DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

PETER B. CARLISLE
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

2011/ELOG-121 (mw)

January 20, 2011

Mr. Herman Tuiolosega, Acting Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Tuiolosega:

Subject: Draft EIS for the Kapa'a Light Industrial Park, ~~Kailua~~, Koolaupoko, Oahu, TMK 4-2-15: 1 (por.), 6 and 8

Please publish a notice for this project in your next issue of The Environmental Notice.

We are the accepting authority for this project. This Draft Environmental Impact Statement (EIS) is being issued pursuant to the project EIS Preparation Notice listed in the July 23, 2010 issue of the Environmental Notice.

A hard copy and a CD of the Draft EIS for the above project are attached. We have ~~included~~ submitted the OEQC publication form ~~on the CD, as per your web site's instructions.~~ via e-mail. MW

Should you have any questions, please contact Mike Watkins of our staff at 768-8044.

Very truly yours,

fr David K. Tanoue, Director
Department of Planning and Permitting

DKT:js

cc: Kapa'a I, LLC
Sustainable Design & Consulting LLC

Enclosures: 1 hard copy of the Draft EIS
1 CD of the Draft EIS

Transm'l to OEQC

DRAFT ENVIRONMENTAL IMPACT STATEMENT

For Activities to develop the proposed

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Volume I: Main Report

January 2011

Sustainable Design & Consulting LLC
www.sustain-HI.com

This page is left blank intentionally

Cover Sheet

Applicant:

Kapa’a I, LLC
905 Kalanianaloe Hwy.
Kailua, HI 96734
Contact: Mr. John King and Mr. Paul King

Accepting Authority:

City and County of Honolulu
Department of Planning & Permitting
650 So. King St, Honolulu, HI 96813
Contact: Mr. Mike Watkins

Propose Action:

The Applicant’s proposed action is the development the Kapa’a Light Industrial Park on his property, Kailua, Hawaii.

Designation: Draft Environmental Impact Statement (DEIS)

Abstract.

This DEIS evaluates the potential environmental impacts of construction and operation of a proposed light industrial park, the Kapa’a Light Industrial Park in Kailua, Island of Oahu. The Preferred Alternative would add approximately 606,000 square feet of industrial space to an already 283,000 square feet existing warehouse development at the site. The proposed industrial space would provide much needed industrial space to the Koolaupoko region and would result in an increase in the workforce of approximately 600 new employees at the site. The Preferred Alternative would develop approximately 60 percent of proposed site with a low impact development approach designed to achieve LEED Silver certification. The low impact development approach will greatly reduce impact to environmentally sensitive adjacent wetlands and streams. Under Alternative B, the same amount of space would be added and the entire industrial development would be built using conventional building and site preparation methods. The No Action Alternative, which is required by statute, assesses impacts at the proposed site in the event no further construction occurs.

For additional information concerning this document, please contact:

Consultant: Manfred Zapka, PhD, PE, Principal
LEED-AP, CEM, CBE
Sustainable Design & Consulting LLC
P.O. Box 283267
Honolulu, Hawaii 96828, USA
Tel: 808-265-6321,
e-mail: sustainabledc@gmail.com

This page is left blank intentionally

EXECUTIVE SUMMARY

General

This Draft Environmental Impact Statement (EIS) examines potential environmental impacts of the development of a proposed light industrial park, the Kapa'a Light Industrial Park, in Kailua on the windward side of Oahu, State of Hawaii.

The specific recommendations are:

- Construct a comprehensive light industrial development on a site that is adjacent to an existing industrial warehouse development;
- Provide much needed light industrial space to the market of the Koolaupoko region, and more specifically the greater Kailua/Kaneohe area, which is presently significantly undersupplied with industrial space;
- Prepare the site including grading, roadways and infrastructure and construct individual warehouses at a pace that matches the region's ability to absorb the added space in a time period expected to be between 15 to 17 years to full absorption;
- Implement impact mitigation measures to avoid any significant impacts to the environment and community, such as measures to project the water quality in the Kapa'a Stream and adjacent wetland;
- Develop the portions of the proposed of the site that are closest to environmentally sensitive wetland and stream using a low impact development approach, which significantly reduces environmental impact and can improve certain parts of environmental uses;
- Commit to design and construct the proposed project to the requirements of the U.S. Green Building Council's Leadership in Environmental and Energy Design (LEED) rating system and achieve LEED Silver certification for the portions of the site that are closest to the most environmentally sensitive portions of the proposed site and thus require the largest commitment of environmental mitigation measures.

This Draft Environmental Impact Statement (DEIS) is prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes, Act 241, Session Laws of Hawaii 1992, and Chapter 200 of Title 11, Department of Health Hawaii Administrative Rules, "Environmental Impact Statement Rules".

This DEIS is prepared to be submitted, as part of a Zone Change Application, to the City and County of Honolulu, Department of Planning and Permitting. This DEIS documents potential environmental impacts of the proposed project and evaluates proposed impact mitigation measures. The DEIS presents evaluations, findings and the determination of significant criteria.

In the course of the environmental review for the proposed action, this DEIS was preceded by an Environmental Assessment. The Approving Agency, the City and County of Honolulu, Department of Planning and Permitting, determined in its May 27, 2010 letter that a full EIS would be required for the project.

The Accepting Authority, the City & County of Honolulu, Department of Planning and Permitting, published the Environmental Impact Statement Preparation Notice (EISPN) on July 23, 2010 in *The Environmental Notice*, which is published by the Office of Environmental Quality Control (OEQC), State of Hawaii. The publication date of the EISPN initiated a 30-day public review period upon which nine responses to the EISPN were received. The comment letters are presented in this DEIS.

Background and need for the proposed action

Over the past two decades the applicant, Kapa'a I, LLC / Mr. John King, has developed industrial zoned land in the Kapa'a Valley, located at the outskirts of Kailua, a major economic and residential center on the windward side of the island of Oahu, State of Hawaii. After first building basic warehouse structures, including some 15 Quonset type warehouses, on land that he leased for more than two decades, the applicant acquired three contiguous land parcels, TMK 4-2-15:001 (portion of), 006 and 008, totaling 79 acres, in recent years. The applicant proposes to develop a light industrial park, the Kapa'a Light Industrial Park, on an approximately 27 acre portion of these three parcels. The proposed new industrial development would be built adjacent to existing warehouses and would share some of the existing infrastructure. While the existing warehouse development was started some twenty years ago without a uniform development approach, now that the entire property is under the ownership of the applicant, a comprehensive site development plan has been created, which endeavors to create a modern, efficient and environmentally friendly industrial park that will serve the community and the region.

The proposed new light industrial development would be built in response to the growing needs for industrial space in the Koolaupoko region. The Koolaupoko region is currently significantly undersupplied with industrial space and the per capita allowance of industrial space in Koolaupoko region is presently only 20 percent of the average per capital allowance on Oahu. This extremely low per capita allowance of industrial space in the Koolaupoko region renders this market one of the lowest supplied in the state and suggests that the community would greatly benefit from added industrial space in the region. The region's great demand and the fact that with the exception of the proposed site there are very few locations in the region that provide potential for a significant added supply of needed industrial space suggests that the proposed site would indeed be an appropriate location for a light industrial development.

The intended companies which would most likely lease space in the proposed project would be businesses from within the Koolaupoko region or business from outside the region, which would serve the region as local service centers, thus avoiding high costs and impacts associated with long-distance service operations. The proposed project intends to primarily serve local and sub-regional demand of industrial services or small manufacturing companies. A survey conducted for this DEIS shows that 85 percent of the companies currently leasing spaces at the existing warehouse development are small businesses with fewer than 10 employees. The survey further revealed that 57 percent of all employees reside in the greater Kailua and Kaneohe region. These results emphasize that the existing warehouse development primarily serves small companies from the local region, a trend that is expected to continue for the future under the proposed project. It is not the intention of the proposed project to lease space to companies that serve an island-wide market, or whose operations would include handling, manufacturing or transporting materials or products that have a high risk of adverse impacts to the environment.

A market study conducted for the environmental review of the proposed project suggested that over the next 15 to 17 years, approximately one million square feet of industrial space could be readily absorbed by the region, which would satisfy new demand for industrial space. The applicant proposes to add 606,000 square feet of net new industrial space to the existing 283,000 square feet and add 30 new warehouses to the existing 31 warehouses. Over the build out period, the estimated added work force would be approximately 600 employees. This would double the number of warehouses and triple the industrial space and workforce at the proposed site.

The proposed site for the light industrial park would be located on portions of three contiguous land parcels which are owned by the applicant. One of the three land parcels, in the center of the proposed site, is within the Intensive Industrial (I-2) county land use district and therefore the zoning is consistent with the intended land use of the proposed project (e.g. industrial warehouses or base yards). The remaining two land parcels, situated at the western and eastern side of the proposed site, are within the county General Preservation (P-2) land use district and therefore require a zone change to Limited Industrial (I-1) to be consistent with the intended light industrial land use of the proposed project. Since a portion of the proposed site is also located within the Special Management Area (SMA), an SMA permit would also be necessary for the project.

The development footprint of the proposed new light industrial park would be exclusively located on land that is previously disturbed land, graded areas that are not or are only sparsely vegetated. Therefore no previous undisturbed land, natural vegetation area, wetland areas or streambeds would be used to construct any part of the development footprint, which includes buildings, roadways, parking areas, loading facilities and infrastructure.

The proposed project schedule expects a development period of between 15 and 17 years. During this time individual warehouses would be constructed in accordance with the pace of evolving demand for industrial space in the region. There would be two major project development milestones, the completion of development of the upper and lower portions of the proposed site. These two milestones are expected for the years 2016 and 2026, respectively. The development of both the upper and the lower portion of the site would include site development, including, grading, roadway construction and infrastructure installation. After this first phase, construction of the individual buildings would occur. Therefore short-term impacts would mainly occur during the site development work, and much less during construction of the individual warehouse structures. It is expected that during the anticipated 15 to 17 years of development, period minor construction activities on individual buildings would be carried out over three to four month of every year. It is anticipated that this construction work would not result in significant impacts due to the relative small scope of ongoing construction work. Thus, by stretching out the development over 15 to 17 years, impact will be limited and the effectiveness of mitigation measures can be continuously examined and streamlined to ensure effective impact mitigation.

A portion of the proposed site would use low impact development approaches in order to reduce the ecological footprint and to mitigate impact on the community. The lower portion of the site is closest to environmentally sensitive land, including wetlands and stream corridors, and a portion of the proposed site would be developed using a comprehensive range of sustainable building design and construction measures. The applicant has made a commitment to develop the lower portion of the site in accordance with requirements for LEED Silver certification, which the project will apply for upon completion of the project. The LEED Silver certification reflects an advanced level of building “green” and the certification under the LEED rating system includes a third-party audit to ensure that low impact development is indeed implemented as planned.

Alternatives

To implement the proposed action, the applicant has identified two action alternatives that differ in their development approach for the lower portion of the site. These are the Preferred Alternative and Alternative B. The topography of the proposed site is basically divided into two near level plateaus, which have an elevation difference of about 50 to 60 feet. Both portions are situated on former landfill that was created several decades ago by quarry deposits and municipal waste. The upper portion of the site accommodates the existing warehouse development. The plateau of the upper portion of the site is 40 to 60 feet above the adjacent stream corridor that includes the Kapa’a Stream and a delineated wetland area of about 15 acres. The upper portion of the site is approximately 2,000 feet away from the Kawainui Marsh and the distance between the center of the upper portion of the site and the center of the delineated wetland area in the lower stretches of the stream corridor is about 1,400 feet. The lower portion of the site, on the other hand, is located directly adjacent to the stream corridor and wetland and is elevated between 10 and 30 feet above the wetland area in the Kapa’a stream corridor. The perimeter of the development footprint of the lower portion of the site is at least 300 feet from the nearest wetland areas of the Kawainui Marsh.

It is expected that the lower portion of the site has the largest need for effective and comprehensive impact mitigation. This assumption is also supported by the fact that the lower portion of the proposed site is located entirely within the Special Management Area (SMA), which calls for special considerations of potential impacts and effective impact mitigation.

The differentiating characteristics between the two action alternatives is that the Preferred Alternative would implement the development in the lower portion of the site with a comprehensive sustainable design approach, which would qualify for LEED Silver certification upon completion of the project. Alternative B, on the other hand, would use conventional building technologies in the lower portion of the site. Both action alternatives would develop the upper portion of the proposed site with conventional building technologies. Building “green” is still more expensive than conventional building development and the applicant, in his goal to use a low impact development approach to the extent possible, considers it more beneficial to invest in advanced sustainable site development for the lower portion than to implement a more basic sustainable development approach for the entire proposed site.

Both action alternatives would add the same amount of industrial space. The buildings under the two action alternatives, though having the same building footprint, would be significantly different in terms of building envelope, energy and water efficiency, reuse of material, indoor environmental quality and other differentiators.

The **Preferred Alternative** would add a net total of 606,000 square feet of industrial space -- 269,000 to the upper and 337,000 square feet to the lower portion of the site, respectively. It is anticipated that at build-out, the proposed project would eventually have a new workforce of 600 new employees, of which approximately 340 would be from Kailua or Kaneohe. Under the Preferred Alternative, a total of 27.3 acres of presently developed, graded, pervious but not vegetated land would be used for the proposed development footprint, which includes buildings, paved traffic areas and some landscaped area within the development. The development footprint for the upper and lower portion of the site would comprise 10.6 and 16.7 acres, respectively.

The 10.6 acre development footprint of the <u>upper portion of the site</u> would have a continuous impervious concrete pavement between the buildings. The warehouse structures would be steel framed structures with a varying size of up to 24,000 square feet. The paved areas would serve as internal roadways, parking and loading areas. The conventional warehouse structures would have septic wastewater systems; each system having one septic tank and one leach field which would serve multiple warehouses as needed. The below ground installed electricity and water infrastructure would be interconnected with some of the existing systems and new capacities would be added as required. The site would be drained through a system of concrete and grass swales and below ground channels. Two new conventional detention ponds would provide flood control before storm water is released to the Kapa’a Stream corridor, which is directly adjacent to but at a lower elevation than the upper portion of the site. As an alternative, the site drainage scheme might use an existing drainage area, which is located at the western site boundary. The upper portion of the development would use two existing driveways to the Kapa’a Quarry Access Road, and would construct one additional driveway, which would serve only as an emergency exit.

Of the 16.7 acre development footprint of the lower portion of the site, 5.7 acres would have either pervious open grid pavement or be landscaped areas around the buildings. Internal roadways would have a width of 22 feet, a total length of about 5,400 feet and with impervious concrete surface. The drainage of a portion of the roadways would be collected in underground cisterns for use in irrigating the landscaped area and part of the planned 7.8 acres of restored habitat around the site perimeter; therefore, no potable water would be used for irrigation. The overflow of the drainage along with the runoff from the remaining roadways would be conveyed to a number of flow-through catchment units draining into an extended detention pond. The runoff from the detention pond would flow to the existing drainage canal along the quarry road. The drainage from the roof of the buildings would similarly flow to the cistern and overflow to the detention ponds. Therefore 100 percent of all runoff would be treated and discharged to avoid streambed erosion. The warehouse structures would have a varying size of up to 24,000 square feet, would be steel framed featuring a building envelope with good thermal and daylighting performance, and would be equipped in accordance to the LEED Silver certification project goal. The warehouse buildings are designed to use 30 and 40 percent less electricity and water, respectively, than the baseline conventional warehouses. The wastewater would be treated in alternative septic systems, which would include aerobic, denitrification and absorption treatment processes in addition to regular septic treatment system. The effluent of the alternative septic systems, containing very low concentration of organics, nutrients and suspended solids, would be used for irrigation and/or could be safely injected into the ground even if the injection points have small vertical and horizontal distances to the adjacent wetland and stream. In the lower portion of the development, two new driveways to the Kapa’a Quarry Access Road would be constructed, one of which would only serve only as an emergency exit.

Alternative B would construct the same amount of industrial space as the Preferred Alternative in the upper and lower portions of the site, resulting in the same expected number of new employees working for companies in the new industrial development.

Under Alterative B, the development approach would be consistent in the upper and lower portion of the site, e.g. the site development and construction of the buildings would follow applicable codes and ordinances but without a LEED certification goal.

The 10.6 acre development footprint of the upper portion of the site would have continuous impervious concrete pavement between the buildings. The warehouse structures would be steel framed structures with a varying size of up to 24,000 square feet. The paved areas would serve as internal roadways, parking and loading areas. The conventional warehouse structures would have septic systems, each system having one septic tank and one leach field which would serve multiple warehouses as needed. The below ground installed electricity and water infrastructure would be interconnected with some of the existing systems and new capacities would be added as required. The site would be drained through a system of concrete and grass swales and below ground channels. Two new conventional detention ponds would provide flood control before the stromwater is released to the Kapa'a Stream corridor, which is directly adjacent. As an alternative the site drainage scheme might use an existing drainage area, which is located at the western site boundary. The development would use two existing driveways to the Kapa'a Quarry Access Road and would construct one additional driveway, which would serve only as an emergency exit.

Under Alternative B, the 18 acre development footprint of the lower portion of the site would have continuous impervious concrete pavement between the buildings. The warehouse structures would be steel framed structures with a varying size of up to 24,000 square feet. The paved areas would serve as internal roadways, parking and loading areas. The conventional warehouse structures would have septic systems, each system having one septic tank and one leach field which would serve multiple warehouses as needed. Electricity and water infrastructure would be installed underground. The site would be drained through a system of concrete swales and below-ground channels. One or more new conventional detention ponds would provide flood control before the stromwater is released to the drainage canal and/or the Kapa'a stream corridor, which is directly adjacent to the site. Two new driveways to the Kapa'a Quarry Access Road would be constructed, one of which would only serve only as an emergency exit.

The third alternative is the **No Action Alternative**, which is required by statute. This alternative describes the impacts at the proposed project site in the event that the proposed project would not be built. Under this alternative there would be no construction.

Possible environmental impacts by area

Significant potential issues and impacts associated with the action-alternatives are discussed below. The No Action Alternative would not implement the planned development and therefore would not cause impact to the existing environment.

Geology, topography and soils: For the Preferred Alternative, 21.7 acres of the 27.3 acres development footprint would be converted from pervious to impervious land. An area of 2.2 acres of presently not vegetated land would be converted to a restored habitat, using native and adaptive plant species. Approximately 5.6 acres of the 27.3 acres development footprint would have pervious open grid pavement or would be landscaped area. Under Alternative B, 28.6 acres of the disturbed and pervious land would be converted to impervious land. Before construction, the project would require an approved erosion and sediment control plan and applicable permits, which would require appropriate site-specific best management practices (BMPs) for controlling runoff, erosion, and sedimentation during construction.

Water Resources: The Preferred Alternative and Alternative B would convert approximately 21.7 and 28.6 acres, respectively, from pervious to impervious land to implement the proposed development. Under both action alternatives, the implementation of erosion and sediment control plans would be required to reduce soils erosion, lower runoff flow rates and capture eroded soils and concentrated nutrients before they enter the downstream water flow. Stormwater runoff during construction would be controlled by stormwater BMPs and erosion and sediment controls to lower the potential impact to surface and ground water. Structural and non-structural management practices would be implemented for the operation of the proposed industrial park.

The surface water resources that would be affected by direct discharge of through seeping out of underground flow include adjacent wetland areas in the stream corridor, the Kapa’a Stream, the drainage canal along the quarry road and indirectly the Kawainui Marsh, which is the receiving water for the entire Kapa’a watershed. Groundwater recharge would be affected by converting previous to impervious land.

Under the Preferred Alternative: A total of 21.7 acres would be converted from pervious to impervious land. Runoff from impervious surfaces in the upper portion of the site would flow through detention ponds and be discharged through armored spill ways into the stream corridor. In the lower portion of the site an approximately 50 percent of the runoff from impervious surfaces such as roofs and roadways would be collected and stored in underground cisterns for use in irrigation. The rest of the runoff and the overflow of the cisterns would be conveyed to one extended detention pond, where the runoff would be gradually released to the drainage canal in order to lower the rate at which the water leaves the site.

Under Alternative B, all runoff from impervious surfaces would flow to detention ponds and be released to the stream corridor or the drainage canal.

The DEIS discusses possible impacts from leaching of the landfill body. The old landfill on which the proposed project would be developed lacks an underground sealing, such as by an impermeable barrier, which protects potential harmful leachate to seep into the groundwater. The DEIS discusses that it might be beneficial to restrict the amount of rainwater to infiltrate into the landfill body in order to reduce the amount of leachate. The DEIS discusses the positive effect of the proposed project on the overall water quality of the Kapa’a Stream since the stormwater discharge of the proposed project would reduce pollutants compared with existing conditions. None of the action alternatives would result in development within flood plains.

Biological Resources: Both action alternatives would convert only land that is presently developed. No open space, natural vegetated land or mature forest habitat would be used for the development footprint of either alternative. Under the Preferred Alternative, 2.2 acres would be converted from developed to restored habitat and 7.8 acres of open land at the site perimeter which presently has sparse or invasive vegetation would be restored to habitat, using native or adaptive plant species for promoting indigenous biodiversity. Under both action alternatives, rare and endangered species would not be affected since the existing condition of the project site is only habitat for a population of urbanized birds and small mammals but no endangered species. The adjacent Kawainui Marsh is habitat for federally listed water birds but no land of the marsh will be used for the proposed development.

