across Honoapi'ilani Highway and discharges it into the existing cane fields on the makai side of the highway.

There is an existing grass swale traversing across the MTP site parallel to Honoapi'ilani Highway from the northeast corner of the project site to approximately 1,000 feet south of the project driveway. Runoff sheet flowing across the mauka side of the project site is captured by the grass swale and diverted in a southerly direction and across Honoapi'ilani Highway by the existing 72-inch culvert located 1,000 feet to the south of the project driveway. Runoff within the grass swale is conveyed across the project driveway by a 30-inch culvert. The estimated existing 100-year, 24-hour storm runoff from the Phase I and Phase II project sites mauka and makai of Honoapi'ilani Highway are shown in Table Nos. 49 ~~43~~ and 50 ~~44~~.

Table 49 ~~43~~: Phase I Existing Runoff from Mauka and Makai Project Sites

Phase I Existing Runoff from Mauka and Makai Project Sites		
Phase I	Existing Runoff (CFS)	Runoff Volume (CF)
Mauka	452	2,418,629
Makai	373	2,133,808

Table 50 ~~44~~: Phase II Existing Runoff from Mauka and Makai Project Sites

Phase II Existing Runoff from Mauka and Makai Project Sites		
Phase II	Existing Runoff (CFS)	Runoff Volume (CF)
Mauka	447	2,916,206
Makai	361	2,062,681

Presently, onsite runoff sheet flows across the project site in a west to east direction, across Honoapi'ilani Highway and into the existing sugar cane fields towards Kūihelani Highway and eventually discharges into Keālia Pond in North Kīhei.

Potential Impacts and Mitigation Measures. The Drainage Report analyzes anticipated changes in stormwater runoff and identifies improvements necessary to comply with County drainage requirements. In general, the drainage design criteria are to minimize any alteration to the

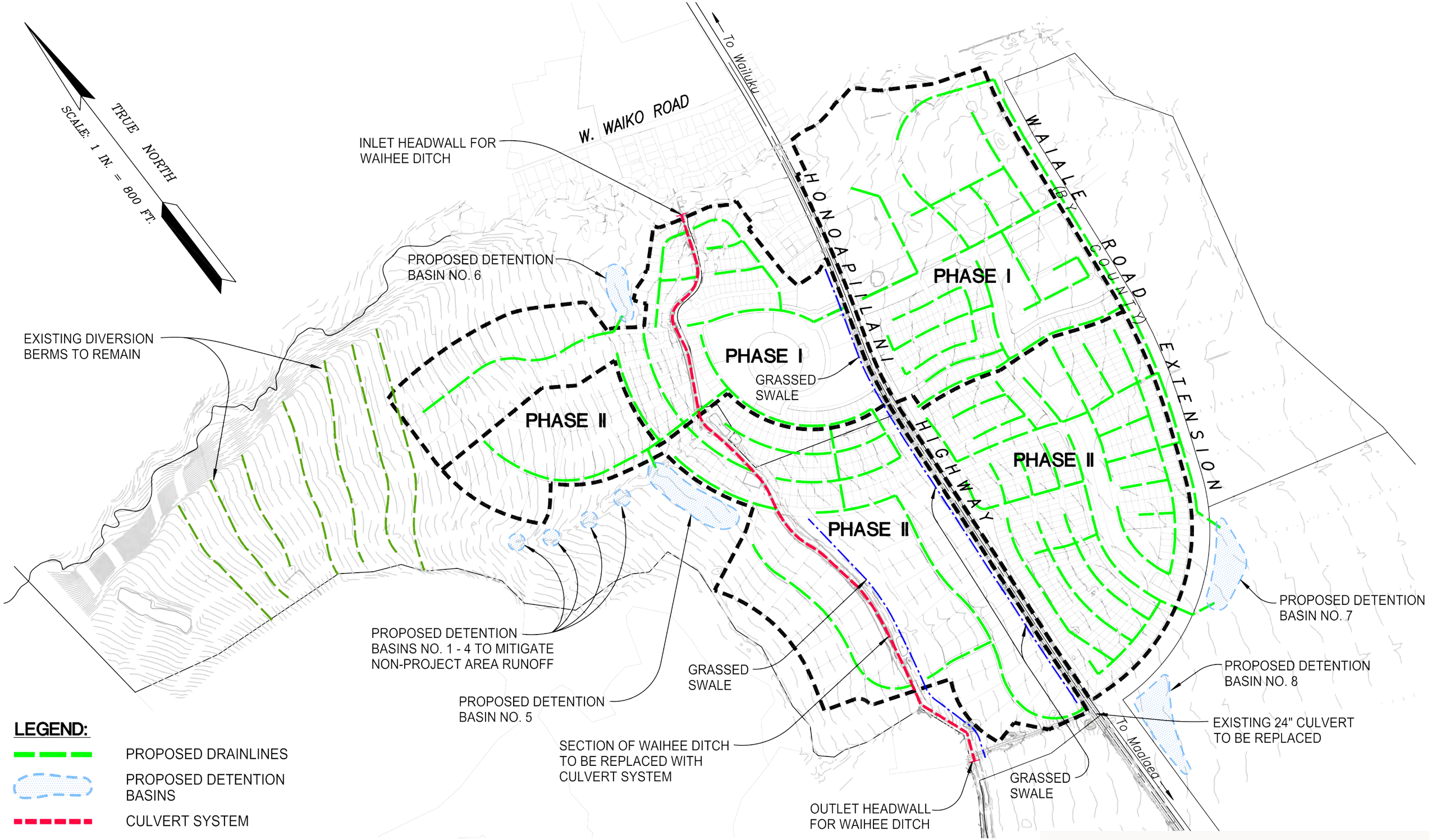

Figure 46:
Proposed Drainage System Improvements

existing drainage patterns and volumes. Figure No. 46 ~~41~~ identifies the proposed drainage system improvements. The system will accommodate the increase in runoff generated by the project. Table Nos. 51 ~~45~~ and 52 ~~46~~ compare pre- and post-development runoff conditions.

