (e.g., coffee and taro);
- **Other Important Agricultural Land** - Non-Prime and non-Unique agricultural and that is important to the production of crops;
- **Unclassified** – Lands that are not rated.

Based on the available maps of ALISH, the vast majority (75.6 acres) of the project site is “Unclassified” and a portion (1.7 acres) is rated as “Prime” (*Figure 4-2*).

Land Study Bureau Detailed Land Classification: In 1972, the UH LSB developed the Overall Productivity Rating which classifies soils according to five (5) levels of productivity - A, B, C, D, and E – with the letter A representing the highest class of productivity. The proposed project site is classified as Class E soils which have the lowest agricultural productivity rating (*Figure 4-2*).

Potential Impacts and Mitigation Measures

Impacts on Diversified Crop Farming

The project site is unsuitable for most commercial field crops grown in Hawai'i. While the site has high solar radiation, it consists of poor soils having low soil ratings, and lacks irrigation water. Nevertheless, high-value crops could be grown on the project site provided that the land is cleared of rocks, kiawe, grasses and weeds; the soil is amended; and water is obtained. Crops that do not require good soil, such as hydroponic crops and algae, could also be grown provided that water is available. It should be noted, however, that Kihei has a large supply of low-quality agricultural land similar to that of the proposed school site. High-quality farmland is also available in Central and West Maui due to past closures of sugarcane and pineapple plantations.

Farmers in Central Maui are well-situated to supply the Maui Island market because of the short trucking distance to Kahului, the island's commercial, industrial, distribution and transportation center. While the Maui Island market is significant, it is comparatively small with a 2009 de factor population of about 181,050 (*Appendix B*). Compared to farmers on O'ahu, Maui farmers are at a disadvantage in supplying the Honolulu market due to inter-island shipping costs, delays and extra handling. Furthermore, they are also at a disadvantage in supplying mainland markets due to competition with low-cost producers, and particularly if their products have short shelf-lives and must be shipped by air.

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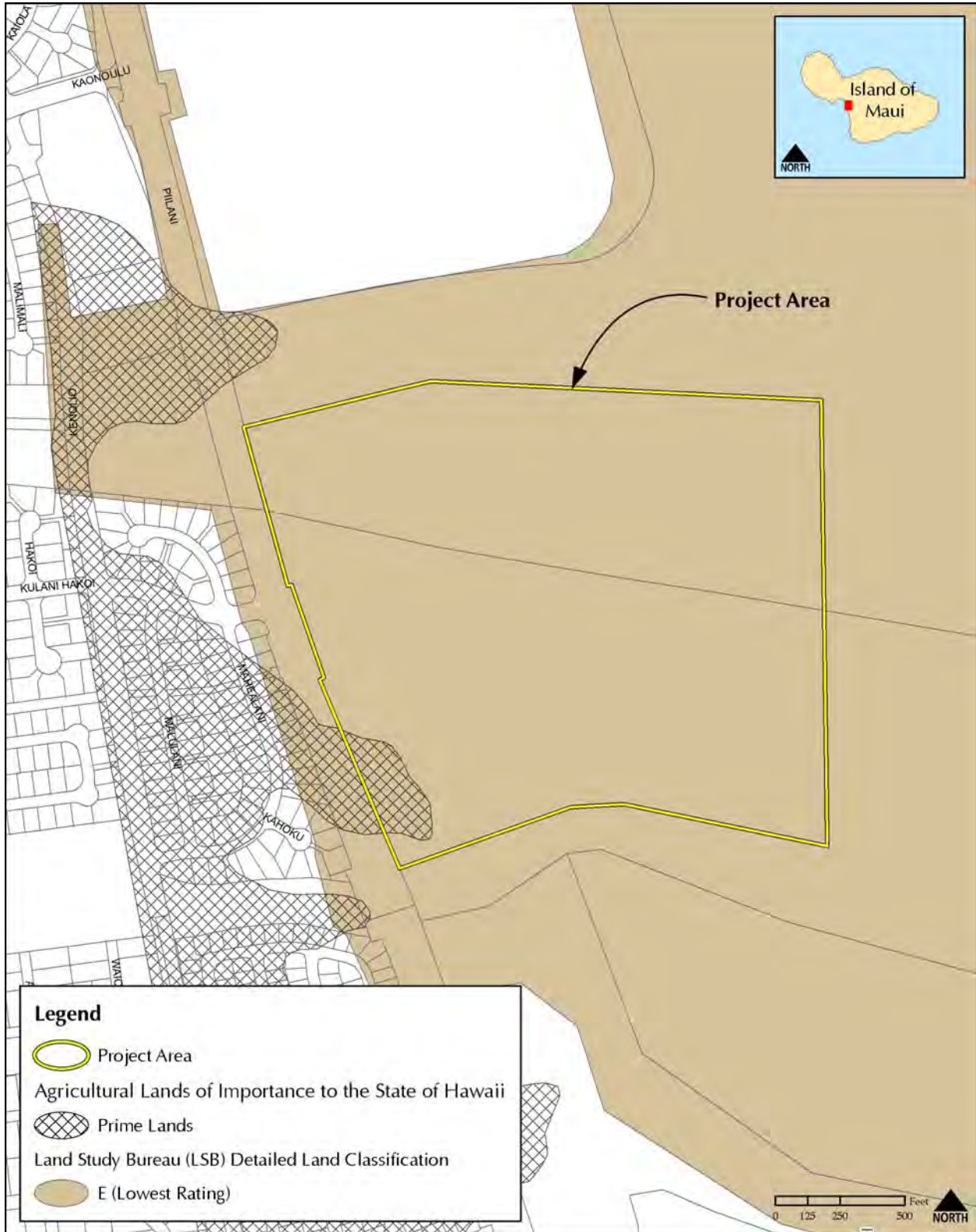


Figure 4-2
Agricultural Lands of Importance to the State of Hawai'i and Land Study Bureau Map

The project will commit approximately 77 acres of land currently in the Agricultural District, for a non-agricultural type use. However, as detailed above, the land is poorly suited for growing commercial field crops due to poor soils and the lack of water for irrigating crops.

Maui has a large supply of low-quality agricultural land, including about 20,000 acres mauka of Kīhei that is similar in quality to the proposed site. Additionally, with the contraction and eventual closure of Pioneer Mill (sugarcane) and Maui Pineapple Company over 19,000 acres of high-quality farmland was released in Central and West Maui. While some of this former plantation land was planted in other crops (e.g., seed corn and coffee) and some was developed for homes, most of it remains available for farming.

A small percentage of low-quality agricultural lands will be lost with the implementation of the Kīhei High School project. However, there will be no affect on the supply of available high-quality farmland. Consequently, the School will have no impact on the growth of diversified crop farming. No mitigation measures are recommended.

Impacts on Ranching Operations

The school site is currently used for grazing cattle by Haleakala Ranch and Ka'ono'ulu Ranch. As discussed below, the proposed high school, in combination with other projects, will result in insignificant impacts to the cattle operations of Haleakala Ranch and Ka'ono'ulu Ranch. As such, no mitigation measures are required or recommended.

Haleakala Ranch

Incorporated in 1888, Haleakala Ranch is the oldest and largest cattle ranch on Maui. This family-owned ranch has approximately 23,000 acres used for grazing cattle, 1,700 breeding cows, and 30 employees involved with its cattle operation. To increase the available feed, the Kīhei lands were planted in drought-resistant buffelgrass in the early 1900s. Cattle grazing on Kīhei pastures occur in the winter when the grass is more plentiful following winter rains. The number of cattle and the duration of their grazing depend upon rainfall.

Development of the Kīhei High School will remove approximately 44 acres of grazing land from Haleakala Ranch, or 0.2% of its total 23,000-acre supply of grazing land. The corresponding reduction in feed produced will be approximately 0.1%. While Kīhei pastures are important for winter cattle grazing, Haleakala Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues, employment or payroll. Haleakala Ranch has sufficient land to move its cattle to other pastures. Over the next 20 years, planned and proposed projects could result in the development of approximately 415 acres at Haleakala Ranch which is currently used for cattle grazing. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 1.8% of the Haleakala Ranch grazing land, or about 0.9% of its available feed. Haleakala Ranch regards a 0.9% loss in feed as too small to have a significant effect on its cattle operations. In addition, the Ranch has sufficient lands to move its cattle to other pastures. Even if Haleakala Ranch was operated at its maximum carrying capacity and replacement pastures were not available, the impact would be small and insignificant. Refer to *Appendix B* for additional details.

Ka'ono'ulu Ranch

Ka'ono'ulu Ranch is a family-owned and operated cattle ranch that comprises most of the Ka'ono'ulu Ahupua'a which was purchased by the family in 1916. Ka'ono'ulu Ranch has approximately 9,000 acres used for grazing cattle, 1,100 breeding cows on average, and 4.5 employees involved with its cattle operation.

Development of the proposed school site will remove approximately 32 acres of grazing land from Ka'ono'ulu Ranch, or 0.4% of the 9,000 acres of their grazing land. The corresponding reduction in feed produced from its grazing land will be approximately 0.2%. While Kīhei pastures are important for winter cattle grazing, Ka'ono'ulu Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including the size of its herd, production, revenues, employment or payroll. Ka'ono'ulu Ranch has sufficient land to move its cattle to other pastures.

Over the next 20 years, planned and proposed projects could result in the development of approximately 347 acres that Ka'ono'ulu Ranch currently uses to graze cattle. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to approximately 3.9% of its grazing land, or 2% of its available feed. Ka'ono'ulu Ranch views a 2% loss in feed as an insignificant effect on its cattle operations. In addition, the Ranch has sufficient lands to move its cattle to other pastures. Even if Ka'ono'ulu Ranch was operated at its maximum carrying capacity and replacement pastures were not available, the impact would be small and insignificant. Refer to *Appendix B* for additional details.

Recommendations

The development of the Kīhei High School project is not expected to have a significant impact on existing and future agricultural activities such as farming and ranching operations.

With regard to diversified crop farming, there are no existing or recent farming activities taking place on the site. While the project will result in a small loss of low-quality agricultural land of which there is a large supply on Maui, the large supply of good farmland on the island will not be affected. Consequently, the Kīhei High School project will not result in significant impacts to the growth of diversified crop farming. No mitigation is proposed.

With regard to ranching operations, approximately 76 acres of the proposed school site is currently used for grazing cattle, however, feed production is low, due to arid conditions. While the project will result in a loss of land for ranching operations, the overall acreage loss will be too small to effect cattle operations of Haleakala Ranch and Ka'ono'ulu Ranch. In view of this finding, mitigation measures are not recommended.

4.1.4 Natural Hazards

Natural hazards that may occur in and affect the Kīhei High School project area include floods, tsunamis, hurricanes, earthquakes, and other natural events.

Flood

The Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) flood zone designations are:

- A – Areas of 100-year flood, base flood elevations not determined
- AE – Areas of 100-year flood, base flood elevation determined
- XS – Areas of 500 year flood; areas of 100-year flood with average depths of less than one (1) foot or within the drainage area less than one (1) square mile, and areas protected by levees from 100-year flood
- X – Areas determined to be outside the 100-year flood plain
- D – Areas in which flood hazard is undetermined
- VE – Areas of 100-year coastal flood with velocity (wave action), base flood elevations determined (Coastal High Hazard District)

The proposed Kīhei High School site is located in an area designated Zone X, outside the 100-year flood plain (*Figure 1-8*). The site is flanked by Kūlanihākoʻi Gulch and Waipuʻilani Gulch. These gulches are generally dry except after significant rainfall events. Due to the topography of the land, flooding is not expected within the project site.

Tsunami

Tsunamis are a series of destructive ocean waves generated by seismic activity that could potentially affect shorelines of Hawaiʻi. Tsunamis affecting Hawaiʻi are typically generated in the waters off South America, the west coast of the US mainland, Alaska, and Japan. Local tsunamis have also been generated by seismic activity on the Island of Hawaiʻi.

The Oʻahu Civil Defense Agency establishes tsunami evacuation zones and maps for all coastal areas in Hawaiʻi. Tsunami maps for the Island of Maui indicate that the Kīhei High School project area is not within the tsunami evacuation zone.

Hurricane

The Hawaiian Islands are seasonally affected by Pacific hurricanes from June to November. These storms generally travel toward the islands from a southerly or southeasterly direction and can deposit large amounts of rain with high winds on the Hawaiian Islands. The storms generally contribute to localized flooding and coastal storm surges. Coastal storm surges would not impact the Kīhei High School project area. The buildings associated with Kīhei High School will be designed to withstand lateral winds of up to 150 mph.

Earthquake

Because Maui is an older Hawaiian island with dormant volcanic activity, it is not particularly prone to seismic activity. Seismic activity usually occurs on the Island of Hawai'i, and has been felt as far away as O'ahu. The Uniform Building Code seismic provisions contain six (6) seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). Maui is listed in Seismic Zone 2B under the Uniform Building Code of 1997 (ICBO 2000). Zone 2B indicates a location that has low potential for ground motion created by seismic activity (USGS, 2001).

Potential Impacts and Mitigation Measures

The proposed project would be constructed in compliance with applicable building codes and DOE standards in regards to preparation for natural hazards. The Kihei High School could also be used as a shelter for the Kihei community if a natural hazard were to occur.

4.1.5 Groundwater Resources and Supply

An assessment of existing surface and groundwater resources in the project area was prepared by Water Resources Associates (May 2011) and is included as *Appendix C*.

Kama'ole Aquifer System

The Kihei High School project site is located in the northern part of the Kama'ole Aquifer System approximately three-quarters of one (0.75) mile inland from the coast. The aquifer system consists of a triangular-shaped area of approximately 90 square miles. It is bounded on the south by the Southwest Rift Zone, which extends from the coast near La Perouse Bay to the top of Haleakalā summit and back to the coast just north of Kihei. Although the Kama'ole Aquifer System ranges from low coastal areas to steep mountain slopes, the system has an average annual rainfall of only 28 inches per year, primarily due to its location on the leeward side (leeward of Trade winds) of East Maui. Within the aquifer system, annual rainfall ranges from 10 inches a year at the Kihei coast to 40 inches a year at elevations of 5,000 to 6,000 feet.

The State Commission on Water Resource Management (CWRM) has estimated the groundwater recharge from rainfall in the Kama'ole Aquifer System to be 25 MGD (*Appendix C*). Of the estimated 25 MGD of groundwater recharge, it is estimated that 11 MGD of groundwater can be developed within the Kama'ole Aquifer System on a sustainable basis (*Appendix C*).

Existing water use within the Kama'ole Aquifer System is approximately 1.859 MGD (*Appendix C*). This water use is primarily for golf course and landscape irrigation purposes from brackish wells located near the coast. These wells yield non-potable water with chloride concentrations ranging from approximately 300 milligrams per liter (mg/L) and higher.

There are a number of existing wells in the Kama'ole Aquifer System (*Appendix C*). Most of the existing wells in the Kama'ole Aquifer System have been drilled near the coast to develop brackish groundwater or to dispose of waste effluent and storm runoff into the underlying aquifer. A few wells have been drilled further inland at higher elevations in search of potable or less brackish water. In the Kihei area, most of the existing wells have been drilled makai of Pi'ilani Highway.

Data from these wells indicate that wells located in the Kīhei coastal area can be expected to yield small quantities of brackish water with varying chloride salinities.

Potential Impacts and Mitigation Measures

Total Water Requirement (Potable and Non-Potable Water)

The project's total water requirement, which includes potable water for domestic use from the Maui Department of Water Supply's (DWS) Central System and non-potable water for irrigation use from two (2) new onsite brackish water wells, amounts to 189,900 GPD in the opening year (2015) of the high school. In subsequent years as student enrollment increases, potable water use will increase, while non-potable water use for irrigation will remain unchanged. Consequently, the total project water requirement is estimated to increase slightly each year, from an average 189,900 GPD in 2015 to 222,450 GPD in the year 2025. Refer to *Table 4-1*.

Table 4-1 ESTIMATED TOTAL PROJECT WATER REQUIREMENT (AVERAGE DAY DEMAND)			
Year	Potable Water Requirement (GPD)	Non-Potable Water Requirement (GPD)	Total (GPD)
2015	4,900	185,000	189,900
2016	9,000	185,000	194,000
2017	14,300	185,000	199,300
2018	18,800	185,000	203,800
2025*	37,450	185,000	222,450

Source: Gray, Hong, Nojima and Associates, Inc., August 2011

* Design capacity at year 2025

Water Availability and Supply (Potable and Non-Potable Water)

Potable Water

There are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be developed for the proposed high school. With no prospect for potable water development within a two-mile radius of the project site, the proposed Kīhei High School project will request potable water service for the proposed project from DWS. Although DWS does not currently provide service to the project site, an existing water system (Central Water System) is located in the vicinity. This system serves the Kīhei area (as well as others) and has an 18-inch transmission main located directly makai of the project site, across Pi'ilani Highway.

The project will seek necessary approvals from DWS to supply potable water for both domestic and fire flow requirements, in accordance with the County's water system standards. The potable water system will include a main pipeline connecting to the County's 18-inch transmission main, booster pumps, storage tanks, and other appurtenances as may be required by the DWS. When completed, the potable water system leading to the school property will be dedicated to DWS.

In order to reduce project potable water demand, the project design may incorporate water efficient plumbing fixtures, such as low-flow fixtures.

For additional information, refer to *Section 4.2.10.1, Appendix C, and Appendix K*.

Non-Potable Water

A separate non-potable water supply will be developed to meet the project's irrigation water needs. This planned source of water will be the brackish basal aquifer that underlies the project site. It is estimated that the aquifer, although thin, will yield brackish water of a quality suitable for irrigation use.

The proposed non-potable water system will include two (2) brackish wells, transmission and distribution pipelines, control valves, and other appurtenances, but is not proposed to include a storage tank. The suggested location for the first well is in the northeast corner of the school property at an elevation of approximately 90 feet. A second well is proposed as a standby or supplemental source for the non-potable water system. This second well is proposed in the southeast corner of the school property, also at an elevation of approximately 90 feet. Construction of the second well will depend on the results of the first well. See *Figure 4-3*.

Each well is projected to have a pump capacity ranging from 250 to 350 gallons per minute (GPM) while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Since the proposed non-potable system will operate as a pressurized system without a storage tank, the system's wells must produce at least 385 GPM to supply the estimated daily requirement of 185,000 GPD within an irrigation period of eight (8) hours. However, the pumping rate required can be decreased by increasing the irrigation period, and vice versa.

Alternative consideration is also being given to the use of surplus R-1 effluent from the County's Kīhei WWRF located approximately one (1) mile south of the project site. The feasibility of using this alternative source of water to meet the project's irrigation water requirement is being explored. For additional information, refer to *Section 4.2.10.1, Appendix C, and Appendix K*.

Probable Impacts and Mitigation Measures (Potable and Non-Potable Water)

Potable Water

The proposed Kīhei High School will require an estimated average of 37,450 GPD of potable water at full build out. The potable water requirement for the school is expected to be provided by DWS by connecting to an existing 18-inch transmission main located near the project site located on Liloa Drive situated makai of the project site across Pi'ilani Highway. The project's potable water requirement represents less than one percent of the County's Central Water System sources of supply which include wells located in a five (5) mile stretch of windward West Maui, extending from Wailuku to north of Waihe'e Valley.

DOE and its representatives will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Necessary approvals will be obtained in accordance with the County's water system standards. Adverse impacts to existing potable water supplies are not anticipated.

Non-Potable Water

The proposed Kīhei High School will require an estimated average of 185,000 GPD of non-potable water. The project's non-potable water requirement will be met from two (2) new onsite wells which will be fed by basal groundwater from the underlying Kama'ole Aquifer System. The 185,000 GPD withdrawal of brackish water from the two (2) new onsite wells represents 1.7 percent of the 11 MGD sustainable yield. The proposed withdrawal of brackish groundwater for the proposed project is not expected to have adverse impacts on the recharge or sustainable yield of the underlying Kama'ole Aquifer System.

Based on an assessment of existing wells in the Kīhei coastal area (including comparative distances between existing wells, and evaluation of groundwater withdrawals from nearby wells), the project's proposed brackish wells and withdrawal of an average 185,000 GPD for landscape irrigation are not expected to have any adverse effect on existing wells located nearby or in the general vicinity of the project. In addition, the proposed development of the non-potable wells and the withdrawal of brackish groundwater are not expected to have adverse impacts on the existing water quality of the Kama'ole Aquifer at Kīhei. The project's anticipated non-potable water requirement of 185,000 GPD is also not expected to have adverse impacts on the brackish water quality of any existing wells and their existing primary use for landscape irrigation.

Since no adverse impacts on water resources are expected from the withdrawal of brackish groundwater from two (2) new wells located in the project site, no direct mitigation measures are proposed. However, the proposed project will indirectly mitigate impacts on Maui's water resources in the following ways:

- Utilizing brackish groundwater for irrigation purposes, instead of potable water.
- Designing the brackish wells for optimum water withdrawal from a thin basal aquifer.
- Designing the irrigation system for efficient operation to conserve water resources.
- Utilizing efficient irrigation practices to conserve water resources.
- Utilizing drought and brackish-water tolerant plants appropriate for water conservation and Kīhei's dry climate.

Development of the project's proposed non-potable wells will require permits for well construction and pump installation from CWRM. Construction and testing of the wells and installation of pumps will conform to the Hawaii Well Construction and Pump Installation Standards. Based on a preliminary discussion, the CWRM currently has no particular concerns regarding the project's proposed brackish wells, and it was noted that others in the Kīhei area are utilizing non-potable wells for landscape irrigation.