Air Quality: Impacts on air quality would be primarily through increased traffic on the adjacent roads. The alternatives would not use fuel combustion for power generation or process heat. Some minor air impacts within the proposed project could result from dust and the operation of engines. Major air impacts are expected from diesel operated vehicles, such as trucks. While there would be an approximately 160 percent increase of heavy vehicle traffic on the section quarry road with the highest traffic volume after full build out, it is expected that air quality impacts would not significantly increase. Recent regulations for diesel engines exhaust and cleaner diesel would reduce the air quality impact of heavy vehicles over time.

Noise: Construction would occur under both action alternatives and would be short-term, typical of construction activities. It is expected that no sensitive receptors are located within the range of construction noise. Traffic related noise would be similar under both alternatives. The increased noise impacts due to the expected increases in traffic would be typically below threshold of a discernible difference to the human ear. The expected noise impacts would remain within the range typical for urban regions. Noise impacts during operations are not expected to be at significant levels, and would occur in industrially zoned land where some level of noise could be expected.

Traffic: Impacts on traffic are similar for both action alternatives, since the anticipated increase in traffic is a function of trips generated per unit of warehouse space. The increase of traffic would affect two roadways and three intersections. The level of service (LOS) on both roadways, the Kapa’a Quarry Road and the Kapa’a Quarry Access Road, would not decrease below a level, typically a LOS “D” that would result in a significant deterioration or require mitigation. The three intersections (1) Kapa’a Quarry Road & Mokapu Blvd, (2) Kapa’a Quarry Road & Kalanianaole Hwy, and (3) Kapa’a Quarry Road & Kapa’a Quarry Access Road would operate at sub performance level, e.g. at a LOS of “E” or worse, at the time of project completion, expected around 2026. This would require mitigation to improve the traffic flow through the most critical movements through the intersection. Prior to 2026 the LOS at these intersections is expected to be at a “C” or “D” level. The DEIS recommends that a new traffic impact analysis be conducted approximately seven years into the project development, or after the completion of the development in the upper portion of the site.

Infrastructure: Impact on the infrastructure would be different depending on the alternative. It is expected that both alternatives would not have significant impact on the utility’s capability to provide the required increase in electricity and water supply on an island wide level. In terms of site specific infrastructure, the water supply mains are expected to have sufficient transmission capability while the electric power lines supplying the site might need installation of additional capacity at existing utility poles. The site is presently not connected to the municipal sewer system and wastewater is treated onsite with septic tanks. The Preferred Alternative would result in less demand on the electricity and water infrastructure than Alternative B, due to the 30 and 40 percent electricity and water conservation rates, respectively, targeted under the LEED Silver certification. The mitigation of impact on wastewater systems would be more elaborate under the Preferred Alternative, since an advanced onsite treatment would be carried out in the lower portion of the site using alternative septic systems. These alternative septic systems have a much higher removal rate of pollutants in wastewater than conventional septic system and result in an effluent that can be safely injected into the ground or used for irrigation.

Socio-economic: The beneficial socio-economic impacts are expected to outweigh possible adverse impacts. The proposed project would provide much needed industrial space to the region and would strength the local economy be generating significant capital investment and tax revenues. It is expected that over half of future employees would come from within the region – it is estimated that only about 260 of the future employees would come from outside the region, and some are expected to relocate with their families to the region, thereby increasing the demand on public service through in-migration. It is forecasted that during the same time frame, the population of the Koolaupoko region will shrink by about 3,500 residents due to out-migration from the region. Therefore comparing the project related in-migration with expected out-migration there would likely be a net decrease in residents, and an associated decrease in demand on public services.

Cultural: Neither alternative should have any adverse effect on cultural assets, since no cultural or archeological sites are known at the proposed site. The land on which the proposed development would be built is a landfill area that was created approximately two decades ago. In the unlikely event of an archeological find during construction, standard procedures would be followed to protect any assets.

Cumulative impacts: There are no other major projects planned in the vicinity of the site and therefore there should be no significant cumulative impacts.

Potential mitigation measures

The DEIS has identified and discusses potential mitigation measures to reduce impacts on water resources, soil, air, noise and traffic, including the following:

Mitigation of construction related impacts from soil erosion and sedimentation include measures such as silt fencing and sediment traps to contain sediment onsite where necessary, covering disturbed soil or soil stockpiles, and sequencing construction activities with BMPs to reduce the amount of area exposed to erosion.

Stormwater Management Measures: Implementation of structural and non-stormwater management practices such as:

- Structural measures that could include detention ponds, filtration or screening systems, flow-through settling tanks, rainwater collection and harvesting
- Nonstructural measures that could include, landscaped areas, grass swales, disconnection of rooftop and non-rooftop runoff, and rainwater & stormwater irrigation

Air quality during construction: Control measures to limit fugitive dust would include water for dust control, applying filter material when handling dusty material, washing vehicles and tires before they leave the construction site, and cleaning adjacent streets frequently.

Air quality during operation: Controlling air quality during operation would include procedures to avoid hazardous handling and storage of material in the warehouses and open areas, cleaning internal roadways frequently, stabilizing all soil with vegetation, and cooperating with traffic authorities to reduce project related traffic on public roadways.

Noise Reduction during Construction: Measures would include adhering to local requirements for noise control and staying within allowable noise limits at different periods during the day, using equipment with low noise emissions, constructing vegetative buffer zones early in the project before mass grading or other noisy construction activities are carried out in the lower portion of the site, and scheduling especially noisy operations to occur in the same time period.

Noise reduction during operation: Methods of control could include monitoring all noise sources in development in accordance with occupational safety and health codes; using vegetation within and around the site to impede sound propagation, orienting noise sources away from environmentally sensitive areas, and cooperating with traffic authorities to mitigate project-related traffic noise on public roadways.

Improvement of traffic impacts: In accordance with the traffic impact analysis, the project generated traffic would not require any mitigation until several years after completion of the development in the upper portion of the site; therefore no mitigation would be required earlier than approximately 2020. Before this point in time a new traffic impact analysis should be carried out to assess the actual increased traffic generated by the projects and decide on mitigating. Notwithstanding the absence of short-term mitigation, the DEIS has identified several mitigation measures which would reduce the impact on the three intersections by adding deceleration lanes at the two intersections of Kapa’a Quarry Road with Mokapu Boulevard and Kalanianaole Highway and adding a separate left turn lane to the north-bound traffic at the intersection Kapa’a Quarry Road & Kapa’a Quarry Access Road.

Impact mitigation through low impact development approach

Under the Preferred Alternative, the lower portion of the site which is close to environmentally sensitive areas would be developed using an array of sustainable building and site preparation methods and technologies. The low impact development approach will be quantitatively verifiable by achieving the LEED Silver certification goal of the applicant for this lower portion of the site. In order to qualify for LEED Silver certification that project has to achieve at least 50 percent of the total number credit points available under the selected LEED New Construction Core and Shell V.3 rating system. The applicant has chosen to select and satisfy those LEED credit categories which achieve the needed points, but this will also result in effectively mitigating the most prominent impacts on the environment and on the adjacent wetland areas and the Kawainui Marsh. Therefore the LEED Silver certification plan has become a blueprint for effective impact mitigation at the proposed site. Since the LEED Silver certification involves a third-party audit of the design and construction the commitment to mitigate certain impacts becomes transparent and verifiable to all stakeholders of the project.

The selected sustainable design approach of the proposed project is presented in detail in Appendix 4 of this DEIS. The selected credits mirror the types of impact that the applicant expects will require the most attention and invested capital. According to the plan, the water resource related impact is a priority for mitigation due to the proximity to important wetland areas and the desire to protect the Kawainui Marsh. The water resource related impact would be mitigated under LEED Water Efficiency and Sustainable Sites category by means of advanced stormwater treatment, advanced wastewater treatment, water efficient landscaping and water savings. Other credits that were selected to mitigate important impacts on the Marsh are light pollution reduction, energy efficiency, incentivizing alternative transportation, habitat restoration and open space improvement.

Project Funding: The development of the proposed Kapa’a Light Industrial Park project would be privately funded.

Relationship to Plans, Policies and Controls:

The proposed project would be consistent with all of the applicable plans and policies of the Honolulu City and County General Plan, and the Koolaupoko Sustainable Communities Plan.

Honolulu City and County Land Use Districts: The intended land use of proposed project would require a zone change for two of the three parcel properties from General Preservation (P-2) to Limited Industrial (I-1) to be consistent with the county land use zoning. The remaining third parcel of the property is already zone Intensive Industrial (I-2) and the intended land use of the proposed project would already be consistent with county land use zoning.

State Land Use Districts: The intended land use of proposed project would be consistent with the state "Urban" land use district.

Permits and unresolved issues

The project will require permits to carry out construction work including but not limited to building, grading, and work on public roads. In addition, all applicable NPDES permits plus underground injection permits will be required. The project work may possibly also need permits to perform work in streams (stream alteration permit) and a permit to abandon two wells on the property.

It has to be determined if the project needs permits by the U.S. Army Corp of Engineers or the State Department of Health for wetland and surface water related construction.

The proposed project needs an approved major zone change for two of its land parcels from General Preservation (P-2) to Limited Industrial (I-1) and a Special Management Area (SMA) Permit in order to proceed with proposed action.

This page is left blank intentionally

EXECUTIVE SUMMARY

TABLE OF CONTENTS

LIST OF APPENDICES:

List of Figures

Table of Tables:

CHAPTER ONE - PURPOSE AND ORGANIZATION OF THE EIS

This Environmental Impact Statement (EIS) will examine the potential environmental impacts of developing the Kapa'a Light Industrial Park (KLIP) on a site that consists of three contiguous land parcels, which presently have different land use designations under the county zoning ordinance. While one of the three land parcels is already properly zoned for the development of the KLIP, the other two land parcels require a change of zoning before the development can commence. According to county statutes the required land use zone change is a major zone change, which triggers an environmental review process.

The EIS is prepared pursuant to Hawaii's environmental impact statement law (HRS 343), which is patterned after the National Environmental Policy Act (NEPA). The law requires that the government considers environmental, social and economic consequences of developments, which are not exempt under the law. Developments for which an environmental assessment (EA) or an environmental impact statement (EIS) has to be prepared require adequate opportunities for the public to participate in the review process.

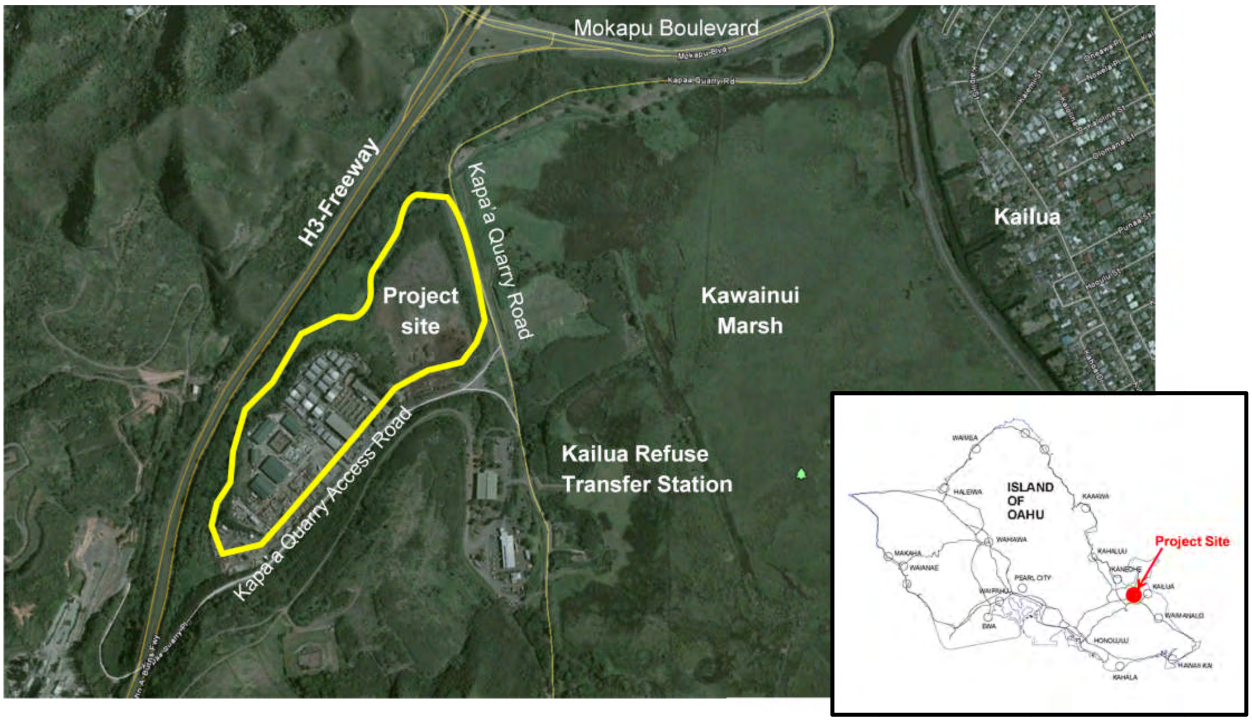
The following sections of Chapter 1 provide background, purpose and need of the proposed action as well as describe the EIS process for the proposed action and process steps that have been completed.

1.1 Project Background

The applicant is the owner of three contiguous land parcels on which the applicant intends to develop the Kapa'a Light Industrial Park (KLIP). The KLIP represents an expansion of an already existing warehouse development. The development plans call for adding 606,000 square feet of warehouse space to the already existing 283,000 square feet of warehouse space at the proposed site. The new warehouse space will be developed on all three land parcels owned by the applicant. These three land parcels are TMK 4-2-15:001 (portion of), 006 and 008. Land parcel 4-2-15:008 is already zoned to allow development of industrial warehouse space, whereas the other two land parcels, require zone change to allow the construction and operation of industrial warehouse space.

The project site is located on the windward side of the island of Oahu, at the western boundary next to the important Kawainui Marsh. The proposed project site is adjacent to Kapa'a Quarry Road and Kapa'a Quarry Access Road. The H3-Freeway passes the project site at a distance of about 300 feet to the north. The proposed project site and immediate surroundings are shown in Figure 1-1.

Figure 1-1 Vicinity map of project site and immediate surroundings



The development objective of the proposed KLIP is to provide the Kailua and Kaneohe region with additional industrial space, which is in short supply in this region. The Koolaupoko region, in which the proposed project is located, is significantly undersupplied with industrial space when compared to other markets on Oahu. Due to the shortage of industrial space, businesses that serve the region are often forced to locate within other regions on Oahu, resulting in long commutes and trip for employees and clients, which reside in the Koolaupoko region. Since there is virtually no other land within the Koolaupoko region to provide additional industrial space the proposed site is an important asset for the region to improve the economic infrastructure.

The project concept design has been developed over the past three years and has undergone several planning revisions. Due to the proximity of parts of the proposed site to important wetland area the development approach now includes low impact development measures that should help to mitigate impacts on the environment and the community.

1.2 Purpose and Need for the EIS

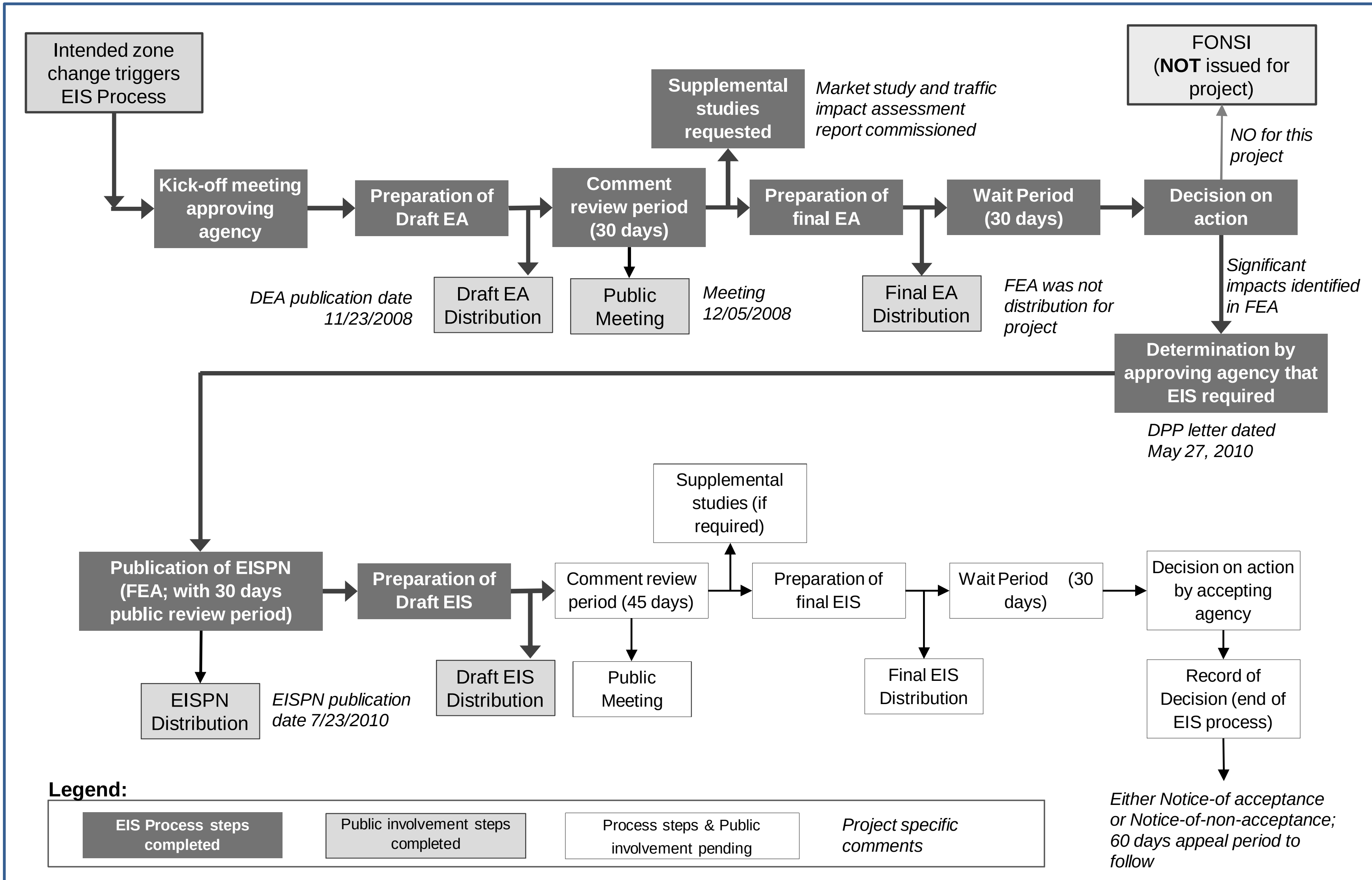
An environmental review is required for the anticipated major zone change for two of the three contiguous land parcels on which the proposed KLIP will be developed. The three land parcels are described by the tax map key (TMK) 4-2-15:001 (portion of), 006 and 008. Parcel 4-2-15:008 is currently within the Intensive industrial (I-2) county land use zoning district; parcels 4-2-15:001 (portion of) and 006 are currently within the General Preservation (P-2) district. The development of light industrial space, with the intended land use such as warehousing, base yards, minor repair, storage yards, light manufacturing or wholesale distribution, requires rezoning from preservation to industrial districts. In accordance with the county land use ordinances such land uses with few environmental impacts can be located with the Limited Industrial (I-1). Thus, the applicant will apply a major zone change from P-2 to I-1 for the two land parcels TMK 4-2-15:001 (portion of) and 006.

The EIS will identify and evaluate possible environmental, social and economic impacts of the proposed development. The EIS will specifically describe its evaluation of impacts, on the hydrology of the Kapa'a Stream and Kawainui Marsh, on traffic on roadways and highways affected by the project, on important viewplanes surrounding the Kawainui marsh, on the public services, on wildlife, as well as others. The EIS will also evaluate the effectiveness of mitigation measures for the impacts identified.

1.3 The EIS Process steps of the proposed action

Under Hawaii's environmental impact review process, agencies are required to consider the impacts of their proposed major actions on the quality of the human and natural environment. The process is intended to make decisions on developments that are based on the understanding of impacts to the environment and community and identify and assess reasonable mitigation measures in order to avoid or minimize adverse effects. Figure 1-2 illustrates the generic process as prescribed by law. Figure 1-2 also shows the process steps that apply to the proposed action, including process steps that have been completed and those which are still pending completion.

The environmental review process has to be applied to certain types of projects and certain triggers call for the preparation of an EIS. The intent of the applicant to develop a light industrial park on his property will result in land uses and structures that are not permitted within present preservation districts, thus requiring a major zone change considering the size of the land to be rezoned. This intended major zone change has triggered the need for an environmental review process for the proposed project.



Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 1-2: Overview of environmental review process for project

In a kick-off meeting with the accepting agency, the City & County of Honolulu, Department of Planning and Permitting (DPP) it was decided that an environmental assessment (EA) would be required, at the minimum, to satisfy the environmental review process requirements for the intended zone change The Draft EA was completed and distributed in November 2008, in accordance with the guidelines State of Hawaii Office of Environmental Quality Control (OEQC), which includes publication of the Draft EA in *The Environmental Notice* as well as distribution of hard copies and data CDs to about 35 identified stakeholders. A public presentation about the project was given to the Kailua Neighborhood Board on December 4, 2008.

A total of 24 comments were received from governmental agencies and community groups. The comments and review of the Draft EA resulted in the request by DPP to conduct two supplemental studies, a market study to identify if the region could accommodate the intended size of industrial space and a traffic impact assessment to determine anticipated traffic volume resulting from the proposed project and assess the impact of level of service of affected roads and intersections.

All comments as well as the supplemental studies were included in the Final EA, which was submitted to DPP at the end of December 2009. In May 2010 the DPP determined that the project would have significant impact, and that a full Environmental Impact Statement (EIS) would be required.