Table 51 ~~45~~: Phase I Pre- and Post-Development Runoff from Mauka and Makai Project Sites

Phase I Pre- and Post-Development from Mauka and Makai Project Sites						
Phase I	Pre-Development Runoff (CFS)	Pre-Development Runoff (CF)	Post Development Runoff (CFS)	Post Development Runoff (CF)	Increase (CFS)	Increase (CF)
Mauka	452	2,418,629	497	2,567,545	45	148,916
Makai	373	2,133,808	639 ~~634~~	2,905,771	261	771,963

Table 52 ~~46~~: Phase II Pre- and Post-Development from Mauka and Makai Project Sites

Phase II Pre- and Post-Development from Mauka and Makai Project Sites						
Phase II	Pre-Development Runoff (CFS)	Pre-Development Runoff (CF)	Post Development Runoff (CFS)	Post Development Runoff (CF)	Increase (CFS)	Increase (CF)
Mauka	447	2,916,206	507	3,131,436	60	215,230
Makai	361	2,062,681	506	2,454,808	145	392,127

The drainage system will be designed to accommodate the increase in surface runoff volume from a 100-year, 24-hour storm created by the project and the volume required to meet the post construction water quality standards. In addition to the detention basins, large grassed swales will be constructed within the open space areas to divert runoff to designated outlets. The drainage plan includes the development of eight detention basins, which are shown on Figure No. 46 ~~41~~ and described in the Preliminary Engineering and Drainage Report in Appendix H.

In accordance with the County's *"Rules for the Design of Storm Drainage Facilities",* the Phase I development mauka of Honoapi'ilani Highway will be required to mitigate an increase in runoff of 45 cfs and provide a minimum storage volume of 148,916 cubic feet and the Phase I

development makai of Honoapi'ilani Highway will be required to mitigate an increase in runoff of 266 cfs and provide a minimum storage volume of 771,963 cubic feet.

The Phase II development mauka of Honoapi'ilani Highway will be required to mitigate an increase in runoff of 60 cfs and provide a minimum storage volume of 215,230 cubic feet. Phase II makai of Honoapi'ilani Highway will be required to mitigate an increase in runoff of 145 cfs and provide a minimum storage volume of 392,124 cubic feet.

After the development of the proposed project, there will be no change in the volume of runoff diverted to Waikapū Stream from the upper agricultural preservation area. The existing diversion berms will continue to divert runoff from the areas mauka of the project site into Waikapū Stream.

In accordance with the County's *"Rules for the Design of Storm Water Treatment Best Management Practices",* the design of the stormwater system will include water quality treatment to reduce the discharge of pollutants to the maximum extent practicable. Some examples of stormwater best management practices (BMP) are:

Grassed Swales will be implemented within the landscaped areas where practical. Grass and groundcover provides natural filtration and allows for percolation into the underlying soils.

Open Space and Parks will be maintained with grass or other landscape materials, thereby reducing the amount of impervious surfaces which promotes infiltration.

Stormwater Detention serves to collect stormwater allowing some of the suspended solids to settle out. The stored runoff will infiltrate into the underlying soils and recharge groundwater. In accordance with the County's *"Rules for the Design of Storm Drainage Facilities",* the design of the drainage systems with retention basins shall be based on the following design conditions:

> *"In areas where the existing drainage systems are inadequate, the existing system shall be upgraded to handle runoff from the new project area or a new system shall be provided to connect to an adequate outlet. When there is no existing drainage system or adequate outlet to connect to, the additional runoff*

generated by the development may be retained on-site in a temporary retention basin with the following design conditions:

A. Storage volume of an infiltration basin, infiltration trench piping, or retention basin shall equal at least the total additional runoff volume for the appropriate storm intensity.

B. Soil percolation shall not be used in satisfying required storage volumes.

C. Fifty percent (50%) of voids within the rock envelope for subsurface drains may be used in satisfying required storage volume provided that filter fabric is installed around the pipe and at the interface of the rock envelope and soil.

D. Sumps, detention and retention facilities will remain private.

E. Detention or retention ponds with embankment heights equal to or in excess of 50 acre-feet shall conform to all state and federal requirements relative to dams".

Runoff from Agricultural Lands into the Waikapū Stream. The Applicant is working with Waikapū community stakeholders to address concerns regarding stormwater runoff from the agricultural lands that may be contributing to sedimentation of the Waikapū Stream. The implementation of on-site low impact development techniques (LID's) may help to mitigate these concerns. LID's that may be feasible along the upper reaches of the Waikapū Stream include: 1) a landscaped buffer and or riparian zone adjacent to the stream that is planted with vegetation to promote filtration and infiltration; 2) grass swales; and 3) bio-retention systems. All of these techniques are proven to promote infiltration and filtration of groundwater.

Post-Construction Water Quality Goals and Standards. The Project's drainage system will be designed to meet the County's drainage and water quality standards. The project will also be required to comply with Ordinance 3902, which requires subdivisions to comply with Section 18.20.130 Post Construction Storm Water Quality Best Management Practices of the Maui County Code. The criteria for sizing of storm water quality facilities are:

"(a) The criteria can be met by:

(1) Either detaining storm water for a length of time that allows storm water pollutants to settle (detention treatment from such methods as extended detention wet and dry ponds, created wetlands, vaults/tanks, etc.);

(2) By use of filtration or infiltration methods (flow-through based treatment from such methods as sand filters, grass swales, other media filters, and infiltration);

(3) Short-term detention can be utilized with a flow-through based treatment system (e.g., a detention pond designed to meter flows through a swale of filter) to meet the criteria; or

(4) Upstream flow-through treatment and detention treatment can be utilized.