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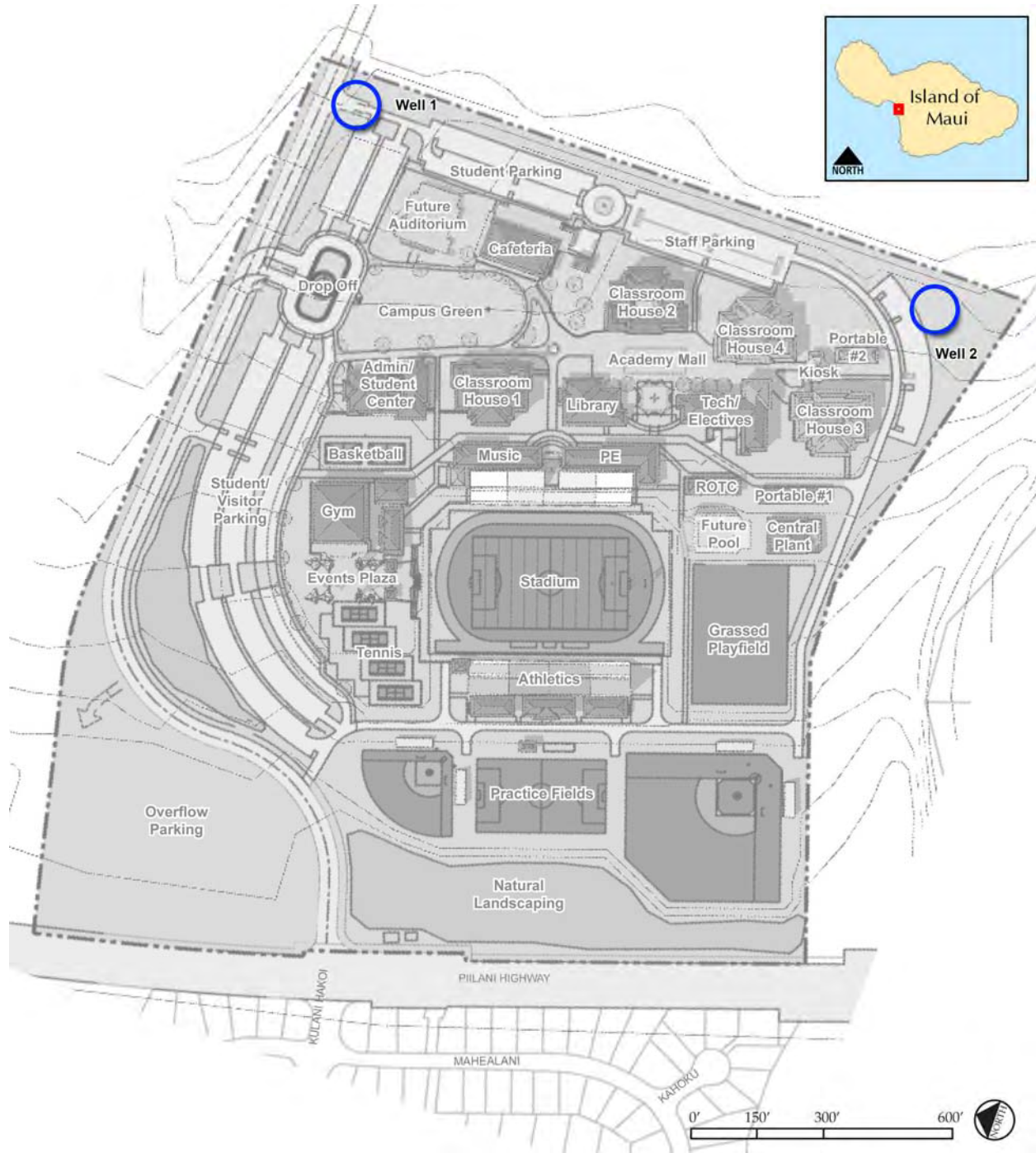


Figure 4-3
Proposed Kīhei High School Well Locations

4.1.6 Flora

Rana Biological Consultants, Inc. conducted botanical, mammalian and avian surveys on the Kīhei High School project site and summarized the findings in their report, *Biological Surveys Conducted for the Proposed New Kīhei High School* (December 2009). The report is included as *Appendix D*. The primary purpose of these surveys was to determine if there were any botanical, avian or mammalian species currently listed, or proposed for listing as endangered or threatened under either the Federal or the State's endangered species programs on, or within the immediate vicinity of the project site. Results are summarized below.

The site is currently being used for cattle pasturage and is highly degraded. The vegetation on the site is best described as a savanna: grassland with scattered trees. There are ample signs of past wildfires on the site.

The botanical survey was undertaken on November 17 and 18, 2009 utilizing wandering transects that traversed all parts of the subject parcel. A plant checklist (*Table 4-2*) was compiled from the field observations, with entries arranged alphabetically under plant family names. The Kīhei High School project area supports two (2) basic vegetation types: grassland and savanna.

Excluding the observation of a fungal fruiting body, the total number of species recorded for the property (all flowering plants) was six (6). This is an astoundingly low number for the size of the property and the number of hours spent conducting the survey. Only 'uhaloa (*Waltheria indica*) counted as a native species, but the low number of all species results in a respectable (for lowland, disturbed sites) ratio of natives of 17%.

Although the survey area was considered to be *mauka* of the fence along the highway and back away from the upper margins of the gulches on the north and south, the land between the fence and the highway was surveyed on the premise that the project could have some impacts in this area, even if limited to access roadways. This area added an additional six (6) species of plants to the listing in *Table 4-2* (see Note 1). These are, with one (1) exception, ruderal weeds typical of a highway verge. The exception is Hawaiian cotton or *ma'o* (*Gossypium tomentosum*). *Ma'o* is an endemic species. Combining the surveys yields a total of 12 recorded flowering plants (still a very low number), no ferns, and includes one (1) each of indigenous and endemic Hawaiian plant species (17% native).

The entire Kīhei High School project site is highly disturbed from a natural vegetation perspective, strongly influenced by low amounts of rainfall and grazing by deer and pasture animals. No plants of interest or concern were observed on the property. However, two (2) specimens of Hawaiian cotton or *ma'o* were observed along the top of the road cut fronting the property. These are in a location unlikely to be used for construction access. *Ma'o* was at one time considered for listing as an endangered species by the USFWS, but this status was downgraded (candidate status withdrawn) when it was established that the species was more widespread than originally believed. Presently the plant has no status under the endangered species act (*Appendix D*).

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Table 4-2 LIST OF BOTANICAL SPECIES				
Species Listed by Family	Common Name	Status	Abundance	Notes
FUNGI				
LYCOPERDACEAE				
Vascellum sp. Or Bovista sp.	Puffball Fungus	Nat	R	-
DICOTYLEDONES (FLOWERING PLANTS)				
EUPHORBIACEAE				
Chamaesyce hyssopifolia (L.) Small	-	Nat	-	1
FABACEAE				
Acacia farnesiana (L.) Willd.	Klu	Nat	O	-
Indigofera hendecaphylla Jacq.	Prostrate Indigo	Nat	-	1
Leucaena leucocephala (Lam.) de Wit	Koa Haole	Nat	-	1
<i>Prosopis pallida</i> (Humb. and Bonpl. Ex Willd.) Kunth	Kiawe	Nat	AA	-
MALVACEAE				
Gossypium tomentosum Nutt. Ex Seem.	Ma'ō, Hawaiian Cotton	End	-	1
Sida rhombifolia L.	-	Nat	-	1
STERCULIACEAE				
Waltheria indica L.	'Uhaloa	Ind.	O	-
MONCOTYLEDONES				
POACEAE				
Cenchrus ciliaris L.	Buffelgrass	Nat	AA	-
Chloris sp.	Finger Grass	Nat	A	2
Cynodon dactylon (L.) Pers.	Bermuda Grass	Nat	-	1
Eragrostis pectinacea (Michx.) Nees	Carolina Lovegrass	Nat	AA	2
STATUS - distributional status for the Hawaiian Islands: End - Native only to the Hawaiian Islands. Ind - indigenous; native to Hawai'i, but not unique to the Hawaiian Islands. Nat - naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation. NOTES: 1 - Observed only outside the property along the highway verge fronting the site. 2 - Specimens encountered lacked fruit or flowers; dead material; species determination uncertain.		ABUNDANCE - occurrence ratings for plants by area: R - Rare seen in only one or perhaps two locations. O - Occasional seen with some regularity A - Abundant found in large numbers; may be locally dominant. AA - Very abundant and dominant; defining species for vegetation type.		

Potential Impacts and Mitigation Measures

A primary goal of the survey was to determine if there were any federal or State listed endangered, threatened, proposed, or candidate botanical resources on or in the immediate vicinity of the project site; none were found. The results of the botanical survey indicate there are no special concerns related to botanical resources in the Kihei High School project area. No adverse short-term or long-term direct or indirect impacts to flora are anticipated.

4.1.7 Fauna

The project area was surveyed for avian and mammalian species in November 2009; the associated study is included as *Appendix D*.

4.1.7.1 Avian Resources

The findings of this survey are consistent with the extremely xeric nature and the habitat present on the site. During the course of this survey a total of 11 avian species were recorded during the time spent within the Kīhei High School project area (*Table 4-3*). One (1) of the species recorded, Pacific Golden-Plover is a native species. Pacific Golden-Plover is an indigenous migratory shorebird species that nests in the high Arctic during the late spring and summer months, returning to Hawai'i and the Tropical Pacific to spend the fall and winter months each year. One (1) species detected, Red Junglefowl (*Gallus gallus*), is a domesticated alien species. Red Junglefowl are currently not considered to be established in the wild on the Island of Maui, so the two (2) birds heard were likely domestic birds, which may have escaped from their owners. The remaining nine (9) species detected are considered to be alien to the Hawaiian Islands (*Table 4-3*). Avian diversity and densities were in keeping with the habitat present within the Kīhei High School project area and its location. No species currently listed, or proposed for listing under either the federal or the State endangered species programs were detected during the course of this survey.

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffins auriculars newelli*), fly over the project area between the months of May and November (*Appendix D*). Recent surveys using ornithological radar have recorded these species flying inland along Maui's southern and western facing shores (*Appendix D*). There is no suitable nesting habitat within or close to the Kīhei High School project site for either of these pelagic seabird species.

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Table 4-3 LIST OF AVIAN SPECIES			
Common Name	Scientific Name	Status	Relative Abundance
GALLIFORMES			
PHASIANIDAE – Pheasants and Partridges			
Phasianinae – Pheasants and Allies			
Gray Francolin	<i>Francolinus pondicerianus</i>	A	1.78
Black Francolin	<i>Francolinus francolinus</i>	A	1.22
Red Junglefowl	<i>Gallus gallus</i>	A	0.22
CHARADRIIFORMES			
CHARADRIIDAE – Lapwings and Plovers			
Charadriinae – Plovers			
Pacific Golden-Plover	<i>Pluvialis fulva</i>	IM	0.78
COLUMBIFORMES			
COLUMBIDAE – Pigeons and Doves			
Spotted Dove	<i>Streptopelia chinensis</i>	A	0.67
Zebra Dove	<i>Geopelia striata</i>	A	5.11
PASSERIFORMES			
ZOSTEROPIDAE – White-eyes			
Japanese White-eye	<i>Zosterops japonicus</i>	A	1.89
STURNIDAE – Starlings			
Common Myna	<i>Acridotheres tristis</i>	A	1.00
CARDINALIDAE – Cardinals and Allies			
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	0.67
FRINGILLIDAE – Fringilline and Carduline Finches and Allies			
Carduelinae – Carduline Finches			
House Finch	<i>Carpodacus mexicanus</i>	A	3.78
ESTRILDIDAE – Estrildid Finches			
Estrildinae – Estrildine Finches			
Nutmeg Mannikin	<i>Lonchura punctulata</i>	A	1.56
Status: A – Alien, introduced to the Hawaiian Islands by humans IM - Indigenous Migratory Species, native to Hawai‘i, but also found elsewhere naturally, does not nest in Hawai‘i Relative Abundance - Number of birds detected divided by the number of count stations (9)			

4.1.7.2 Mammalian Resources

Seven (7) mammalian species were detected during the course of this survey (Table 4-4). Only two (2) of these: humans (*Homo sapiens*) and axis deer (*Axis axis*) were seen alive. The findings of this survey are consistent with the habitat present on the site, its location on Maui, and its current usage as cattle pasturage.

All of the other mammalian species recorded during the course of this survey are commonly occurring species in pastures in the Kīhei area. All of the quadrupeds recorded are considered to be alien to the Hawaiian Islands, and none are protected under either the federal or the State endangered species statutes.

Table 4-4 LIST OF MAMMALIAN SPECIES		
Common Name	Scientific Name	Detection Type
PRIMATES - LEMURS, LORISIDS, GALAGOS, TARSIIERS MONKEYS AND ALLIES		
Hominidae - Great Apes and Humans		
Human	<i>Homo sapiens</i>	V, A, Si
CARNIVORA - FLESH EATERS		
Canidae - Wolves, Jackals and Allies		
Domestic dog	<i>Canis f. familiaris</i>	A, T, Si
Felidae - Cats		
House cat	<i>Felis catus</i>	T, Si
PERISSODACTYLA - ODD-TOED UNGULATES		
Equidae - Horses, Asses and Zebras		
Domestic horse	<i>Equus c. caballus</i>	T, Si
ATRIODACTYLA - EVEN-TOED UNGULATES		
Suicidae - Old World Swine		
Pig	<i>Sus s. scrofa</i>	T, Si
Cervidae - Antlered Ruminants		
Axis deer	<i>Axis axis</i>	V, A, Si
Bovidae - Hollow-horned Ruminants		
Domestic cattle	<i>Bos taurus</i>	Sk, T, Si
Detection Type: V Visual – at least one live animal was seen A Audio – animals were heard Si Sign – rubbing, rut marks, dust wallows were seen on the site T Tracks – foot prints were seen Sk Skeletal – skeletal remains were encountered on the site		

Potential Impacts and Mitigation Measures

The development and operation of the Kīhei High School project is not expected to result in deleterious impacts to any avian or mammalian species currently listed or proposed for listing under either the federal or the State endangered species statutes.

Avian Resources Protected Under the Endangered Species Act

The principal potential impact that construction and operation of the Kīhei High School project poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two (2) main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, 2) following build-out the potential operation of streetlights and athletic field lighting.

If nighttime construction activity or equipment maintenance is proposed during the construction phases of the Kīhei High School project, all associated lights should be shielded, and when large flood/work lights are used they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

If streetlights or facility lighting is installed in conjunction with the school, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures (Reed et al. 1985, Telfer et al. 1987). This minimization measure would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Maui County Code § 20.35 *et seq.* that requires that exterior lights on Maui be shielded.

4.2 BUILT ENVIRONMENT

4.2.1 Planned Projects within the Region

A number of potential projects are being planned within the vicinity of the proposed Kīhei High School. These potential projects include Kīhei Mauka, Pi'ilani Promenade and Maui Outlet Centers, Maui Research and Technology Park, and Honua'ula Development. Although the development plans and implementation schedules for these projects are currently unknown; descriptions of each proposed project are provided below.

Kīhei Mauka

The agricultural lands surrounding the proposed Kīhei High School project site are owned by Ka'ono'ulu Ranch and Haleakala Ranch. The ranches have future plans to develop these lands (currently referred to as "Kīhei Mauka") as a community that will include residential, commercial, and industrial uses.

Pi'ilani Promenade and Maui Outlets Center

The Pi'ilani Promenade and Maui Outlets Center will be located adjacent to Pi'ilani Highway north of the Kīhei High School project. The two (2) projects are expected to include over 703,000 SF of retail and restaurant space and include the extension of Ka'ono'ulu Street further east.

Maui Research and Technology Park

The existing Maui Research and Tech Park is located east of Pi'ilani Highway near the intersection with Lipoa Street. The proposed project will include the expansion of the existing technology park, as well as development of other residential and commercial uses in the surrounding areas.

Honua‘ula Development

The Honua‘ula Development will be located on an approximately 670 acre parcel near the southern end of Pi‘ilani Highway in Mākena. The proposed development will include a maximum of 1,400 residential units (mix of single- and multi-family units), mixed use areas, two (2) golf courses, and a variety of public and private amenities.

4.2.2 Current Land Uses and Regulations

Land Regulation

The Kihei High School project site is 77.2 acres of undeveloped land in the Kihei-Mākena region. The project area encompasses two (2) land parcels, TMKs 2-2-2-002:081 and 2-2-2-002:083. The project site is currently used by the ranches for cattle grazing. There are no other on-site land uses. The site lies within the State Agricultural district and is designated Public/Quasi-Public and Agriculture by the Kihei-Mākena Community Plan. County zoning is Agricultural district.

Table 4-5 and Figures 1-4, 1-6 and 1-7 summarize the State and County land use designations.

Table 4-5 STATE AND COUNTY LAND USE DESIGNATIONS		
Jurisdiction	Existing Designation(s)	Proposed Designation(s)
State Land Use District	Agricultural	Urban
County Zoning	Agricultural	P-1 Public/Quasi-Public
Kihei-Mākena Community Plan	Public/Quasi-Public; Agriculture	Public/Quasi-Public

Adjacent Land Use

Land uses adjacent to the project site are summarized below:

North: The Kūlanihāko‘i Gulch forms the northern site boundary. Beyond the gulch to the north are undeveloped Ka‘ono‘ulu Ranch lands.

West: Immediately adjacent to the site on the west is Pi‘ilani Highway. Across Pi‘ilani Highway is the Pi‘ilani Village residential subdivision.

South: Immediately south of and adjacent to the site is the Waipu‘ilani Gulch and Elleair Golf Course. The Maui Research and Technology Park is located to the southeast and the Pi‘ilani Shopping Center is located to the southwest. The Kihei Wastewater Reclamation Facility is located south of the Elleair Golf Course.

East: Undeveloped lands owned by Ka‘ono‘ulu Ranch and Haleakala Ranch. These lands to the east are part of the Kihei Mauka future growth area designated by the Maui Island Plan General Plan 2030 Draft.

Potential Impacts and Mitigation Measures

Land Regulation

The Kīhei High School development is not consistent with existing State Land Use classification and County zoning, and is only partially consistent with current County Community Plan designations.

The applicant is pursuing a State Land Use District Boundary Amendment, Amendment to the Kīhei-Mākena Community Plan, and Rezoning to allow development of the Kīhei High School project.

The proposed State Land Use classification change from Agricultural to Urban, County zoning change from Agricultural to P-1 Public/Quasi Public, and the proposed Kīhei-Mākena Community Plan designation change from Agriculture to Public/Quasi Public would have beneficial long-term impacts on public services as described in *Section 4.3.5*. The project is not anticipated to have adverse long-term significant impacts on agriculture, as described in *Section 4.1.3*.

Adjacent Land Uses

Ranching activities north and east of the Kīhei High School project area are not expected to be adversely impacted by the proposed development. The proposed high school is compatible with and supportive of existing residential areas to the west of the project site. Pi'ilani Highway will provide separation between the high school and residential areas. No impacts are anticipated with the golf course and Research and Tech Park to the south. Waipu'ilani Gulch serves as a natural divide between the school and these areas.

Current Land Uses

Approximately 77 acres of ranching lands will be replaced by the project. The ranching activities are anticipated to relocate offsite onto adjacent ranch lands. It is anticipated that the ranching activities will relocate with no significant impact to ranching employment and operations. The island-wide impact on ranching would be minor.

In light of the relatively small adverse impact to loss of agricultural and ranching land, no mitigation is proposed. No mitigation is proposed for the reduction of two (2) acres of prime land from the Maui agricultural land inventory.

4.2.3 Archaeological and Historic Environment

The proposed Kīhei High School project is classified as a "State project", and subject to a historic preservation review process under the HRS, Chapter 6E-8. Under Chapter 6E-8(a), before the State can commence with this project, it needs to afford the Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD) an opportunity to review the effect of the Kīhei High School project on known or potential historic properties. In December 2009, an *Archaeological Inventory Survey (AIS) for the Proposed Construction of Kīhei High School* was completed by Scientific Consultant Services, Inc. (SCS). The AIS report is included as *Appendix E*. The findings of this AIS report identified several past studies around and within the vicinity of the Kīhei High School project site.

Previous Archaeological Research in the Vicinity

A substantial number of archaeological investigations have been conducted over the past few years near the present project site. Despite a large number of studies, relatively few significant sites have been documented.

Previous archaeological research has documented a fairly limited degree of human settlement in the Kīhei area. Within the “barren zone”, archaeological reconnaissance and inventory surveys adjacent to and nearby the project area have yielded a modest amount of evidence of both historical and traditional human activities. Based on over 30 years of archaeological study in the “barren zone” of the former Kula District (presently Makawao), it is clear that the area was not a desirable location for either a permanent population or for large scale agricultural endeavors that were undertaken in locales further upland. Whether this pattern was the result of poor soil development, low precipitation, or lack of population pressure that would have forced individuals to seek new areas to settle, it is likely that previous archaeological studies would have identified at least remnants of any permanent habitation or agricultural complexes, like those that can be found in the more inland reaches of Kula. As such, archaeological structures associated with permanent habitation sites and/or ceremonial sites were not expected within the Kīhei High School project area prior to the inventory survey.

Archaeological Inventory Survey

Archaeological work in the project area was conducted to determine the presence or absence of archaeological deposits in surface and subsurface contexts through a thorough survey and representative subsurface testing. The goal of the survey was to determine if significant cultural or historic resources, and/or human burials occurred on the parcel; and, to provide significance assessments and recommendations to SHPD.

A 100% pedestrian survey of 77 acres and limited subsurface testing re-documented one (1) site located in the northeastern portion of the project area. State Inventory of Historic Properties (SIHP) No. 50-50-10-6393 consists of eight (8) features (seven (7) mounds and one (1) alignment) (*Figure 4-4*). The site is located on Ka’ono’ulu Ranch lands on a relatively level portion of the project area, approximately 300 meters (m) from Pi’ilani Highway at an elevation of 20 m AMSL. The eight (8) features consist of a series of low mounds and one (1) alignment constructed of basalt cobbles and boulders. A portion of this site was previously documented by SCS (*Appendix E*) and was described as consisting of “three features, all of which are rock mounds that were likely constructed during bulldozer activities on the lot, due to the angular, broken up condition of stones in the features and the presence of a bulldozed area (possibly an old road) just north of Feature three (3) (*Appendix E*).