The environmental impact statement preparation notice (EISPN) was prepared by publishing the document that was planned to be the FEA in *The Environmental Review* and by providing data-CDs and several hard-copies to stakeholders and public libraries. The publication in The Environmental Notice Nine started a 30 day public review period. Nine letters with comments and suggestions were received.

1.4 Determination Letter and EISPN Publication

This section presents the determination of the approving agency of the EA, the City & County of Honolulu, Department of Planning and Permitting, to require a full EIS as well as the content of, publication of and comments received to the EISPN.

1.4.1 Determination Letter by DPP dated May 27 2010

The letter by DPP stating the determination that a full EIS is required is presented hereafter (described as Figure 1-3)

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

MUFI HANNEMANN
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

2010/ELOG-209 (mw)

May 27, 2010

Dr. Marc M. Siah, President
Marc M. Siah & Associates, Inc.
820 South Beretania Street, Suite 201
Honolulu, Hawaii 96813

Dear Dr. Siah:

Subject: Final Environmental Assessment for Kapa'a Light Industrial Park, Kailua, Koolaupoko, Oahu, TMK 4-2-15: 1 (por.), 6 and 8

After reviewing the Final Environmental Assessment (FEA) for this project, submitted on December 30, 2009, we have determined that an **Environmental Impact Statement** (EIS) will be required. Thus, whichever consultant the developer selects to prepare the project's EIS should submit an EIS Preparation Notice, which we will forward to the Office of Environmental Quality Control for notice in The Environmental Notice.

The reasons for this determination are as follows.

We find that four possibly significant impacts have not been adequately studied: (1) the ability to locate an extremely heavy industry at the industrial park if I-2 zoning is granted, (2) impacts on the marsh from doubling heavy truck traffic, (3) unintended impacts on the marsh such as failing to enforce the LEED certification requirements or the proposed restrictions on tenant activities, and (4) the visual impacts on people looking across the marsh or looking at the site from nearby park lands.

The FEA also needs to make minor revisions to the EIS to address the following:
(1) statements in the FEA that are not supported by the project's market study, (2) whether a catastrophic septic tank failure is in fact possible, as some comment letters suggest, and (3) impacts from the pre-existing condition of contaminants leaching from the ground within the project site, which is not discussed.

We find that there is a chance that the proposed industrial park expansion could meet one or more of the following three Significance Criteria in the EIS rules:

"9. Substantially affects a rare, threatened, or endangered species, or its habitat"
"11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain..."

"12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies"

According to the EIS rules, we must require an EIS Preparation Notice if we determine "that a proposed action **may** have a significant effect" (emphasis added). Only if we determine "that a proposed action is not likely to have a significant effect" can we approve the FEA and issue a Finding of No Significant Impact. And, since the FEA still leaves several questions unanswered, it is clear that an EIS does in fact need to be prepared if this project is to move forward.

We did mention at every step in this process that the project might need an EIS. One reason for this is that your project will greatly expand an existing industrial park in an isolated setting that happens to be located within a large preservation-zoned valley as well as next to the largest wetland in the state, where four endangered waterbirds (the Hawaiian Stilt, Coot, Gallinule or Moorhen, and Duck) are found. Thus, there is a greater chance that your project will have significant impacts (such as affecting habitats and endangered species) than if it were located in the midst of a fast-growing suburban area.

Also, since the proposed development of the lower portion of the project (TMK 4-2-15: por. 6) will require a Special Management Area Use Permit (SMP), it would take a highly detailed full-disclosure document such as an EIS to meet the SMP's environmental review requirements. We anticipate that the processing of the SMP will result in a detailed public debate about the project's impacts on two natural features – Kawainui Marsh and the ditch area that fronts Kapaa Quarry Road, which falls within Flood Zone A. Thus, preparing a full EIS could provide the additional information needed to potentially reduce community concerns over this project, both at the zone change and SMP stages.

We suggest that the contents of your EIS Preparation Notice be a revised version of Volume I of the FEA plus the attachments at the back of Appendix B, along with simple revisions to address issues discussed below. Revisions which will require additional analysis should be listed at the beginning of the Notice. We also ask that the mailing list be expanded to include the U.S. Army Corps of Engineers and the State Department of Health.

In the following sections, we recommend a number of changes to the FEA as it becomes an EIS.

<u>IMPACTS NOT ADEQUATELY ANALYZED</u>

Noxious Industries

If the project's preferred alternative is to seek I-2 zoning for the expansion areas, then the EIS should discuss the impacts of all heavy industries. This is needed because a zone change runs with the land and thus applies not just to the current project but to any successor plans or operations, and so the EIS must account for the eventuality that another developer might later take over the project and add uses or build a conventional industrial park.

Noise, Air and Water Quality Impacts from Traffic on Kawainui Marsh
The analysis of impacts on Kawainui Marsh fails to evaluate one possible impact. Specifically, discuss the noise impacts and the air and water quality impacts of doubling heavy truck traffic on the northern section of Kapaa Quarry Road, as evident from the data in Appendix B's Figure 9. This route circles the north end of the marsh as it connects the industrial park to Mokapu Saddle Road, and nearly all heavy trucks will also presumably double back near the marsh, following Mokapu and probably the H-3 Freeway as well. Thus, even if these impacts are shown to be insignificant compared to all the rest of the traffic along these same routes, they still need to be evaluated. This is because marsh impacts do not need to be substantial in order to qualify as a significant environmental impact; they merely need to **affect** an environmentally sensitive area.

Unintended Impacts on Kawainui Marsh from the Industrial Park
A sensitivity analysis needs to be conducted on several proposed mitigation measures to see if actions by industrial park tenants could totally negate the needed mitigations and thus result in significant impacts. Of special importance are hazardous wastes, litter, excess noise, and light pollution.

Scenic Vistas and Viewplanes
Much more work is needed on the visual impacts of the project's lower area, next to the marsh. This includes: (1) an after-mitigation version of Figure 3-22, the key visual impact illustration, and (2) additional pairs of similar illustrations from vantage points looking across the marsh, such as the end of Kaha Street in Coconut Grove and the eastern edge of the Kawainui Model Airplane Park, just across Kapaa Quarry Road from the project. All of these "after" illustrations should show how the proposed mitigation – including the new idea of a landscaped earthen berm at the front of the project – would soften the visual impact of constructing this large cluster of warehouses next to the marsh. The accompanying text should also: (1) acknowledge that the future presence of the warehouse complex will not be totally hidden by the proposed mitigation measures, especially from higher elevations (H-3 and Mokapu Saddle Road), (2) be more exact in describing the view up Kapaa Valley on page 3-13, since the valley has more of an undeveloped open space appearance than an industrial appearance, and (3) discuss how the lower part of the valley near Kapaa Quarry Road currently has an undeveloped look, with the City's Refuse Transfer Station next to the project's lower area blending naturally into its hillside and with the lower area's current greenwaste operation having an agricultural look.

<u>STATEMENTS CONTRARY TO THE MARKET STUDY</u>

Substantial Secondary Impacts
The FEA does not properly analyze the project's secondary impacts, since it assumes that the project will attract few businesses and employees to the region. Yet the project's market study (Appendix D, especially Table 10 and prior pages) suggests that over 90 percent of the region's future demand for industrial space will result from either new or expanding businesses ("natural trade area evolution") or relocations from the urban core. Thus, assuming that the project is the only major supplier of this demand, then almost all businesses occupying its newly built floor

space would be new to the region, and possibly half of all new employees would be new to the region as well. If so, then the project might result in "substantial secondary impacts" – one of the 13 criteria for declaring a project to have significant environmental impact. Thus, careful analysis is needed of how the project's new floor space, businesses, and employees will impact public facilities, population, and all of the services that will be needed, including services needed by future employees who move into the area.

That questionable assumption in the FEA occurs in Sections 3.8, 3.9, and 9.1. The two clearest statements which we question are as follows:

> "These findings therefore argue against concerns that the planned addition of industrial space within the proposed Kapa'a Light Industrial Park would attract businesses to the Koolaupoko region and would therefore significantly impact the local infrastructure." (Page 3-47)
>
> "In summary, it is anticipated that the proposed development would not significantly and adversely impact socio-economic conditions in the region. This is mainly due to the fact that proposed development would not create a large pool of new employment converging to the windward areas and placing new and heavy burden on housing, day-care center, schools, hospitals and other institutions in the region." (Pages 3-48 to 3-49)

However, it should also be noted that the DPP projects that this region will see a small population decline in the future, which might help to offset the project's likely socio-economic impacts.

We also question the market study's finding (repeated in Section 3.8) that this region is unique in having little industrial floor space per person. In fact, this is also the case in East Honolulu, Waianae, the North Shore, and Koolauloa. See the jobs data published in Table I-3 of the DPP's Annual Report on the Status of Land Use on Oahu, Fiscal Year 2008. The EIS should make use of this data, which is broken down into the island's eight development plan areas, instead of just relying on the market study's breakdown of Oahu's industrial floor space into the following four trade areas: greater Honolulu, Ewa/Waianae, Central Oahu, and Koolaupoko.

Substantial Energy Consumption
Sections 3.4.1 and 9.1 need to provide a better explanation of why the project will not require substantial energy consumption. We suggest a review of comparable projects such as the Ewa Industrial Park FEA (July 2008). Also, the market study contradicts the statement on page 9-6 of the FEA that almost all of the project's new floor space would be replacement space from elsewhere on Oahu, and thus "would result in a net reduction of energy consumption on Oahu", partly as a result of the project's planned energy conservation measures. Our interpretation of the market study's findings, as applied to this project, is that approximately 22 to 37 percent of the project's new industrial floor space is likely to be occupied by relocating businesses, which means that new or expanding businesses would occupy all the rest of the floor space and thus

would be new sources of energy consumption. We also request a table and a graph comparing the current industrial park's existing energy usage with the project's projected additional usage – using LEED measures – so that the reader can see just how much of the ultimate industrial park's total future energy usage will be due to the project.

NEEDED BACKGROUND INFORMATION

Total Size of the Industrial Park
The EIS needs to state: (1) how many of the existing warehouses will remain, and (2) how large the ultimate industrial park will be at full buildout, in terms of floor space and land area. This will help us to compare this project with other industrial parks and to make other analyses.

Alternatives Considered
If a new preferred alternative is developed, then the old one should be included in Chapter 8. Also, Chapter 8 should include any new alternatives that the applicant seriously considers but rejects, such as the I-1 zoning alternative which we have discussed under "Noxious Industries", above.

Should you have any questions, please contact Mike Watkins of our staff at 768-8044.

Very truly yours,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:js

cc: OEQC
Kapa'a I, LLC

FEA response

1.4.2 Environmental Impact Statement Preparation Notice (EISPN)

The EISPN was published in July 23, 2010 issue of *The Environmental Notice*. A copy of the electronic version of the July 23, 2010 issue is presented in Appendix 1 and the section of this issue that addresses the proposed action is reprinted hereafter. The publication date initiated a 30-day public review period upon which nine responses to the EISPN were received. The comment letters are presented in this DEIS.

Below is a reproduction of the Section of *The Environmental Notice,* July 23, 2010 issue that announced the EISPN of the proposed project.

The Environmental Notice
Office of Environmental Quality Control
July 23, 2010
Pages 3 and 4 (selected section of the publication)

3. Kapa'a Light Industrial Park (EISPN)

Island:	Oahu
District:	Koolaupoko
TMK:	(1) 4-2-15: 1 (por.), 6 and 8
Applicant:	Kapa'a I, LLC, 905 Kalanianaole Highway, Kailua, HI 96734. John King, 853-4768
Accepting Authority:	City and County of Honolulu, Dept of Planning and Permitting, 650 South King Street, 7th Floor, Honolulu, HI 96813. Mike Watkins, 768-8044
Consultant:	Sustainable Design & Consulting LLC, P.O. Box 283267. Honolulu, HI 96828. Dr. Manfred Zapka, 265-6321
Permits:	Zone Change, SMA, NPDES, Grading, Building
Comments:	EISPN 30-day comment period starts from the date of this Notice. Address comments to the Applicant, with copies to the Accepting Authority and Consultant.

This project's Draft EA was listed in the January 8, 2009 issue of the Environmental Notice. The Department of Planning and Permitting has reviewed this project's Final EA, and has determined that an EIS Preparation Notice needs to be issued, rather than a Finding of No Significant Impact. The project's Final EA can be viewed on OEQC's web site.

The applicant, Kapa'a I, LLC, is proposing to expand its existing 22-acre light industrial park in Kapa'a Valley on the windward side of Oahu. This area is zoned I-2 Intensive Industrial District. The applicant is seeking I-2 zoning for two adjacent areas now within the P-2 General Preservation District – an 11-acre area to the west, by the H-3 Freeway, and a 44-acre parcel to the east, just across Kapa'a Quarry Road from Kawainui Marsh.

The proposed Kapa'a Light Industrial Park would be developed incrementally over a span of 15-17 years. Short-term construction impacts during this period would include increased vehicular traffic and heavy machinery operation, soil erosion, noise and air pollution, and water runoff. There would also be long-term impacts, mainly on vehicular traffic, utility systems, utilization of resources, noise levels, local social services and businesses, and visual character and ambiance. Potential project impacts that were not clearly shown in the FEA to be insignificant include: (1) possible effects on Kawainui Marsh, (2) the potential inclusion of noxious industries within the industrial park, and (3) visual impacts. The applicant plans to expand its coverage of these issues in the Draft EIS. See also the Appendix.

In addition to being available on the OEQC website for download, the EISPN document, the document that was intended to be the FEA, was distributed on data-CD to 30 agencies and the public stakeholders and the Kaneohe public library. One hard copy of the EISPN document was provided to the Kailua public library. The distribution list of the data CDs, as well as one sample letter that accompanied each distributed data CD and hard copy, are presented in Appendix 1.

1.5 Scoping of the DEIS

This section presents the basis of scoping of the DEIS. The determined scope of the DEIS considered all comments and recommendation by the accepting agency, the comments received from the EISPN as well as changes in the design and planning documents. Building on the previous content and analysis of the FEA, the DEIS conducts a more thorough analysis and consideration of possible impacts, to meet requirements of the accepting agencies' comments received during the EISPN, and by the natural evolution of the project. With respect to the evolving project design, the DEIS strategically uses low impact development approaches and building technologies to mitigate the impacts that are considered most important for the adjacent wetland areas and water bodies. In particular, the DEIS contains a comprehensive sustainable design approach to achieve LEED Silver certification for the proposed industrial development within the lower portion of the site and uses the LEED Silver design approach to propose mitigation measures which are not hypothetical but will be verifiable.

The following sections present the responses to the determination of DPP and to the EISPN, as well as a description how the content of the DEIS differs from the document that was used for the EISPN, which represents the intended FEA.

1.5.1 Response to Determination Letter by DPP dated May 27, 2010

The determination by DPP of requiring an Environmental Impact Statement (EIS) rather than issuing a Finding of No significant Impacts (FONSI) for the Final Environmental Assessment

(FEA) is based the decision that certain impacts were either not evaluated in the FEA or that the evaluation needed further analysis and discussion.

This Draft Environmental Impact Statement (DEIS) has incorporated all required changes and additions to the content and analysis of the FEA. The following briefly delineates the approach that was taken in the DEIS to address the comments in the DPP determination letter. Comments are underlined with brief approach to respond following.

<u>Ability to locate an extremely heavy industry at the industrial park:</u> The applicant has changed the goal of obtaining a zone change from General Preservation (P-2) to Intensive Industrial (I-2) to a zone change from P-2 to Light Industrial (I-1). The type of land use which is desired under the changed zoning would be mainly industrial warehouses and related light industrial businesses but could also include base yard operations. All of the intended land uses will be permissible under the light industrial land use designation and no intensive industrial land use designation will be needed. This change in future land use would exclude the possibility of locating extremely heavy industry in the proposed industrial development and thus would avoid the possible impact resulting from very heavy industry.

<u>Impacts on the marsh from doubling heavy truck traffic:</u> The impacts of heavy truck traffic on the marsh have been analyzed, and possible mitigation measures are discussed in the text of the DEIS.

<u>Unintended impacts on the marsh such as failing to enforce LEED certification requirements or the proposed restrictions or the tenant activities:</u> While the FEA described the LEED certification goals of the applicant only in general terms, a detailed sustainable design approach has been developed which clearly describes the design measures which will be implemented by the applicant to obtain LEED Silver certification upon construction of the project. The sustainable design approach is presented in Appendix 4. The document provides a detailed technical and contractual strategy to obtain LEED Silver certification and implement comprehensive measures that minimize possible impacts by the project.

The LEED Core and Shell certification system will be used for the proposed project. This means that the applicant will implement measures that address impact mitigation for the site development as well as for the buildings, such as stormwater treatment, wastewater treatment, energy and water supply, building shell of the warehouses, waste collection and litter control, landscaping, energy and water supply systems for the warehouses, as well as ensuring healthy indoor environmental for the core and shell portions of the buildings. The operator of the industrial park is responsible for maintaining the industrial park in a manner that reflects the nature and objectives of the LEED certification, in the case of the proposed industrial park the LEED Silver certification.

The indoor leasable space is typically configured by tenants according to the special needs of the tenants, who will be provided guidelines regarding acceptable methods to operate the leasable space. The impacts of the leasable spaces are basically limited to the vicinity of the buildings as well as possible impacts that could be beyond the immediate proximity. These would be regulated by contractual terms in the lease agreement. For example, the LEED credit approach of the project will attempt regular and exemplary performance credits by contractually obliging the tenants to reduce noise, air and light pollution from interior lighting. Since the LEED approach will implement certain measures to obtain certification credits as mitigation of impacts on the marsh and the adjacent land around the site, it is important that the tenants will abide by the guidelines and regulations of the park operator.

<u>Visual impacts on people looking across the marsh or looking at the site from nearby park lands:</u> A comprehensive visual impact analysis has been conducted for the DEIS that includes investigating a number of viewplanes that were identified as significant by previous environmental reviews and the specific requirements of DPP. A total of eight significant viewplanes were identified for the visual impact analysis, and of these eight viewplanes, four were studied in more detail with the help of virtual visualization of the future development. The visualizations were created by constructing a virtual 3D-CAD model of the proposed development (including typical site features such as roads, landscaping, cars, trucks as well as buildings) with dimensions that fit the proposed site layout and rendering the 3D-model using the same camera setting as the photographic images of the site from the elected viewplanes. Hybrid visualization mages were then obtained by merging current photographic images with the anticipated future virtual rendering to assess the visual impact of the proposed industrial development.

The visual impact assessment also investigated preferred color schemes for future structures, and preferred placement of trees around and within the development for effective visual impact mitigation. The analysis determined the effectiveness of the proposed vegetative buffer zones around the development, as well as between the upper and lower portions of the site, to mitigate near-distance and long-distance views that are impacted by the proposed project. The comprehensive visual impact analysis is presented in Appendix 8.

<u>Revisiting the market study and amending or updating the pertinent conclusion drawn in the FEA:</u> The DEIS has revisited the market study, conducted an updated analysis of the data presented and discussed the findings of the study in light of the new data or findings. The DEIS includes a survey of the businesses which lease space in the existing light industrial park (e.g. within TMK 4-2-15:008) in order to quantify the percentage of employees of these businesses who come from Kailua or Kaneohe as well as characterize the size and type of the businesses. This survey is presented in Appendix 3: Survey of Existing Businesses at the Project Site

Analyze whether a catastrophic septic tank failure is in fact possible: The preparation of the DEIS has included a review of the technical literature to identify cases of and reasons for septic tank failure, or for failure of the overall septic systems. The results of the review suggest that given proper design, material selection and installation procedures, failures of septic tanks are very uncommon. Reported cases of tank failures typically suggested corrosion of the tank, improper foundation of the tank and external damages, e.g. exceeding of the design loads by trucks or damages due to construction activities. It was identified that regular inspection by certified pumpers or wastewater professionals can detect modes that would lead to structural failure. Good management of the septic tank, which includes regular pumping of the solids when a certain volume of solids in the tanks are surpassed and vigilant inspection of the area around the septic tank, is the best measure against tank failure.

The technical review also identified that the failure of the leach field (or subsurface injection field) can have an equally detrimental effect on the performance of the septic system. Failure of the leach field occurs when part of the infiltration field becomes clogged by exceeding the designed organic loading of the field, from problems resulting from incorrect distribution of the wastewater discharge from the septic tank, or from insufficiently treated sewage reaching the ground water table, to name the most common failure modes. Failure of the septic system can also be attributed by insufficient removal of BOD loads and insufficient removal of total suspended solids (TSS) as well as nutrients (e.g. nitrogen and phosphorus). Part of the sustainable design approach will use advanced onsite wastewater treatment to lower the organic loading of the leach field, increase the rate of nutrient removal and prevent groundwater from being impacted by insufficiently treated wastewater.

Impacts from the pre-existing conditions of contaminants leaching from the ground within the site: The DEIS includes a discussion of a review of the technical literature regarding mechanisms that affect leaching contaminants from landfills. The DEIS discusses reported procedures of reducing leaching by sealing the landfill surface in what is referred to as a “sealed tomb” approach. In this approach, creating impermeable surfaces and using collected rainwater for landscaping would reduce the amount of water that infiltrates into the former landfill body found at the site.

Alternatives considered: Following the recommendations and requirements in the DPP letter, the DEIS is presenting additional alternatives and design alternatives considered by the applicant in more detail. The DEIS discusses the merits and disadvantages of alternative approaches and then selects two alternatives plus the “no action alternative” for a more detailed discussion of possible impacts.