(b) Other proposals to satisfy the water quality criteria may be approved by the director if the proposal is accompanied by a certification and appropriate supporting material from a civil engineer, licensed in the State of Hawai'i, that verifies compliance with one of the following (by performance or design):

(1) After construction has been completed and the site is permanently stabilized, reduce the average annual total suspended solid ("TSS") loadings by eighty percent. For the purposes of this measure, an eighty percent TSS is to be determined on an average annual basis for the two-year/twenty-four hour storm.

(2) Reduce the post development loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings."

BMPs will consist of grassed swales and retention basins sized adequately to promote infiltration and filter pollutants to meet water quality standards. Other Low Impact Development Techniques (LID's) will also be explored to help reduce runoff volumes, promote infiltration and filtration of groundwater. Some of these measures may include promoting rain gardens, the use of rain barrels, developing green roofs, and use of permeable paving surfaces, where appropriate, within residential, commercial, and institutional developments. The Applicant will also explore the opportunity of utilizing bio-retention swales with native plantings at appropriate locations within the street network to reduce and filter stormwater runoff and to take advantage of natural drainage for irrigation.

A maintenance plan will also be developed for the stormwater BMPs. The plan will include the requirements for removal of the accumulated debris and sediment, maintaining vegetation, and performing inspections to insure that the BMPs are functioning properly.

Temporary erosion control measures will be incorporated during the construction period to minimize dust and soil erosion. Additional controls will be implemented to protect Waikapū Stream. Temporary BMPs include the construction of diversion berms and swales, dust fences, silt fences, stabilized construction entrances, truck wash down areas, inlet protection, temporary grassing of graded areas, and slope protection. Additional construction phase BMP's will include: preventing toxic substances such as oil, fuel, cement products from leaching into the water; avoiding application of fertilizers and biocides during periods of rainfall; and stabilizing denuded areas by sodding or planting as soon as possible.

Water trucks and temporary sprinkler systems will be used to minimize dust generated from the graded areas. A National Pollution Discharge Elimination System (NPDES) permit will be required by the Department of Health prior to approval of the grading permit.

The drainage design criteria will be to minimize any alterations to the drainage pattern of the existing onsite surface runoff. No additional runoff will be allowed to sheet flow toward Keālia Pond.

4. Water

Existing Conditions. The Preliminary Engineering Report documents existing sources of water and infrastructure improvements that service the property (**See**: Appendix H, "Preliminary Engineering and Drainage Report).

Water service in the vicinity of the project site is provided by the County's water system consisting of a 12-inch waterline from the 300,000 gallon tank near the mauka terminus of Waiko Road. The storage tank is at an elevation of 764 feet.

The existing 12-inch waterline crosses Honoapi'ilani Highway and terminates to the east of Waikapū town in the vicinity of the industrial area. A 4-inch waterline connects to the 12-inch

waterline on Honoapi'ilani Highway and traverses in a southerly direction and ends near the northerly boundary of the MTP. The MTP site is currently being serviced by two 5/8-inch water meters located at the northeast corner of the mauka property.

Fire protection for the MTP is presently provided by a private system consisting of a gravity fire line from the existing lagoon located immediately to the west of the MTP restaurant. Non-potable water from the lagoon is fed to fire pumps located on the exterior of the existing buildings and supplies water to the fire sprinkler systems in the buildings. There are also fire hydrants located on the grounds of the MTP. However, the fire hydrants may not have adequate pressure and capacity.

Potential Impacts and Mitigation Measures. The Preliminary Engineering Report (Appendix H) analyzes anticipated increases in water demand and proposes improvements to meet the projected demand. Water and fire protection for the project will be provided from a private onsite water system (**See**: Figure 47 ~~42~~, "Private Water System"). The private water system is being designed in accordance with the Department of Water Supply's rules and standards in order to allow it to be dedicated by the Applicant to the County at a future undetermined date. Since the facility it will be operated as a private system, it will be subject to State of Hawai'i, Department of Health water quality standards. The County of Maui's Department of Water Supply has been consulted on several occasions regarding the Project's proposed private water system. In responding to the Applicant's DEIS the Department stated the following:

> *"A private water system will be utilized for the entire development. Our Department has no jurisdiction to impose requirements over subdivisions served by water systems that are not owned and operated by the County. Please note that any proposal to dedicate this water system to the County should reference compliance with the department's rules and regulations, the Maui County Code, and Water System Standards in the FEIS."*

The County of Maui's Department of Water Supply is in the process of updating the Maui Island Water Use and Development Plan and is aware of the details of the Applicant's proposed private water system.