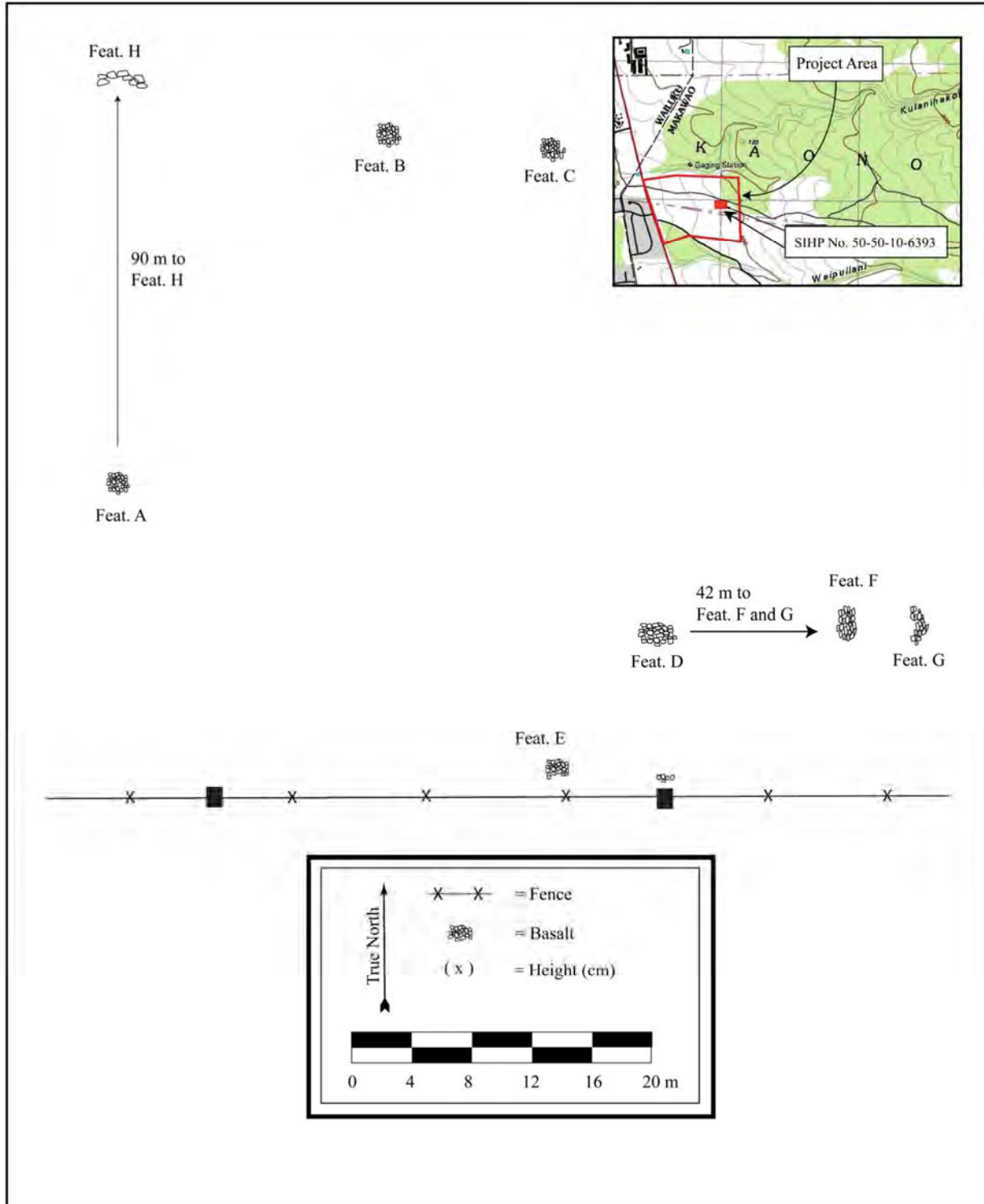


Figure 4-4
 Plan View of SIHP No. 50-50-10-6393

SIHP No.: 50-50-10-6393

Site Type: Mound Complex

Function: Agriculture/Ranching

Feature (#): eight (8)

Age: Historic

Condition: Poor

Previous archaeological investigations and historic documentation in the vicinity of the project site suggests that the area was marginally utilized in pre-contact times and has been used in the historic era primarily for ranching activities and World War II military training exercises. The site re-identified during this survey is associated with the historic period activities.

The site has been evaluated for significance according to the criteria established for the State and NRHP. SIHP No. 50-50-10-6393 is (and was previously) designated under Criterion D as a site that has yielded or has the potential to yield information important in prehistory or history. The eight (8) features have been thoroughly documented with photographs, scale plan view maps and written descriptions, and three (3) of the features were manually tested to gather additional information.

No further work was recommended for SIHP No. 50-50-10-6393. This recommendation follows a previously accepted recommendation made during other archaeological investigations (Appendix E). It is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history. It is therefore recommended that no further archaeological work is warranted within the project area.

The findings of the AIS did not recommend archaeological monitoring during the proposed construction for the new Kīhei High School. However, should the inadvertent discovery of significant cultural materials and/or burials occur during construction, all work in the immediate area of the find must cease and the SHPD be notified to discuss mitigation.

Potential Impacts and Mitigation Measures

SIHP No. 50-50-10-6393

SIHP No. 50-50-10-6393 will be adversely impacted through project construction. Although designated eligible under Criterion D for the NRHP, it is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history.

The SHPD accepted the AIS in their letter dated February 12, 2010. SHPD stated that while continuous monitoring did not appear to be necessary, a program of intermittent monitoring during the initial phases of ground preparation and build out should be implemented. SHPD requested to

reserve further recommendations and final comment pending review of project related permit applications and plans.

Per the SHPD-approved AIS, SIHP No. 50-50-10-6393 has been documented to the fullest extent and no further mitigation is recommended.

Inadvertent Finds during Construction

Potential exists for inadvertent cultural or archaeological finds during the course of construction. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.

Contractors working in the project area will be advised that, should any significant cultural deposits or human skeletal remain area be encountered, work shall stop in the immediate vicinity and SHPD shall be promptly contacted to determine the appropriate course of action.

4.2.4 Cultural Resources

A Cultural Impact Assessment (CIA) for the proposed construction of Kīhei High School was completed by SCS in April 2010. The Kīhei High School project requires compliance with Act 50 Session Laws of Hawai'i 2000 and the State of Hawai'i environmental review process under Chapter 343, HRS, which requires consideration of a proposed Kīhei High School project's effect on traditional cultural practices. The CIA report is included as *Appendix F*.

The area of potential effect consists of the project area in the context of the Waiohuli Ahupua'a and other places on Maui that may be traditionally associated or connected with Kīhei, Ka'ono'ulu, Kōheo and/or the Kīhei High School project area.

Traditional Settlement Patterns

Trails extended from the coast to the mountains, linking the two (2) for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi'ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, including Kīhei. Kolb noted that two (2) traditional trails extended through Kēōkea. One (1) trail, named "Kekuawaha'ula'ula" or the "red-mouthed god", went from Kīhei inland to Kēōkea. Another, the Kalepolepo trail, began at the Kalepolepo fishpond and continued to upland Waiohuli. These trails were not only used in the pre-contact era, but were expanded to accommodate wagons bringing produce to the coast in the 1850s (*Appendix F*).

Western Contact

Early descriptions of this portion of Maui are brief and infrequent and usually refer to coastal activities. Captain King, Second Lieutenant on the *Revolution* during Cook's third voyage briefly described what he saw from a vantage point of "eight or ten leagues" (approximately 24 miles) out to sea as his ship departed the islands in 1779 (*Appendix F*). He mentions Pu'u Ōla'i south of Kīhei and enumerates the observed animals, thriving groves of breadfruit, excellence of the taro, and almost prophetically, says the sugar cane is of an unusual height. Seen from this distance and the mention of breadfruit suggest the uplands of Kīpahulu-Kaupo and 'Ulupalakua, and not the lower regions, were his focus.

In the ensuing years, LaPérouse (1786), Nathaniel Portlock and George Dixon (also in 1786), sailed along the western coast, but added little to our direct knowledge of Kīhei. During the second visit of Vancouver in 1793, his expedition becalmed in Ma‘alaea Bay close to the project area.

Archibald Menzies, a naturalist accompanying Vancouver stated, “...we had some canoes off from the latter island [Maui], but they brought no refreshments. Indeed, this part of the island appeared to be very barren and thinly inhabited.” According to Kahekili, then chief of Maui, the extreme poverty in the area was the result of the continuous wars between the Island of Maui and Island of Hawai‘i causing the land to be neglected and human resources wasted.

The Great Mahele

The Great Mahele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Hewahewa, Kamehameha’s Kahuna Nui, was awarded Ka‘ono‘ulu (LCA3237).

As western influence grew, Kalepolepo in Kīhei became the important provisioning area. Europeans were now living or frequently visiting the coast and several churches and missionary stations were established. A Mr. Halstead’s residence and store situated at Kalepolepo landing was known as the Koa House having been constructed of koa logs brought from the uplands of Kula. The store flourished due to the whaling and successful upland potato industry, and provided an accessible port for exported produce. A landing was built at Kīhei around 1890. Several of Hawai‘i’s ruling monarchs stayed at the Koa House, including Kauikeaouli (Kamehameha III), Kamehameha the IV, Lot Kamehameha (V), and Lunalilo. Wilcox, giving a glimpse of the surroundings before abandonment stated, “...Kalepolepo was not so barren looking a place. Coconut trees grew beside pools of clear warm water along the banks of which grew taro and ape...” (Appendix F). However, by 1887 this had changed. Wilcox continues:

“...the Kula mountains had become denuded of their forests, torrential winter rains were washing down earth from the uplands, filling with silt the ponds at Kalepolepo...ruins of grass huts [were] partly covered by drifting sand, and a few weather-beaten houses perched on the broad top of the old fish pond wall at the edge of the sea, with the Halstead house looming over them dim and shadowy in the daily swirl of dust and flying sand...”

Ranching was present prior to the 1840s and large sections of Crown Lands were leased for grazing cattle. By the 1880s, the lower Kula lands, including the project area, consisted primarily of pasture land for ranching. Large portions of Ka‘ono‘ulu Ahupua‘a were used for cattle by the Ka‘ono‘ulu Ranch Company Limited and by Ulupalakua Ranch, Incorporated.

Agricultural development on the leeward side of Maui was likely to have begun early in what is known as the Expansion Period (AD 1200-1400). The present project area is located in what has been referred to as the “barren zone.” The barren zone is perceived as dry and antagonistic to permanent habitation. This zone was an intermediary region between verdant upland regions and the coastline. In the transitional/barren zone, agriculture endeavors were practically non-existent and tool procurement materials, such as basalt rock and wood, were selected from other locales. Sediment regimes in the area are shallow, most often overlying bedrock, and perennial water

sources are virtually non-existent. In addition, the immediate slope in back of the coast receives less than 30 inches of rainfall annually, which is needed for productive cultivation.

Scattered amongst the few habitation sites along the coast were places of cultural significance to the kama'āina of the district including at least two (2) heiau. In ancient times, there was a small village at Kalepolepo, supported primarily by marine resources. Several fishponds were also located in the vicinity of Kīhei; Waiohuli, Kēōkea-kai, and Kalepolepo Pond (also known by the ancient name of Kō'ie'ie Pond). Constructed on the boundary between Ka'ono'ulu and Waiohūi Ahupua'a, these three ponds were some of the most important royal fishponds on Maui. The builder of Kalepolepo and two other ponds (Waiohuli and Kēōkea-kai) has been lost in antiquity, but they were reportedly rebuilt at least three (3) times through history, beginning during the reign of Pi'ilani.

Cultural Impact Assessment

Through document research and cultural consultation efforts, the CIA report provided information that was applicable to the assessment of the Kīhei High School project and its potential impacts to cultural practices. Hawaiian organizations, agencies, and community members have been contacted for this study in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Kīhei High School project area and its vicinity.

Consultation letters were sent to organizations whose jurisdiction included knowledge of the area. Consultation was sought from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD; Office of Hawaiian Affairs (OHA), O'ahu Branch; Thelma Shimaoka, OHA Maui Branch; Charles Maxwell, Maui Island Burial Council; Kimokeo Kapahulehua; Department of Planning, Cultural Resources Commission; Hinano Rodrigues, DLNR; Kīhei Community Association; and Central Maui Hawaiian Civic Club.

In addition, a CIA Notice was published on March 28, 30, and 31, 2010 in *The Honolulu Advertiser* and *The Maui News*, and in the April 2010 issue of the OHA newspaper, *Na Wai Ola*. These notices requested information of cultural resources or activities in the area of the proposed Kīhei High School project.

Two (2) responses were received from the above listed organizations or news periodical announcements. Neither contained additional information concerning on-going cultural activities or resources in the Kīhei High School project area. This would be expected from an area known for its general lack of pre-contact usage. One (1) letter was from the O'ahu Branch of the OHA acknowledging receipt of the letter of inquiry. The other letter was from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD, also acknowledging receipt of the letter of inquiry and suggesting several contacts, many of whom had already been contacted with no results.

An interview was also conducted in 2000 with Mr. Henry Rice, owner of Ka'ono'ulu Ranch (containing the present Kīhei High School project area) by SCS pertaining to another CIA (*Appendix F*). Mr. Rice is descended from a kama'āina family and, at the time of the interview, the ranch consisted of approximately 9,000 acres of land that had been held by the Rice family since 1916. Mr. Rice stated that land was used for pasturage and the cattle were rotated according to vegetation growth, up and down the slope. Mr. Rice did not know of any old trails, traditional properties, or cultural activities occurring on his Ka'ono'ulu Ranch lands. He did mention that in the late 1800s people living in the Kula region were still obtaining fish from the Ka'ono'ulu

fishpond in Kīhei. With the introduction of a dependable water supply in 1952 to the dry Kīhei region, came overseas investment and development for the tourist industry, which has continued up to, and including, this time.

Historical and cultural source materials were extensively used and can be found in more detail in *Appendix F*. In addition, an archaeological report specific to the project vicinity was reviewed. Early archaeological investigations and historic documentation in the vicinity of the project area suggested that the area was marginally utilized in pre-contact times and had been used in the historic era primarily for ranching activities and World War II military training exercises. An AIS was conducted in 2010 (*Appendix E*) which included a 100% pedestrian survey, limited subsurface testing and documentation of one (1) site (SIHP No.0-50-10-6393) consisting of eight (8) features. After analysis, it was decided the features were historic and associated with ranching activities. No new sites were identified during the recent inventory survey.

Potential Impacts and Mitigation Measures

The information presented in the CIA report for the project site reveals no notable cultural activities took place at the specific project areas (*Appendix F*). There was no additional information from the contacted organizations, newspapers, and archival research. Therefore, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by the activities of the proposed Kīhei High School. Adverse effects are not anticipated since no cultural activities were identified to occur at the project area.

4.2.5 Traffic

A Traffic Impact Report (TIR) (May 2011) was prepared for the Kīhei High School project by Wilson Okamoto Corporation to identify and assess potential impacts of the project on existing roadways and traffic conditions. This report is included as *Appendix G*.

4.2.5.1 Area Roadway System

In the vicinity of the Kīhei High School project, Pi'ilani Highway is a predominantly four-lane, two-way roadway oriented in the north-south direction that provides access through Kīhei. At the intersection with Kūlanihāko'i Street, the northbound approach of the highway has an exclusive left-turn lane and two (2) through lanes while the southbound approach has two (2) through lanes and an exclusive right-turn lane. Kūlanihāko'i Street is oriented in the east-west direction and serves as a connector roadway between South Kīhei Road and Pi'ilani Highway. At the intersection with Pi'ilani Highway, the Kūlanihāko'i Street approach has two (2) stop-controlled lanes that serve left-turn and right-turn traffic movements. See *Figure 4-5*.

The access roadway for the proposed Kīhei High School will connect to the east side of the intersection creating a four (4) way intersection. After the connection is completed, the westbound approach of the access road is expected to have two (2) westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition, northbound deceleration and acceleration lanes are expected to be constructed along Pi'ilani Highway to facilitate entering and exiting traffic at the school's access.

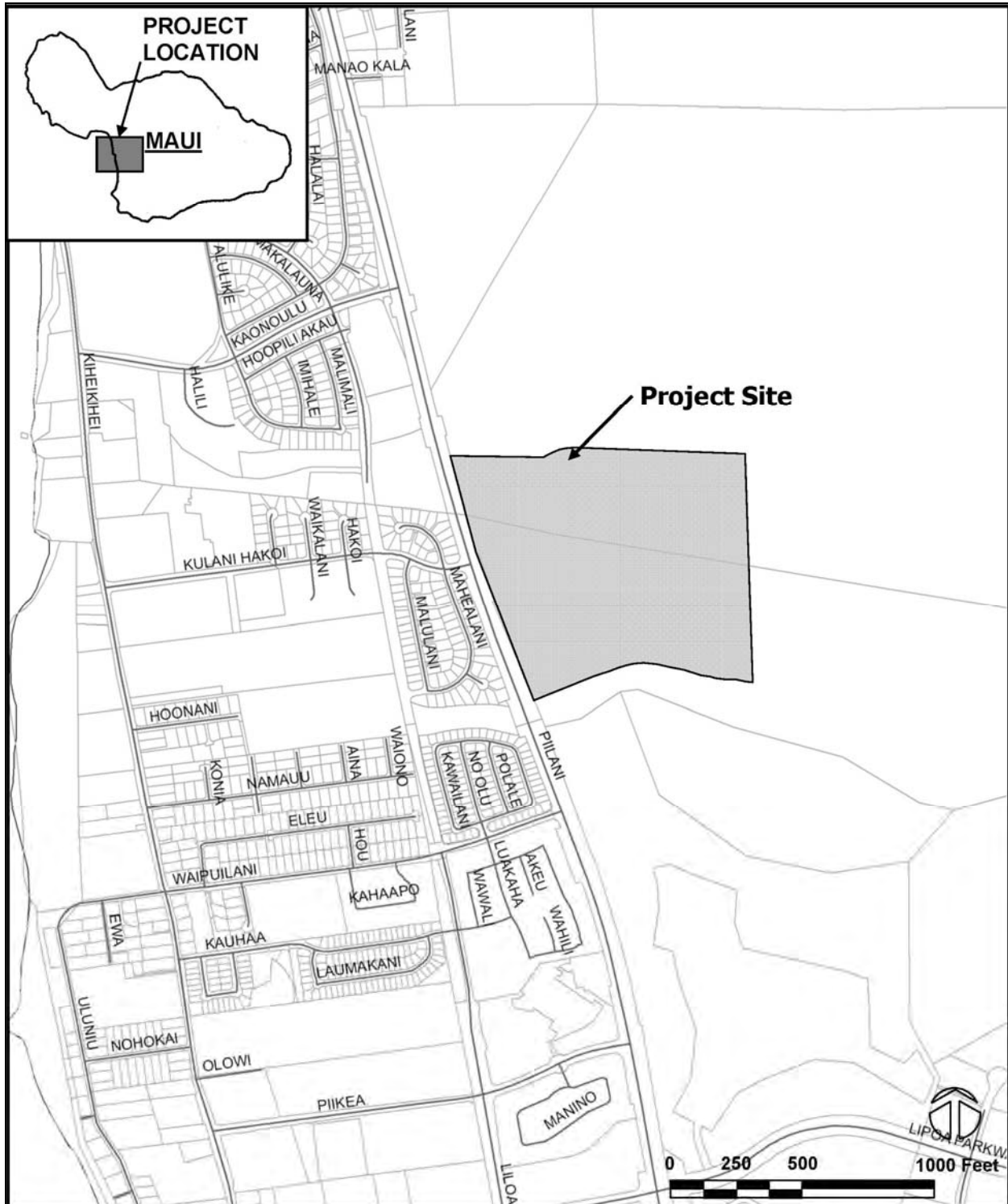


Figure 4-5
Area Roadways and Project Site Map

Existing Traffic Volumes and Levels of Service

Morning and afternoon peak hour traffic counts were conducted at each of the five (5) analyzed intersections in January 2011. The AM peak hour of traffic generally occurs between the hours of 7:15 AM and 8:15 AM. During the afternoon, the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM. *Figure 4-6 (1)* and *Figure 4-6 (2)* illustrate the existing traffic study area for each of the following intersections:

- Pi'ilani Highway and Ka'ono'ulu Street
- Pi'ilani Highway and Kūlanihāko'i Street
- Pi'ilani Highway and E. Waipu'ilani Road
- Pi'ilani Highway and Pi'ikea Avenue
- Kūlanihāko'i Street and South Kīhei Road

The highway capacity analysis performed for the TIR is based upon procedures presented in the Highway Capacity Manual (HCM) (2000), Transportation Research Board and the Synchro software, developed by Trafficware. Level of Service (LOS) is a quantitative and qualitative assessment of traffic operations. LOS are defined by LOS "A" through "F"; LOS "A" represents ideal or free-flowing traffic operating conditions and LOS "F" represents unacceptable or potentially congested traffic operating conditions. *Table 4-6* below summarizes the results of the level of service analysis for each of the five (5) study intersections.