General requirements to use low impact development technologies: The DPP letter addresses the need to effectively mitigate impacts of the project, since the proposed project site is located within a large preservation-zoned valley as well as next to the largest wetland in the state, where four species of endangered water birds are found. While the applicant needs to ensure the commercial viability of the development goals of the project, which are to provide modern and secure industrial space to the Koolaupoko region, the applicant is committed to develop the project with a significant number of low impact development measures, in order to reduce and mitigate any possible impacts on the community and environment.

In due process, the design of the project has evolved and has planned for specific low impact development technologies and procedures to effectively reduce impact. Since the applicant is fully committed to develop the proposed project in the most environmentally responsible way, he has specified developments goals and procedures that will earn a LEED Silver certification upon completion of the project.

1.5.2 Responses to the Comments Received from the EISPN

There were eight comments received from the published EISP by the following agencies:

1. Department of the Army, Corp of Engineers, District Honolulu, dated July 28, 2010
2. Oahu Metropolitan Planning Organization (Oahu MPO), dated August 2, 2010
3. State of Hawaii, Department of Health, Clean Water Branch, dated August 5, 2010
4. State of Hawaii, Department of Health, Safe Drinking Water Branch, Environmental Management Division, dated August 11, 2010
5. State of Hawaii, Department of Health, Indoor and Radiological Health Branch, dated August 11, 2010
6. United States Department of the Interior, Fish and Wildlife Services, Pacific Islands Fish and Wildlife Office, dated August 20, 2010
7. State of Hawaii, Department of Land and Natural Resources (DLNR), Land Division, dated August 24, 2010
8. State of Hawaii, Department of Transportation, dated September 1, 2010
9. Hawaiian Electric Company, Inc, dated October 12, 2010

The scanned letters by the agencies containing the comments are presented in Appendix 1.

<u>Response to the letter No. 1 by the Department of the Army, Corp of Engineers:</u>

The development work of the proposed project will not include any construction, dredging or other activities in, over or under navigable waters of the U.S. as well as any wetland areas. According to the recommendations of the U.S. Army Corp of Engineers (USACoE), a Water Resources Investigation (refer to Appendix 7) was conducted, describing wetlands, drainage ditches, gulches, gullies, streams, on or adjacent to the proposed site, that may be impacted by the proposed project. The Water Resources Investigation found that there is one stream, one drainage ditch, one flood control and sedimentation basin, several acres of wetland and one percolation field within the property. With the exception of the percolation field, which receives stormwater runoff from an adjacent street, all of the identified water resource components are outside the development footprint and will not be impacted by project. The percolation field would be basically maintained adjacent to the graded development and would be improved, in conjunction with a restoration of vegetated area around the discharge point of the culvert through which the storm runoff from the adjacent road enters the site.

As recommended in the letter, the proposed project will employ efficient Best Management Practices to curb any polluted runoff into the adjacent receiving waters. The comments and recommendations were discussed with the staff of the USACoE.

Response to the letter No. 2 by the Oahu Metropolitan Planning Organization:

The letter indicates several long-range transportation issues, needs, goals and objectives which are in the same general vicinity of the proposed light industrial park. The list provided in the letter indicates that no transportation improvements are planned in the direct vicinity of the project.

Response to the letter No. 3 by the State of Hawaii, Department of Health, Clean Water Branch:

The recommended review of DoH guidelines were followed to ensure that the proposed project would comply with all water quality and land use related issues.

The project will abide by the statues and laws pointed out in the letter, specifically as it relates to antidegradation policies, designated use and water quality issues. The project will obtain all permits required under the National Pollutant Discharge Elimination System (NPDES), both during construction and operation. Based on the specifics of the project and the planned stormwater mitigation as well as onsite wastewater systems, it is not anticipated that the project would require NPDES individual permits. The USACoE has been contacted to ascertain that construction work for the proposed project would not be carried out in, over and under navigable water of the U.S., which would require a section 401 water Quality certification.

The proposed project will implement sound measures to avoid any negative impacts on the water quality of the receiving waters. As part of the LEED certification requirements the project will be implementing sustainable design and construction measures for the portions of the site that are in close proximity to wetlands, streams and drainage canals. The proposed sustainability design approach (see Appendix 4) delineates that the water resources approach of the proposed project section, including stormwater quantity and quality runoff treatment as well as wastewater treatment, is outperforming the already high LEED requirements.

Response to letter No. 4 by State of Hawaii, Department of Health, Safe Drinking Water Branch

The DoH letter indicates that the agency does not object to the project plans of obtaining drinking water from the Board of Water supply system. Since the project proposes the use of non-potable for irrigation, wastewater conveyance and, possibly, some custodial uses, the letter indicates the need to design and operate the dual water system in such a way to avoid cross-connection and backflow conditions. The project intends to follow strict guidelines for the design and operation of non-potable water, such as properly labeling of water faucets with signs of non-potable water, using below-ground irrigation for graywater, and using a separate system for use of harvested water in the buildings (i.e. for toilet flushing), among other measures.

The recommended water system management plan is part of the sustainable design approach for obtaining LEED Silver certification upon construction of the development. The water system management plan will be maintained and enforced by the industrial park operator.

Response to letter No. 5 by State of Hawaii, Department of Health, Indoor and Radiological Health Branch:

Following the request by letter, the project will comply with the Administrative rules of the Department of Health, Chapter 11-46, Community Noise Control.

Response to letter No. 6 by United States Department of the Interior, Fish and Wildlife Services, Pacific Islands Fish and Wildlife Office:

The project will follow the requirements, guidelines and recommendations of the letter in order to preserve the habitat conditions of the indicated federally endangered Hawaiian stilt, Hawaiian moorhen, Hawaiian coot and Hawaiian duck as well as populations of migratory waterfowl and shore birds protected under the Migratory Bird Treaty Act (MBTA).

The letter states the previous plans of the developer of the proposed light industrial park to develop a 15-acre wildlife habitat and wetland restoration project on land adjacent to the project site and within the land parcels owned by the developer. The developer (in a change from the FEA) is no longer pursuing plans for the wetland restoration project that would develop a 15-acre wildlife habitat. The wetland area that would have been restored by removal of vegetation to create a series of about 15 of shallow ponds and mud flats will remain in its original state. The developer might revisit the plans for an improvement of the 15-acre wetland site, but such improvement would be to improve water quality in the wetland area, not to create a wildlife habitat.

Therefore the requirements and recommendations in the letter, which address the concerns of the development of the wildlife habitat and wetland restoration, are no longer directly applicable to the project. One of the comments, which address the need to minimize water bird attraction to detention ponds, remains a concern, even though the wildlife habitat project is no longer pursued. The detention ponds are required to manage stormwater runoff quantity and quality issues in the case of intensive precipitation events. Rainwater from less intense events will be harvested in underground cisterns to be used for irrigation. Therefore the detention ponds will be typically completely empty and will only be filled or partly filled on rare occasions. There will be no permanent large residual water surface in the detention ponds which could attract a permanent habitat for the endangered water birds that were mentioned in the letter.

Response to letter No. 7 by State of Hawaii, Department of Land and Natural Resources (DLNR), Land Division:

The letter posted a number of comments to which we respond in the order that they are presented in the letter:

1. The Board of water Supply has been advised of the project and has indicated that the project can be supplied by the existing water supply infrastructure. As a change from the FEA, the project now will implement significant water savings for a portion of the project.

4. Water efficient fixtures, as recommended in the letter, will be installed and water efficient practices will be incorporated in the project in all phases. These measures are part of the LEED certification goal for a portion of the development.

5. Best Management Practices (BMP) will be implemented as are required by applicable codes and laws. In following the Sustainable Design Approach and LEED certification goals the BMP selected will adhere to more stringent requirements than those required by codes and laws.

7. The developer will adhere to all required measures to ensure the water quality of the receiving waters and the ground water at the project site.

11. The developer does not plan to use the indicated wells and no infrastructure has been installed to pump water from these wells. If these wells are affected by the proposed construction they will be properly abandoned and sealed and a permit for well abandonment will be obtained.

13. Stream channel alterations are not planned in conjunction with the project, but if they become necessary the applicable permits will be obtained before start of construction.

Others: Planned construction will not affect the stream bed of the Kapa’a Stream. If any alterations of the stream bed become necessary, the applicable permits will be obtained before start of construction.

Response to letter No. 8 by State of Hawaii, Department of Transportation:

The letter suggests that State highway facilities, Mokapu Saddle Road, and Kalanianaole Highway will impacted by the project. The comments were discussed with the DoT project team. As recommended in the letter, the traffic and roadway impacts will be addressed in the DEIS and mitigation measures will be recommended. The traffic impact assessment report which was developed for the FEA is also part of the DEIS. The TIAR presents a quantitative assessment of the future traffic resulting from the development and provides several mitigation measures.

The LEED approach developed for a portion of the proposed development will implement measures to promote alternative modes of transportation such as incentivized carpooling, use of low emitting cars, a private shuttle between the site and public transportation, as well as promoting bicycles, which will reduce future traffic impacts. The objective of all of these measures are to incentivize or promote alternative modes of transportation in order reduce the traffic volume to and from the proposed development.

Response to letter No. 9 by Hawaiian Electric Company, Inc:

According to the request, more design specifics will be communicated with Hawaiian Electric Company, Inc. (HECO) as the project develops and construction plans are finalized. The DEIS reports on anticipated electric consumption and load requirements and suggests some strategies to lower demand by energy conservation measures (e.g. delineated in the sustainable design approach in Appendix 4).

1.5.3 Changes of Content and Development Approach from FEA Document

The following analyses and discussions of possible impacts and issues are presented in the DEIS, which are different from the content of the FEA document:

Change in land use zone change intent from I-2 to I-1: The applicant will seek a zone change from General preservation (P-2) to Light industrial (I-1), rather than to Intensive Industrial (I-2). This change in requested land use zoning of the two land parcels TMK 4-2-15:001 (portion of) and 006 (portion of) mitigates concerns of the possibility of extremely heavy industries moving into the Kapa'a Valley. The intention of the applicant of developing a light industrial park on the three contiguous land parcels in the Kapa'a Valley has not changed, but the type of businesses that will be leasing the newly developed industrial space can conduct their businesses in space that is zoned I-1. The reason that the applicant originally sought a zone change for the two parcels to I-2 was that the land parcel TMK 4-2-15:008, which is located between the parcel TMK 4-2-15:001 and 006 (portions of), is already zoned as I-2, and therefore a land use zoning of I-2 for all three contiguous and parcels seemed the preferred approach in the initial design phase.

Discontinuation of the proposed 15-acres wildlife habitat and wetland restoration project: The 15-acre wildlife habitat and wetland restoration project which was envisioned by the applicant in the lower stretches of the Kapa’a Stream corridor and within land parcel TMK 4-2-15:006 will not be developed as described in the FEA. The original plans of the applicant were to establish a 15-acre large wildlife habitat, surrounded by a special wildlife fence to keep non-native predators of water birds out, within a restored wetland area. The applicant intended to develop the wildlife habitat and wetland restoration in cooperation with and with partial funding by the U.S. Department of Agriculture Natural Resources conservation Service (NRCS). The applicant commissioned a concept design study that delineated a suitable configuration of the wildlife park and the envisioned system of 15 cascading ponds, which would provide habitat for the endangered water birds (e.g. shallow ponds that are dry through the summer months, mud flats that are preferred by the Hawaiian stilt). One or two public observation sites were planned to allow the public opportunity for bird watching inside the wildlife habitat).

The concept design study was presented to the State of Hawaii Department of Health and it was determined that the removal of the thick wetland vegetation, which was required to establish the desired habitat for the water birds, might negatively impact the ability of the wetland area to remove pollutants carried and deposited in the area by the Kapa’a Stream. A degradation of the water quality in the Kapa’a Stream, which is listed on the State list of impaired water bodies, could therefore be a result of the habitat project. The 15-acre wildlife habitat and wetland restoration project was therefore terminated. The applicant might, at a future point in time, initiate a wetland restoration project that would increase the water treatment capacity of the wetland area on his property rather than developing a wildlife habitat.

Existing drainage ditch (canal) along the quarry road: The previous planned development approach intended to develop the new site directly adjacent to the drainage ditch along the quarry road. Previous proposals suggested a change to this plan for the drainage ditch, e.g. partly filling the ditch with pervious gravel and placing a drainage pipe inside the filled ditch to allow drainage of surface and seepage water towards the Kapa’a Stream. It was proposed to develop the established area with native or adaptive plants and provide a shoulder for the quarry road, which at this point does not have a shoulder (or an insufficiently wide shoulder) between the road and the drainage ditch. In conjunction with these development strategies the applicant further proposed to locate a portion of the envisioned marsh perimeter trail (combined walkway and bikeway) on the area that would be established by filling the canal.

The DEIS presents a change in the design of the development adjacent to the drainage ditch along the quarry road. In the new design approach the development would be set-back from the drainage ditch by about 15 to 20 feet, and an existing service dirt road would be retained that is used for maintenance of the drainage ditch. The earth berm with the vegetative buffer around the eastern side of the lower portion of the site would commence on the mauka side of the maintenance road. Therefore, in the new design the drainage ditch would remain in the current state and the development would not impact on the stream channel or the banks of the ditch.

The applicant might at a point in the future revisit plans of improving the canal if such an initiative would be supported by the community and the federal, state and county agencies which are responsible to approve such changes to the drainage ditch.

Distinction between impacts and mitigation measures between the lower and the upper portion of the project site: The lower portion of the site encompasses the part of the land parcel TMK 4-2-15:006 created by a former land fill. The lower portion of the site may impact the surrounding wetland areas, the Kapa'a Stream and the surrounding environment more significantly than the upper portion of the proposed site. The upper portion of the site is a quasi-level plateau with elevations about 40 to 60 feet higher than the lower portion of the site, thereby providing a natural buffer zone between the industrial development and the surrounding wetland and open space.

The development approaches of the upper and lower portions of the site will therefore be significantly different. The upper portion of the site will be developed following conventional building technologies and site development procedures, resulting in impact mitigation measures that are equal to applicable codes or laws. The lower portion, however, will be developed in accordance to sustainable building technologies which will go beyond the basic requirements of applicable codes and laws, in order to minimize impacts to the environment and the community. When discussing impact mitigation in the text a clear distinction is drawn between mitigation strategies applying to the lower and upper portions of the site.

Commitment to develop the lower portion of the site in accordance with the requirements for LEED Silver: While the FEA generally mentioned the intention of the applicant to use a development methodology that included sustainable building technologies, and mentioned the goal to be “LEED certified”, the DEIS contains the specific sustainable design approach (refer to Appendix 4) with a detailed description of which credits will be attempted to attain the LEED Silver certification goal. The FEA presented a list of possible credits that the project would be choosing from, without committing to the concrete LEED certification strategy. The DEIS lists and describes the credits that will be attempted to achieve LEED Silver certification.

Strategic choice of the LEED certification strategy to effectively mitigate possible impacts that are important for the site: The approach to achieve sufficient LEED credits for the certification goal gives the project team the ability to choose which credit categories best apply. For example, of the 110 possible credits under the LEED V.3 Core and Shell certification system, the project team has to achieve at least 51 points for Silver certification. In general circumstances, a project team may choose to attempt those credits which offer a comparatively moderate investment for the number of credits achieved. However, for the proposed Kapa’a Light Industrial Park, the choice of the credit categories is according to the mitigation measures that are most important at the site. For the proposed project the Water Efficiency (WE) credit category was given the highest significance, due to the close proximity of the project site to important wetlands and the Kapa’a Stream. The sustainable design approach seeks all possible credits of the WE category, and in addition an exemplary performance credit is also attempted for innovative wastewater systems. In order to achieve the attempted certification of the WE category, highly effective mitigation measures have been selected for water savings, onsite wastewater treatment and efficient irrigation. Thus, by choosing the appropriate sustainable design solution to achieve certain LEED credits, many verifiable impact mitigation measures will be implemented at the site. In many EIS reports mitigation is reported as “desirable” or “preferred”, but by mapping the LEED credits to the strategic impact mitigation goals of the project, a mitigation strategy emerges that is much more tangible and conclusive, and is based on committed actions. The DEIS discusses what important impacts are mitigated by the specific LEED credits.

Water resources analysis and survey: The DEIS presents a survey and discussion of water resources on and adjacent to the site. Background information was assembled that reports on the development of water resources in the Kapa’a valley and a field investigation was conducted to document the current water resources and to identify how the proposed project would impact these water resources. The comprehensive water resources assessment is presented in Appendix 7.

A comprehensive visual impact analysis: The FEA contained a brief description of the anticipated visual impact of the project on views from one location in the vicinity of the project. The FEA used a single, simple visualization of the anticipated future view by superimposing an approximated rendering of the future development on a current photographic image. The DEIS presents a comprehensive visual impact analysis, comprised of eight important viewplanes that were identified as significant. For four of these viewplanes, a more detailed visual analysis was conducted by creating refined 3D-CAD models and generating more comprehensive virtual renderings of the future development. In stronger fashion than the FEA, the DEIS contains several virtual renderings showing a range of visual impact mitigation; thus creating realistic estimates of the anticipated visual impact of the proposed project. The comprehensive visual impact assessment is presented in Appendix 8.

Changed systems for energy and water supply: The design approach for the energy and water supply systems of the lower portion of the site has changed. Part of the electricity will be furnished by onsite Photovoltaic (PV) panels. The electricity demand of the buildings within the lower portion of the site will be at least 30% lower than the baseline consumption of conventional industrial warehouses. Likewise, the water supply methodology has been changed, since the water savings under the LEED certification approach needs to be at least 40% below a conventional commercial building baseline consumption rate.

Changed stormwater treatment system: The stormwater treatment system used in the DEIS design has changed from the design presented in the FEA. In the updated design of the lower portion of the site stormwater will be collected and harvested for irrigation and certain recycled water uses inside the buildings. The stormwater to be used for irrigation will be collected not only from the roofs but also from sections of the roadways, and conveyed to underground cisterns, and from there pumped to irrigation systems.

More advanced onsite wastewater treatment systems: The FEA considered the use of conventional septic systems, each consisting of one septic tanks and one underground injection fields (leach fields), for all of the onsite wastewater treatment systems.

The design approach considered in the DEIS uses advanced onsite wastewater treatment for the lower portion of the site. As pointed out, the lower portion of the site requires a more thorough impact mitigation process than the upper portion of the project site, due to the proximity to wetland areas, the Kapa’a Stream and groundwater table. The advanced wastewater treatment scheme selected includes aerobic treatment, anaerobic de-nitrification and filtration process steps. These steps significantly increase the removal rates of biological oxygen demand (BOD), total suspended solids and nutrients from the wastewater. The high level of treatment will make it possible to use the treated wastewater for irrigation (e.g. drip irrigation and percolation fields for below ground irrigation). The high efficiency in nutrient (mostly nitrogen) removal from the wastewater is an especially effective measure which will protect the adjacent wetlands and receiving waters from excess nutrient loads. The selected onsite wastewater treatment approach is part of the sustainable design approach (see Appendix 4) and the wastewater treatment will be submitted to receive exemplary performance credit under the LEED project approach.

Discussion of possible catastrophic failure of septic systems: As requested the DEIS discusses the possibility of a catastrophic failure of septic tank system. In addition, the DEIS includes discussion of the possibly more potent impact of failure of the underground infiltration system.

Impact potential of leaching of the former landfill area which constitutes the site: The DEIS presents the results of a technical literature review about mechanisms associated with leachate from older landfills. The DEIS discusses the impact of the planned development schemes on the potential of leachate quantity and quality.

Alternatives considered for the development methods of the proposed project: The DEIS expands on the alternatives considered in the FEA. Several alternative development and design approaches for the entire site or parts of it are discussed. For the assessment of impacts of the proposed project, two alternatives are selected, incorporating the candidate design measures for the proposed project. A No-action alternative, under which no construction occurs, is analyzed and discussed to serve as a baseline against which the anticipated impacts of the action alternatives are compared. In addition, since “no action” could also infer to a scenario under which a land zone change is denied, the DEIS also briefly discusses possible scope of construction and development in only parcel TMK 4-2-15:008, which is already zoned as I-2 and therefore does not require a zone change.

Presentation of findings of the market study: As requested, the DEIS is revisiting the findings about the impact of the proposed Kailua Light Industrial Park project on the economy and the public services in the Kailua and Kaneohe region. A survey of companies presently doing business at the existing industrial development was conducted for the DEIS, to provide baseline data for the estimate of how many employees of new businesses would move towards the Kailua and Kaneohe region, thereby impacting the public services in the region.

Analyzing a broader range possible impacts on the Kawainui Marsh: While the FEA identified a range of possible impacts of the proposed project on the Kawainui Marsh, the DEIS expands the list of possible impacts, discusses the degree of impacts and recommends mitigation procedures.

Impacts on the marsh from increased volume of heavy truck traffic: As requested in the DPP determination letter, the DEIS discusses impacts from increasing traffic of heavy trucks on the marsh and recommends mitigation measures.

This page is left blank intentionally

CHAPTER TWO - PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action, and identifies the design and development alternatives that have been considered during the concept design phase of the project.

2.1 Proposed Action

The specific recommendation is to develop a light industrial park on three contiguous land parcels in the lower stretches of the Kapa'a Valley to provide much needed industrial space to businesses within the Koolaupoko region.