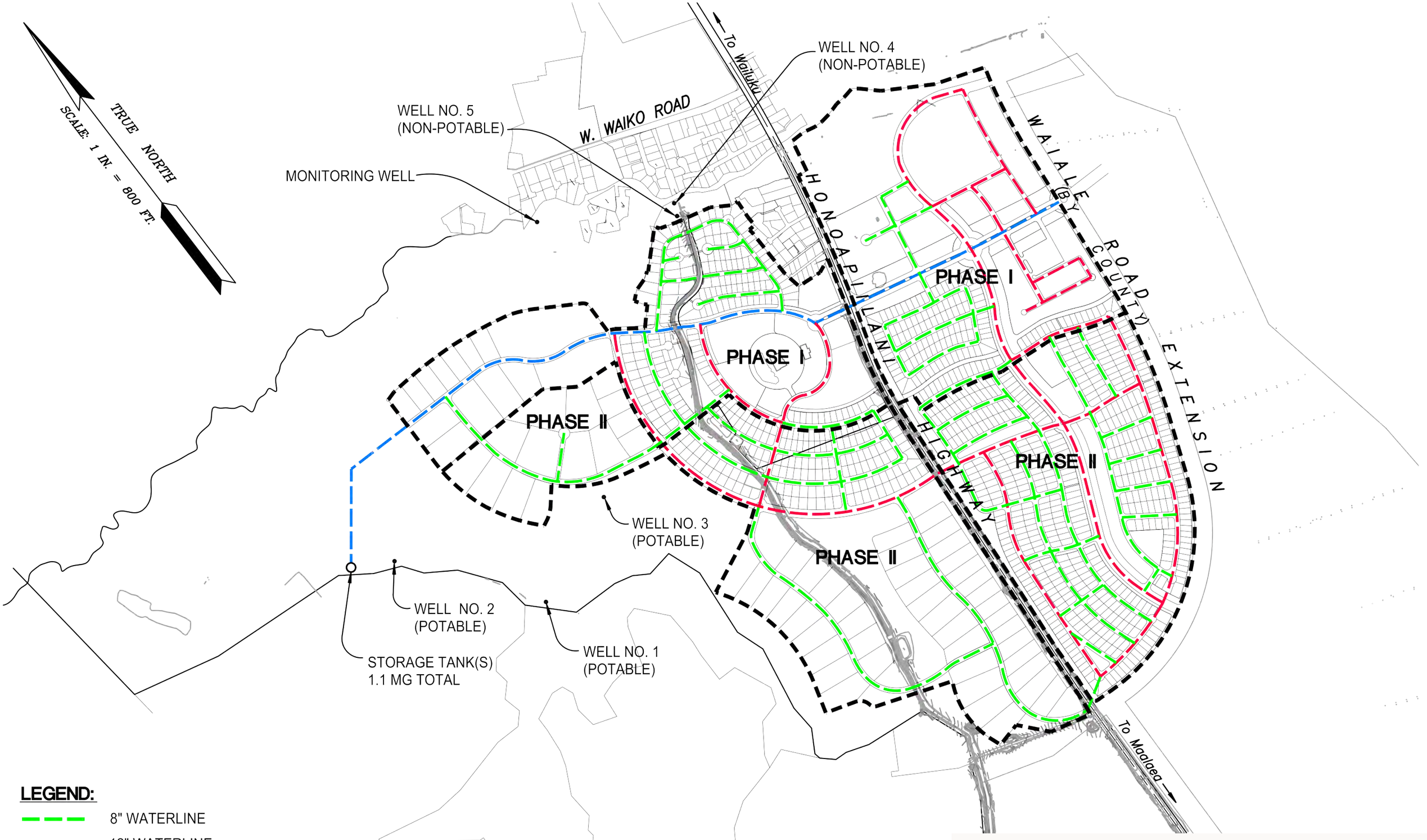

Figure 47, A:
Private Potable Water System Improvements

TRUE NORTH

SCALE: 1 IN. = 800 FT.

WELL NO. 4
(NON-POTABLE)

WELL NO. 5
(NON-POTABLE)

MONITORING WELL

W. WAIKO ROAD

To Wailuku

HONOAPILANI HIGHWAY

WAILEY ROAD (COUNTY) EXTENSION

PHASE I

PHASE I

PHASE II

PHASE II

PHASE II

NON-POTABLE
STORAGE AREA

WELL NO. 3
(POTABLE)

WELL NO. 2
(POTABLE)

WELL NO. 1
(POTABLE)

To Maalaea

LEGEND:

NON-POTABLE WATERLINE

Figure 47, B:
Proposed Non-Potable Water System Improvements

~~Five (5) wells have been drilled on the site. Three (3) wells have been designated for potable use and two (2) for non-potable purposes. All of the wells are located within the Waikapū Aquifer. The three potable water wells have been approved by the State of Hawai'i, Commission on Water Resource Management for a total pumping capacity of 2,300 gallons per minute (gpm). Water pumped from the non-potable wells will be discharged into the Waihe'e Ditch or lined onsite reservoirs and used for irrigation purposes for the residential lots, agricultural farming, parks and open areas.~~

Six (6) wells have been drilled on the site. Waikapū Country Town Well No. 1 (State Well No. 5030-01) was drilled at a ground elevation of approximately 654 feet above mean sea level (MSL) and will be used as a potable water source. It has a rated capacity of 500 gpm. Waikapū Country Town Well No. 2 (State Well No. 5131-02) was drilled at a ground elevation of approximately 778 feet above MSL and will be used as a potable water source. It has a rated capacity of 700 gpm. Waikapū Country Town Well No. 3 (State Well No. 5131-04) was drilled at a ground elevation of approximately 523 feet above MSL and will be used as a potable water source. It has a rated capacity of 1,000 gpm.

A 10-day pump test was conducted from April 26, 2016 to May 6, 2016 for Potable Wells 1, 2 and 3 by Water Resource Associates (WRA). The results of the pump test at each well were:

Well 1 was pumped at a constant rate of 972 gpm (1.39 mgd) for 10 days for a total pumpage of 13,600,000 gallons. The chloride content varied from 41 mg/L to 47 mg/L (potable water limit is 250 mg/l). WRA suggested that Well 1 is capable of yielding 1.4 mgd with a static water level of 8.5 feet above mean sea level.