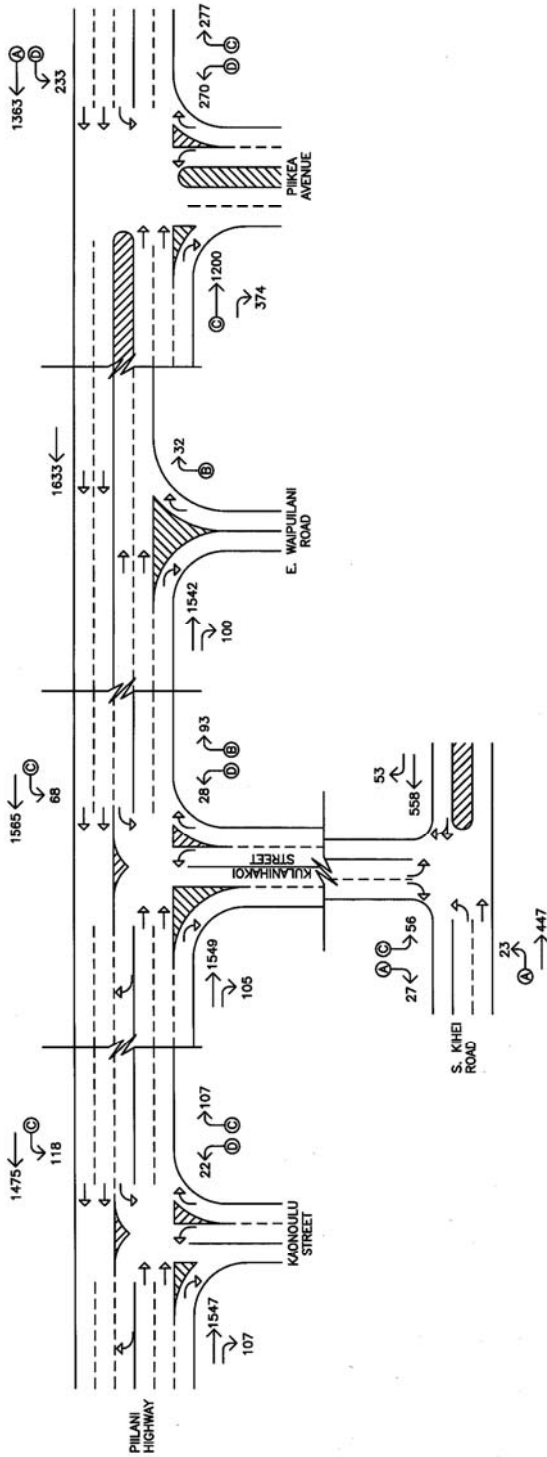


Figure 4-6 (1)
Existing AM Peak Hour of Traffic

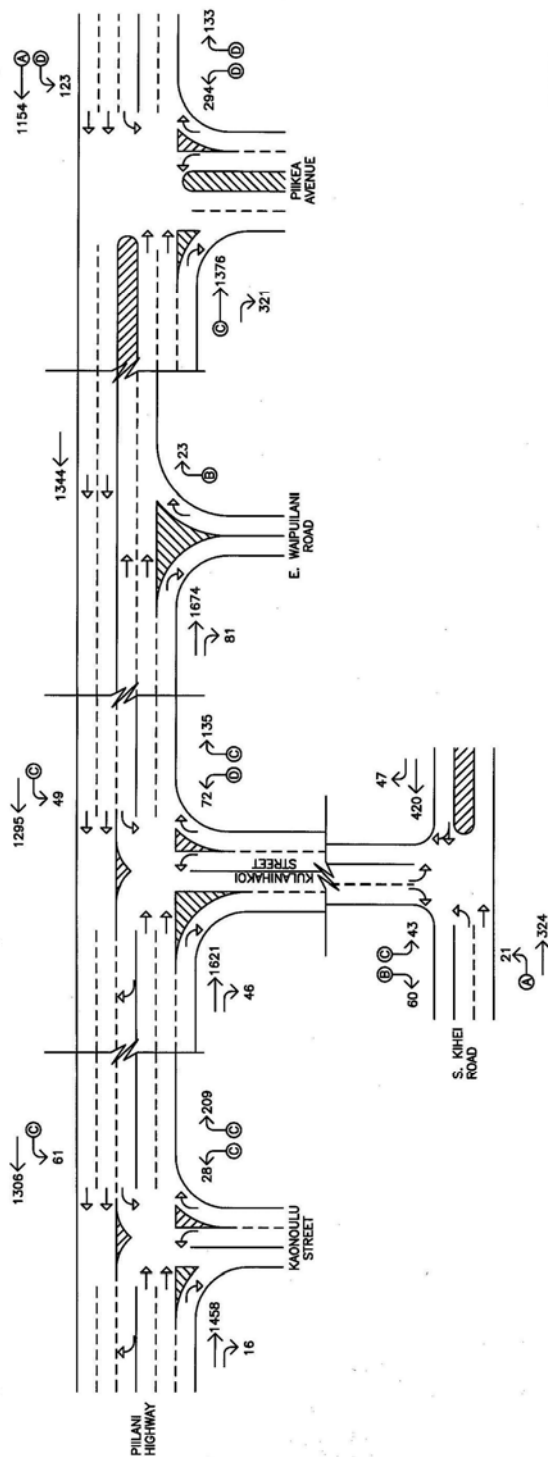


Figure 4-6 (2)
Existing PM Peak Hour of Traffic

LEGEND
 90 ← TRAFFIC MOVEMENT VOLUME (VPH)
 → LANE USAGE
 ⓐ LANE GROUP LEVEL OF SERVICE

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Table 4-6 EXISTING AND PROJECTED YEAR 2015 (WITHOUT PROJECT) LOS TRAFFIC OPERATING CONDITIONS						
Intersection	Critical Traffic Movement		AM		PM	
			Existing	2015 w/o	Existing	2015 w/o
Pi'ilani Highway/ Ka'ono'ulu Street	Eastbound	LT	C	C	D	D
		RT	C	C	C	C
	Northbound	LT	C	C	C	C
Pi'ilani Highway/ Kūlanihāko'i Street	Eastbound	LT	D	D	D	D
		RT	C	C	B	C
	Northbound	LT	C	C	C	C
Pi'ilani Highway/ E. Waipu'ilani Road	Eastbound	RT	B	B	B	B
Pi'ilani Highway/ Pi'ikea Avenue	Eastbound	LT	D	D	D	D
		RT	D	D	C	D
	Northbound	LT	D	D	D	D
	Southbound	TH	C	C	C	C
Kūlanihāko'i Street / South Kihei Road	Westbound	LT	C	C	C	C
	Southbound	LT	B	B	A	A

Potential Impacts and Mitigation Measures

The trips generated by the Kihei High School project are expected to be associated with the existing and new high school students. High school students from Kihei currently attend high schools in Kahului and Wailuku and these students are expected to transfer to the new high school once it is opened. As provided by the DOE, there are currently 704 students from Kihei attending high schools in other regions. *Table 4-7* summarizes the project site trip generation characteristics applied to the AM and PM peak periods of traffic.

Table 4-7 PEAK HOUR TRIP GENERATION CHARACTERISTICS			
		Projected Trip Ends	
		2015 800 Students	2025 850 Students
AM Peak	Enter	228	243
	Exit	108	114
	Total	336	357
PM Peak	Enter	49	52
	Exit	55	59
	Total	104	111

A number of potential residential and commercial projects are being considered within the vicinity of the proposed Kihei High School. These potential projects include Kihei Mauka, Pi'ilani Promenade and Maui Outlet Centers, Maui Research and Tech Park, and Honua'ula Development. The project development plans and implementation schedules for these projects are unknown; therefore, they have not been incorporated into projected traffic scenario conditions for the proposed project.

Future Traffic Volumes without the Project

Projected traffic operations in year 2015 without the project are expected to deteriorate slightly from existing conditions due to ambient growth in traffic along the surrounding roadways (*Table 4-8*). The eastbound right-turn traffic movement at the intersection of Pi'ilani Highway and Kūlanihāko'i Street is expected to deteriorate from LOS "B" to LOS "C" during the PM peak period while the eastbound right-turn traffic movement at the intersection of Pi'ilani Highway and Pi'ikea Avenue is expected to deteriorate from LOS "C" to LOS "D" during the PM peak period. The remaining traffic movements at this intersection as well as the other study intersections are expected to operate at levels of service similar to existing conditions.

Future Traffic Volumes with the Project

The Year 2015 cumulative AM and PM peak hour traffic conditions with the Kihei High School project are summarized in *Table 4-8*, and shown in *Figure 4-7 (1)* and *Figure 4-7 (2)*. With the anticipated increases in traffic due to ambient growth in traffic and the inclusion of the proposed access for the high school, a Traffic Signal Warrant Study (*Appendix G*) was completed for the intersection of Pi'ilani Highway and Kūlanihāko'i Street. Based on existing and projected traffic volumes, the study recommended the installation of a traffic signal system. As such, a traffic signal system is assumed to be installed in conjunction with the Kihei High School project by school opening, anticipated in the Year 2015.

Traffic operations in Year 2015 with project conditions are expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Pi'ilani Highway, the traffic movements at the intersection with Ka'ono'ulu Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period, while the intersection of Pi'ilani Highway and Pi'ikea Avenue are expected to continue operating at LOS "D" or better during both peak periods. The eastbound approach of E. Waipu'ilani Road and Pi'ilani Highway is expected to continue operating at LOS "B" during both peak periods, while traffic movements at the intersection of Kūlanihāko'i Street and South Kihei Road are expected to continue operating at LOS "C" or better during both peak periods. The intersection of Pi'ilani Highway and Kūlanihāko'i Street is expected to operate at LOS "D" or better during both peak periods primarily due to the installation of the traffic signal system.

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Table 4-8 PROJECTED YEAR 2015 (WITHOUT AND WITH PROJECT) AND YEAR 2025 (WITH PROJECT) LOS TRAFFIC OPERATING CONDITIONS								
Intersection	Critical Traffic Movement		AM			PM		
			2015 w/o	2015 with	2025 with	2015 w/o	2015 with	2025 with
Pi'ilani Highway/ Ka'ono'ulu Street	Eastbound	LT	C	C	D	D	D	E
		RT	C	C	C	C	C	C
Pi'ilani Highway/ Kūlanihāko'i Street*	Eastbound	LT	D	D	D	D	D	D
		TH	-			-		
		RT	C	D	D	C	D	D
	Westbound	LT-TH	-	D	E	-	D	E
		RT	-	D	D	-	D	D
	Northbound	LT	C	D	E	C	D	E
		TH	-	B	C	-	A	A
	Southbound	LT	-	D	E	-	D	E
		TH	-	B	C	-	B	A
	Pi'ilani Highway/ East Waipu'ilani Road	Eastbound	RT	B	B	C	B	B
Pi'ilani Highway/ Pi'ikea Avenue	Eastbound	LT	D	D	E	D	D	E
		RT	D	D	D	D	D	D
	Northbound	LT	D	D	E	D	D	E
	Southbound	TH	C	C	C	C	C	C
Kūlanihāko'i Street/ South Kīhei Road	Westbound	LT	C	C	C	C	C	C
	Southbound	LT	B	B	B	A	B	B

*Traffic signal system installed in conjunction with the proposed high school

Projected traffic operations in Year 2025 with the Kīhei High School project are expected to deteriorate slightly from Year 2015 with project conditions primarily as a result of ambient growth in traffic along the surrounding roadways (Table 4-8). Along Pi'ilani Highway, the traffic movements at the intersection with Ka'ono'ulu Street are expected to operate at LOS "D" or better during the AM peak period and LOS "E" or better during the PM peak period, while traffic movements at the intersections with Kūlanihāko'i Street and Pi'ikea Avenue are expected to operate at LOS "E" or better during both peak periods. At the intersection of Pi'ilani highway with E. Waipu'ilani Road, the eastbound approach is expected to operate at LOS "C" and LOS "B" during the AM peak periods, respectively. Along South Kīhei Road, the critical movements at the intersection with Kūlanihāko'i Street are expected to operate at LOS "C" or better during both peak periods. Figure 4-8 (1) and Figure 4-8 (2) illustrate the projected traffic volumes with the Kīhei High School project and other development projects in the vicinity proposed for completion in the Year 2025.

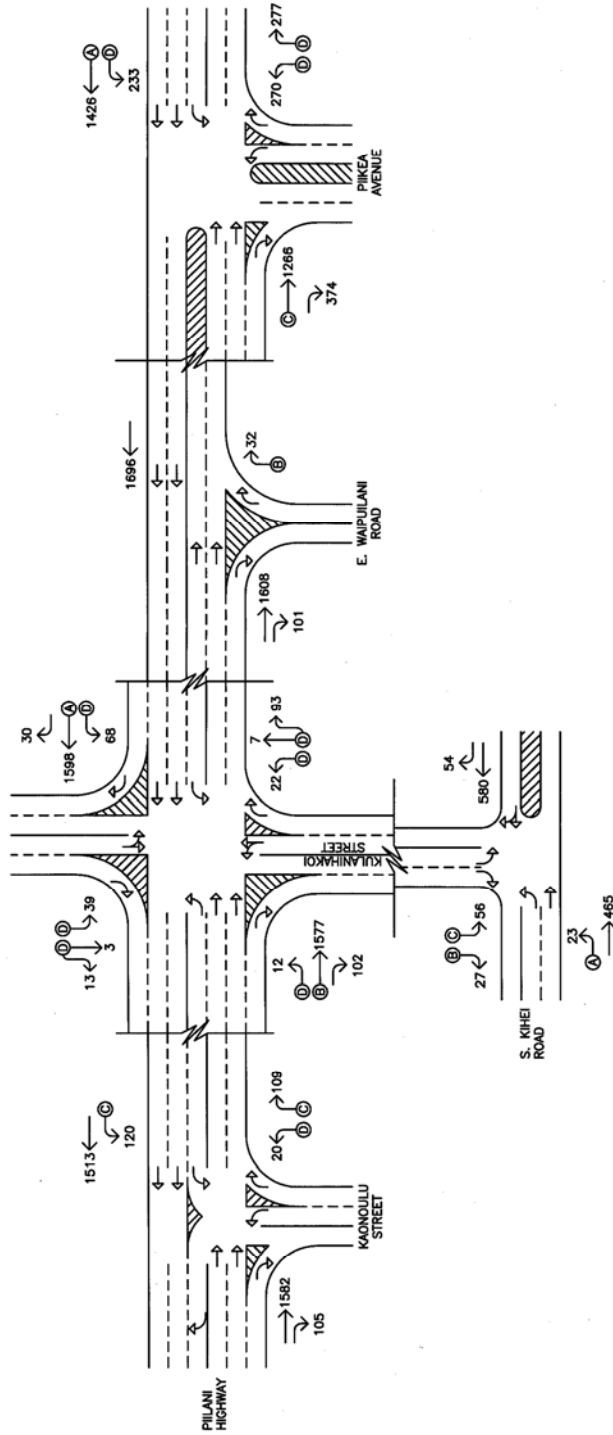


Figure 4-7 (1)
Year 2015 AM Peak Hour of Traffic
With Project

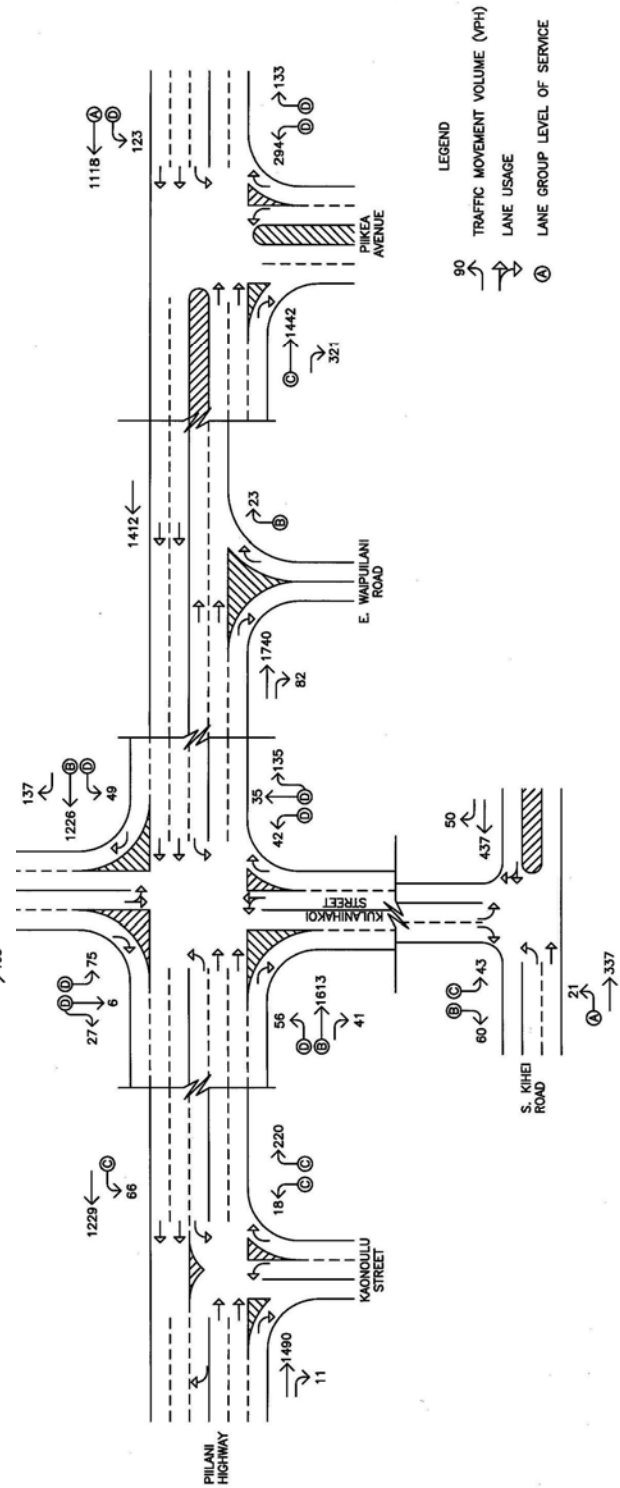


Figure 4-7 (2)
Year 2015 PM Peak Hour of Traffic
With Project

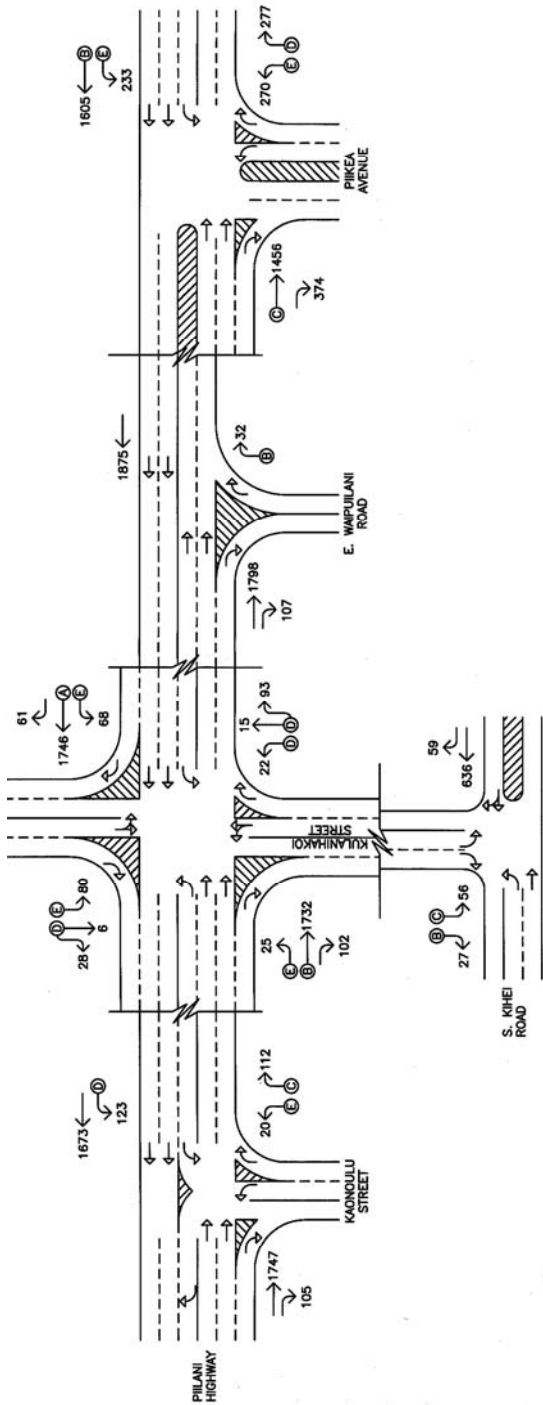


Figure 4-8 (1)
Year 2025 PM Peak Hour of Traffic
With Project

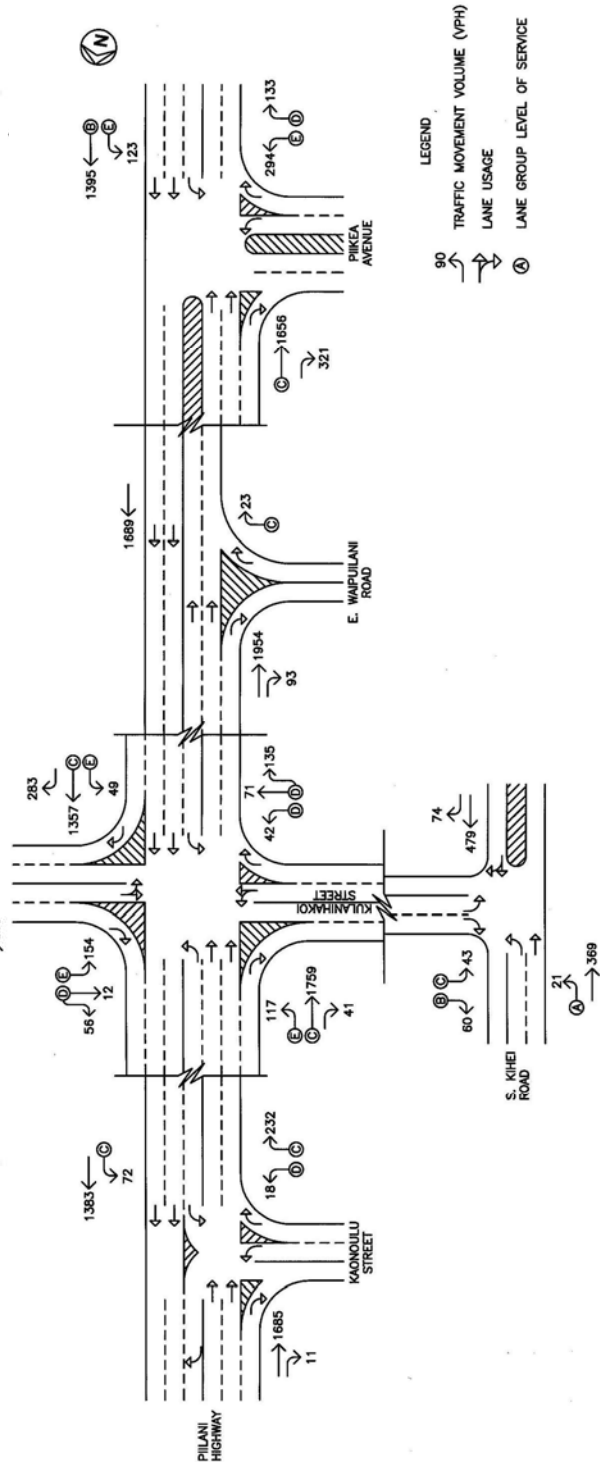


Figure 4-8 (2)
Year 2025 AM Peak Hour of Traffic
With Project

Recommendations

The development of the Kīhei High School project is not expected to have a significant impact on traffic operations in the project vicinity. This is primarily due to the provision of turning lanes and a traffic signal system at the intersection of Pi'ilani Highway with Kūlanihāko'i Street and the access road for the high school. Mitigation measures considered for the project include:

- Maintain sufficient sight distances for motorists to safely enter and exit all project roadways.
- Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
- Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site and avoid vehicle-reversing maneuvers onto public roadways.
- Provide sufficient turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
- Provide an exclusive right-turn lane, shared left-turn lane and through lanes on the access road approach from the high school at the intersection with Pi'ilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide a channelized northbound deceleration lane and acceleration lane along Pi'ilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide an exclusive southbound left-turn lane along Pi'ilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide two (2) eastbound departure lanes along the access road for the high school from the intersection with Pi'ilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
- Modify the eastbound approach of Kūlanihāko'i Street at the intersection with Pi'ilani Highway and the access road for the high school to provide an exclusive right-turn lane and a shared left- turn and through lane. The layout and dimension of these lanes should be determined during the design phase of the project.
- Install a traffic signal system at the intersection of Pi'ilani Highway and Kūlanihāko'i Street, and the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Prepare a Traffic Management Plan for the high school to minimize the impact of school related vehicles on the surrounding roadways. This plan should address daily school and special event traffic.
- Consider preparing Traffic Assessment Reports periodically once the high school is opened to verify projected traffic conditions in the vicinity and assess the effectiveness of traffic management strategies implemented by the proposed high school.