To implement the action, the applicant proposes to implement the following measures and provide:

- About 23 acres of newly rezoned land that will support businesses to expand or relocate light industrial activities within the Kailua and Kaneohe regions.
- A new light industrial park that will be developed as an expansion of an already existing industrial warehouse development, taking advantage of already existing infrastructure and expanding the light industrial land use at the site.
- Land for industrial activities that are located on former landfill area. The development of the landfill area will reduce problems of soil erosion and resulting runoff.
- A total of 625,000 square feet of newly constructed industrial zoned space in modern warehouse structures or, as an alternative, several acres of base yard space which would replace a specific amount of warehouse space. Since 19,000 square feet of existing warehouse space planned to be demolished, this results in a net addition of 606,000 square feet of warehouse space at the proposed site.
- Infrastructure to supply the new industrial space with water and electric power by interconnecting with municipal water and power infrastructure.
- Onsite wastewater treatment. since the project site as well as the entire Kapa'a Valley is presently not connected to the municipal sewage system, and a connection would require a forced sewer system.
- A comprehensive stormwater system that avoids high peak discharge rates during heavy storm events and avoids polluted runoff from the site into the receiving waters. The stormwater system would comprise runoff conveyance in swales, channels and pipes, detention ponds, stormwater treatment units to eliminate floatables and significantly reduce sediments, oil and nutrients content in the stormwater, and rainwater harvesting systems. The measures of quality and quantity control of stormwater differ between the parts of the proposed industrial park.

- Sufficient on-site (off road) parking for the additional employees and visitors of the development on site as well as facilities for parking and loading of heavy trucks within the development.
- Development of the larger part of the rezoned land in accordance to low impact development technologies and principles. The lower portion of the proposed site, which comprises the larger part of the land to be rezoned, is located in close proximity to environmentally and culturally important wetland.
- In accordance with the recognized need for low impact development approaches, the lower portion of the site would implement design, construction and operational measures to achieve Leadership in Energy and Environmental Design (LEED) Silver certification upon completion of the project. The LEED development approach for the development involves measures to limit impacts derived from the site, efficient use of water and energy, material reuse and recycling as well as lowering indoor environmental impacts. The LEED Silver certification is a quantifiable measure for the environmentally friendliness and energy effectiveness of the proposed

2.2 Ability of Region to Absorb Amount of Planned Additional Industrial Space

A market study was conducted for the project and is presented in Appendix 2. The main conclusions of the market study corroborate the ability of the region to absorb the planned amount of added industrial space, as is summarized in the following:

- The Koolaupoko region, also characterized as “Greater Kailua/Kaneohe” from the trade area perspective, has a significantly undersupplied industrial sector, when compared with any urban regions on Oahu. The area currently only supplies about 21 percent of the industrial space demand created by the size of its resident population.
- The market study predicts that over the next 20 years (through 2030) the Koolaupoko region will readily support an additional about 1,000,000 gross square feet of industrial-type floor area or about 96 acres of vacant industrial zoned. The 606,000 square feet of new floor space that the proposed project will provide would therefore only provide some 63% of the predicted demand. Currently there is limited available land in the region that is appropriately zoned for industrial-type activities and industrial lands in the region are being diminished by ongoing or planned transformation to higher return commercial or residential development. Due to this very limited alternative availability of industrial-type floor space in the region, it can be assumed that the proposed project will be able to lease all of its planned space.
- Based on historical trends it is forecasted that it would take from 15 to 17 years for the proposed 606,000 square feet of expanded floor space in the Kapa’a Light

Industrial Park to reach full adsorption. For the subsequent analysis in this DEIS a development time of 15 years is assumed.

2.3 Identification of Alternatives

To implement the Proposed Action, the applicant has identified two action alternatives. These alternatives are identified in the DEIS as the Preferred Alternative and Alternative B.

The two action alternatives differ in their use of construction technologies and the use of the open space that directly surrounds the proposed site. The Preferred Alternative uses a low impact development approach for the area that is closest to the adjacent wetland area. The Preferred Alternative implements sustainable building technologies and utilizes the surrounding open space as restored habitat in order to effectively mitigate impacts and to lower the energy and water demand. Alternative B follows a conventional construction and development approach of the buildings and the site. While Alternative B satisfies applicable local, State and federal codes, the Preferred Alternative far exceeds this basic code requirement in order to derive a significantly lower environmental foot print. The Alternative B results in less development costs than the Preferred Alternative, due to the additional costs for sustainable building technologies and site development approaches.

In addition, the No-Action alternative is evaluated. The No-Action alternative is required by statute and describes the impact at the proposed site and for the region if no additional industrial space is added to the existing space. The three alternatives which are evaluated in this DEIS are briefly summarized as follows:

Preferred Alternative:

The lower and upper portions of the site are developed, with the lower portion of the site, e.g. the part of the site adjacent to wetland area, developed with low impact development practices.

Alternative B:

The lower and upper portions of the site are developed, and all parts of the proposed industrial park are developed with conventional building technologies.

No-Action Alternative:

No further addition of warehouse space occurs on the portions of the site covered by this DEIS.

2.4 Siting of Facilities

General siting criteria include consideration of compatibility between the functions of the proposed industrial development and the sought land use zone designation for the site, adequacy of the site for the function required, proximity to related activities, availability and capacity of roads, efficient use of property and resources, development approaches and special site characteristics, including environmental compatibilities.

Specific siting criteria include considering possible migration to the region of the future workforce which will be employed by companies leasing space in the proposed development, the ability of the region to absorb the added industrial space, and the possible impact on public services by the project.

The following list presents constraints, considerations and criteria for the evaluation of the proposed site, which are derived from the overall impact on the environment and community:

- Business objectives and measures to implement business objectives
- Topography
- Areas of no-constructability, preservation of open space and habitat
- Wetlands and Buffer zones (specifically impacts on the adjacent marsh)
- Drainage and stormwater treatments
- Soil considerations
- Orientation (i.e. sun and wind exposure)
- Visual impact
- Accessibility with alternative transportation
- Utilities availability
- Site work
- Environmental aspects
- Watershed considerations and effects on water quality receiving waters
- Restoration of habitat
- Permitting
- Historical and cultural considerations
- Regional, State, and Federal planning
- Building and fire codes
- Parking requirements
- Acreage/height limitations
- Land use
- Waste management
- Traffic (level of service, emissions, safety, flow capacity)
- Public relations
- Disruptions due to construction
- Outdoor lighting

- Phasing
- Economics (life cycle cost, construction cost, operations and maintenance costs)
- Improvement of regional economic base (tax revenues, added employment, growth of regional economy)
- Impacts on utilities and resource capacity
- Local/Regional planning regulations and guidelines
- Impact on endangered species

Figures 2-1 and 2-2 show the property boundaries and the existing land uses at the proposed site, respectively.

As illustrated in Figure 2-1, the proposed site comprises three land parcels, TMK 4-2-15:001 (portion of), 008 and 006. The land parcel 4-2-15:001 has a listed total area of 378 acres, but only 13 acres of the parcel is included in the evaluation of this DEIS, since the rest of the parcel is not located adjacent to the project site and is not part of the proposed action. The proposed site is located south of the H3- Freeway. The site is accessible from the Kapa'a Quarry Access Road. The proposed site includes sections of the Kapa'a Quarry Road, which is the roadway that connects the existing land uses in Kapa'a Valley with Kailua and Kaneohe.

Figure 2-2 shows the existing land uses at the proposed site. The figure categorizes the existing land use in four functions:

- Open space, which is vegetated and pervious, includes areas such as the Kapa'a Stream corridor with delineated wetland, a flood control area which was a settling pond for a upstream landfill area, the vegetated area between the lower and upper portions of the project site and the vegetated area that borders the quarry road. Open space is located only within the parcels TMK 4-2-15:001 and 006.
- Graded and non-vegetated land, that is pervious. This area is used by land tenants for exterior storage as well as processing of inert building material and green waste processing. Graded land is located in all three parcels.
- Developed land, which is impervious. The area includes existing warehouses and other structures and surrounding paved area. Developed and paved area is presently only located in parcel TMK 4-2-15:008.
- Other areas, comprising land use such as publicly accessible roadways, maintenance roads and drainage facilities. The parcel TMK 4-2-15:001 includes a portion of the Kapa'a Quarry Access Road. The parcel TMK 4-2-15:006 includes some portions of the Kapa'a Quarry Road, the drainage canal next to the quarry road, and the gravel maintenance road for the drainage canal.

Aerial photographic image shows the situation at the site at the beginning of 2008

Scale 1" = 500 feet

	TMK 4-2-15:001 (port. of)	TMK 4-2-15:008	TMK 4-2-15:006
Parcel in upper or lower portion of site	upper portion	upper portion	lower portion
Size of land parcel (acres)	13.0 (note A)	22.3	43.8
Current State land use district	Urban	Urban	Urban
Current County land use district	P-2 General Preservation	I-2 Intensive Industrial	P-2 General Preservation

Note A:
total size of parcel TMK 4-2-15:001 is 378 acres; only 13.0 acres are located close to the by project, the remaining acres of the parcel are located beyond the H3-freeway

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-1:
Property boundaries of project site

Aerial photographic image shows the situation at the site at the beginning of 2008

Scale 1" = 500 feet

	TMK 4-2-15:001 (port. of)	TMK 4-2-15:008	TMK 4-2-15:006
Open vegetated space, pervious (acres)	Open space, including Kapa'a Stream corridor and flood basin for landfill runoff (8.1)	Small open vegetated space, permeable, along quarry access road (0.2)	Open space, including Kapa'a Stream corridor and exist. earth berm at quarry road (20.1)
Graded non-vegetated, pervious (acres)	Graded non-paved area, land tenants, outside storage for inert construction material (4.4)	Graded non-paved area, land tenants, outside storage for inert construction material (6.2)	Graded non-paved area, land tenants, green waste processing, bldg. material storage (18.9)
Developed non-vegetated area, impervious (acres)	No developed paved area with permanent structures (0 acres)	Developed area with permanent structures, paved around builings (16.0 acres)	No developed paved area with permanent structures (0 acres)
Other area; not affected by development (acres)	Kapa'a Quarry Access road in on propety (0.5 acres)	none (0.0)	Kapa'a Quarry road and drainage canal is on property (4.8 acres)

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-2
Current land use at project site

2.5 Summary Description of Alternatives

The three alternatives are briefly described in the following sections. It should be noted that only two of the alternatives, the Preferred Alternative and Alternative B, represent action alternatives since they consider that the required land use zone change of two of the three parcels comprising the project site has been approved. The remaining alternative, the No-Action Alternative, represents a situation with no further development at the site and the development limited to the already industrial zoned parcel TMK 4-2-15:008. While a No-Action alternative is typically evaluated to serve as a baseline for the added environmental impact by the proposed actions, the No-Rezone Alternative depicts a realistic scenario, where the applicant would continue development of industrial land on limited available land if the zone change is denied.

2.5.1. Preferred Alternative

In this section the Preferred Alternative is described in general terms in order to allow comparison with the remaining three alternatives. A more detailed description of the Preferred Alternative is described in Section 2.6. The major design differentiation of the Preferred Alternative is the use of a low impact development approach for the lower portion of the site, in order to significantly minimize possible impacts on the community and environment.

Figure 2-3 shows the schematic layout of the Preferred Alternative. The existing buildings in parcel TMK 4-2-15:008 would remain, with several older structures, accounting for about 19,000 square feet of floor space, to be demolished to make room for two new buildings. Under the Preferred Alternative 625,000 square feet of new buildings would be developed. Considering that about 19,000 square feet of existing building space would be demolished the net added floor space will be 606,000 square feet. This results in a total floor space area of 889,000 square feet at full build out, including the already existing structures at the site.

New buildings would be constructed in all three land parcels, with the largest addition of floor space being added in the lower portion of the site, e.g. TMK 4-2-15:006. The construction of new buildings is limited to area that is currently graded. No current open space area would be used for the construction of buildings, roadways, parking areas and ancillary facilities. All new development would only occur on already disturbed land.

In parcel TMK 4-2-15:006, which represents the lower portion of the site, open space would be increased by about two acres due to conversion of currently graded and non-vegetated land into restored habitat or open space area. In the lower portion of the site a total of 16.7 acres of presently pervious land would be converted to serve as a development foot print for the proposed warehouse development; 11.1 acres of the development footprint would be converted to impervious surface.

In the upper portion of the site, the currently 10.6 acres of graded and pervious area is converted to impervious area, which includes all areas within the development footprint, such areas as impervious pavement around the buildings, impervious pavement of roadways, impervious parking space and the roofs of the buildings. In the Preferred Alternative, not all land within the development footprint in the lower portion of the site is converted to impervious land. Some areas within the development footprint remain pervious. (see a more detailed description of the preferred Alternative in Section 2.6.)

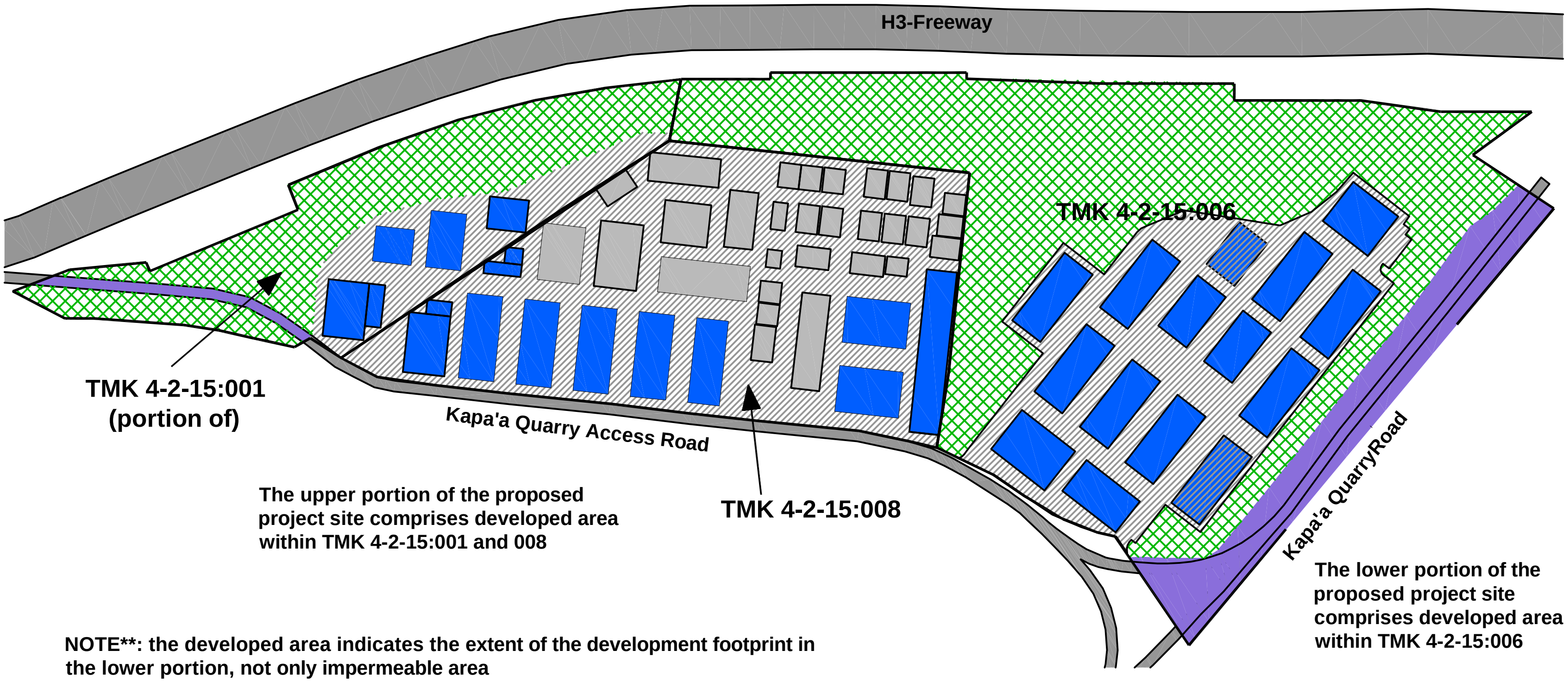
2.5.2 Alternative B

Alternative B differs from the Preferred Alternative in the approach the development footprint in the lower portion of the site (the landfill area within TMK 4-2-15:006) is developed. Alternative B would be built using conventional development approaches and technologies.

Figure 2-4 shows the schematic layout of the Alternative B. The existing buildings in parcel TMK 4-2-15:008 would remain, with several older structures, accounting for about 19,000 square feet of floor space, to be demolished to make room for two new buildings. Similar to the Preferred Alternative, in Alternative B, 625,000 square feet of new buildings would be developed. Considering that about 19,000 square feet of existing building space would be demolished the net added floor space will be 606,000 square feet. This results in a total floor space area of 889,000 square feet at full build out, which includes the already existing structures at the site.

New buildings would be constructed in all three land parcels, with the largest addition of floor space being added in the lower portion of the site, e.g. TMK 4-2-15:006. The construction of new buildings is limited to area that is currently graded. No current open space area would be used for the construction of buildings, roadways, parking areas and ancillary facilities. All new development would only occur on already disturbed land.

The open space in parcel TMK 4-2-15:006 would remain the same as the open space area at the present. A total of 28.6 acres of presently pervious land would be converted to impervious area within the proposed development foot print.



	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetaed area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	0.0	4.4	None	61,000	0.5
TMK 4-2-15:006	**22.3**	0.0	16.7 (NOTE**)	None	337,000	4.8
TMK 4-2-15:008	0.0	0.0	22.4	283,000	208,000	0.0

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-3:
Preferred Alternative, schematic overview

The warehouses would be constructed in a high density manner with paved, most likely concrete pavement, surfaces surrounding the buildings. Parking would be along the warehouses on the continuous pavement. Areas that function as internal roadways would be constructed with concrete pavement. Shallow open swales and underground channels would provide drainage conveyance to one or more detention ponds.

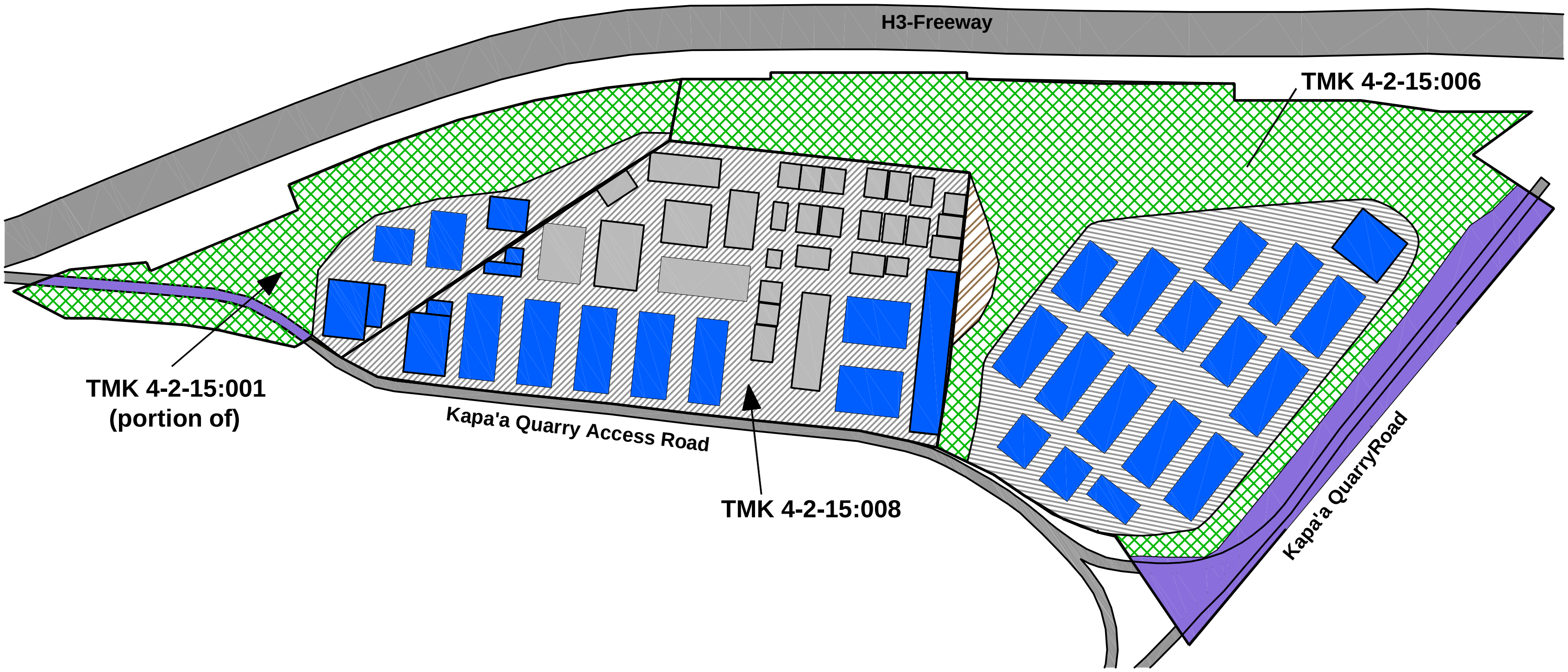
In the upper portion of the site, the currently 10.6 acres of graded and pervious area would be converted to impervious area. This includes all areas within the development footprint, such as impervious pavement around the buildings, impervious pavement of roadways, impervious parking space and the roofs of the buildings. Likewise, 18.0 acres of graded and pervious area would be converted to impervious area in the lower portion of the site.

2.5.3 No-Action Alternative

For the purpose of this DEIS, the No-Action Alternative would maintain the status quo. Under the No-Action Alternative no floor space would be added to space currently available at the site.

Figure 2-5 shows the existing facilities at the project site under the No Action alternative. The parcel TMK 4-2-15:008 has a total of 33 permanent warehouse structures on 16 acres and 6.2 acres of graded, non-vegetated and pervious land used by land tenants. The 16 acres containing the warehouses is paved and non-pervious land. The existing warehouses have a total area of 283,000 square foot; 24 of the warehouses are older types (built prior to 2001) with an average building footprint of 5,000 square foot and seven newer warehouses with an average footprint of 16,700.