Well 2 was pumped at a constant rate of 720 gpm (1.03 mgd) for 10 days for a total pumpage of 10,238,400 gallons. The chloride content decreased from 132 mg/L to 100 mg/L. WRA suggested that Well 2 is capable of yielding 1.0 mgd with a static water level of 15.0 feet above mean sea level.

Well 3 was pumped at a constant rate of 747 gpm (1.07 mgd) for 10 days for a total pumpage of 10,487,8800 gallons. The chloride content varied from 25 mg/L to 109 mg/L. WRA suggested

that the sustainable capacity of Well 3 is less than 700 gpd, despite a static water level of 8.5 feet abovemean sea level. They recommended further testing at lower pumping rates and drawdowns to assess Well 3's sustainable pumping capacity with regard to chlorides.

The WRA report stated the following regarding water quality:

> *"The water quality parameter which is of most concern during a pumping test is chloride because it is an easily determined indicator of salt water intrusion. The potable water limit for chloride content is 250 mg/L, which indicates that Well 1 produces the freshest water at approximately 40 mg/L, followed close behind by basalt Well 2 at approximately 100 mg/L and alluvial Well 3 varying between 25 and 109 gm/L. In addition to the frequent tests for chlorides, representative water samples were carefully collected from Wells 1, 2 and 3 for testing by Eurofins Analytical, an approved lab, in accordance with the requirements of the Hawai'i Department of Health for new potable water sources. The results indicate that all three wells are capable of producing potable water of excellent quality. The chlorides are low and the tested inorganic constituents are well within the Federal maximum contaminant levels (MCL) of public water systems. Further, all volatile and non-volatile organic contaminants and pesticides analyzed were non-detectable."*

Two non-potable water wells were drilled as designated as Waikapū Country Town Wells No. 4 (State Well No. 5130-03) and No. 5 (State Well No. 5130-04). Well No. 4 was drilled at a ground elevation of approximately 459 feet above MSL and Well No. 5 was drilled at a ground elevation of approximately 482 feet above MSL. The capacity of Well No. 4 is 500 gpm and 650 gpm for Well No. 5. Both wells have preliminarily shown low salinity levels, and testing is being conducted to determine the viability of those wells for domestic use. If not viable for domestic use, it will be used for non-potable agricultural use. Water pumped from the non-potable wells will be discharged into the Waihee Ditch or lined onsite reservoirs and used for irrigation purposes for the residential lots, agricultural farming, parks and open areas. Well No. 6 is a monitoring well.

The estimated water demand for the project was determined from the Department of Water Supply's Water System Standards (DWSWSS), dated 2002, as follows:

Table 53 ~~47~~: Department of Water Supply Water System Standards, 2002

Department of Water Supply Water System Standards, 2002	
Use	Gallons per Day (GPD)
Single-Family	600 gallons per day (gpd) per unit
Rural Residential	1,000 gpd/unit
Multi-Family	560 gpd/unit
Country Town Mixed-Use (Dwelling)	560 gpd/unit dwelling
Country Town Mixed-Use (Commercial)	140 gallons/1,000 s.f.
Commercial/Employment	140 gallons/1,000 sq. ft.
Parks and Open Space	1,700 gallons/acre
School	1,700 gallons/acre

The Department of Water Supply (DWS) does not have water demand standards for a dual water system (both potable and non-potable). However, in discussions with the DWS, it was determined that the DWSWSS standards could be conservatively reduced by one-third if a dual water system was used for a project. Table 54 ~~48~~ identifies the estimated water demand for the project based on the use of a duel water system.

Table 54 ~~48~~: Estimated Demand for Potable Water Using a Dual Water System

Department of Water Supply Water System Standards, 2002	
Use	Gallons per Day (GPD)
Single-Family	400 gallons per day (gpd) per unit
Rural Residential	667 gpd/unit
Multi-Family	373 gpd/unit
Country Town Mixed-Use (Dwelling)	373 gpd/unit dwelling
Country Town Mixed-Use (Commercial)	93 gallons/1,000 s.f.
Commercial/Employment	93 gallons/1,000 sq. ft.

Department of Water Supply Water System Standards, 2002	
Parks and Open Space	0 gallons/acre
School	1,300 gallons/acre

Based on the water usage, the projected average daily water demand for Phase I is 311,033 gpd. In accordance with the DWSWSS, the maximum daily water demand is calculated as being 1.5 times the average daily demand, or 466,650. Based on the school and commercial uses, the maximum fire demand is 2,000 gpm (See Appendix B of the Preliminary Engineering and Drainage Report (~~DEIS~~ FEIS Appendix H) for Water Demand Calculations). The projected average daily water demand for Phase II is 334,475 gpd and the maximum daily water demand 501,713 gpd. Irrigation of parks and open spaces, including landscaping of residential and commercial lots, will be provided by the non-potable water system.

The maximum daily potable water demand for the entire Project, not including irrigation of urban open space and agricultural lands, is estimated to be 968,363 gallons per day (gpd), whereas the Waikapū Aquifer has a sustainable yield of 3 million gpd. Before drawing ground water from the Aquifer, a permit will be required from the Commission on Water Resource Management (CWRM) which has regulatory jurisdiction over the aquifer. The CWRM will ensure that the use of the aquifer will not exceed its sustainable yield.

Water conservation measures, such as low-flow toilets and shower heads, will be utilized throughout the Project, which will further decrease water demand. As noted, irrigation of the parks and open space will be from the non-potable water source, which will also decrease potable water demand.