Plans to mitigate the construction period traffic impacts include scheduling off-peak movement of equipment and materials to minimize the disruption to traffic flow and inconvenience to the motoring public, bicyclists and pedestrians. Dust and noise pollution will be contained through

job-site construction management practices and adherence to State and County laws which pertain to construction dust management and noise control. A Construction Traffic Management Plan will be prepared to minimize conflicts with traffic along roadways during construction.

With the implementation of the above mitigation measures, traffic impacts are not expected to be significant.

Pedestrian Safety

The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school. Safe walking and bicycling opportunities will be integrated into the overall project design. The installation of a traffic signal system at the intersection of Pi'ilani Highway and Kūlanihāko'i Street, and the access road for the high school, will provide for safe crossing and pedestrian travel to and from the campus.

4.2.5.2 Parking and Loading

Parking for students, staff and visitors will be provided in parking lots adjacent to the campus. A school bus loading/parking area will be provided to allow loading and parking for up to 15 buses. During normal school days, buses will unload and pick up students here. Buses can unload and park here during events such as football games. Overflow parking for events will potentially be accommodated on a seven-acre portion of the campus located across the Kūlanihāko'i Street extension. A Conceptual Parking Plan is provided below (*Figure 4-9*).

Parking requirements for the proposed high school are determined from several different regulations. DOE standards for faculty and visitors are part of the FADS system. DOE has determined 226 stalls are required to support faculty and visitors to the campus.

The County of Maui Zoning Code has age-based requirements for student parking based on total number of classrooms. According to the Zoning Code, approximately 560 stalls will be required for student parking. The Zoning Code also requires parking spaces to accommodate component facilities such as the future auditorium, football / soccer stadium, library, the future swimming pool, gymnasium and cafeteria. The 5,000-seat football/soccer stadium will be the largest single component use, requiring 833 parking spaces per code. Under the Zoning Code, the total number of parking spaces required for the campus is approximately 1,941.

Loading spaces will be provided as necessary throughout the campus per the requirements of the Maui County Code.

Potential Impacts and Mitigation Measures

Campus parking requirements per the Maui County Zoning Code are very high due to student and staff parking requirements in addition to parking requirements for the 5,000-seat stadium. Because sporting events at the stadium are not anticipated during school hours, it is possible that some of the student and staff parking can serve as stadium parking during sporting events. The conceptual site plan currently shows 948 total parking spaces, which does not meet the 1,941 spaces required by the County Zoning Code, but would serve to meet the school's parking needs during normal school hours or during sporting events at the stadium. This issue remains unresolved and will need to be determined between DOE and the County.

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Figure 4-9
Conceptual Parking Plan

4.2.6 Air Quality

An Air Quality Study was conducted for the proposed Kīhei High School project by B.D. Neal and Associates in September 2011 (*Appendix H*). The study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce potential air quality impacts.

Both federal and State standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawai'i air quality standards are generally comparable to the national standards although the state standards for carbon monoxide are more stringent than the national standards.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the project area is very much affected by its elevation near sea level and by nearby mountains. Haleakala shelters the area from the northeast trade winds, and local winds (such as land/sea breezes and upslope/downslope winds) affect the wind flow in the area much of the time. Temperatures in the project area are generally very consistent and warm with average daily temperatures ranging from about 63°F to 86°F. Rain-fall in the project area is minimal with an average of only about 12 inches per year.

The largest sources of air pollution in the immediate project area are likely agricultural operations and automobile traffic using local roadways. Emissions from these sources consist primarily of particulate, carbon monoxide and nitrogen oxides. Power plants burning diesel fuel are located several miles away. These sources mostly emit sulfur dioxide, nitrogen oxides and particulate. Volcanic emissions from distant natural sources on the Big Island also affect the air quality at times during kona wind conditions. By the time the volcanic emissions reach the project area, they consist mostly of fine particulate sulfate.

Potential Impacts and Mitigation Measures

Except for periodic impacts from volcanic emissions (vog) and possibly occasional localized impacts from traffic congestion and local agricultural sources, the present air quality of the project area is believed to be relatively good. There is very little air quality monitoring data from the State DOH for the project area, but the limited data that are available suggest that concentrations are generally well within State and National air quality standards.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control

measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Monitoring dust at the project boundary during construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, motor vehicles coming to and from the proposed development will result in a long-term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, a computer modeling study was undertaken to estimate current ambient concentrations of carbon monoxide at intersections in the project vicinity and to predict future levels both with and without the proposed project. During worst-case conditions, model results indicated that present 1-hour and 8-hour carbon monoxide concentrations are well within both the state and the national ambient air quality standards. In the year 2015 without the project, carbon monoxide concentrations were predicted to decrease (improve) somewhat in the project area, and worst-case concentrations should remain well within air quality standards. With the project in the year 2015, carbon monoxide concentrations compared to the without-project case were projected to remain nearly unchanged, and worst-case concentrations should remain well within air quality standards. This would continue to be so in the year 2025 when full enrollment is reached. With or without the project, carbon monoxide concentrations in the project area during the next 15 years will likely decrease (improve) somewhat compared to existing concentrations. Implementing mitigation measures for traffic-related air quality impacts is probably unnecessary and unwarranted.

4.2.7 Noise

Y. Ebisu and Associates conducted an Acoustic Study for the Kīhei High School project in September 2011 (*Appendix I*). The study describes the existing and future noise environments in the vicinity of the proposed Kīhei High School site and provides recommendations for mitigating noise impacts associated with the project.

Noise is defined as unwanted sound. Sound may be classified as noise when it damages hearing ability, causes other bodily effects detrimental to health and safety, disturbs sleep and rest, interferes with conversation or other forms of communication.

The Day-Night Average Sound Level (DNL) method, developed by the Environmental Protection Agency, is the most widely used to describe environmental noise. The measurement is weighted so that late night noises are penalized, on the assumption that these noises are more objectionable because they can disturb sleep. Current federal noise standards and acceptability criteria for residential land uses is presented in the following *Figure 4-10*. An exterior noise level of 65 DNL or less is considered acceptable for residences. This standard is applied nationally, including Hawai'i.

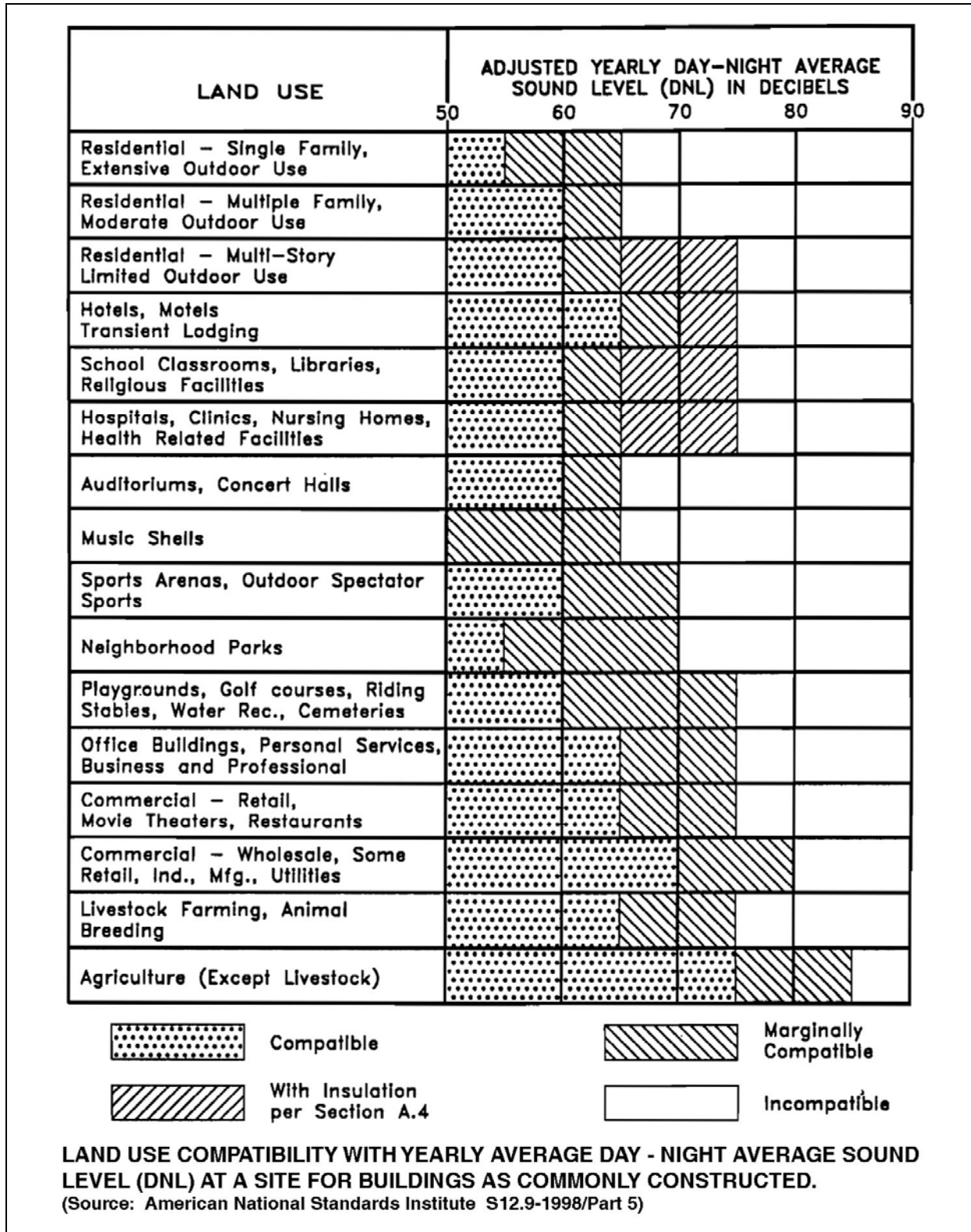


Figure 4-10
Land Use Compatibility Day-Night Average Sound Level Guideline Chart

In Hawai'i, the State DOH regulates noise from fixed mechanical equipment and construction activities. State DOH noise regulations are expressed in maximum allowable noise limits rather than DNL. Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for single family residential lands equate to approximately 55 DNL. For multifamily residential, commercial, and resort lands, the State DOH noise limits equate to approximately 60 DNL. For light and heavy industrial lands, the State DOH noise limits equate to approximately 76 DNL. Construction activities, which are typically noisier than the State DOH noise limits, are regulated through the issuance of permits for allowing excessive construction noise during limited time periods.

Traffic and background ambient noise measurements were obtained in September 2011. Calculations of existing traffic noise levels during the AM and PM peak traffic hours and hourly equivalent sound level contribution from each roadway section in the project environs were provided for comparison with forecasted traffic noise levels in calendar year (CY) 2025 with and without the project.

The existing background ambient noise levels within the project site are relatively low at the mauka (east) end and relatively high on the makai (west) end of the site. Traffic along Pi'ilani Highway controls the background noise levels at the makai end of the project site, noise levels diminish to relatively low levels at the mauka end of the project site. On the makai side of Pi'ilani Highway, existing traffic noise levels also diminish with increasing distances from Pi'ilani Highway, and are controlled by the traffic on connector roads and South Kihei Road in areas between Pi'ilani Highway and the shoreline.

The existing background noise levels at the school site were estimated to range from approximately 56 to 62 DNL near the proposed Practice Fields to approximately 45 DNL at the mauka end of the project site. These estimates were based on traffic noise model calculations of existing noise levels along Pi'ilani Highway. According to federal noise standards, the existing traffic noise levels in the project environs along Pi'ilani Highway are in the "Significant Exposure, Normally Unacceptable" category, and at or greater than 65 DNL at the first row of existing homes on the makai side of the highway. The existing traffic noise levels in the project environs along South Kihei Road are in the "Significant Exposure, Normally Unacceptable" categories, and at or greater than 65 DNL within 50 feet of the roadway's centerline. Along the lower volume connector streets, existing traffic noise levels are in the "Moderate Exposure, Acceptable" category, and less than 65 DNL at 50 feet or greater distance from the roadways' centerlines.

Potential Impacts and Mitigation Measures

Predictions of future traffic noise levels were made using the traffic volume assignments of 2025 with the proposed project. The dominant traffic noise sources in the project environs will continue to be traffic along Pi'ilani Highway and South Kihei Road, with the increases in future traffic noise levels being relatively small along these two roadways and primarily associated with non-project traffic.

Very small changes in traffic noise levels (0.0 to 0.1 DNL) are expected along Pi'ilani Highway in the project environs between CY 2010 and 2025 as a result of project traffic. The growth in non-project traffic by CY 2025 is predicted to result in traffic noise level increases of 0.5 to 0.6 DNL along Pi'ilani Highway.

Along Kūlanihākoʻi Street, makai of Piʻilani Highway, increases in future traffic noise levels of 0.7 DNL are predicted by CY 2025, primarily as a result of project traffic. Traffic noise level increases on the mauka side of the Piʻilani Highway along the future entrance road to the project site are associated only with project traffic. Noise increases on the Kūlanihākoʻi future entrance road mauka of Piʻilani Highway are anticipated to increase to 62 DNL in CY 2025 due to project traffic, a level considered Acceptable per Federal noise guidelines.

Future traffic noise levels on the proposed school site from forecasted traffic along Piʻilani are anticipated to range from 45 DNL near the mauka property line to 63 DNL near the makai edge of the Practice Baseball Field. The future campus of Kīhei High School is planned so that the noise sensitive buildings and classrooms are set back at least 650 feet from Piʻilani Highway, where future traffic noise levels are predicted to be “Acceptable” at less than 55 DNL. The terracing of the school grounds plus the noise shielding effects from buildings which are closest to the highway should further reduce traffic noise levels from Piʻilani Highway.

Potential short-term and long-term noise impacts are discussed below.

Short-term Impacts

General Construction Noise: Temporary, unavoidable noise impacts may occur during construction activities within the project area, particularly during the excavation and earth moving activities on the project site. Construction activities are predicted to be audible within the project site and at nearby properties, therefore, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment and compliance with State DOH construction noise regulations are recommended as standard mitigation measures.

Long-Term impacts

Traffic Noise: Along Piʻilani Highway fronting the school site, traffic noise levels are expected to increase from approximately 70 to 71 DNL at 100 foot distance from the centerline by CY 2025 as a result of project and non-project traffic. The 0.7 DNL increase is relatively small due to the relatively high existing traffic volumes on the highway when compared to the projected increases in future traffic volumes along the highway by CY 2025. Project traffic will account for approximately 0.1 of the 0.7 DNL units of noise increase along Piʻilani Highway in the immediate vicinity of the project. Along Kūlanihākoʻi Street, west of Piʻilani Highway, traffic noise levels are expected to increase by 0.7 DNL by CY 2025 as a result of project traffic. Along South Kīhei Road north and south of Kūlanihākoʻi Street, traffic noise levels are expected to increase by 0.5 to 0.6 DNL by CY 2025 as a result of non-project traffic. These levels of traffic noise increases resulting from non-project and project generated traffic are not considered to be significant. The predicted increases in project generated traffic noise levels are not expected to generate adverse noise impacts by CY 2025.

The conceptual campus site plan is designed such that noise sensitive buildings of the school are situated at very large setback distances from Piʻilani Highway, where existing and future traffic noise levels are predicted to be less than 55 DNL. The large buffer distances to the highway will allow for the use of naturally ventilated buildings on the school campus.

On-Site Noise Sources: The potential noise from playground, practice field, pool, and athletic stadium activities could disturb neighboring residences. Noise levels associated with these outdoor facilities tend to be high due to the shouting and screaming which occur during these outdoor activities and play periods. The neighboring properties to the south and across Pi'ilani Highway to the west are the most likely areas to experience the highest noise levels (53 to 65 decibels A-weighted) from these outdoor activities. In addition, potential noise levels from the school's central plant equipment may also cause adverse noise impacts if the noise levels are not controlled.

Noise mitigation measures which limit the noise from fixed mechanical equipment to those allowed by the State Department of Health should be incorporated into the project. In addition, public address systems installed at the outdoor facilities should be designed to minimize sound spillover into adjacent properties.

4.2.8 Hazardous Materials

A Phase I Environmental Site Assessment (ESA) was prepared by Group 70 International, Inc., in August 2011 for the proposed Kihei High School project site comprised of TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 (*Appendix J*). The Phase I ESA was conducted at the request of the DOE to meet requirements of the Innocent Landowner Defense identified in the requirements for All Appropriate Inquiry (AAI) under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), for disclosure within an EIS being prepared in association to the proposed Kihei High School project, to acquire the property, and to achieve a prerequisite for LEED for Schools Certification.

The purpose of the Phase I ESA is to identify any recognized environmental conditions (specifically, evidence as to the presence or likely presence of any hazardous substance or petroleum product under conditions that indicate an existing release, a past release or a material threat of a release into property structures or to ground, groundwater or surface water) on the subject parcels. The Phase I ESA complies with the American Standard for Testing and Materials (ASTM) Standard E 1527-05 Standard Practice for ESA: Phase I ESA Process; and includes a historical review, regulatory agency and document reviews, site reconnaissance, interviews and identification of environmental concerns.

The term hazardous materials or hazardous wastes means those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Sections (§§) 9601 et seq., and Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901–6992. In general, these include substances that, because of their quantity, concentration, or physical, chemical, or toxic characteristics, may present an unreasonable risk to health, safety, and the environment when released.

Upon completion of the Phase I ESA of the subject property, no evidence of current or historical use or storage of hazardous and/or regulated materials or wastes was identified on the subject property or adjacent properties. At the time of the site investigation, site activities included vacant undeveloped pasture land. RCRA regulated hazardous waste was not observed to be generated, stored, accumulated, transported, or disposed on the project site.

Potential Impacts and Mitigation Measures

Based on the information gathered for the Phase I ESA, no adverse environmental impacts to the subject property resulted from past activities. As defined by ASTM, the assessment revealed no evidence of recognized environmental conditions in connection with the subject property.

Short-term construction-related impacts are not anticipated with the implementation of the proposed action. The new Kīhei High School will not require demolition or removal of existing facilities where hazardous materials such as asbestos typically occur. While the accidental release of hazardous materials into the environment associated with the use of construction equipment and vehicles may be possible, impacts are not anticipated. Preparation of a hazardous materials spill response plan prior to commencement of construction activities would greatly reduce the likelihood of significant impacts resulting from any spill.

Hazardous materials may be used on the project site in relationship to ongoing building maintenance operations, such as fluorescents, ballasts, latex paint, solvents, gas, oil, lubricants. These materials will be stored in appropriate designated areas on the property and disposed of in accordance with applicable regulatory controls.

Site-specific BMPs, including procedures for hazardous material storage, handling, and staging; spill prevention and response; waste disposal; and good housekeeping should be developed and implemented by the construction contractor. Spill control measures would entail minimization of hazardous materials on the project site and rapid spill response in the event of a release. Material management practices would also be used to reduce the risk of spills or other accidental release of materials and substances into the environment. No significant long-term impacts are anticipated to occur as a result of hazardous materials.

4.2.9 Scenic and Visual Resources

The Kīhei High School project site is located in the Kīhei-Mākena region on the south side of Maui. The site is characterized by open, undeveloped grazing land dotted with scrub brush and rock outcroppings. The site is located from approximately 20 to 100 feet AMSL elevation and slopes gently upward to the east toward the summit of Haleakalā. The West Maui Mountains are located to the northwest.

The Site Photo Key is provided in *Figure 4-11* below, and *Figures 4-11 (1) through 4-11 (7)* depict existing conditions on the project site.

According to the County of Maui 2030 General Plan and the Kīhei-Mākena Community Plan, the major visual assets in the region are the South Maui sandy beaches, coastal views, expansive open spaces on the leeward slopes of Haleakalā, views from Kīhei-Mākena to Upcountry and Central Maui, and significant views of agricultural land. The Kīhei-Mākena Community Plan also advocates for landscaped buffer areas adjacent to Pi'ilani Highway to reduce noise, reduce visual impacts of development, and maintain a parkway character. The Kīhei High School project site is not located in a designated scenic corridor.

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Due to the geographic separation caused by sloping terrain, the Kīhei High School campus site concept includes terracing at increasing elevations. Academic and administrative buildings are anticipated on the upper levels, and the sports stadium, supporting athletic facilities, outdoor play courts, and practice fields are anticipated on the lower levels. Campus structures will generally range from one (1) to two (2) stories, and the stadium bleachers and broadcast booth are anticipated to reach approximately 40 feet in height.

Potential Impacts and Mitigation Measures

Construction of the proposed high school would result in potential impacts to mauka views from Pi'ilani Highway. Development of the project site will replace vegetated land with a high school campus, playing fields, landscaping, and related infrastructure such as internal roadways.

Kīhei High School will be visible from Pi'ilani Highway and existing neighboring developments. The project design will maintain visual standards of the area by meeting County height and design requirements. To mitigate potential visual impacts, the campus will include open space and landscaped areas throughout the development. Landscaping and playing fields are planned fronting Pi'ilani Highway to maintain a setback for reduction of visual and noise impacts and maintain a park-like open visual corridor. The project is not anticipated to significantly impact mauka views of Haleakala or coastal views. See *Figure 4-12* for an illustrative view of the conceptual campus layout. Final site design will be determined by the project developer and DOE.