The remaining parcels TMK 4-2-15:001 (portion of) and 006 have only areas of graded non-vegetated and un-paved area with a size of 4.4 and 18.9 acres, respectively. In the environmental review analysis, the No Action Alternative performs the important function of an environmental baseline against which the environmental consequences of the other alternatives are measured.

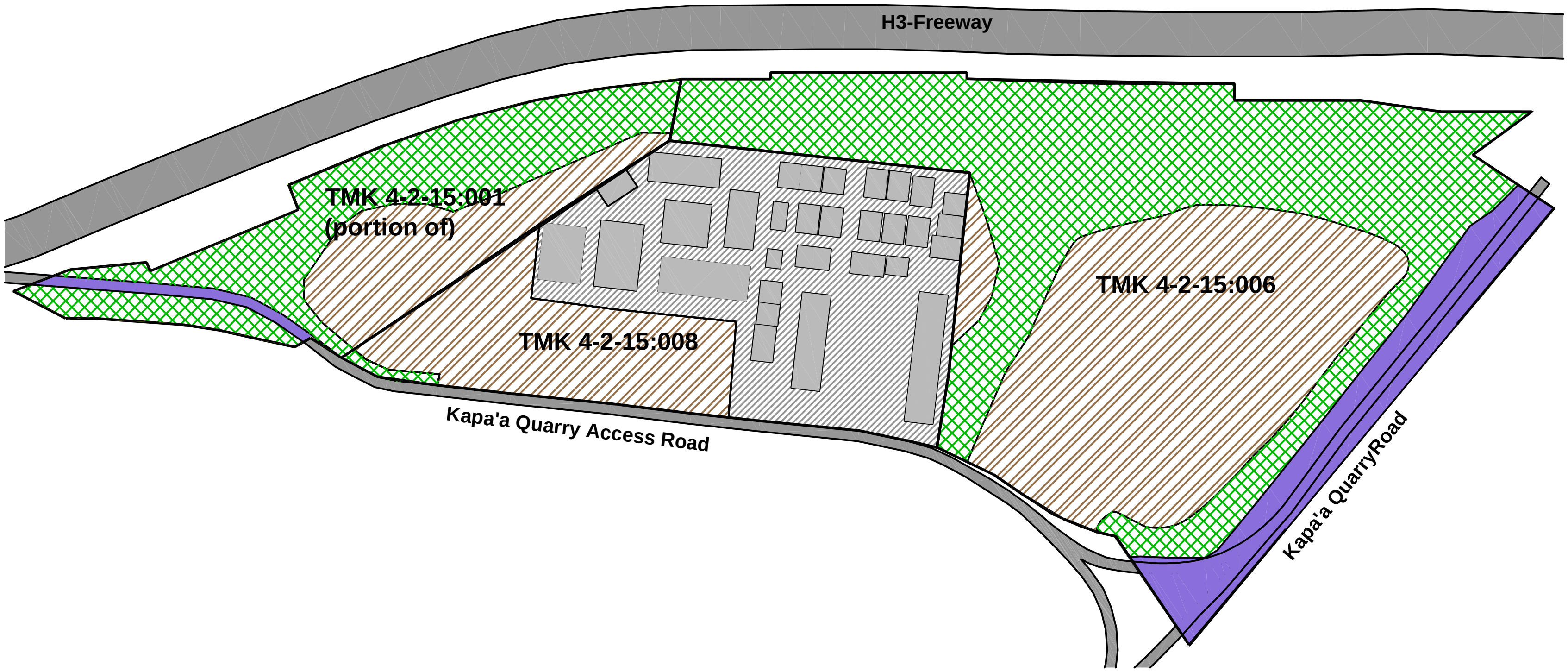


	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetaed area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	0.0	4.4	None	61,000	0.4
TMK 4-2-15:006	**20.2**	0.7	**18.0**	None	337,000	4.8
TMK 4-2-15:008	0.0	0.0	22.4	283,300	208,000	0.0

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-4
Alternative B, schematic overview



	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetaed area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	4.4	None	None	N/A	0.5
TMK 4-2-15:006	20.1	18.9	None	None	N/A	4.8
TMK 4-2-15:008	0.2	6.2	16.0	283,000	N/A	0.0

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-5:
No-Action Alternative, schematic overview

2.5.4 Comparison of Alternatives for Land Use and added Building Footprint

Table 2-1 and 2-2 show comparisons of the three alternatives for areas of land use categories and for building footprints, respectively.

Table 2-1 Comparison of alternatives evaluated - land use

Comparison of alternatives - land use	No-Action Alternative acres	Alternative B acres	**Preferred Alternative** acres
Upper portion:			
TMK 4-2-15:001 (portion of)			
Open space vegetated (outside development footprint)	8.1	8.1	8.1
Graded and pervious but not vegetated	4.4	0.0	0.0
Development area, impervious	0.0	4.4	4.4
Other area (i.e. roadway, drainage canal)	0.5	0.5	0.5
sum	13.0	13.0	13.0
TMK 4-2-15:008 (portion of)			
Open space vegetated (outside development footprint)	0.2	0.0	0.0
Graded and pervious but not vegetated	6.2	0.0	0.0
Development area, impervious	16.0	22.4	22.4
Other area (i.e. roadway, drainage canal)	0.0	0.0	0.0
sum	22.4	22.4	22.4
Lower portion:			
TMK 4-2-15:006 (portion of)			
Open space vegetated (outside development footprint)	20.1	20.2	22.3
Graded and pervious but not vegetated	18.9	0.7	0.0
Development area, impervious (development footprint)	0.0	18.0	16.7
Other area (i.e. roadway, drainage canal)	4.8	4.8	4.8
sum	43.8	43.8	43.8

Note: the 16.7 acres of development footprint under the Preferred Alternative is composed of 11.1 acres impervious and 5.6 acres pervious land.

2.6 The Preferred Alternative

This section provides a more detailed description of design approach and other features of the Preferred Alternative.

As described in Section 2.5.1 the main differentiator of the Preferred Alternative is the use of low impact development approaches and technologies for the lower portion of the site. The lower portion of the site is in close proximity to surrounding wetland areas, thus a development approach for the proposed project that minimizes environmental impact has been designed. The lower portion of the site furthermore is entirely located within the Special Management Area (SMA) and therefore requires a significant degree of impact mitigation to satisfy the SMA permit requirements.

Table 2-2 Comparison of alternatives evaluated – building footprint

Comparison of alternatives - building footprint	No-Action Alternative sqft	Alternative B sqft	**Preferred Alternative** sqft
Upper portion: TMK 4-2-15:001 (portion of) and 4-2-15:008			
Existing buildings	283,000	283,000	283,000
Added buildings	0	269,000	269,000
Lower portion: TMK 4-2-15:006			
Existing buildings	0	0	0
Added buildings	0	337,000	337,000
Total space added to current space in upper and lower portion of the site	0	606,000	606,000
Total building floor space at the site	283,000	889,000	889,000

building footprint rounded to the next thousand

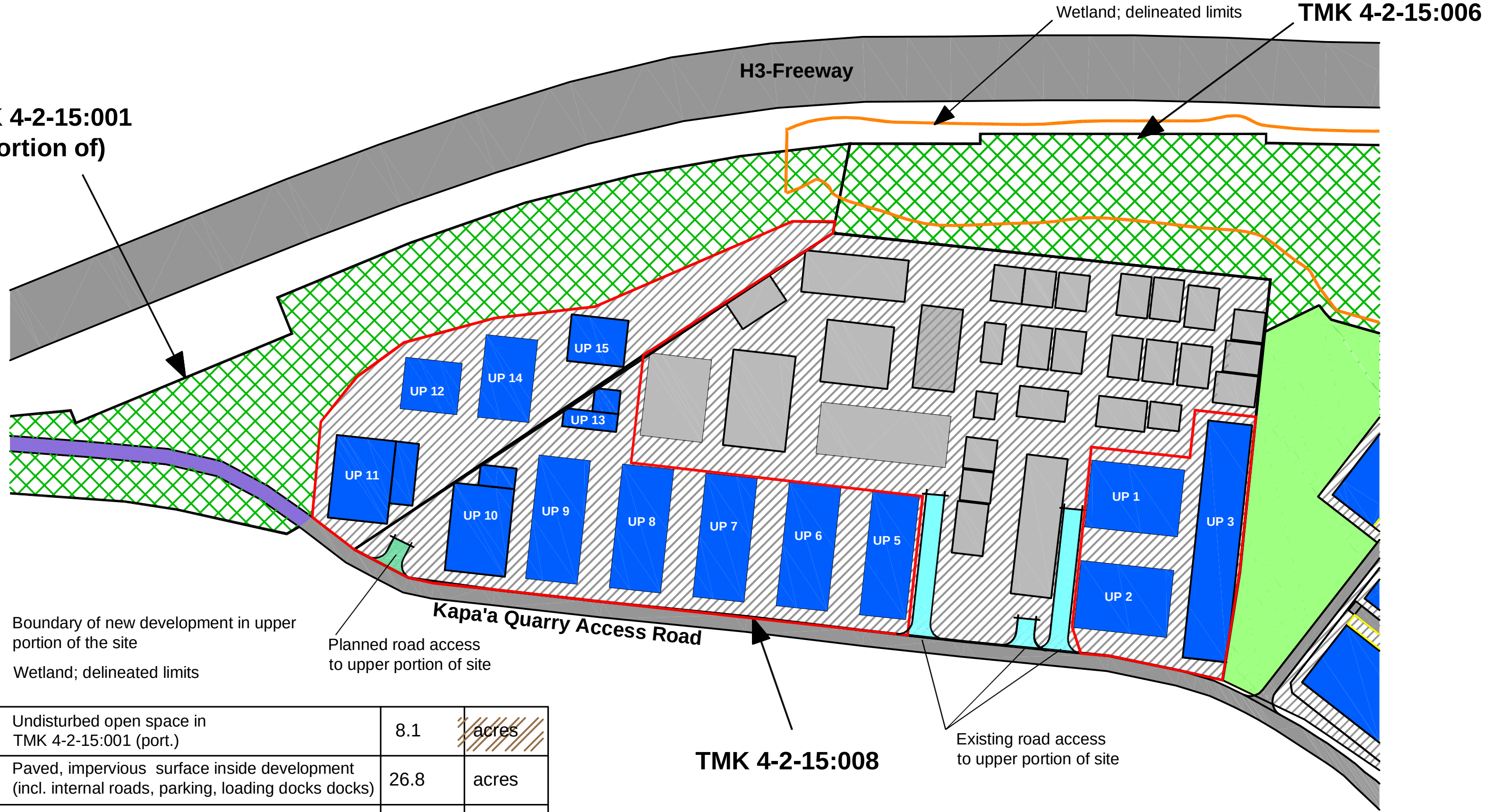
The applicant has therefore decided to develop the lower portion of the project site using design, construction and operational measures that will qualify for the level of certification credits to receive LEED Silver certification upon the completion of the development. In contrast, the upper portion of the site would be developed using conventional design approaches and building technologies. Selecting a different development approach for the upper and lower portions of the site enables the project to allocate additional funds for low impact development to the parts of the project site that have a more stringent need for a low impact approach, e.g. the lower portion of the site.

2.6.1 Conceptual Layout and Areas of Development of the Upper Portion

Figure 2-6 shows the conceptual layout of the upper portion of the site, which is the part of the proposed project site within TMK 4-2-15:001 (portion of) and TMK 4-2-15:008. Table 2-3 indicates the scope of development of the upper portion of the project site.

Table 2-3 Extent of development in upper portion of the project site

Description	acres	acres	pervious acres	impervious acres
Existing conditions				
TMK 4-2-15:001 (portion of)		**13.0**	12.5	0.5
			96%	4%
TMK 4-2-15:008		**22.4**	6.4	16.0
			29%	71%
sum of TMK 4-2-15:001 and 008		**35.4**	18.9	16.5
			53%	47%
With proposed new development:				
TMK 4-2-15:001 (portion of)		**13.0**	8.1	4.9
			62%	38%
open space (remaining undeveloped)	8.1			
developed area, paved and with buildings	4.4			
"Other land" area for roadways outside development foorprint	0.5			
sum	13.0			
TMK 4-2-15:008		**22.4**	0.0	22.4
			0%	100%
developed area, paved and with existing buildings	16.0			
developed area, paved and with new buildings	6.4			
sum	22.4			
sum of TMK 4-2-15:001 and 008		**35.4**	8.1	27.3
			23%	77%



Boundary of new development in upper portion of the site

Wetland; delineated limits

	Undisturbed open space in TMK 4-2-15:001 (port.)	8.1	acres
	Paved, impervious surface inside development (incl. internal roads, parking, loading docks docks)	26.8	acres
	Existing buildings (only in TMK 4-2-15:008)	283,000	sqft.
	New buildings	208,000	sqft.

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-6:
Preferred Alternative, Upper portion of the site; design details

The construction of the warehouses within the upper portion of the site and paving of the areas around the warehouses increases the imperviousness of the total land of the two parcels TMK 4-2-15:001 (portion of) and TMK 4-2-15:008 from 47% to 77%, by converting 10.8 acres from pervious to impervious land.

It is planned to add 15 warehouse structures in the upper portion of the site. Table 2-4 lists the planned building footprint of the warehouse structures

Table 2-4 Planned warehouse structures in the upper portion of the site

ID	Building footprint sqft.	Sqft in parcel TMK 4-2-15:001 (por.)	Sqft in parcel TMK 4-2-15:008
UP 1	23,400		23,400
UP 2	23,400		23,400
UP 3	15,440		15,440
UP 4	N/A		N/A
UP 5	21,600		21,600
UP 6	24,000		24,000
UP 7	24,000		24,000
UP 8	24,000		24,000
UP 9	24,000		24,000
UP 10	22,700		22,700
UP 11	23,800	23,800	
UP 12	11,000	11,000	
UP 13	6,000		6,000
UP 14	16,000	16,000	
UP 15	9,900	9,900	
sum **	**269,000**	**61,000**	**209,000**

Note: sum ** is rounded to next 1,000 square feet area
area for building UP3 is the net increase, considering demolition
the designation pf Building UP 4 was abandoned is only indicated as "N/A"

The new development in the upper portion of the site includes the following construction measures:

The area that is presently graded will be used for the construction of the 15 planned warehouses. The warehouses will be steel structures and will have a height of about 30 to 35 feet. The roof will be insulated and/or will have a high performance exterior coating. The walls of the warehouses will be built using prefabricated, aerated concrete panels that have high thermal performance and good acoustic performance. The warehouses will have skylights to supply daylight and reduce energy consumption for lighting. Exterior lighting will be with fully shielded fixtures to reduce light transmittance.

Site pavement: A total of 2.6 acres (114,000 sq ft) of impervious concrete pavement will be placed around the warehouses to establish one continuous paved working space in the upper portion of the site.

Parking: Paved areas close to the warehouse will be allocated to parking stalls to accommodate a number of parking stalls that exceeds the land use ordinance requirement for off-road parking for the all the new warehouses, which amounts to a minimum total number of 194 parking stalls. A suitable number of loading spaces for light trucks (surface marked properly) will be made available. It is planned to construct one detached loading dock that can service two heavy trucks. The detached loading docks for large trucks will have a staging area and ramps for forklift access to the loading platform.

Roadways: Internal traffic servicing the warehouse development will use the continuous pavement in the upper portion as roadways. There is an existing internal concrete roadway between adjacent to the new buildings UP 5 through UP 9, which will connect the new warehouses with the road access to the Kapa’a Quarry Access Road. The new internal traffic areas will have paved access from the existing internal concrete road to the individual warehouses.

Utilities: Electric and water utilities will be placed below ground.

Site Drainage: Site drainage will be by shallow swales in the roadways, below ground pipes and channels. There will be two detention ponds, sized according to code, which will drain the stormwater after primary treatment in the detention ponds into the open space north of the existing development.

Wastewater treatment: Since the proposed site is not connected to the municipal sewer system, onsite wastewater treatment will be carried out with an approximately 6 to 8 conventional septic systems, each consisting of one 1,250 gallon septic tank and one approximately 2,000 sq. ft. underground injection field (leach field).

2.6.2 Conceptual Layout and Areas of Development of the Lower Portion

Figure 2-7 shows a more detailed layout plan of the lower portion of the site. The development footprint of the lower portion layout in Figure 2-7 has the same size as in Figure 2-3, which shows the overall schematic overview of the site under the Preferred Alternative.

The LEED project boundaries, as indicated in Figure 2-7, include the present graded landfill areas of TMK 4-2-15:006 and a part of the presently open space adjacent to the development footprint. The presently open space between the development and the boundary of TMK 4-2-15:008 will be upgraded to restored habitat using native or adaptive plants to replace the present vegetation cover, mainly wild grown vegetation containing many invasive plants. Restored habitat will furthermore be established within the vegetative buffer zones, which are along the Kapa'a Stream corridor and the Kapa'a Quarry Road. The development footprint includes roadways, parking areas, landscaped areas around the warehouses and the warehouse structures. The different areas of the development in the lower portion of the site and the rest of the parcel TMK 4-2-15:006 are shown in Table 2-5.

Presently, the parcel TMK 4-2-15:006 has 98 percent perviousness, with the remaining 2 percent imperviousness being the quarry road inside the parcel, but outside the project boundary. The development will convert about 5.6 acres of land to what can be considered impervious surface in terms of being a barrier to water infiltration into the ground. The actual impermeable paved area will comprise 11.7 acres, but a minimum of 50 percent of the warehouse roofs and impervious roadway areas inside the development footprint will be used for rainwater harvesting to supply irrigation of the vegetated areas. Therefore, although impervious, the roadway and roof surfaces, which are used for rainwater catchment, are ultimately supplying the rainwater back to the soil via infiltration from the vegetated areas. In this context, the overall perviousness percentage inside the parcel TMK 4-2-15:006 decreases from 98 to 86 percent.

The development footprint will occupy the area that is presently landfill area. Present existing open space will not be used for the development footprint. The LEED project boundary has a 30 feet setback from the NRCS delineated wetland area. Therefore no development, including grading, landscaping, habitat restoration and associated filling will occur inside designated wetland areas and within the Kapa'a Stream corridor. Likewise no development will occur that affects the drainage canal along the quarry road. Consequently, no wetland or navigable waters will be affected by the development and no Section 404 Clean Water Act permit will be required.

		acres
(red line)	LEED certification project site boundaries (area)	24.5
(light green)	Restored habitat area (with native & adapted plants)	7.8
(cross-hatched)	Undisturbed open space in TMK 4-2-15:006	14.6
(orange line)	Wetland; delineated limits	
(dark green)	Landscaped area around buildings & at site boundaries	3.7
(yellow)	Parking areas, gravel bed	1.9
(gray)	Roadways, paved (incl. loading docks)	2.7
(blue)	Building (e.g. warehouses) onlyin lower portion of site	7.7

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-7:
Preferred Alternative, lower portion of the site; design details

Table 2-5 Extent of development in lower portion of the site

Description	acres	acres	acres	% of area considered pervious (Note**)	pervious acres	impervious acres
TMK 4-2-15:006 total area			**43.8**		43.1	0.7
					98%	2%
Open space remaining		14.6			14.6	
LEED project site for certification		24.5				
"Other land" inside parcel but outside LEED project area		4.8		85%	4.1	0.7
sum TMK 4-2-15:006		43.8				
LEED project site for certification			**24.5**			
Restored habitat around development footprint		7.8			7.8	
development footprint		16.7				
landscaped area (pervious)	3.9				3.9	
parking (pervious)	1.9				1.9	
loading dock (paved, impervious)	0.4					0.4
roadways (paved, impervious)	2.7			50%	1.4	1.4
building roofs (impervious)	7.7			50%	3.9	3.9
sum development footprint	16.7					
sum LEED project site for certification		24.5				
				sum	37.5 86%	6.3 14%

Note ** : About 50% of the streets and building roofs will be used for rainwater catchment for irrigation

Table 2-6 shows the building footprint of the planned warehouses in the lower portion of the site. The identifiers of the warehouses are listed in Figure 2-7.

The new development in the lower portion of the site comprises the following construction measures:

The area that is presently graded will be used for the construction of the 15 planned warehouses. The warehouses will be steel structures with envelopes that have a high thermal performance. The roof will be insulated and/or will have a high performance exterior coating. The walls of the warehouses will be built using prefabricated, aerated concrete panels that high thermal performance and good acoustics. The warehouses will have between 5 and 7 percent of roof area with skylights, to supply daylight and reduce energy consumption for lighting. Interior lighting design and controls will abide the strict light pollution requirements of the LZ1 zone. Exterior lighting will be with fully shielded fixtures and a minimum amount of light will be used to reduce light pollution.

The height of the warehouses will be between 30 and 35 feet. There will be trees around the warehouse structure to reduce visual impact and to provide shade for the building shell and parking areas for improved thermal performance of the buildings and reduce heat island effect.

Table 2-6 Planned warehouse structures in the lower portion of site

ID	Building footprint sqft.
LO 1	26,600
LO 2	20,900
LO 3	24,000
LO 4	24,000
LO 5	24,000
LO 6	24,000
LO 7	24,000
LO 8	18,000
LO 9	18,000
LO 10	24,000
LO 11	24,000
LO 12	15,000
LO 13	24,000
LO 14	24,000
LO 15	22,400
sum **	**337,000**

Note: sum ** is rounded to next 1,000 square feet area

Internal roadways: a total of 5,400 linear feet of 22 feet wide internal roadways with impervious concrete pavement will be installed. There will be two road accesses to the Kapa'a Quarry Access Road. Only the roadway access closest to the existing warehouses will be used for regular traffic. The other roadway access closest to the quarry road will only be used as an emergency exit and entrance, since the roadway access is located near a sharp curve of the quarry access road.