The reservoir capacity is based on the DWSWSS Criterion 1 for Reservoir Capacity. Based on this criterion, the required storage volume for the two phases is 968,363 gallons. It is recommended that a 1.0 million gallon reservoir be constructed to accommodate the two phases of the project. As an alternative, the developer could construct two storage reservoirs, each with a storage volume of 0.50 million gallons. Each 0.50 million gallon reservoir could be constructed at the beginning of each phase. The two reservoir option would allow the second reservoir to be

constructed as the demand increases and allow for more flexibility during maintenance and repair should one of the reservoirs have to be taken out of service.

The 1.0 million gallons of water storage will be constructed mauka of Well No. 5 at an elevation of approximately 800 feet MSL. This will allow for the entire project to be serviced by gravity flow from the reservoir(s).

The Applicant will also implement the following well head protection BMP's, pursuant to the Department of Water Supply's comment letter dated June 20, 2016 (See Appendix S, DEIS Agency and Community Comment and Response Letters) in order to prevent pollutants from impacting the quality of the ground water aquifer:

- Inspect exposed parts of the well periodically for problems such as: cracked or corroded well casing, broken or missing well cap, damage to protective casing, settling and cracking of protective seals.
- Ensure that the area around the well is sloped so that the surface runoff drains away from the well.
- Provide a well cap or sanitary seal to prevent unauthorized use of or entry into the well.
- Provide for sediment removal or well cleaning as necessary.
- Have the well tested once a year for fecal coliform or other constituents that may be of concern.
- Keep accurate records of any well maintenance, such as disinfection or sediment removal, that might require use of chemicals in the well.
- Mixing or using pesticides, fertilizers, herbicides, degreasers, fuels, or other pollutants near the well is to be avoided.
- Do not locate any potentially polluting activity within 1000 feet of the well for well head protection.

Non-potable Water Demand and Proposed Supply

Irrigation of the Project's agricultural lands will be from surface water from the Iao Stream via the Iao-Waikapū Ditch and Waikapū Stream via the South Waikapū Ditch and Waihee Ditch,

which are operated by the Wailuku Water Company. This system has historically provided irrigation water to WCT's agricultural lands, which were used to grow kalo and other canoe crops and then later sugarcane and pineapple. These water sources, which are part of the larger surface water system known as the "Nā Wai 'Ehā", have been designated by the CWRM as a Surface Water Management Area. Before drawing water from the Nā Wai 'Ehā, surface water use permits will be required from the CWRM, which has regulatory jurisdiction over this Surface Water Management Area. The Applicant filed surface water permits with the CWRM in February 2016 for irrigation of TMK Numbers (2) 3-6-005:007, (2) 3-6-004:003, (2) 3-6-004:006, (2) 3-6-006:036. With the closure of HC&S and its announcement to the CWRM in July 2016 that it would not seek a surface water use permit from the CWRM for its Iao-Waikapū fields, the Applicant filed a request with the CWRM in July 2016 to be allowed to pursue the surface water use permit in lieu of HC&S. HC&S's Iao-Waikapū fields include the following parcels owned by the Applicant: TMK Number (2) 3-6-002:001 and TMK Number (2) 3-6-2:002:003.

In addition to Ditch water, the Applicant proposes agricultural wells to produce non-potable water that will be stored in agricultural reservoirs and also used for irrigation. The use of the agricultural wells will require a ground water use permit from the CWRM since the water would be drawn from the Waikapū Aquifer, which has been designated by the CWRM as a Ground Water Management Area. The agricultural wells would be pumped from the alluvial aquifer, whereas the potable wells would be drawing from the basalt aquifer. However, further testing is required to determine the interdependence of these two aquifers and if pumping from the alluvial aquifer would impact the sustainable yield from the basalt aquifer.

An additional source of non-potable irrigation water will be recycled wastewater from WCT's wastewater reclamation facility. At full build-out of the WCT development, the wastewater reclamation facility is expected to be able to generate approximately 650,000 gallons per day of reclaimed water. R-1 quality recycled water may be used for landscape and agricultural irrigation via spray, surface drip or subsurface drip irrigation. Table 53 ~~47~~ documents the potential supply of non-potable water versus the Project's potential demand for irrigation of its urban landscape planting areas and agricultural lands.

As is shown in Table 55, it is expected that sufficient non-potable irrigation water should be available to irrigate the agricultural lands as well as the urban and rural open space lands. Ground water from the Waikapū Aquifer and surface water the Nā Wai ʻEhā are managed and regulated by the CWRM, which should ensure that these resources are used sustainably and in a manner that is consistent with the Hawaiʻi State Plan and its Functional Plans.

Table 55: Estimated Demand for Non-Potable Water Irrigation Water

Non-Potable Water Source	Estimated Historical Supply in MGD	Estimated Future Supply in MGD	Estimated WCT Demand in MGD	Surplus / Deficit in MGD
Ditch Water[25]	5.82[26]	5.82		
Pumped Well Water	N/A	Unknown		
Reclaimed Wastewater	N/A	.650		
TOTAL	5.82	6.47	3.42[27]	+3.05

The Applicant intends to establish a private water company to manage, operate, and maintain its water and wastewater systems. The private water company will be responsible for the WCT's on-site non-potable and agricultural irrigation water sources, storage and distribution systems.

5. Wastewater

A Preliminary Engineering Report was prepared for the ~~DEIS~~ FEIS that assesses current wastewater system capacity and existing infrastructure to support the Project (**See**: Appendix,

[25] WCT's future use of ground water from the Iao and Waikapū Streams will require the issuance of a Surface Water Use Permit from the Commission on Water Resources Management. These permit requests have been filed but not yet issued.

[26] Based upon a water duty of 5408 gallons per acre per day (GAD) multiplied by WCT's 1077 acres of agricultural land. In the Nā Wai ʻEhā IIFS proceedings, the Commission on Water Resources Management determined that this was a reasonable daily water use requirement for sugarcane cultivation.