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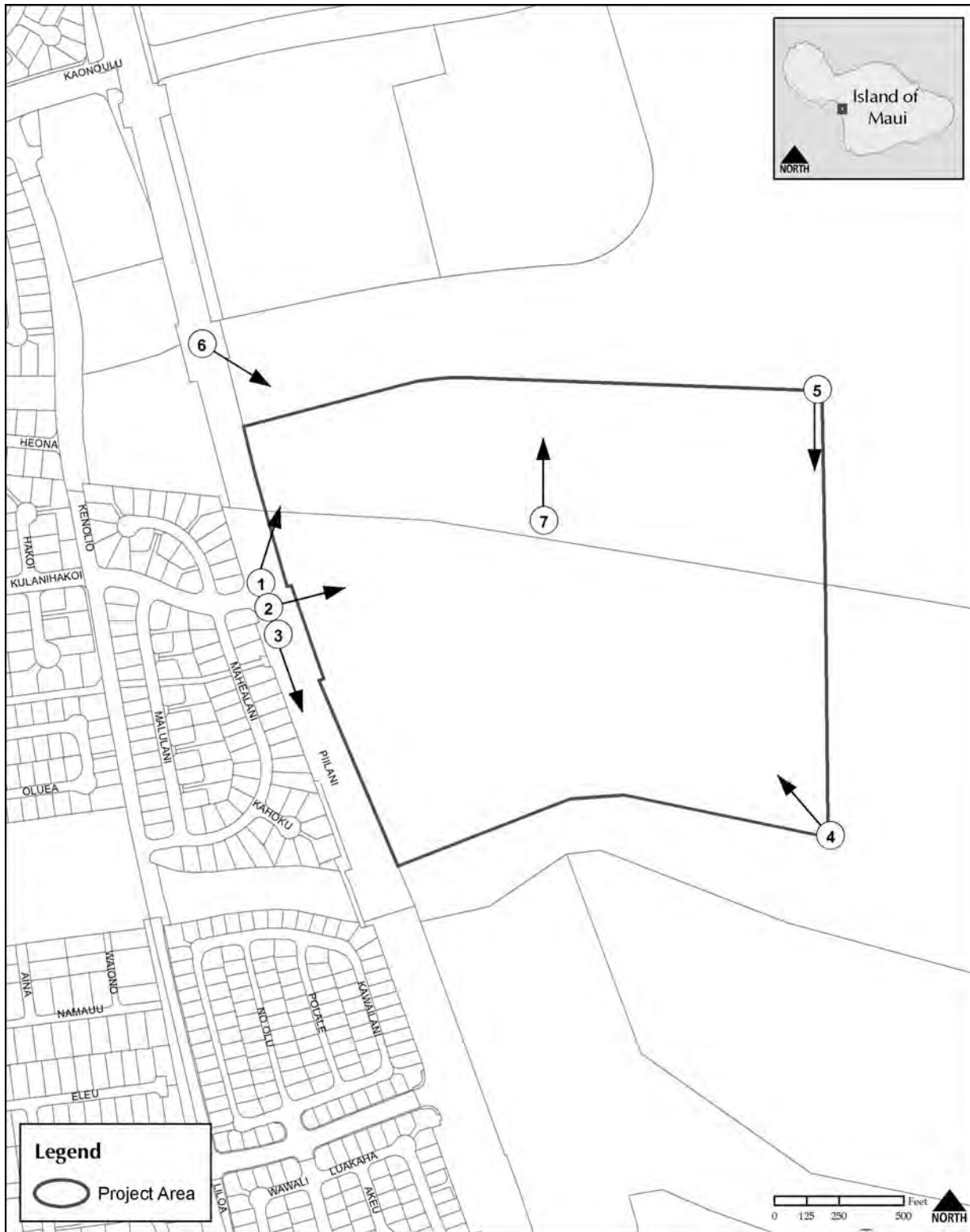


Figure 4-11
Site Photo Key



Figure 4-11 (1)
View From Pi'ilani Highway at Kūlanihāko'i Street, Looking North



Figure 4-11 (2)
View From Pi'ilani Highway, Looking East



Figure 4-11 (3)
View From Pi'ilani Highway, Looking South



Figure 4-11 (4)
View from Southeast Corner of Site, Looking Northeast



Figure 4-11 (5)
View from Northeast Corner, Looking South



Figure 4-11 (6)
**Looking Northwest from Pi'ilani Highway at
Southeast Corner of Site**



Figure 4-11 (7)
**Northern Portion of Site Taken from Center of
Property**

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Figure 4-12
Conceptual Perspective Rendering

4.2.10 Infrastructure

Gray, Hong, Nojima and Associates, Inc. conducted a Preliminary Civil Engineering Report for the Kīhei High School project in October 2011 (*Appendix K*). The study evaluates the existing and future infrastructure systems required to support the proposed project.

4.2.10.1 Water System

Water Resource Associates studied the existing hydrogeological conditions of the Kīhei area and concluded "...there are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be economically or feasibly developed for the proposed high school" (2011). Therefore, potable water is proposed to be provided by the DWS Central Maui Water System. According to available information, the Central Maui Water System does not extend to Pi'ilani Highway or the Kīhei High School project site. The nearest water facility to the project site is the 8-inch water line at the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village Subdivision. Further south on Kūlanihāko'i Street at the intersection with Līloa Drive is a 36-inch concrete pipe transmission main and 18-inch ductile iron distribution main. The 18-inch distribution main is connected to both reservoirs in the area, but is primarily served by the Hale Kīhei Reservoir at elevation 220 feet AMSL. According to DWS staff the water pressure at fire hydrant 763 located on Mahealani Street near to the intersection of Kūlanihāko'i Street in the Pi'ilani Village subdivision is 82 pounds per square inch (PSI) at elevation 33 feet AMSL.

The DOE will eventually conduct a final subdivision to consolidate the properties acquired from Haleakala Ranch and Ka'ono'ulu Ranch into the proposed Kīhei High School project site. In the past the water availability policy (a verification of long-term reliable water source for developments) per Title 14 of the Maui County Code would be a condition for subdivision approval. The recent passing of Ordinance 3818, effective April 5, 2011, amends the Maui County Code exempting public developments within the Central Maui Water System from the water availability policy.

Water Demand Estimate

Conceptual site plans for the proposed school were developed through a design charrette process with input from a variety of stakeholders. Based on the charrette discussions and the DOE's anticipated growth in enrollment for the proposed school, preliminary water demands have been projected as shown in *Table 4-9*. In recognition of Maui's water shortage, dual water systems are being planned for the proposed Kīhei High School. It is anticipated that potable water will be supplied by the County's Central Maui Water System and brackish water wells will be constructed at the school site to serve as the non-potable source of irrigation water.

Potable consumption rates used in the water demand projections were developed on the basis of incorporating low-flow and other water conservation fixtures throughout the various buildings. A sustainable design approach will take into account the water efficiency criteria in accordance with the LEED rating system. In working with the DOE, the project team estimated an average potable demand of 20 gallons per capita day (GPCD) for students and staff. A corresponding 10 GPCD average demand for visitors was used. At full build-out, the average daily potable demand is projected at 37,450 GPD. In addition, due to the hot arid climate of Kīhei, the non-potable

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irrigation demand, estimated to be at 185,000 GPD, is significantly higher than typical high school campuses. The total projected potable and non-potable demand is 224,450 GPD at full build out.

Year	No. of Students and Staff	GPCD	No. of Visitors	GPCD	Potable (GPD)			Non-Potable (GPD)
					Average Day	Max Day	Peak Hour	
2015	240	20	10	10	4,900	7,350	14,700	185,000
2016	440	20	20	10	9,000	13,500	27,000	185,000
2017	700	20	30	10	14,300	21,450	42,900	185,000
2018	920	20	40	10	18,800	28,200	56,400	185,000
2025	1,830	20	85	10	37,450	56,175	112,350	185,000

Proposed Infrastructure

There are no on-site public or private water systems serving the property. The domestic water and fire supply would be supplied through the Central Maui Water System by connecting to the existing 18-inch water main on Liloa Drive and upgrading the existing 8-inch water main in the Pi'ilani Village Subdivision. A booster system will be required to meet required fire flow pressure. Irrigation water will be supplied via on-site brackish wells. The domestic, fire, and irrigation lines will consist of separate looped distribution systems following the main roadways and sidewalks throughout the campus.

Potable Supply

The proposed on- and off-site domestic water facilities must comply with DWS Water System Standards and are proposed to be supplied through the Central Maui Water System. Preliminary indications by the DWS are that the proposed Kihei High School Campus would be served off an existing 18-inch ductile iron water main on Liloa Drive makai of the Pi'ilani Village subdivision. Although there is an existing 8-inch main in Kūlanihāko'i Street connected to the 18-inch main, DWS will require that the DOE install a larger diameter water main in Kūlanihāko'i Street to service the proposed school. In addition, because Kūlanihāko'i Street is narrow and shares the right-of-way with other utilities, DWS requests that DOE connect any existing services to the proposed larger diameter water main and abandon the existing 8-inch main. The proposed larger diameter main will cross Pi'ilani Highway and connect to water meters near the project site. The new water main will be situated in both State and County right-of-ways and will be dedicated to the County. DWS will also require separate meters and on-site water mains for domestic and fire purposes, of which the fire meter should be a double-check detector assembly per Water System Standards Detail M-23 for the fire line. The fire main will be sized for fire flow (2,000 GPM) with a residual pressure of 20 PSI at the critical fire hydrant. Hale Kihei Reservoir is at elevation 220 feet AMSL while the highest elevation at the site is approximately 110 feet AMSL, giving an elevation head of 110 feet AMSL or 48 PSI static pressure. Since 20 PSI is needed for fire flow, the fire line can only have a maximum loss of 28 PSI until a booster system is required. It should be noted that per Ordinance 3819 effective April 5, 2011, the requirements for adequate fire protection for

building permit applications for all non-residential units or structures will be transferred from DWS and administered by the Maui Department of Fire and Public Safety.

The domestic water supply will be served by a compound meter. The size of the compound meter would be dependent on the domestic demand. Once the potable demand is established by the Design-Build team, the domestic line will be sized per the Uniform Plumbing Code, which stipulates a minimum 15 PSI pressure per plumbing fixture. Assuming the critical fixture is in a multi-story building at elevation 150 feet AMSL, the static head from the Hale Kīhei Reservoir is approximately 70 feet or 30 PSI. Since 15 PSI is needed for domestic flow, the line can only have a maximum loss of 15 PSI until a booster system is required.

Water pressure calculations should be submitted to the DWS by the Design-Build team to ensure adequate pressures can be attained in both fire and domestic lines. If adequate pressure is unavailable, DWS will require installation of a tank and pump, with an air gap off each meter. The air gap will separate the proposed Kīhei High School water and fire mains from the Central Maui Water System. The tank and pump must be designed to have sufficient capacity and pressure to provide the proposed Kīhei High School the required domestic and fire flow. Per the County Code §14-04-50, the DOE “shall agree to; and shall execute a written release in favor of the department for all claims on account of any inadequacy in the department’s system or inadequacy of water supply to the premise.”

DWS will also require fire hydrants on Pi’ilani Highway fronting the school. The fire hydrants would feed off the proposed County water main system upstream of the proposed meters. The fire hydrant and corresponding water main would be transferred to the County.

Refer to *Figure 4-13* for a conceptual water system plan and *Appendix K* for conceptual construction costs.

Non-potable – Brackish Groundwater

Irrigation water will be provided by on-site brackish (fresh/salt mixture) wells drilled into the groundwater lens below the site. Brackish water would be pumped from the “lens” between the salt water and the fresh water. The lens is a transition zone of brackish water that separates the fresh water from the salt water. The lens forms because the weight of the rain water that percolates into the ground depresses the salt water beneath it. Due to the high salinity of the brackish water, project landscaping should consist of salt tolerant species.

The proposed non-potable water system for irrigation of the school site will include two brackish wells, pressurized transmission and distribution lines, control valves, and other appurtenances, but will not include a storage tank. A primary well would be located at the northeast corner of the site at an elevation of approximately 90 feet MSL (*Appendix K*). The second well would serve as a supplemental/standby well located at the southeast corner of the property at roughly the same elevation as the first well (*Figure 4-13*).

According to the project’s Groundwater and Resources Report prepared by Water Resources Associates (2011), it is projected that each well will have a capacity in the range of 250 to 350 GPM while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Actual pumping capacities will be determined during well tests when the wells are drilled. Therefore, pending the test results, the system may run under alternating or simultaneous operation

of the wells in order to meet the estimated demand of 185,000 GPD within a 9 to 13 hour irrigation period. According to Water Resources Associates (2011), the wells are not expected to have any adverse impact on the existing water supply (fresh and brackish) and nearby wells. Refer to *Appendix K*.

Potential Impacts and Mitigation Measures

The Kīhei High School project will require construction and extension of on- and off-site domestic water utilities. Final water demand calculations and water supply system design will be prepared by the DB team. Improvements will comply with DWS Water System Standards and are proposed to be supplied through the Central Maui Water System.

According to Water Resources Associates (2011), the two (2) non-potable wells are not expected to have any adverse impact to the existing water supply (fresh and brackish) and nearby wells.

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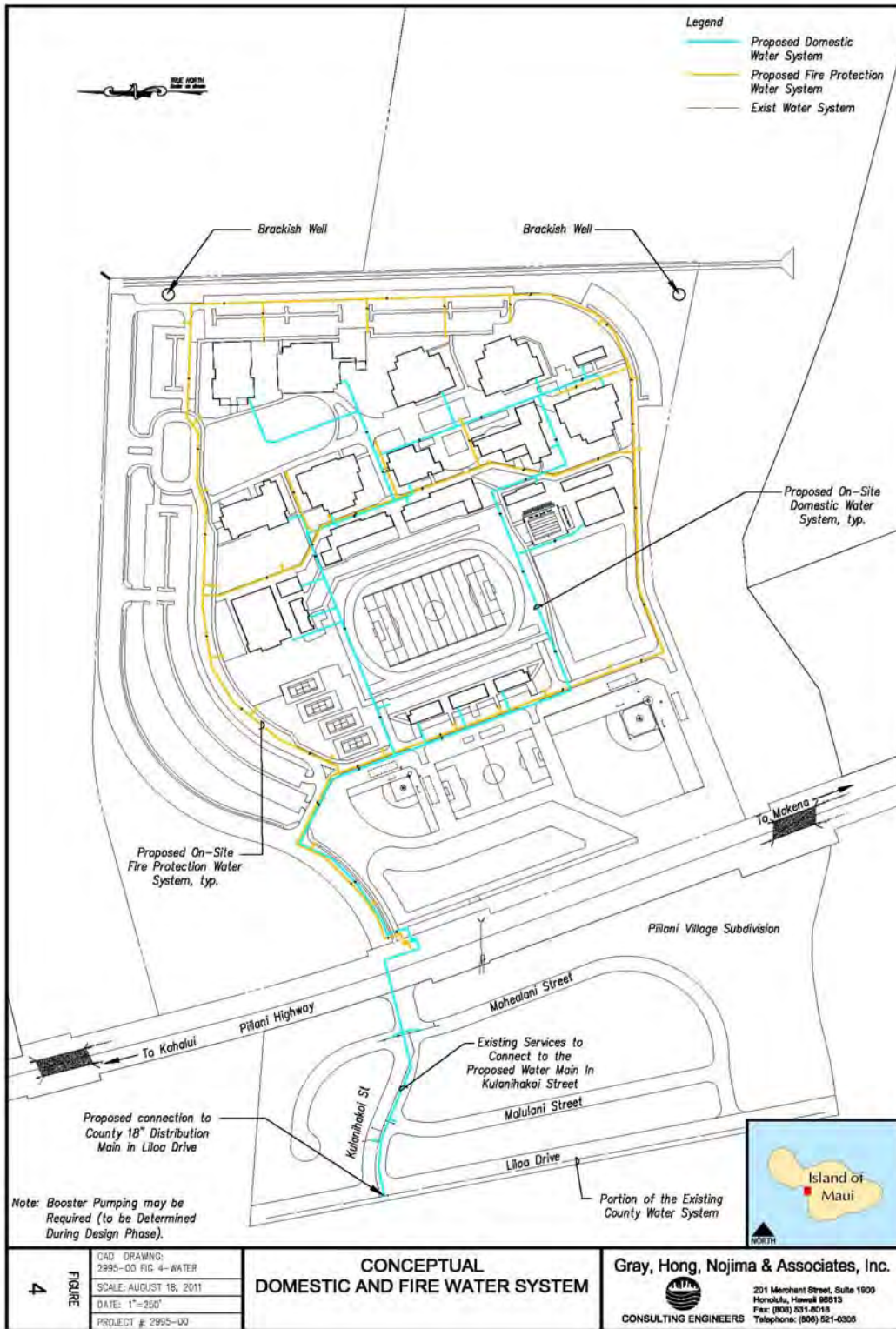


Figure 4-13
Conceptual Domestic and Fire Water System

4.2.10.2 Wastewater

According to available information, there are no existing wastewater facilities on-site or sewer connections to the site on Pi'ilani Highway. The nearest wastewater connection is a drop manhole at the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village Subdivision. Wastewater is conveyed through a collection system and pump stations to the Kihei WWRF.

Proposed Infrastructure

Proposed on- and off-site sewer lines will comply with the County standards. The existing collection system (including Kihei Wastewater Pump Station Nos. 3, 4, 5 and 6) should have adequate capacity for flows generated by the proposed Kihei High School such that upgrades are not necessary (*Appendix K*). The County will formally determine if any upgrades are required after the Plan Review Application form is submitted. If upgrades are necessary to support the proposed Kihei High School, the DOE will be required to fund any mandatory off-site improvements to the collection system. It is anticipated that sewer service will be provided by the extension of the County system from an existing drop manhole in the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village subdivision approximately 300 feet from the proposed Kihei High School. The proposed sewer line would extend across Pi'ilani Highway to an on-site property sewer service manhole. The DOE would be responsible for any required costs to connect to the County system. The on-site system will consist of gravity sewer mains to be located within roadways and sidewalks. The DOE will be responsible for maintenance of the on-site sewers, since the County will not accept sewer easements that traverse private property. The wastewater flow projections for the project are based on land use areas, unit counts, and estimated enrollment using demand rates from the State HAR Chapter 11-62, Appendix F and the County Wastewater Reclamation Division, *Wastewater Flow Standards*. The flow rate estimates in *Table 4-10* factor in both wet and dry inflow and infiltration and peak flow factors, including a maximum peak flow factor of five (5).

Table 4-10 WASTEWATER FLOW PROJECTIONS					
Year	Population (Students, Staff and Visitors)	GPCD	Wastewater Flows (MGD)		
			Average Day	Max Day	Peak Hour
2015	240	25	4,900	7,350	14,700
2016	440	25	9,000	13,500	27,000
2017	700	25	14,300	21,450	42,900
2018	920	25	18,800	28,200	56,400
2025	1,830	25	37,450	56,175	112,350

Refer to *Figure 4-14* for a conceptual sewer system plan and *Appendix K* for conceptual construction costs.

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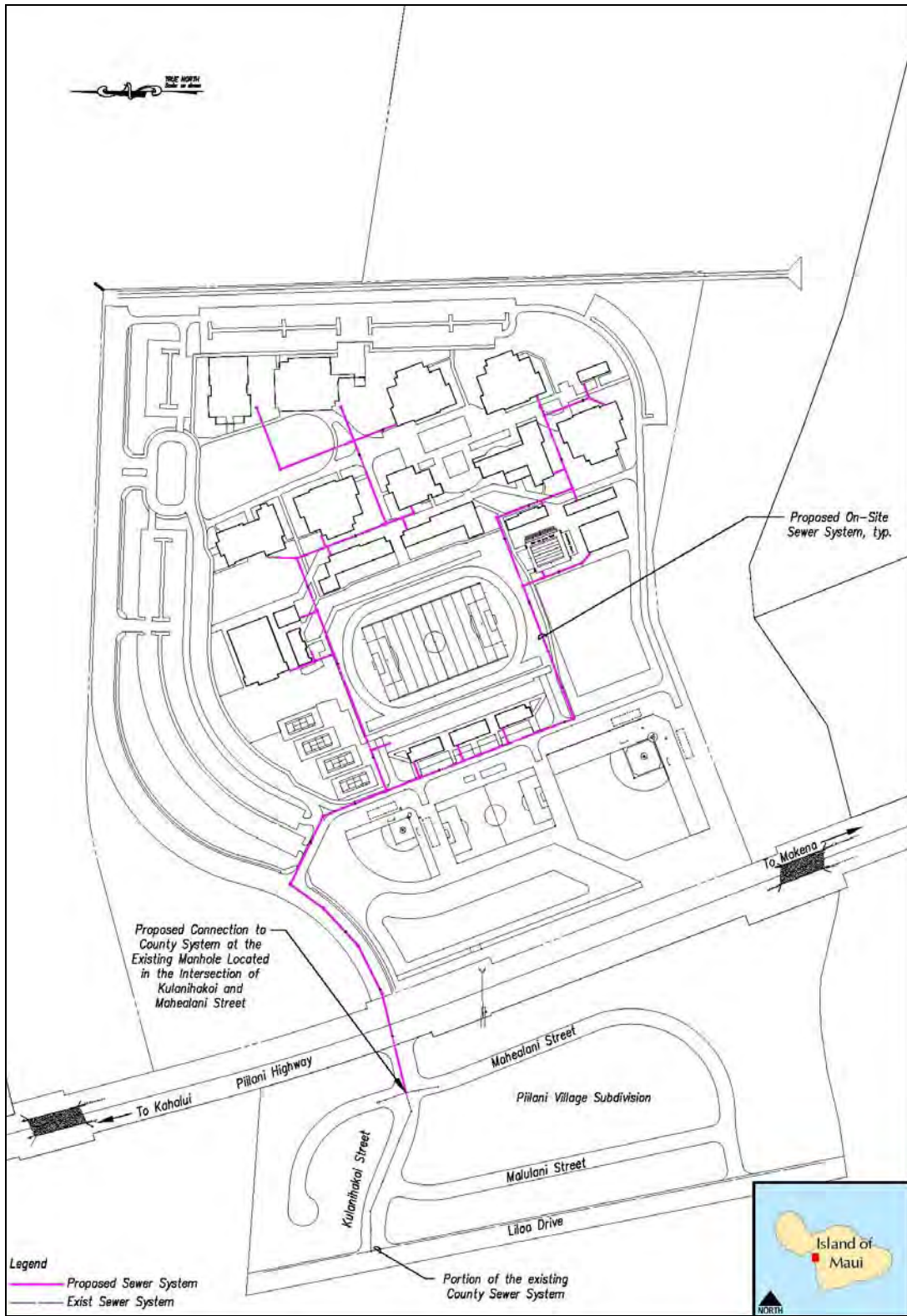


Figure 4-14
Conceptual Sewer Plan

Potential Impacts and Mitigation Measures

The Kīhei High School project will require construction of on-site wastewater facilities and extension of on- and off-site sewer connection. The proposed sewer line will comply with the County of Maui standards. While the existing collection system should have adequate capacity for flows generated by the proposed high school, the County will formally determine if upgrades are required. The DOE will be responsible for costs required to connect to the County System. Significant adverse impacts are not anticipated.