Parking: Pervious areas close to the warehouse will be allocated to parking stalls to accommodate a number of parking stalls that exceeds the land use ordinance requirement for off-road parking for the all the new warehouses, which amounts to a minimum total number of 225 parking stalls. The surface of the parking stalls will be pervious gravel bed or open grid. Trees will be planted in suitable planting wells within the pervious parking areas to provide canopy shade for the parking stalls as well as provide a “green barrier” for visual impact mitigation.

A suitable number of loading spaces for light trucks (surface marked properly) will be made available. It is planned to construct one detached loading dock that can service three heavy trucks. The detached loading trucks will have a staging area and ramps for forklift access to the loading platform.

Landscaped areas: The size of the planned landscaped areas around the warehouses and at the perimeter on the development footprint is 3.7 acres. It is planned to plant native or adaptive plants including larger trees that will supply shade to the building and will provide a visual “green barrier” around the warehouses for visual impact mitigation. The irrigation of the landscaped areas will be done with rainwater that is collected and harvested from the roofs of the warehouses.

Restored habitat / vegetative buffer zones: As an important component of the sustainable development approach, it is planned to restore 7.8 acres of presently open space as habitat, using native or adapted plants. All of the open space for the restored habitat is outside the designated wetland area and outside the drainage canal along the quarry road, with setbacks of 30 and 20 feet from the wetland boundary and the drainage canal, respectively. As illustrated in Figure 2-8, the habitat will surround the development footprint of the lower portion of the site at three sides:

1. At the side of the development bordering the quarry road the habitat will comprise an earth dam of about 10-12 feet height on which bushes and large trees will be planted for visual impact mitigation as well as noise abatement and air pollution mitigation. The habitat will provide living environment for wildlife. However, it is not planned to establish water bodies with permanent surfaces, to avoid attracting endangered water birds that might be subject to predation by non-native predators.
2. At the side of the designated wetland inside the Kapa’a Stream corridor, to the north of the development, the habitat will contain trees and bushes inside the vegetative buffer zone. As noted before all grading and site development will be outside the delineated wetland.
3. At the side of the existing warehouse development, the restored habitat area will be developed on the land between the upper and lower portions of the site.

Utilities: Electric and water utilities will be placed below ground.

Site Drainage: Site drainage will be by shallow swales in the roadways, below ground pipes and channels. There will be one extended detention pond, sized according to code, which will drain the stormwater after advanced treatment into the drainage canal along the quarry road. The stormwater treatment will be advanced with respect to quantity and quality of the stormwater. Refer to the Section 2.8 for a brief description of the stormwater treatment as part of the sustainable design approach for the lower portion of the site.

Rainwater harvesting: The lower portion of the site will use rainwater catchment to provide all of its irrigation water and a significant amount of the water for sewage conveyance and/or custodial water from harvested rainwater. The rainwater catchment will be from roof tops and sections of the internal roadways. The rainwater that is collected from section of the road will drain laterally to shoulders which are gravel filled shallow trenches that provide an initial filtering of the rainwater. The collected rainwater is then conveyed to underground taverns for storage and use in irrigation. The rainwater collected from the roof tops will flow directly to the underground taverns or to smaller tanks next to the warehouses. The rainwater from the smaller storage tanks, after being filtered, is used in the warehouses for sewage conveyance and suitable custodial uses.

Wastewater treatment: Since the proposed site is not connected to the municipal sewer system, onsite wastewater treatment will be carried out with approximately eight alternative septic systems. The onsite wastewater treatment goes beyond the treatment effectiveness of conventional septic systems, and will use advanced treatment process steps to significantly improve the quality of the wastewater that is infiltrated on the site. Refer to the Section 2.8 for a brief description of the wastewater treatment as part of the sustainable design approach for the lower portion of the site.

2.7 Project Schedule and Milestones of Preferred Alternative

The project will be implemented over a period of about 15 – 17 years. The market study conducted for the environmental review of the proposed industrial park suggests that the planned approximately 600,000 sq. ft. of gross leasable space will be easily absorbed by the region within this time range.

Table 2-7 shows the progress of adding new warehouse space to the development based on an assumed project completion within 15 years after start of development. The 15 years of project completion would represent the “fast track” development. Table 2-7 and Figures 2-8 and 2-9 describe the planned development pace at which warehouse space is added in the upper and lower portions of the site. Table 2-7 and Figures 2-8 and 2-9 suggest the planned development approach, in which case after the first six years the upper portion of the development will be full-built, and in the following nine years warehouse space will be added in the lower portion of the site. The warehouse buildings are identified in Figures 2-7 and 2-8 for the upper and lower portions of the site, respectively.

Table 2-7 Estimated schedule - additions of warehouse space to site

Year	Building added	Building added	Building added	Building added	Total Space added in year	Cumul. Space added	Space absorbed in year	New Space available at end of year
	refer to Figure 2-6 and 2-7 for bldg. ID				[sqft]	[sqft]	[sqft]	[sqft]
2010					0	0	0	0
2011	UP 1	UP 2			46,800	46,800	40,400	6,400
2012	UP 3		UP 5	UP 6	61,000	107,800	40,400	27,040
2013	UP 7				24,000	131,800	40,400	10,640
2014	UP 8	UP 9			48,000	179,800	40,400	18,240
2015	UP 10	UP 11			46,500	226,300	40,400	24,340
2016	UP 12	UP 13	UP 14	UP 15	42,900	269,200	40,400	26,840
2017	LO 1				26,600	295,800	40,400	13,040
2018	LO 2	LO 3			44,900	340,700	40,400	17,540
2019	LO 4	LO 5			48,000	388,700	40,400	25,140
2020	LO 6	LO 7			48,000	436,700	40,400	32,740
2021	LO 8	LO 9			36,000	472,700	40,400	28,340
2022	LO 10				24,000	496,700	40,400	11,940
2023	LO 11	LO 12			39,000	535,700	40,400	10,540
2024	LO 13	LO 14			48,000	583,700	40,400	18,140
2025	LO 15				22,400	606,100	40,400	N/A
						sum	**606,000**	

Note:

Yellow schaded area indicates that warehouses in **lower portion** of site are added

Cyan schaded area indicates that warehouses in **upper portion** of site are added

Table 2-7 suggests that at the projected pace of adding warehouse space the development will be at full-built in the year 2025, e.g. 15 years after start of construction. The gradual pace of development over a stretch of 15 to 17 year helps to mitigate certain impacts, such as construction related traffic due to construction on the site.

Figure 2-8 Warehouse space added and absorbed per year over the project duration

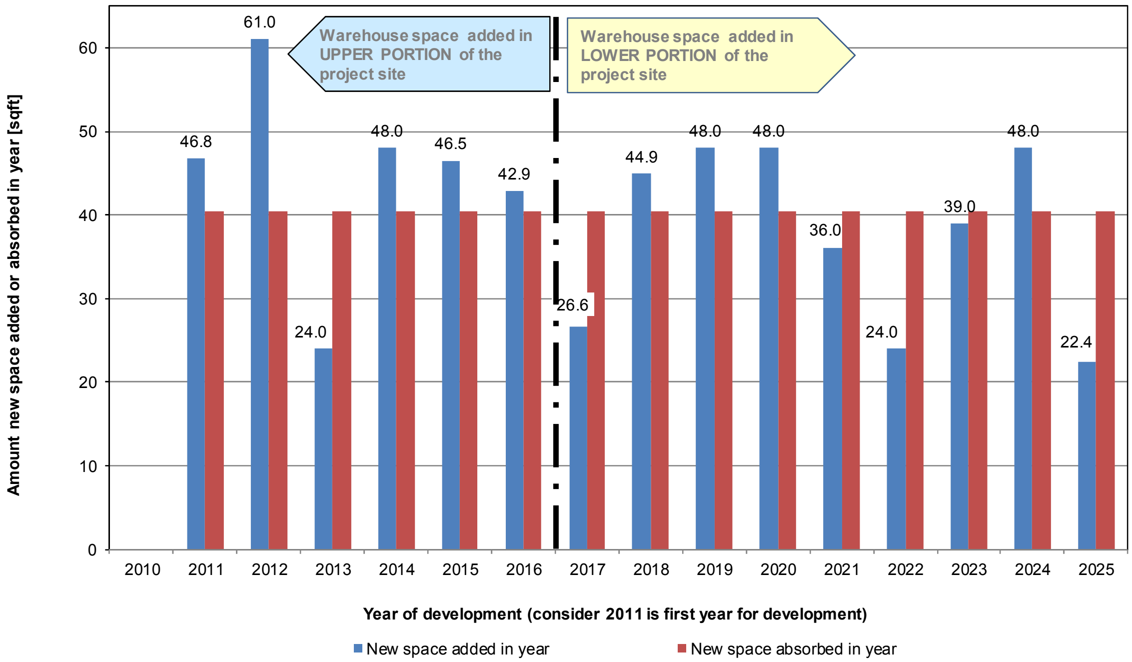
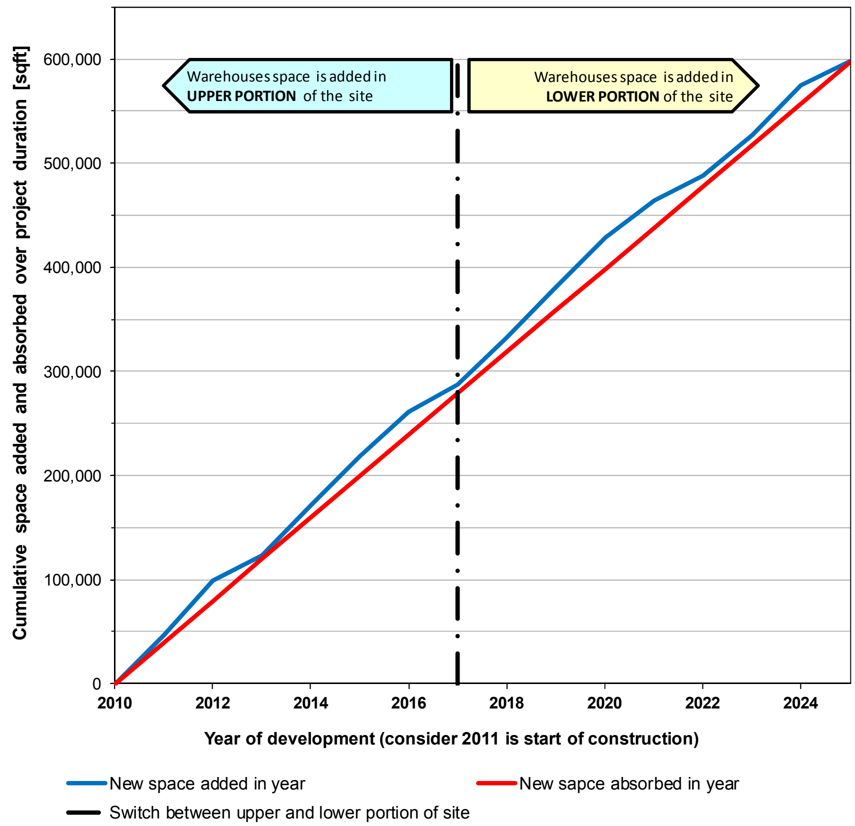


Figure 2-9 Warehouse space added and absorbed over the project duration



The development schedule of 15 to 17 years describes the overall progress of first developing the site, and then adding a certain amount of warehouse space each year for the entire project length. Construction of the warehouses added to the proposed industrial park will only occur over a part of the year. Figure 2-10 suggest the anticipated construction schedule for the warehouse structures and the site immediately surrounding the structures. It should be noted that the site grading and development of site infrastructure, including mass grading, roads, stormwater treatment and utilities, would occur at the beginning of the development of the upper and lower portions of the site. For the upper and lower portion, the length of the initial site development work is estimated at 3 and 6 months, respectively. The construction of the individual warehouses would occur after the site has been developed.

The following four major categories of construction work will occur for the construction of individual warehouses:

Grading of building footprint and adjoining land: Establishing the finished grade for the buildings and the surrounding traffic areas, parking areas and open-space.

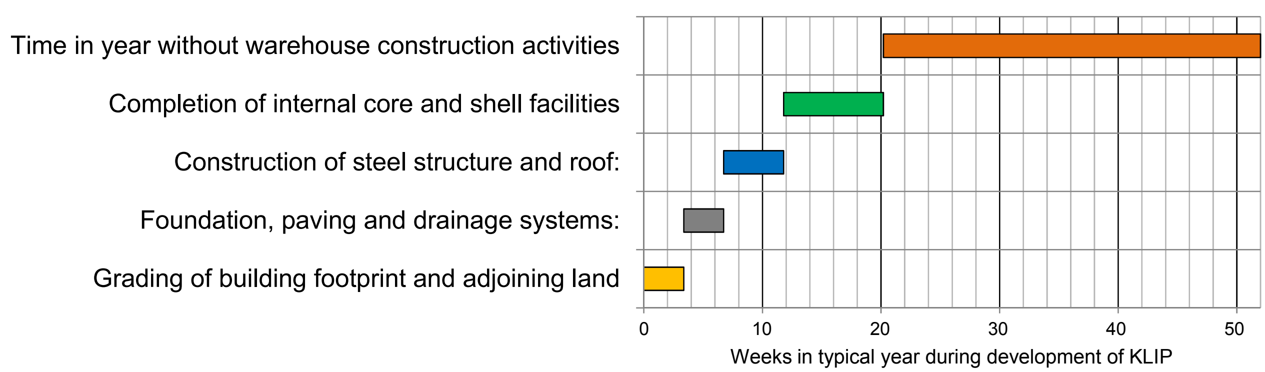
Foundation, paving and drainage systems: Installing the foundation for the structures, paving of the parking and traffic area around the buildings and connecting the site drainage system to the overall development stormwater system.

Construction of steel structure and roof: Construction of the outer building envelope.

Completion of internal core and shell facilities: Carrying out all internal building work relative to the core and shell facilities.

Figure 2-10 suggests the anticipated annual construction schedule for adding about 40,000 square feet of warehouse space. As suggested in Figure 2-10 the length of significant construction activities would be an average of 20 weeks in any year and the remainder of the year would see no significant construction activities at the site. It is estimated that the impact of additional heavy truck traffic during construction would be minimal, since the building envelope of the warehouses would be pre-fabricated and assembly of each warehouse on the site will be accomplished within a matter of three to five weeks, depending on the size of the warehouse. The completion of the core and shell facilities inside the warehouses would then be carried out inside an enclosed building envelope, resulting in less impact than the external construction activities.

Figure 2-10 Typical annual phasing of construction of warehouses



The following are major project milestones:

1. Completion of the Environmental Review process: It is anticipated that the environmental review of the proposed action will be completed by April 2011. If the FEIS is accepted the project will go forward; with filing the applications for the required permits.
2. Application for zone change: After the EIS has been accepted the applicant will apply for a zone change for the two land parcels, TMK 4-2-15:001 (portion of) and 006.
3. Special Management Area (SMA) permit: After the EIS has been accepted the applicant will apply for a Special Management Area permit for the development in the lower portion of the site.
4. Start of construction for proposed KLIP: The start of construction for the proposed Kapa'a Light Industrial Park is anticipated for the middle of 2011. Since most of the upper portion is already graded, the individual warehouses will be added and the concrete pavement will be added around warehouse to provide parking and space to support the activities inside the warehouses (e.g. unloading of trucks). The various components of the drainage system for the new warehouses will be installed, such as the detention ponds, swales, inlets, underground pipes and channels. Likewise the utilities for the new warehouses and the onsite wastewater treatment systems (e.g. conventional septic systems) will follow at the speed of construction of warehouses.
5. Continuous addition of warehouses in the upper portion of the site: Starting 2011 and through 2017 warehouses will be constructed on the prepared site within the upper portion of the site at the anticipated pace of absorption of warehouse space in the region.
6. Start construction vegetative buffer zones around the lower portion of the site: The start of the development of the lower portion of the site will start around the middle of 2012 with the installation of the vegetative buffer zones around the development footprint. The first activities will be to construct the grading of the buffer zones, adding topsoil and planting trees and bushes. The early installation of the vegetative buffer zones has the significant advantage that trees and bushes, which will provide visual impact mitigation, will have already grown before the first warehouse is scheduled to be constructed.
7. Grading of lower portion of the site: After the vegetative buffer zones have had time to develop a stable vegetation cover, the grading and soil stabilization of the remaining development footprint will occur. Since the site will by then be completely surrounded by earth dams, it is anticipated that no significant untreated runoff will occur during mass grading. Appropriate best management practices (BMPs) will be used to minimize any impacts. It is planned to carry out the general grading of the site around two years after the vegetative buffers have been installed.

8. Soil stabilization: The graded site will be stabilized by seeding a vegetation cover and other soil stabilization methods.
9. Detailed grading for warehouse construction: The detailed grading of sites for the first several warehouses and adjoining parking areas will commence. It is planned that detailed grading, including the grading of site features immediate adjacent to the warehouses will be carried out as the construction of the site continues.
10. Electric and water infrastructure installation: Installation of the main parts of the electric and water infrastructure; the first parts of the electricity and water infrastructure will serve the first several warehouses, which will be constructed. The infrastructure for the warehouses still to be erected will be added as needed according to the development schedule.
11. Onsite wastewater systems: Installation of the first septic systems close to the warehouses and the installation of the first modules of the advanced septic system, including wastewater conveyance, aeration processes, denitrification, sand filter and infiltration fields, will occur at the perimeter of the development footprint (e.g. within the landscaped area or within the restored habitat areas). The remaining septic systems will be added as is required with the growing development within the lower portion of the site.
12. Installation of paved roadways: Installation will occur of the first sections of impervious concrete roadway pavement, along with rainwater catchments for these roadways, and installation of the first underground rainwater cistern and the system for irrigation.
13. Installation of the drainage system: Installation of the initial site drainage from impervious surfaces (e.g. roadways and warehouse roofs), installation of the detention pond, and installation the initial runoff treatment unit upstream of the detention pond.
14. Completion of all the warehouses in the upper portion of the site: The completion of all the warehouses in the upper portion of the site will occur by approximately 2017, at the anticipated pace of absorption of the leasable warehouse space.
15. Start of construction of warehouses in lower part of the site in 2017: Assuming that the upper portion of the site will be built out at that point in time, warehouse space will be begun in the lower portion of the site.
16. Continuous addition of warehouses in the lower portion of the site: Starting in approximately 2017 and through 2025, warehouses will be constructed on the prepared site at the anticipated pace of absorption of warehouse space in the region.
17. Completion of the development: It is anticipated that the entire planned leasable space, around 606,000 square feet, will be completed in 2026. This ends the development project

Table 2-8 lists major project milestones and their anticipated timing in the project schedule.

Table 2-8 Summary and timeline of major project milestones of preferred alternative

No.	Anticipated time in schedule (year)	Description of milestone / major project development step
1	April 2011	Completion of the environmental review process:
2	April 2011	Application for zone change:
3	October 2011	Special Management Area (SMA) permit:
4	July 2011	Start of construction for proposed KLIP in upper portion of the site
5	2011 through 2017	Continuous addition of warehouses in the upper portion of the site:
6	April 2012	Start construction vegetative buffer zones around the lower portion of the site:
7	Summer 2015	Grading of the entire development footprint in lower portion of the site
8	Summer 2015	Soil stabilization in lower portion of the site
9	Summer 2016	Detailed grading for warehouse construction in lower portion of the site
10	Summer 2016	Electric and water infrastructure installation lower portion of the site
11	Fall 2016	Onsite wastewater systems lower portion of the site
12	Fall 2016	Installation of paved roadways lower portion of the site
13	Fall 2016	Installation of the stormwater drainage system lower portion of the site
14	End of 2016	Completion of all the warehouses in the upper portion of the year:
15	Spring 2017	Start of construction of warehouses in lower portion of the site in 2017:
16	2017 though 2025	Continuous addition of warehouses in the lower portion of the site:
17	2025	Completion of the development:

2.8 Summary of the Sustainable Design Approach for the Lower Portion of the Site

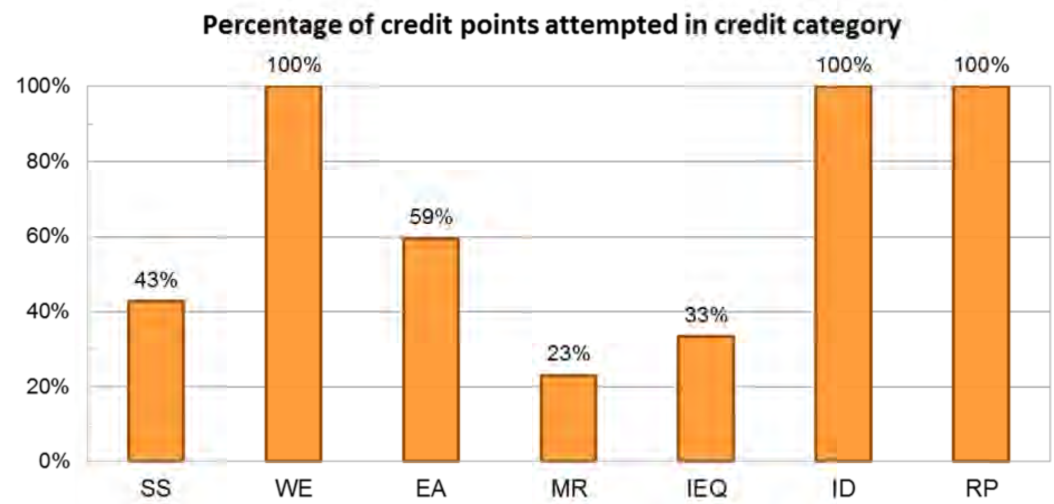
The development of the lower portion of the project site will be carried out in accordance with requirements to achieve LEED Silver certification upon completion of the project. The project team has developed a sustainable design approach, which is presented in Appendix 4 of this DEIS. The sustainable design approach contains a number of design and construction features for the development of the lower portion of the site to qualify for at a minimum of 50 LEED credit points, required for LEED Silver certification. In addition to laying the basis for LEED Silver certification, the sustainable design approach is formulated to mitigate the most relevant impacts of the proposed project.