[27] Assumes a demand for 2.75 mgd to irrigate 1077 acres of agricultural lands based upon a water duty of 3400 GAD for diversified agriculture. This is the application rate used by the State Department of Agriculture for diversified crops. The estimate assumes that 75 percent of the crop land is being irrigated at any given time (1077*.75)*3,400 ≈ 2.75 MGD. Urban open space demand for non-potable irrigation water is estimated to be about 0.67 mgd.

H, "Preliminary Engineering Report"). In addition to the Preliminary Engineering Report, two wastewater reports were prepared to assist the Client with future planning and development of a private wastewater reclamation facility. Enviniti LLC conducted an analysis of a conventional wastewater reclamation facility. The Enviniti study identifies regulatory and design requirements for the planning, design, construction, operation, and maintenance of such a facility. The Enviniti study also documents the Project's projected wastewater generation and provides order of magnitude cost estimates for the facility (**See**: Appendix J). Mana Water LLC, in association with Kennedy/Jenks Consultants, prepared a wastewater report for a facility based on Organica's Food Chain Reactor (FCR) treatment technology. Organica was established in 1988 and is an international leader in utilizing Fixed-Bed Biofilm Activated Sludge (FBAS) technology for wastewater treatment. In a plant using FCR technology, as water flows from one reactor to the other it passes through different ecologies. These ecologies are comprised of plants and other natural microorganisms that break down the wastewater components using the nutrients as food. The sub-ecosystems utilized in an FCR system provide for enhanced removal efficiency while utilizing less energy and producing less sludge than a conventional treatment plant. The Mana Water and Kennedy Jenks report provides the following documentation:

- Projected wastewater flow from the Project;
- Estimated volume of recycled water generated by the facility at build-out;
- Estimated order of magnitude construction and operating costs for the facility;
- Facility operating revenues versus facility costs;
- Advantages of FCR facilities over more conventional treatment facilities;
- Conceptual site plan; and
- Conceptual architectural rendering. (**See**: Appendix K).

The Applicant conducted an analysis of wastewater treatment alternatives to determine the preferred method of treating the Project's wastewater (**See**: Chapter VIII of the FEIS). Based upon the analysis, it was determined that the preferred method of wastewater treatment is to construct a private wastewater reclamation facility within the subject property. The preferred wastewater treatment technology is Organica's FCR system. The Project's wastewater treatment plan is described in detail in Section III.B.8 of the FEIS).

Existing Conditions. The existing MTP is serviced by a private sewer system which connects to the County's sewer system on Waiko Road near Waikapū Town. The system is owned and maintained by the MTP. The system consists of a 6-inch sewerline and manholes from the existing buildings, crossing Honoapi'ilani Highway, to a sewer pump station located approximately 500 feet east of Honoapi'ilani Highway. A 4-inch forcemain conveys the wastewater from the sewer pump station through the cane fields, across Waikapū Stream, up to Waiko Road where it connects to a sewer manhole on Waiko Road east of Waikapū town. There is an 8-inch gravity sewerline from the existing sewer manhole which connects to a County-owned sewer manhole east of Waikapū Town.

The County's sewer system traverses from the manhole on Waiko Road through the Waikapū Gardens Subdivision, through privately owned properties, onto Wai`ale Road, down Lower Main Street and discharges into the Wailuku Sewer Pump Station near the intersection of Kahului Beach Road, Lower Main Street and Waiehu Beach Road. Sewer collected at the Wailuku Sewer Pump Station is pumped to the Kahului Wastewater Reclamation Facility (KWRF) in Kanahā.

According to the Wastewater Reclamation Division, County of Maui, as of July 31, 2014, the KWRF has a capacity of 7.9 million gallons per day (mgd). The average flow into the KWRF is 4.7 mgd and the allocated capacity is 6.33 mgd. The remaining wastewater capacity at the KWRF is approximately 1.57 mgd. In response to the Project's January 2016 DEIS, the Wastewater Reclamation Division notified the Applicant in its April 13, 2016 comment letter that the KWWRF does not have the capacity to accept flows from outside the current service area and that the collection system is unable to accept flows from the development without significant upgrades. The Division also stated that the Applicant shall work with the County and area developers to complete a master plan for a regional treatment solution and shall contribute its fair share towards its implementation (**See**: DEM letter dated April 13, 2016 and Applicant response dated October 25, 2016 in Appendix S, DEIS Agency and Community Comment and Response Letters).

Potential Impacts and Mitigation Measures. ~~In a letter dated July 16, 2013 (See Appendix I), the Department of Environmental Management (DEM) notes that the Kahului Wastewater Reclamation Facility, as of June 30, 2013, has capacity allocation remaining for approximately 1.11 mgd (3,000 dwelling units) and 0.54 mgd for other supportive uses to issue building~~

~~permits. The Department notes that most of this capacity is necessary to accommodate existing entitled projects at Kehalani, Waiolani Mauka, Waikapū Gardens Multi-Family and Maui Lani. The Department further notes that in order for the existing collection system to accept flows from the WCT, the following transmission system improvements will be required:~~

~~Table 49-43: Required Off-site Wastewater Transmission System Improvements~~

~~Required off-site Wastewater Transmission System Improvements~~		
~~Location~~	~~Description~~	~~No. Units Accommodated~~
~~Lower Main Street~~	~~Upgrade existing gravity sewer line in Lower Main Street from 12-inch to 15-inch. This segment stretches from ʻĀinahou Place to Hala Place (Manholes KA2OGE0100 to KA20GB0510) and is approximately 1,950 linear feet.~~	~~200~~
~~Waiko Road; Wailuku Pump Station~~	~~Upgrade approximately 2,750 linear feet of the 8-inch main trunk line from the force main daylight manhole in Waiko Road through Waikapū Gardens to 12-inch;~~ ~~Upsize the final two pipe segments prior to the Wailuku Pump station from 24-inch to 36-inch, which is approximately 150 linear feet with a major bypass operation.~~	~~450~~
~~TOTAL UNITS~~		~~650~~