4.2.10.3 Drainage

The Kīhei High School project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakalā. The project site ranges in elevation from about 30 feet AMSL at Pi'ilani Highway, to an elevation of about 110 feet at the eastern boundary with slopes ranging from two (2) to eight (8) percent.

Because the property is vacant there is no existing drainage system serving the site except for drainage infrastructure in Pi'ilani Highway, which is owned and maintained by the DOT. The majority of the existing runoff at the site drains towards a 72-inch diameter culvert under Pi'ilani Highway. The remainder of the runoff drains into either Kūlanihāko'i Gulch or Waipu'ilani Gulch. Both gulches cross Pi'ilani Highway under bridges spanning the gulches. These gulches are generally dry except after significant rainfall events.

Existing Hydrology

According to the Trans-Meridian Engineers Hydrology report (no date) for the DOT's Pi'ilani Highway, the site extends over three (3) drainage basins labeled as 8, 9 and 10 (refer to *Figure 4-15*). Basins 8 and 10, which contain Kūlanihāko'i and Waipu'ilani Gulch, respectively, extend from bridges crossing Pi'ilani Highway up to Haleakalā South West Rift Zone. Basin 9 encompasses a small area between the gulches which empties into the existing 72-inch culvert under Pi'ilani Highway. Since the report was completed in the 70s, the current Maui Drainage Standards were applied to the basin parameters to obtain updated existing peak flows (refer to *Table 4-11*).

Table 4-11 PRELIMINARY ANALYSIS OF EXISTING BASINS (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)						
Basin No.	Area (Acres)	CN	Tc (Min.)	Q (50) (cfs)	Q (100) (cfs)	Outlet
8	9,649	73	99	9,762	12,330	Kūlanihāko'i Bridge
9	143	79	26	367	450	72-inch Culvert
10	7,314	73	96	7,547	9,532	Waipu'ilani Bridge

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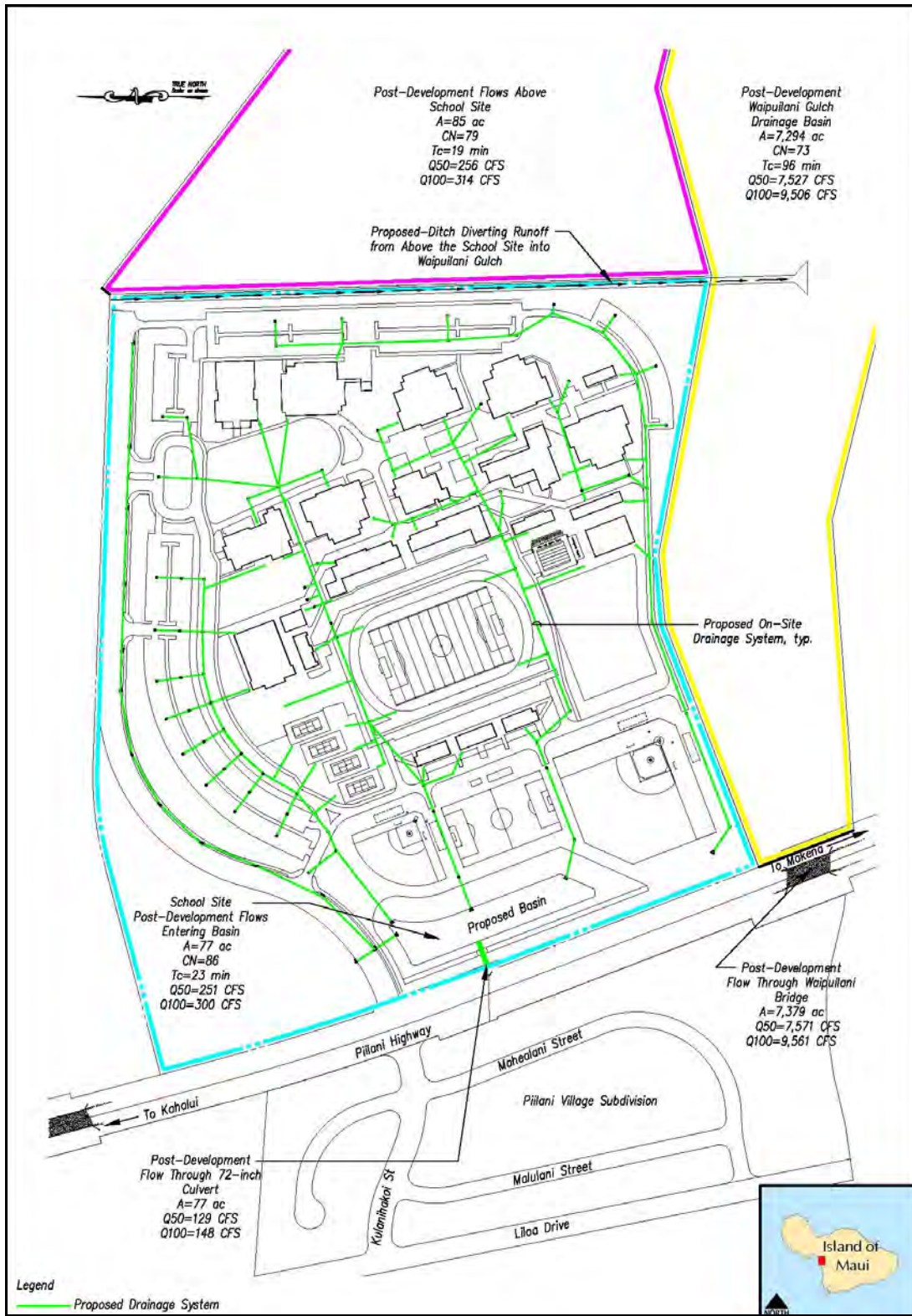


Figure 4-15
Conceptual Drainage Plan

Design Criteria

The proposed drainage system's hydrologic criteria should be in accordance with County Standards with the exception of applying National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Volume 4 Version 2.1 (2009) in lieu of Plates 2, 4 and 7 (Intensity Duration Curves and Rainfall Intensity Maps). The on-site drainage system should be designed for runoff determined by the rational method for 1-hour rainfall with return periods of 10 years or 50 years per the County of Maui Drainage Standards. The rational method is based on the drainage area, runoff coefficient (ground cover conditions), and the rainfall intensity for duration equal to the time of concentration. Since the project site is less than 100 acres and potential sumps in the school site, the 50-year return period should be applied to the project site.

During the design phase, the Design-Build entity would review the effects of the proposed school development on neighboring gulches, bridges and downstream properties. It should be noted that the offsite basins' drainage area exceeds 100 acres, therefore the NRCS hydrograph method for the 100-year return period based on 24-hour rainfall should be considered during the design phase. The NRCS hydrograph method uses watershed characteristics (drainage area, time of concentration, rainfall, SCS curve number of the land use or soil group, and a SCS design storm based on geographic locale) to develop a runoff hydrograph (See *Appendix K*).

Since the existing undeveloped site will be replaced with impervious surfaces, an on-site basin is necessary to regulate the increase in runoff into the existing 72-inch culvert under Pi'ilani Highway. The basin should be designed in accordance with County Drainage Standards which stipulate that the storage volume of the basin shall be equal to at least the total additional runoff volume for a 50-year return period based on a 1-hour storm. Additionally, the Design-Build entity could incorporate the current requirements of the United States Green Building Council (USGBC) in the basin design which may allow for possible Leadership in Excellence and Environmental Design (LEED) Site Sustainability credits.

In addition, the Maui County Public Works Engineering Division and R.M. Towill Corporation are preparing a drainage master plan for Kihei with a draft scheduled for release in 2012. During design, the design-build team should prepare a drainage report that describes the project's overall drainage concept and incorporates the stormwater management strategies in accordance with any recommendations of the forthcoming Kihei drainage master plan. The drainage report should include: analysis of existing conditions, stormwater system sizing criteria, detention/retention analysis, flood analysis, drainage system plans, and hydraulic calculations. As part of the approval process for this project, the drainage report should be submitted to both the County and DOT and include any additional criteria per the respective drainage standards.

Conceptual Drainage Plan

The proposed drainage system will consist of the following improvements:

- The off-site drainage improvements are intended to divert runoff generated above the proposed Kihei High School into the neighboring Waipu'ilani Gulch.
- The on-site drainage system should be designed to safely convey on-site runoff into the basin and prevent runoff entering Pi'ilani Highway.

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- The on-site basin should be designed to reduce post-development flow rates and quantity to below pre-development levels.
- The 7.7-acre parcel formed by the extension of Kūlanihākoʻi Street will remain vacant; there will not be any drainage improvements constructed within the parcel at this time.

On-site Drainage Concept

The proposed school site occupies portions of Basins 8, 9, and 10 as described above. The majority of the school site is situated within the lower portion of Basin 9. The runoff from the remainder Basin 9 and portions of Basin 10 will be intercepted by a proposed ditch constructed along the Kīhei High School upper boundary and diverted into Waipuʻilani Gulch (refer to *Figure 4-15*). The proposed ditch should be designed in accordance with County Drainage Standards with appropriate freeboard and velocity dissipation. Based on the conceptual site plan, it is anticipated that the ditch will be a 5-foot wide reinforced concrete channel with an approximate wall height of 8 feet. Final design and dimensions will be determined by the design-build team.

Before the ditch is designed, it is likely that the DOE will need to obtain permission from Haleakala Ranch to grade and construct the ditch in their property. If DOE cannot obtain permission, the runoff from the upper portion of Basin 9 must be conveyed through the proposed Kīhei High School site. The result would increase construction cost due to larger and more extensive on-site drainage infrastructure. The effects of the additional flow into Waipuʻilani Gulch are quantified in *Table 4-12* and *Appendix K*. In summary, the increase in off-site runoff will be less than 1% after the school is constructed.

Table 4-12 PRELIMINARY ANALYSIS OF WAIPUʻILANI GULCH (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)					
Basin Description	Area (Acres)	CN	Tc (Min.)	Q50 (cfs)	Q100 (cfs)
1. Post-Development Flows Above School Site	85	79	19	256	314
2. Post-Development Flows Entering Waipuʻilani Gulch	7,294	73	96	7,527	9,506
3. Post-Development Flows Entering Waipuʻilani Bridge	7,379	N/A	N/A	7,571	9,561
4. Pre-Development Flows Entering Waipuʻilani Bridge	7,314	73	96	7,547	9,532

On-site stormwater runoff will sheet flow or be directed by grassed swales/gutters into drain inlets and pipes. Due to on-site sumps, the underground drainage system should be sized to convey the 50-year runoff quantities with a one-foot freeboard allowance. The underground drainage system should drain into a detention basin before entering the existing 72-inch culvert under Piʻilani Highway (refer to *Figure 4-15* for a conceptual drainage plan and *Appendix K* for preliminary cost estimates). On-site grading of the proposed Kīhei High School site near Piʻilani Highway should direct runoff into on-site inlets and/or the detention basin. It is likely that the DOT will not allow any additional runoff on to Piʻilani Highway.

On-site Basin Concept

Based on the conceptual campus site plan, a possible location for the basin is the lower end of the property adjacent to Pi'ilani Highway (refer to *Figure 4-15*). The final basin location and dimensions will be determined by the design-build team. It should be noted that the on-site basin will be designed to meet County Standards. Discharge into existing 72-inch diameter culvert must be regulated and controlled and the basin must be sized to handle the total additional runoff volume or more. The basin could be designed to satisfy LEED Site Sustainability Credit requirements. The conceptual basin geometry and sizing are as follows:

- 90 feet wide/480 feet long
- Overall depth of 10-feet
- Side slopes at 3H:1V
- Minimum 10-foot overflow weir crest length
- Weir crest above 100-year water surface elevation
- 12-foot wide access road

Potential Impacts and Mitigation Measures

A preliminary hydrologic and hydraulic analysis of the basin based on the above dimensions may be found in *Appendix K*. A summary of the results are shown in *Table 4-13* below; approximate water surface and invert elevations are depicted in *Figure 4-15*.

Table 4-13 PRELIMINARY BASIN ANALYSIS (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)							
School Site Condition	CN	Tc (Min.)	Q1 (cfs)	Volume ₁ (cf)	Q ₂ (cfs)	Volume ₂ (cf)	Q ₅₀ (cfs)
Existing Condition	79	13.5	20	150,428	47	294,327	248
Developed Condition	86	23	35	252,362	64	436,632	251
Flow Leaving Basin	N/A	N/A	3	107,021	10	291,292	129

The preliminary analysis demonstrates that detention can be provided such that the post development flows will not exceed existing flows, and that the additional runoff volume generated by the two-year storm can be adequately retained in the bottom three (3) feet of the basin.

Best Management Practices

The inland waters near the property are designated as Class 2 by the DOH and are not listed in the Clean Water Act §303(d) list (impaired waters bodies that do not meet State Water Quality Standards). According to DOH Water Quality Standards, “The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation” (HAR §11-54-03(b)(2)). Discharges into

Class 2 inland waters qualify for coverage under NPDES General Permit which calls for the application of permanent and construction BMPs.

BMPs are pollution control measures, applied to nonpoint sources, on-site or off-site, to control erosion and the transport of sediments and other pollutants which have an adverse impact on waters of the state. Construction BMPs are temporary measures installed before construction commences and removed once the site has been stabilized and permanent BMPs are in place. Potential construction BMPs include, but are not limited to gravel entrance, dust screen, silt fence, retention basins, diversion berm/ditches, and grading procedures that conform to Maui County Code Chapter 20.08 – Soil Erosion and Sediment Control.

Unlike construction BMPs, permanent BMPs are designed to remain part of the project features after the site grading operation is completed. The permanent BMPs are intended to reduce storm water pollution typically associated with the increased impervious surfaces. Examples of permanent BMPs include gravity separators before each outlet, grass swales, infiltration trenches, vegetative filter strips, maximize open space, and the use of on-site soil general or yard fill. Permanent BMPs may also qualify for LEED credit if they meet the criteria in Site Sustainability Credit 6.2 – Storm water Design – Quality Control.

In addition, DWS recommends the following BMPs to protect underlying the Kama'ole Aquifer (*Appendix K*):

- Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the water.
- Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
- Retain ground cover until the last possible date.
- Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.
- Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical runoff.
- Keep run-off on site.
- Use brackish or reclaimed water for irrigation and dust control during construction where available.

Increase in runoff rates resulting from the development will be mitigated by the proposed retention/detention basin and the implementation of BMPs. As a result, the proposed project should not an adversely impact nearshore waters.

4.2.11 Power, Telecommunications and Cable Services

Electrical power on the Island of Maui is provided by Maui Electric Company (MECo). Telephone and cable services in the project vicinity are provided by Hawaiian Tel (HTel), and Oceanic Time Warner Cable, respectively.

Potential Impacts and Mitigation Measures

Construction of the proposed Kīhei High School project will result in the demand for additional electrical, telecommunication, and cable services. The project site is currently undeveloped and utilities will need to be extended on site. Electrical, telephone, and cable television transmission lines will be installed underground and connect with existing systems. This project will incorporate energy efficient technology and design to reduce the project's overall energy consumption. It is anticipated that MECo, HTel and Oceanic Time Warner Cable will provide necessary services to the project site. No significant environmental impacts are anticipated from provision of these services.

4.2.12 Solid Waste

Solid waste collection in the Kīhei-Mākena region is served by County Department of Environmental Management (DEM), which disposes to the Central Maui Landfill (CML) in Pu'unene, operated by the DEM. The landfill contains contracted recycling and composting facilities which accept green waste and used motor oil. According to the County Integrated Solid Waste Management Plan (2009), approximately 200,000 tons of solid waste is deposited at the landfill every year. The landfill is projected to reach capacity in 2026. The County has diverted around 30% of its waste to recycling, composting, and other beneficial uses per year since 2006. The County Integrated Solid Waste Management Plan (2009) calls for 50% diversion of Maui's waste through waste collection and recycling programs improvement and infrastructure improvements, including consideration of a waste-to-energy facility. This will extend the life of the landfill to 2042. Since 1994, construction and demolition waste has been banned from the Central Maui Landfill. DeCoite Construction and Demolition Landfill is a privately-owned facility near Mā'alaea which is permitted to accept construction and demolition waste for disposal. The Pohakulepo Concrete Recycling Facility accepts concrete from demolition and construction activities, along with solid waste.

The project site is vacant and therefore no solid waste services are currently required.

Potential Impacts and Mitigation Measures

The Kīhei High School project will be served by DEM solid waste collection and disposal services. During the construction of the proposed project, cleared vegetation will be transported to the County's green waste recycling facility at the Central Maui Landfill. There will be no demolition waste, as the property is currently undeveloped. Construction waste will be hauled to the DeCoite Landfill for disposal. After build out, waste collection and disposal will be handled by a private waste collection service. The management of solid wastes generated by the proposed project will emphasize waste diversion and recycling. Additionally, in order to achieve LEED or comparable certification, one of the requirements of the project will be to divert a certain percentage of construction waste from landfills.

A school facility is estimated to generate 0.0013 tons of waste per SF per year (California Department of Resources Recycling and Recovery, Estimated Solid Waste Generation Rates for Institutions, 1999). Therefore, Kīhei High School is estimated to generate 280 tons of waste per year at a full build-out of 215,000 SF. It should be noted that some students will be transferring to Kīhei High School from other high schools, and the waste generated by these students would not be considered “new” waste. The management, diversion and recycling of solid wastes generated by Kīhei High School will be emphasized in operations.

Waste generated by the proposed project is not expected to have a significant adverse impact on the solid waste collection services and disposal facilities.

4.3 SOCIO-ECONOMIC ENVIRONMENT

The Kīhei High School project is planned in response to the regional needs for a new educational facility to support the growing population of the Kīhei-Mākena region. This section examines the socio-economic conditions and trends of Maui County, the Kīhei-Mākena region, and the proposed project area. The socio-economic conditions evaluated include the social settlement pattern (population and housing) and economic resources (employment and economy). In July 2011, Plasch Econ Pacific, LLC, prepared an Economic and Fiscal Impacts assessment for the Kīhei High School project (*Appendix L*). The findings of this report are discussed below.

4.3.1 Regional Setting

The Kīhei High School project site is located within the Kīhei-Mākena Community Plan region, which stretches from Mā‘alaea in the north to La Perouse Bay in the south. Urban development in the region consists of residential, commercial, and resort uses. The region has the second highest full-time resident population on Maui and the third highest number of jobs on the island. The region contains a diverse range of physical and socio-economic environments. With its dry and mild climate and proximity to recreation-oriented shoreline resources, the visitor-based economy has continued to grow steadily over the years. The town of Kīhei serves as the commercial and residential center of the region, with Wailea and Mākena serving as the focal points for the majority of visitor activities. A number of luxury hotels and golf courses are also located in Wailea and Mākena.

Potential Impacts and Mitigation Measures

The Kīhei High School project will complement the pattern of development in the Kīhei-Mākena region as envisioned in the Kīhei-Mākena Community Plan. The project will help to support the existing and future residential developments of the surrounding area by providing a new public educational facility. Although the project is not consistent with the existing State Land Use Agricultural District designation, it is consistent with the Kīhei-Mākena Community Plan Public/Quasi Public land use designation. The regional character will be complemented and not be adversely impacted by the development of the Kīhei High School project.

4.3.2 Population

The overall population of the County has exhibited relatively strong growth over the past decade. The 2000 United States Census reported that resident population of the County of Maui was

128,094 people in 2000. Population projections by the Maui County Planning Department (2006) estimate that the island of Maui's population reached 140,289 people in 2010 of which 28,124 people of which were living in the Kīhei-Mākena region.

In addition to the resident population, the County accommodates a large visitor population. For the year 2010, the average visitor census was projected at 49,476 people (Maui County Planning Department 2006). The average visitor census is defined as the average number of visitors on an average day. Of the 49,476 people, approximately 21,621 or 43 percent, of these visitors are in the Kīhei-Mākena region (Maui County Planning Department 2006).

Combining the resident population and the average visitor census, the total population of the County was estimated to be 189,765 people in 2010 of which 49,745 people were from the Kīhei-Mākena region.

The proposed Kīhei High School site is undeveloped and does not contain any residents.

Potential Impacts and Mitigation Measures

By the year 2025, projections indicate that the County population will increase to 174,184, which is a 24 percent increase from the 2010 population projection. In the year 2025, the Kīhei-Mākena region population is expected to increase by 28 percent from the 2010 population to 35,962 people. The average visitor census for the County is projected to increase to 63,482 visitors by the year 2025, which accounts for a 28 percent increase from the 2010 visitor census. Of these visitors, approximately 47 percent or 30,241 will be in the Kīhei-Mākena region. Overall, the total population (including the resident population and the average visitor census) in 2025 is estimated to be 237,666 people of which 66,203 people will be from the Kīhei-Mākena region.

The Kīhei area currently contains a mix of housing types, both multi-and single-family, as well as commercial uses. The proposed Kīhei High School will respond to the existing and future needs of the surrounding area by providing educational facilities to serve a growing population and community. This will have a positive impact by decreasing long travel commutes for families driving their children back and forth to school in Central Maui. In addition, the project will help to relieve the overcrowding of Central Maui schools currently serving students from the South Maui region. When fully built out, the total population of the high school is projected to be 1,650 students. Provision of a public high school is supportive of the residential community. No significant impacts to population are anticipated.

4.3.3 Housing

The Kīhei-Mākena region is home to many full-time residents and is also a vacation destination for visitors. In 2010, there was an estimated 11,286 housing units in the Kīhei-Mākena region (Maui County Planning Department, 2006). By 2030, it is projected that the housing demand will reach approximately 22,287 homes (County Planning Department 2006).