~~The DEM further states that adding additional WCT residential units beyond 650 would require further analysis to determine the extent of Lower Main Street improvements.~~

~~The policy of the DEM is that wastewater capacity cannot be reserved until the project is ready to receive building permits. If capacity at the KWRF is available at the time building permits are ready to be issued for the project, the project proposes to temporarily connect to the County's sewer system and complete the upgrades to connect up to 650 units in the phase I development.~~

~~The DEM's long-term desire is for a wastewater treatment plant to be constructed in the Waikapū Area to accommodate future flows generated by development within the Waikapū region. The WCT will need to construct a stand-alone private wastewater treatment facility, or partner with other projects in the Waikapū area, such as A&B's Wai`ale project or the County of Maui to construct a regional wastewater treatment facility. The planning and design of a stand-alone or combined wastewater treatment facility will be coordinated with the availability of capacity within the County system. The Applicant is analyzing several package wastewater treatment options, including a conventional wastewater treatment facility and a facility using a Food Chain Reactor (FCR) configuration (See: Appendix H, "Preliminary Engineering and Drainage Report").~~

~~In addition, Brown and Caldwell Consultants were retained by the Department of Environmental Management to prepare the *"Central Maui Recycled Water Study".* The report dated April 2015, concluded that the major elements required for the Central Maui service area includes:~~

- ~~Three new WWPSs.~~
- ~~A wastewater conveyance system that includes gravity sewers and forcemains.~~
- ~~A new Central Maui WWRF to produce R-1 recycled water.~~
- ~~A soil aquifer treatment system for excess recycled water disposal.~~
- ~~A brackish groundwater well to provide supplemental water to the recycled water system.~~
- ~~A recycled water pump station and storage tank.~~
- ~~Recycled water transmission pipelines to the Tier 1 areas.~~

~~The study notes that the total cost for the system is estimated to be $91.4 million, or $20,300 per market-rate EDU.~~

~~The WCT could construct a stand-alone private wastewater treatment plant near the northeast corner of the project site after the maximum units is serviced by the County's wastewater system. However, the treatment plant will be needed in about 2017 and the developers will continue to work with the County and other projects within the Waikapū area on a collaborative wastewater treatment facility.~~

The Project will produce an increase in demand for wastewater treatment. Based on the *"Preliminary Wastewater Report"*, prepared by Enviniti LLC, dated March 2013 (**See**: Appendix J), the following were the determined average wastewater and design maximum flow rates[28] for the project:

AVERAGE FLOW ESTIMATES:

- Phase I – 395,000 gpd
- Phase II – 303,000 gpd
- Total Project – 698,000 gpd

DESIGN MAXIMUM FLOW ESTIMATES:

- Phase I – 1,548,652 gpd
- Phase II – 1,257,125 gpd
- Total Project – 2,449,819 gpd

If capacity at the KWWRF is available at the time building permits are ready to be issued for the Project, the Applicant may consider a temporary connection to the County's sewer system and complete the required upgrades for the connection in the Phase I development as described in this report. However, since the DEM stated in its letter dated April 13, 2016 that the Project

[28] The estimated flow rates were calculated using the conceptual phasing plan. Assumptions were made on the use and development of land classifications. The low rates will be refined as a more detailed development plan becomes available.

would not be allowed a connection to the KWWRF, the proposed private wastewater reclamation facility utilizing FCR technology, together with a collection system and pump stations will be constructed to service the Project's wastewater treatment demand. At full buildout of the Project, the wastewater reclamation facility is expected to process an average daily flow of about 0.65 million gpd. The peak flow into the facility is estimated to be approximately 1.3 million gpd. Wastewater processed at the facility will be reclaimed to R-1 standards, which will allow the non-potable recycled water to be used for above-ground irrigation of most agricultural crops and open space uses, including parks. The Agricultural Preserve as well as the Project's parks and open space elements are expected to be the facility's future reclaimed water users. The Project's wastewater treatment plan is described in detail in Section III.B.8 of the FEIS.

6. Airports

In the State Department of Transportation's response letter dated May 18, 2016 the Airports Division advised the Applicant that the Kahului Airport is within five (5) statute miles between the farthest edge of the Air Operations Area and land use activities within the WCT that could attract hazardous wildlife movement into or across aircraft approach or departure space (**See**: Appendix S, DEIS Agency and Community Comment and Response Letters). The DOT letter included as an attachment the FAA's Advisory circular 150/5200-33B, Hazardous Wildlife Attractants On or Near Airports. The letter also noted that the FAA recommends that stormwater detention ponds be designed, engineered, constructed, and maintained for a maximum of 48-hour detention period after the design storm and remain completely dry between storms.

The WCT's drainage system will be designed to accommodate the increase in surface runoff volume from a 100-year, 24-hour storm created by the project and the volume required to meet the post construction water quality standards. In addition to the detention basins, large grassed swales will be constructed within the open space areas to divert runoff to designated outlets.

The design of the detention basins will include an overflow pipe which will allow a minimal discharge during a storm event and fully drain the basin within 48 hours after each storm event.

Moreover, in recognition of the Airport's concerns the Applicant will consult with the FAA and the Airports Division and other applicable agency's to identify BMPs that will help to mitigate hazardous wildlife movement into and from the Project's proposed urban and agricultural infrastructure systems.