From 2000 to 2005, the County experienced a strong demand for housing due to a strong local economy, low mortgage interest rates, and non-resident interest in Maui real estate. The participation by non-resident buyers in the County's real estate market has a great impact on the overall housing demand. In 2004, approximately 37% of all housing sales were to buyers residing

outside of the County. This demand by non-resident buyers for general residential units is significant in the Kīhei-Mākena region where 42 percent of all Kīhei-Mākena housing sales were to buyers residing outside of the County (County Planning Department 2006).

In December 2009, the year-end average sales price of a single-family home in the County was \$747,891 and the year-end average sales price of a single-family home in Kīhei was \$607,327. The year-end average sales price of a condominium in the County was \$648,043 and the year-end average sales price of a condominium in Kīhei was \$321,966 in December 2010 (Realtors Association of Maui, Inc. 2011).

Potential Impacts and Mitigation Measures

In light of the current and projected housing market conditions, the proposed Kīhei High School will provide a significant community benefit by offering existing and future residents within the surrounding area a new educational facility for children.

The Kīhei High School project is not expected to introduce new residents into Kīhei or any neighboring area once completed. It is possible, however, that a small percentage of development and/or construction workers may relocate into the area during the project development phase, thereby resulting in minimal impacts to existing housing. No negative impacts on housing conditions are anticipated.

4.3.4 Economy and Labor Force

The County's economy is heavily dependent on the visitor industry, particularly in the Kīhei-Mākena region. As a major resort destination area, the Kīhei-Mākena region provides vacation rentals, world-class resorts, and recreational facilities. Numerous retail commercial centers are also located here to provide necessary support services.

In 2011, the State of Hawai'i's economic situation continues to fluctuate. The continued fluctuation is a result of economic weakness from the mainland and softening in a variety of real estate sectors in 2007, the collapse of Aloha and ATA Airlines in 2008, and advent of economic recession on the US mainland and throughout the Pacific Basin. These events have reduced tourism, leading to increasing unemployment, business failures, and modified spending levels island wide.

Traditionally among the lowest in the nation, the unemployment rate of the County has more than doubled since 2008. During the second quarter of 2011, the unemployment rate was 7.4 percent, which actually decreased 1.1 percent from the previous year (8.5 percent). The County saw a net loss of about 600 jobs or 0.9 percent decrease in the second quarter of 2011 from the same quarter of 2010. Job gains were in accommodation, wholesale trade, professional and business services, and financial activities were more than offset by job losses in construction, government, and health care and social assistance (Department of Business, Economic Development and Tourism, 2011).

Tourism indicators have improved since 2008. Total spending by visitors who came to Maui in January 2011 rose 21.1 percent (\$323.8 million) from the previous year. Total visitor arrivals to Maui also grew with an increase of 9.2 percent from the previous year (Hawai'i Tourism Authority, 2011).

Potential Impacts and Mitigation Measures

The development of the Kīhei High School will result in significant expenditures that will have a positive impact on the economies of the State and the County on a direct and indirect basis. With significantly increasing capital investment and capital flow in the region, new employment opportunities will arise and an expanded tax base will occur, as such, the proposed project will serve as an economic stimulus for the region.

The Kīhei High School economic and fiscal impacts analysis estimates the effects on the economy that will result from the development of the project, including construction and business employment, wages and income, direct and indirect expenditures, and taxes and fees accruing to the State and the County.

Economic Impacts of Construction

The estimated construction period for Phase I of the School is approximately two (2) years and approximately two (2) years for Phase II. The Phase II construction would be completed approximately 10 years after the completion of Phase I construction.

Phase I construction of the School will provide an average of about 340 construction jobs over the two-year construction period, about 320 indirect jobs on Maui, and about 160 indirect jobs on O‘ahu. Thus, total direct-plus-indirect employment associated with Phase I construction activity will average about 820 jobs, of which about 660 jobs will be on Maui. Phase II construction of the School will provide an average of about 82 construction jobs during the two-year construction period, about 80 indirect jobs on Maui, and about 50 indirect jobs on O‘ahu. Thus, total direct-plus-indirect employment associated with Phase II construction activity will average about 200 jobs, of which about 160 jobs will be on Maui.

Over the development period, total construction expenditures for the Kīhei High School are estimated at nearly \$170 million, including about \$140 million for Phase I and about \$30 million for Phase II (*Appendix L*). This translates into average construction expenditures of about \$62.2 million per year during Phase I, and about \$15 million per year during Phase II.

Construction activity will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. Indirect sales are expected to average about \$61 million per year during Phase I (\$41 million per year on Maui and \$20 million on O‘ahu) and about \$14.7 million per year during Phase II (\$9.8 million on Maui and \$4.9 million on O‘ahu). Construction expenditures plus indirect sales related to construction are expected to average \$123 million per year during Phase I and \$30 million during Phase II. Profits on construction and indirect sales are estimated to average \$15.4 million per year for Phase I, and \$3.7 million per year for Phase II (*Appendix L*).

Phase I construction activity is expected to generate a total payroll of about \$41.7 million per year. The corresponding figure for Phase II is about \$10.1 million. Annual wages will range from about \$25,000 to over \$100,000 per year.

During the Phase I construction period, direct and indirect jobs provided by construction activity will support about 1,680 residents housed in about 570 homes (*Appendix L*). Construction jobs will support about 690 residents and about 230 homes, while the remainder will be supported by

indirect jobs. Most of the residents supported by the direct-plus-indirect jobs are expected to live on Maui: about 1,350 residents housed in about 460 homes. Phase II construction activity will support about 400 residents and 140 homes, of which about 320 residents and 110 homes will be on Maui.

In view of the available construction workers, it is expected that the construction jobs for the Kīhei High School will be filled mostly by workers who are already living on Maui. As other construction projects are completed on the island, Maui construction workers will be hired to work on the various components of the School, then move on to other projects. Thus, the School will help keep Maui's existing construction workers employed.

Economic Impacts of Operation

During Phase I operations, the School will accommodate about 920 students and employees. Phase II operations will increase the on-site population to over 1,850 students and employees.

After Phase I construction is complete (Phase I operations), School operations will provide about 120 jobs at the School, about 47 indirect jobs on Maui, and about 23 indirect jobs on O'ahu. The total direct-plus-indirect employment associated with Phase I operations will reach about 190 jobs, of which about 167 jobs will be on Maui. Phase II operations will increase these figures to about 206 jobs at the School, about 81 indirect jobs on Maui, and about 40 indirect jobs on O'ahu. The total direct-plus-indirect employment associated with Phase II operations will reach nearly 330 jobs, of which nearly 290 jobs will be on Maui.

Annual salaries at the School will range from less than \$25,000 to over \$100,000. Total annual payroll for Phase I direct and indirect jobs is estimated at about \$8.4 million, of which about \$7.4 million will be on Maui and \$1 million on O'ahu (*Appendix L*). Phase II will increase total annual payroll of indirect jobs to about \$13 million for Maui and \$1.7 million for O'ahu, for a total of \$14.7 million.

Families of Kīhei High School employees and those who hold indirect jobs generated by Kīhei High School operations will purchase goods and services. For Phase I, consumption expenditures are estimated at \$4.6 million annually (\$4.1 million on Maui and \$500,000 on O'ahu). For Phase II, consumption expenditures are estimated at \$8.1 million annually (\$7.1 million on Maui and \$900,000 on O'ahu). For Phase I, profits on annual consumption sales are estimated at about \$410,000 on Maui and about \$50,000 on O'ahu, for a total of about \$460,000 (*Appendix L*). Phase II will bring annual profits up to over \$710,000 on Maui and over \$90,000 on O'ahu, for a total of nearly \$810,000.

Direct and indirect jobs provided by operations will support about 240 residents on Maui and about 50 residents on O'ahu (*Appendix L*) during Phase I. Phase II will bring the supported population to over 410 residents on Maui and over 80 residents on O'ahu. Housing for the residents supported by Phase I direct and indirect jobs will total about 100 homes (80 on Maui and 20 on O'ahu). Phase II will bring these figures up to about 170 homes (140 on Maui and 30 homes on O'ahu). During Phase I, the homes on Maui will have an estimated value of \$28.6 million, and the O'ahu homes will have an estimated value of \$7.1 million (*Appendix L*). Phase II will bring these values up to about \$49 million for the Maui homes and \$12.1 million for the O'ahu homes.

Once the School becomes operational, experienced faculty, administrators, and professional staff will be recruited from other public and private schools in Hawai'i and, to a lesser extent, from mainland schools. Teachers and professional staff who are new to their fields will be recruited from the UH and other institutions.

Impacts on State and County Finances

Tax Revenues Generated by Construction Activity

Phase I construction activity will generate about \$12.9 million in tax revenues for the State, and Phase II construction will bring total tax revenues up to about \$15.7 million. These tax revenues will offset about 9% of the cost of constructing the high school.

The County derives negligible tax revenues from construction activity. However, the School is not expected to require major additional support improvements from the County or State since the School will not add significantly to County's population growth. Also, State and County services for construction workers and their families are, for the most part, already provided since most of the needed construction workers are current residents of Maui.

Tax Revenues Generated by School Operations

At the completion of Phase I construction, families and businesses supported directly and indirectly by Kihei High School operations will pay about \$590,000 per year in tax revenues to the State, and \$67,000 per year to the County. Phase II operations will increase the tax revenues to about \$1.0 million per year for the State and about \$116,000 per year to the County. These revenues will offset the cost of providing State and County services to these families and businesses.

County expenditures to support the high school will include water and sewer service, solid waste disposal, public safety, etc. The DOE will pay service charges for its fair share of water and sewer services, and solid waste disposal. Police and fire services are financed from the County general fund.

4.3.5 Public Services

Social services are the programs that benefit the community. Although most are government run, some, like many hospitals and schools, are privately run.

The County has a variety of services that serve the community. These services include a police department, fire department, schools, medical care facilities, and recreational parks and beaches.

Police Protection and Law Enforcement

The Maui Police Department is the primary service provider to the proposed project area. In the year 2010, the department employed 375 sworn officers as well as 196 support staff. The County averaged 7,690.2 index offenses (murder, forcible rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft) for the years 1993-2009. In the year 2009 the County reported 6,048 index offenses, its lowest amount in 17 years. (Hawai'i State Data Book 2009 (Updated 2010)).

The Uniformed Services Bureau is responsible for patrol; and has divided the County into six (6) separate districts. The Kīhei High School project area is located within District VI: Kīhei.

The central Maui Police Department station is in Wailuku, approximately 10.5 miles away from the center of the project area. The Maui Police Department station closest to the Kīhei High School project area is located at 1881 South Kīhei Road, in Kīhei Town Center, approximately two and one-half (2.5) miles away from the Kīhei High School project area. In addition to the Uniformed Services Bureau, this station houses the Visitor Oriented Policing, Community Oriented Policing, and Citizens Patrol programs.

Additional law enforcement agencies are located nearby as well; the Federal Bureau of Investigation (Federal) has a branch located in Wailuku and the Public Safety Department Sheriff Division (State) has a branch located in Wailuku.

According to the Proposed Kīhei Police Station Final Environmental Assessment (Munekiyo and Hiraga, June 2009), the County of Maui Police Department is planning a new police station in Kīhei, approximately two (2) miles south of the project site on the makai side of Pi'ilani Highway. This new facility would replace the current police station in Kīhei Town Center.

Fire Protection and Public Safety

Department of Fire and Public Safety protects and preserves life, environment, and property within the County. There are 14 fire stations throughout the County with a combined total of 279 personnel trained to respond to and mitigate a wide variety of emergency situations. Last year the department responded to almost 7,000 emergency situations (www.co.maui.hi.us). The closest Department of Fire and Public Safety station to the proposed project area is located at 11 Waimāha'iha'i Street in Kīhei, approximately two and one-half (2.5) miles from the center of the Kīhei High School project area.

The DOE may coordinate with the Hawai'i State Civil Defense to design a hardened facility such as the gym or cafeteria for use as an emergency shelter.

Education

With the growing population comes a need for schools to serve more students. Kīhei's school-age population generally mirrors the present demographics of the community. Enrollment by race/ethnicity is as follows:

- Asian (1,404 students)
- White (1,187 students)
- Hispanic (158 students)
- Total (2,796 students)

The Kīhei community is part of the DOE's Maui Complex or "mini-district". The schools that make up this complex are:

- Kahului Elementary School

- Kamali'i Elementary School
- Kīhei Elementary School
- Lihikai Elementary School
- Pomaika'i Elementary School
- Lokilani Intermediate School
- Maui Waena Intermediate School
- Maui High School
- Kīhei Public Charter High School

Kīhei offers two (2) public elementary schools (Kamali'i and Kīhei), one (1) public middle school (Lokelani), and one (1) public charter high school to serve its student population.

Lokelani Intermediate School, which contributes to Kīhei's high school student population, has an enrollment of 597 students in 2011-2012. Kīhei Public Charter High School, with grades PK-12, had a total student enrollment of 509 for 2011-2012. It has 248 high school students enrolled in its 9th through 12th grades. The majority of Kīhei's high school-age population is served by Maui High School in Kahului approximately 10 miles away from central Kīhei.

Hospitals and Medical Services

Maui Memorial Medical Center, located at 221 Mahalani Street in Wailuku, is the closest hospital facility, located 11.5 miles north of the center of the proposed project area. It is a 231-bed acute and long-term health care hospital; and is equipped with a 24-hour emergency room.

Recreational Resources

There are two (2) County parks within one (1) mile makai of the Kīhei High School project area: Kalepolepo Park and Waipu'ilani/Kīhei Beach Reserve. Various other parks are scattered north of the Kīhei High School project area along Pi'ilani Highway. More County parks lie along the coast south of the project site. There no national (Federal) or State parks in the immediate vicinity.

Public Libraries

The State Board of Education operates a system of libraries throughout the State. There are six (6) State libraries on the Island of Maui and one (1) bookmobile. There is a public library located approximately two and one-half (2.5) miles south of the center of the Kīhei High School project area, at 35 Waimāha'iha'i Street.

Public Transit Service: Maui Public Bus Transit System

The County currently funds a public bus system that provides service in and between various Central, South, West, Haiku, and Upcountry Maui communities. All buses run seven (7) days a week. Two (2) routes serve the proposed project area, they are:

- Kīhei Villager #15 – loops hourly from 6:05 A.M.-8:05 P.M., seven (7) days a week, from Pi'ilani Village Shopping Center to Ma'alaea.
- Kīhei Islander #10 – loops hourly from 5:30 A.M.-7:30 P.M., seven (7) days a week, from Ka'ahumanu Center to Wailea Ike Drive.

The County also funds a commuter bus service. One (1) commuter route, the Kīhei-Kapalua Commuter, serves Kīhei. This bus commutes people to and from Kapalua and Kīhei in the morning and again in the evening.

Potential Impacts and Mitigation Measures

Police Protection and Law Enforcement

The Kīhei High School project will require additional police protection. This area is currently under police protection, but the Kīhei High School project will add a substantial amount of people and property onto a previously undeveloped lot mauka of Pi'ilani Highway. These people will require protection while at the facility and the property will require protection at all times. Although additional police protection is required, the Maui Police Department is prepared to meet this need, and will continue to grow as population and crime rate dictates. The close proximity of the nearest department station will facilitate the proposed project's protection. Additionally the mauka development of Kūlanihāko'i Street and the on-site roadways will facilitate police patrol and protection on the site.

Significant negative impacts on police protection and law enforcement services are not anticipated and no mitigation measures are necessary.

Fire Protection and Public Safety

The Kīhei High School project will require fire protection during construction and after development is complete. To meet access road and fire flow water requirements, the project will comply with UFC Sections 10.207 and 10.301 (c).

No additional issues are anticipated and further mitigation measures are not necessary.

Educational

The Kīhei High School project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on local schools. The Kīhei High School project is a new educational facility and is anticipated to relieve stress from local educational facilities and residents.

Significant negative impacts on educational services are not anticipated and no mitigation measures are necessary.

Medical Services

The proposed project is not expected to increase the demand on local hospitals.

Significant impacts on local medical facilities are not anticipated and no mitigation measures are necessary.

Recreational Resources

The proposed project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on public parks. The project is anticipated to provide recreational opportunities and help meet regional demand for athletic facilities.

Significant impacts on public parks are not anticipated and no mitigation measures are necessary.

Public Libraries

The proposed project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on public libraries.

Significant impacts on libraries are not anticipated and no mitigation measures are necessary.

Public Transit Service: Maui Public Bus Transit System

The proposed project may increase the number of daily passengers in the Kīhei area when the proposed project is complete. It is common for high school students to use a public transportation option to travel to and from school.

Significant impacts on the public transit system are not anticipated and no mitigation measures are necessary.

4.4 SUMMARY OF PROBABLE IMPACTS

4.4.1 Interrelationships and Cumulative Environmental Impacts

This project and other planned projects in the region are likely to have long-term cumulative impacts, such as increased traffic and higher demand on regional infrastructure. However, many of the planned projects are consistent with County plans and will have cumulative long-term beneficial impacts such as reducing commute traffic to distant parts of the County and increasing employment opportunities. The economic development associated with planned projects will provide additional tax revenue to the State and County governments to fund necessary public services. The anticipated net cumulative impact is expected to be positive.

Adverse impacts relating to traffic, increased demand on regional infrastructure and air quality are likely to be expected by the cumulative development of all of the proposed regional projects. Yet, at the same time, the proposed developments involve significant improvements to regional roadways, drainage, water, and sewer facilities. Kīhei High School will compliment the future housing development by providing high school education and recreational opportunities within the region. Finally, the cumulative development of the region's proposed projects will provide additional tax revenue and economic benefits to State and County governments to fund necessary public services.

Potential Secondary Effects

New developments in general, including the proposed Kīhei High School, have the potential to induce growth outside the project area. An example of such a secondary effect is the stimulation of additional development in the region as a result of the construction of public facilities, such as

enhanced traffic and utilities infrastructure. The Kīhei High School project aims to provide a new educational facility in the Kīhei area, thereby decreasing travel distance for students attending other schools. Planning in accordance with the Kīhei-Mākena Community Plan serves to reduce adverse secondary impacts from unexpected impacts of unplanned growth.

4.4.2 Relationship between Local Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

These relationships are described below in the context of four (4) specific areas of potential concern:

Narrowing the range of beneficial uses of the environment: The proposed project would reduce the amount of land available for ranching but would provide a land use supportive of the community. The project would not adversely affect rights customarily and traditionally exercised for subsistence, cultural and religious purposes, nor would it have a known significant impact on Hawaiian cultural or historic resources.

Long-term risks to health and safety: The project is not expected to pose any such risks. By complying with Federal, State and County regulations pertaining to building codes, environmental health, natural hazard management, etc., risks to health and safety will be limited. No on-site hazardous materials have been identified that pose risks to public health and safety.

Foreclosing of future options: While the proposed project would foreclose future development options for the property, the project would bring a needed public facility to Kīhei, bringing along with it many beneficial impacts to the State and community.

Trade-offs among short-term and long-term gains and losses: Potential short- and long-term environmental impacts would be offset by proposed mitigation measures. The short-term inconveniences caused by construction activity include increased noise, dust and traffic due to construction vehicles. Once construction is completed, Kīhei will have a new high school that is a source of education, employment, and pride for the community. These long-term benefits outweigh the relatively short-term losses anticipated during construction.

4.4.3 Irreversible and Irretrievable Commitments of Resources

The construction and operation of the planned new improvements will involve the irretrievable commitment of land, fiscal resources, labor, construction materials, and energy. There will be a permanent commitment of funds and resources to plan, design, construct and operate the facility.

4.4.4 Adverse Environmental Effects that cannot be Avoided

Implementation of the project will produce unavoidable affects in the short and long term. Short-term effects are generally associated with construction, and prevail only for the duration of the construction periods. Long-term effects generally follow completion of the improvements and relate to net changes to either programs or operations that are permanent. Effects that can be considered both adverse and unavoidable are discussed below.

4.4.4.1 Unavoidable Adverse Short-term Effects

- Disruption of flora/fauna habitat at the site.
- Views of site development and construction activity.
- Temporary increases in soil erosion resulting from construction operations and small amounts of soil may be carried beyond construction sites in surface runoff water and dust.
- Unavoidable, but temporary, noise impacts may occur during construction activities within the project area.
- Impacts to air quality primarily from fugitive dust emissions generated by construction activities.
- Increases in truck traffic associated with removal and redistribution of excavation soil or with imported fill materials and delivery of construction materials.
- Increases in automobile traffic associated with construction workers travelling to and from the site.
- Temporary disruption of traffic patterns at the Pi'ilani Highway/Kūlanihāko'i Street during intersection modifications.

4.4.4.2 Unavoidable Adverse Long-term Effects

- Undeveloped land and existing on-site vegetation will be lost. The site will transition into an developed property. Vegetation will be replaced through the addition of project landscaping, with a preference for native, drought tolerant plants.
- Implementation of the project will result in increased water consumption, wastewater disposal, and solid waste generation.
- There will increased demand for utilities and infrastructure. Where practical and feasible, sustainable design practices and technology will be utilized to reduce energy and natural resource demand requirements.
- There will be some increase in noise as students, staff, visitors and their associated vehicles frequent the area. The High School will periodically generate noise impacts from crowds at athletic events. Event noise will occur over the long term, but each event would be relatively short in duration, lasting only a few hours.

4.4.5 Unresolved Issues**Parking Requirements**

The conceptual site plan currently shows 948 total parking spaces which would serve to meet the school's parking needs during normal school hours or during sporting events at the stadium. This total number of parking spaces to be provided is unresolved and will need to be determined by the project developer in consultation with DOE and Maui County.

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Potable Water

Potable water demand is an issue of island-wide concern on Maui. Given the island's potable water shortage, the school's non-potable water requirement of 185,000 GPD will be met by two new onsite brackish wells, which will provide a long-term basal groundwater source from the underlying Kama'ole Aquifer System. Confirmation of potable water service to the project from the DWS is needed.

Site Plan and Campus Design

Method of delivery for the construction of Kihei High School will be Design-Build. Site plans, renderings and campus descriptions shown in this EIS are preliminary and subject to change. Final design will be determined by the project developer during the DB process.