As described in the sustainable design approach in Appendix 4 in more detail, priority was given to satisfy those LEED credit categories which would provide effective impact mitigation for the proposed site. More specifically, from the seven LEED credit categories, two categories, the water efficiency category (WE) and the sustainable site category (SS), were given special attention since they directly provide the type of impact mitigation that is most important for the Kawainui Marsh. Figure 2-11 illustrates the focus on certain LEED credit categories in the sustainable design approach for the proposed project.

Figure 2-11 Percentage of attempted out of available credit points for LEED credit categories

LEED credit categories:

SS	-	Sustainable Sites	IEQ	-	Indoor Environmental Quality
WE	-	Water Efficiency	ID	-	Innovation in Design
EA	-	Energy & Atmosphere	RP	-	Regional priority
MR	-	Materials & Resources			



The following describes how design measures to achieve LEED Silver certification will be used to mitigate those environmental impacts which are of important concern for the proposed project.

SS - Sustainable Sites

The proposed site is within the State of Hawaii “Urban” land use district and is not a greenfield development. The proposed project will be developed on an area that was formed by landfill of quarry tailing, overburden and some municipal waste. The project therefore meets the goal to conserve previously undeveloped land. Land that is either zoned for industrial use or is well qualified for converting the industrial zoned land is in short supply in the greater Kailua and Kaneohe region, and consequently the region will benefit from developing land for industrial use at the proposed site.

The attempted credits address impacts and mitigation measures that are of significance to the environmentally important land surrounding the proposed site, such as:

- Incentivizing the use of alternative transportation by providing secure storage and changing / shower facilities for bicyclists and providing preferred parking for low emitting vehicles and carpools. *This measure will reduce traffic to and from the project site.*
- Restoring habitat and maximizing open space within the site, by planting open space with native or adaptive plants to provide as much vegetative area within the development footprint as possible. *This measure will reduce the visual impact on the project and will reduce air pollution and noise propagation. The open space around the development footprint will be used for infiltration of wastewater that is treated on-site. The open space will further lower the amount of stormwater runoff by using rainwater for irrigation.*
- Comprehensive stormwater treatment to control the quality and quantity of the stormwater runoff from the developed site, by providing pervious parking areas, harvesting stormwater from roofs and roadways for irrigation, removing pollutants from 100% of the runoff through a multistage treatment system, and providing flood control by means of an extended detention pond. The proposed design for a comprehensive stormwater treatment system far exceeds the basic credit requirements and **an exemplary performance credit will be attempted for the stormwater credit.** *This measure will significantly improve the quality and quantity (in terms of peak discharge rates) of the stormwater runoff from the site.*
- Reducing Light Pollution by controlling internal and external light sources during the night. *This measure provides an important impact mitigation since excessive light can impact the wildlife and birds in the adjacent marsh.*
- Providing guidelines to the tenants to build-out spaces along the green building approach that was used for the Core& Shell certification. In going beyond a non-binding guideline status the developer will make the compliance of certain green building measures contractually mandatory, such as strict compliance with the reduction of light

pollution measures. **For the contractually binding measures the project team will attempt an exemplary performance credit.** *This measure ensures that the impact mitigation of the LEED credits is effectively applied for the project.*

WE - Water Efficiency

The close proximity of the proposed site to important wetland areas makes a high consideration for all water related issues imperative. Water relevant issues include stormwater runoff, water use for irrigation, water use in the buildings and wastewater treatment and disposal. While the stormwater control is treated under the Sustainable Site credit category all the remaining water related credits are grouped under the Water Efficiency credit category. The Water Efficiency (WE) credit category uses the following measures to mitigate impacts of the project:

- Water efficient landscaping will be applied through using harvested rainwater for irrigation instead of potable water. Landscaping will preferably use native and adaptive plants that have lower needs for irrigation, pesticides and fertilizers then introduced plant species. *This measure protects the adjacent wetland and receiving waters by recharging the aquifers and by stimulating evapotranspiration from plants in the vegetative buffers as stormwater treatment. This measure furthermore reduces the amount of fertilizer and pesticides which might be entrained in the runoff from landscaped areas.*

- Innovative wastewater technologies will include advanced onsite treatment systems that go far beyond the performance and effectiveness of conventional septic systems. Since the wastewater is treated onsite, because there is no connection to the municipal sewer system, and the wastewater discharge occurs in close proximity to important wetlands, advanced treatment steps are added to the septic systems on the site. Aerobic and anaerobic treatment process steps are added to the septic systems to remove significant BOD and TSS loads and to significantly reduce nutrients from the wastewater before it is infiltrated in irrigation or in leach fields. Since the proposed wastewater treatment system goes far beyond the basic credit requirements an exemplary performance point will be attempted for the innovative wastewater treatment systems. *This measure is important impact mitigation for the marsh since it drastically reduces any pollutants that are in the wastewater generated on the site. Specifically the selected onsite wastewater treatment drastically reduces nutrients and TSS in the wastewater, and avoids that pollutants are reaching the water table and the receiving waters, which include the Kawainui Marsh.*

- Water use reduction measures will result in a 40% water use reduction by installing only high performance water fixtures in the buildings. *This measure helps in reducing the* *burden of the project on the municipal water supply, and also reduces the amount of wastewater generated inside the buildings. Harvested rainwater is used for wastewater conveyance, thereby conserving precious potable water resources in the region and furthermore causing the rainwater to be distributed onsite rather than added to the site runoff.*

EA - Energy & Atmosphere

The energy and atmosphere credit category implies mitigation of impacts that are relevant to the island-wide environment and economy. The attempted credits involve efforts to save energy and impacts that result from energy generation, as well as verification that these measures are indeed implemented. Hawaii has very significant energy (oil) dependence, since at the present time, almost 90% of all its energy comes from oil. Efforts to save energy and generate energy from renewable energy sources will help the State of Hawaii on its declared effort to mitigate the high oil dependence and substitute it with indigenous energy forms. The relevant credits that also mitigate pertinent impact on the adjacent environment of the proposed project are as follows:

- Optimized energy performance by saving a minimum of 30% of the energy costs of a baseline. *This measure helps to reduce the burden of the proposed project on the electric supply system, and helps reducing burning fossil fuel for electricity generation.*

- Onsite renewable energy will be produced to offset energy derived from imported fossil fuel, especially oil. The onsite renewable energy will be derived from solar thermal/waste heat recovery and PV energy systems. *This measure helps to reduce the burden of the proposed project on the electric supply system, and helps to reduce burning fossil fuel for electricity generation.*

- Measurement and verification will be done on the core and shell part of the buildings as well as in the tenant spaces. Continuous measurement and verification will support the park management and the tenants to monitor the success of energy savings and intervene if the saving goals are not met. *The measure will help to ensure that the impact mitigation through reducing electricity consumption will be effectively adhered by the future tenants of the Kapa'a Light Industrial Park*.

MR - Materials & Resources

The materials and resources credit category addresses island-wide concerns, since it combines efforts to divert as much construction waste as possible from going to landfill, and to conserve virgin material by reusing and recycling waste. In addition, the credit category advocates the use of locally extracted or manufactured materials in lieu of imported material. The relevant credits that mitigate important impacts on the adjacent environment of the proposed project include:

- Construction waste management will be performed to reuse or recycle construction waste and therefore reduce disposal in landfills. *This measure helps to reduce the construction related traffic by reducing the hauling of construction waste from the site and bringing fill material to the site. In addition this measure helps to reduce the amount of material to be deposited in the landfills.*
- Recycled materials will be used in the construction and products will be purchased that have a higher percentage of pre- and post-consumer recycled content. Regionally extracted or manufactured material will be used to support indigenous resources and the economy of Hawaii. *These measures help the environment, and also help the local economy*

IEQ - Indoor Environmental Quality

The Indoor environmental quality credit category addresses concerns about a healthy indoor environment for building occupants. IEQ impacts and their mitigation have only secondary significance to the exterior environment. In selecting what credits will be attempted, the project endeavors to create synergy between increasing the indoor environmental conditions and to mitigate impacts to the exterior environment. The relevant credits that also mitigate pertinent impacts on the adjacent environment of the proposed project are as follows:

- A construction indoor air quality (IAQ) management plan will be developed and implemented that ensures that the buildings will not have an endemic indoor air quality problem that could be avoided if best management strategies are followed during construction. The construction IAQ management plan will also be provided to the tenants as part of the construction guidelines for the build out of the leasable space. Low VOC emitting paints and coatings as well as adhesives and sealants will be used in the core and shell part of building. *These measures limit pollution impacts of the project.*

ID - Innovation in Design

The Innovation in Design credit category includes measures to step outside the conventional design paradigm and implement mitigation measures in excess of the basic credit requirements or use innovative project initiatives that create effective synergies to make the project more "green". The relevant credits that also mitigate pertinent impacts on the adjacent environment of the proposed project include the following:

- An educational program will be implemented that will inform the public about features of the adjacent Kawainui Marsh as well as how green building technologies such as those used in the proposed industrial park can avoid environmental impacts of industrial developments. The educational program will be a continuous public outreach initiative by the developer.
- The maintenance vehicles of the industrial park will use electric vehicles whenever the work tasks allow the use of smaller electric utility vehicles. The energy for the vehicles will come exclusively from renewable energy, either from onsite renewable energy or from offsite renewable energy sources (e.g. through the purchase of renewable energy certificates).
- Since some of the LEED credit measures will also be used as important environmental impact mitigation measures that the developer has guaranteed to implement, certain measures that apply to core and shell will be part of the lease agreement and will be contractually binding. One important measure will be the need to reduce light pollution by controlling interior and exterior lights.
- Since water related impact mitigation measures are very important for the proposed project, the basic requirements for storm water treatment and for the onsite wastewater treatment will far exceed the basic credit requirements.
- The inclusion of at least one LEED-AP in the project team as a principal member will assist the facilitation of the LEED certification and help ensure that the ambitious Silver LEED goals for the green industrial development will be met.

RP - Regional priority

The credits of the regional priority category represent bonus points for the project to implement those credits that are most attractive to the region. Figure 2-11 (as well as Figures SDA 4-1 and SDA 4-2 presented in Appendix 4: Sustainable Design Approach) indicates that the project will quality for 4 out of 4 available credit points or 100 percent of the available credit points, respectively. This underlines the ability of the project team to select those credits that matter most for the region and Hawaii.

2.9 Alternative Design and Development Approaches Considered and not further Evaluated

This section discusses several designs and development approaches that were considered or initially proposed, but after initial evaluation, were not further pursued in the analysis of this DEIS.

2.9.1 Rezoning to Intensive Industrial (I-2)

The original goal of the applicant was to apply for a zone change from general preservation (P-2) to Intensive Industrial (I-2) land use for the two land parcels TMK 4-2-15:001 (portion of) and 006. Since the proposed site includes the three parcels TMK 4-2-15:001 (portion of), 006 and 008, whereby parcel TMK 4-2-15:008 is already zoned as I-2, a zone change to I-2 for all parts of the proposed light industrial park was preferred.

Concerns expressed by comments that the granting of an I-2 zone change could possibly bring about intensive industrial uses close to important and sensitive wetland has resulted in an adjustment of the rezoning goals of the applicant. The applicant now seeks a zone change from P-2 to Limited Industrial (I-1) rather than to I-2, as was stated in the Environmental Assessment for the proposed project.

Table 2-9 demonstrates the main differences of possible industrial land use between the I-1 and I-2 land use zone designation (in accordance with the Land use ordinance of the City & County of Honolulu). Table 2-9 only indicates if the particular land use is possible for I-1 and I-2, without differentiating if the land use is permitted, e.g. permitted subject to certain restrictions or permitted subject to a conditional permit. Table 2-9 furthermore presents only a selection of those land uses which are or would be potentially applicable at the proposed site.

Part 1 of Table 2-9 indicates industrial land uses which are possible (though subject to possible restrictions and conditional permits) within the I-2 district, but are not possible under within I-1. Some of the land uses under part 1 of Table 2-9 could result in significant impacts. None of these land uses are considered for the proposed project, in the present nor for the future, since the proposed warehouse development should first of all provide space for light industrial for a sub-regional market and not for the entire island market.

Part 2 of Table 2-9 shows some land uses that are currently occurring at the proposed site. For the future, these kinds of land uses will represent most of the tenants’ businesses and operations of the proposed industrial development.

Table 2-9 List of industrial land uses that are anticipated at the project site

Description of land use	Possible in I-1	Possible in I-2
Part 1 Industrial land uses NOT anticipated at project site		
Agricultural products processing, major	No	Yes
Agriculture, Composting	No	Yes
Sawmills	No	Yes
Hotels	No	Yes
Explosive and toxic chemicals manufacturing, storage and distribution	No	Yes
Petroleum processing	No	Yes
Repair establishment, major	No	Yes
Truck terminals	No	Yes
Heliports	No	Yes
Salvage, scrap, and junk storage and processing	No	Yes
Waste disposal and processing	No	Yes
Wholesale & retail establishments for bulk material with distribution by truck	No	Yes
Part 2 Industrial land uses anticipated at project site		
Warehouses	Yes	Yes
Building contracting, home improvements, etc.	Yes	Yes
Manufacturing, processing and packaging	Yes	Yes
Repair establishment, minor	Yes	Yes
Base yards	Yes	Yes

As is indicated, land uses listed in Part 1 of Table 2-9 would require an I-2 zone district, whereas land uses under Part 2 of Table 2-9 would only require an I-1 zone designation. Since the applicant does not intend to lease land for types of land uses under Part 1 of Table 2-9, a zone change from P-2 to I-1 for the two parcels TMK 4-2-15:001 (portion of) and 006 would be sufficient to support the development goals of the proposed light industrial park.

The DEIS therefore requests a zone change from P-2 to I-1 for the two parcels TMK 4-2-15:001 portion of) and 006 and the previously stated zone change to I-2 for these two parcels will no longer be pursued.

2.9.2 Making Changes to the Drainage Canal Along the Quarry Road

The FEA suggested that the project would impact the drainage canal along the quarry road by altering the banks or stream bed of the drainage canal. The design approach for the drainage canal was revisited after the completion of the FEA. Two design alternatives that were analyzed as well as the design alternative that was finally selected are discussed in the following paragraphs. Figure 2-12 shoes the present situation of the drainage canal along the Kapa'a Quarry Road and the two design alternatives considered.

Present situation: The present situation is depicted in the aerial photos and the typical section A-A. As can be seen in the aerial photos, there are two drainage canals along the quarry road, one mauka (on the mountainside) and one makai (on the ocean side) of the canal. The mauka drainage canal is entirely on the property of the applicant and the makai canal is partly on the applicant's property. The makai canal is larger and a free water surface of the makai canal can be observed over the year for a longer time than for the mauka canal. The makai drainage canal will not be impacted by the development and therefore the makai canal will not be considered hereafter.

As is depicted in typical section A-A the (mauka) drainage canal runs along the quarry. For some sections of the quarry road, there is no or a very narrow shoulder between the drainage canal and the road. On the mauka side of the canal, towards the proposed site, there is an approximately 15 foot wide gravel road, which is used by county service teams for the maintenance of the canal. Beyond the gravel road, a barren to lightly vegetated strip of about 8 feet continues until the foot of the existing earth mound. The present earth mound has a height of approximately 6 to 7 feet above the gravel road and has a vegetation of mostly wildly grown shrubs, grasses and small trees.

Alternatives to the present situation of the drainage canal: The present situation of the drainage canal led to the search for alternatives of how to improve it. The canal at times has no free surface and is basically filled only with mud (observed in a field survey in September 2010 and depicted in Appendix 7 - Water Resources Assessment for the Project Site). Based on narratives of local observers the canal is often, if not most of the time, totally covered with algae and no free water surface can be seen. In addition, the canal has at times small and large debris in it, such as abandoned cars, refrigerators, larger pieces of trash, etc. Since the county is maintaining the drainage canal, public money has continuously being spent to improve its appearance.

Alternatives that have been considered to improve the present state of the drainage canal include altering the canal geometry by changing the banks, or closing the canal with permeable fill and draining the canal trough with a drainage pipe. The alternative of modifying the canal, e.g. changing its geometry and size, while basically keeping it in its present state, have been evaluated but is not considered to provide a viable alternative and improvement.

The alternative of filling the canal and using the area created to install a shoulder along the mauka side of the quarry road and to provide room for public use would create more benefits than the alternative under which the geometry of the canal is changed and the canal is kept. This alternative is depicted in Figure 2-12. Under this approach, the drainage canal would be filled with permeable gravel or rocks fill. A drainage pipe would be installed at the bottom of the canal trough to collect and convey drainage water towards the Kapa’a Stream, therefore maintaining drainage characteristics.

As illustrated in Figure 2-12, the area that is created above the present canal could be used to install a shoulder for the road, thereby improving traffic safety. Furthermore, the area created could be used for a section of the planned marsh perimeter path, a combined bikeway and pedestrian path around the Kawainui Marsh. The proposed project incentivizes the use of bicycles for future employees or visitors of the development, but at present bicycling on Kapa’a Quarry Road is far from secure. A perimeter path, as planned for the Kawainui Marsh, could be used by people working in or visiting the proposed light industrial park.

As indicated in Figure 2-12, a higher and more extensive vegetative buffer zone would be installed along the quarry road boundary of the proposed site. The proposed buffer zone would include an earth mound of 10 to 12 feet height. The berm would have a range of suitable native or adaptive plants, including shrubs and larger trees. The berm and the planted trees play an important role in mitigating visual impact of the development in the lower portion of the site. As indicated in Figure 2-12 by creating usable area on top of the filled canal bed, the development could be expanded by about 8 to 10 feet beyond the present foot of the existing earth mound. The additional space for the development would increase the size of the vegetative buffer zone by approximately one quarter of an acre.

Although this alternative appears to render tangible benefits in terms of land use and improved traffic conditions on the quarry road, this alternative was not selected for immediate realization. Rather, in the event that the area above the present stream bed would become required for the proposed perimeter path, the proposed fill and installation of the perimeter path could still be implemented under the selected alternative, which is described next.

Alternative selected for the drainage canal: The selected alternative for improving the drainage canal along the quarry road is depicted in Figure 2-12. Under the selected design alternative, the existing earth mound would be expanded in height and in width to accommodate the planned planting of a thick cover of trees and shrubs. This will leave the drainage canal and the maintenance road in its present state, e.g. the canal would not be directly affected by the development.

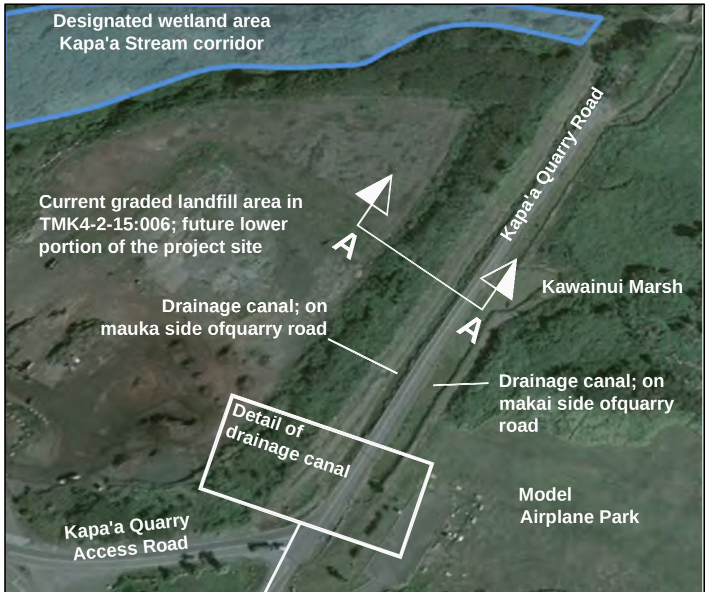
The existing setback of about 20 feet would be maintained from the bank of the canal to the boundary of the development, which is the vegetative buffer zone including the earth dam. Therefore the project site would not encroach on the canal, and the space between the canal and the fence that encircles the site of about 20 feet could still be used as a maintenance road for the canal.

This design decision defuses concerns that were raised about any changes to the drainage canal, since the drainage canal directly drains into the Kapa'a Stream, just up-stream of the culvert under the quarry road. The applicant continues to prefer that the canal will be somehow improved in the future and he wants to work with the community to provide support if the alternative of filling the canal becomes a preferred alternative for the public.

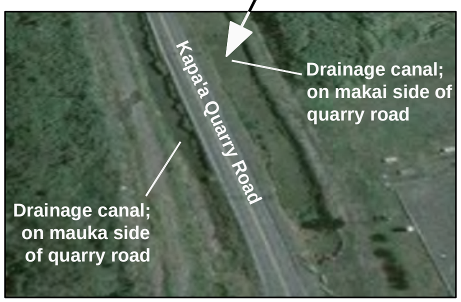
2.9.3 Development of a 13-acre Wildlife Habitat

The FEA described the plans of the applicant, in cooperation with the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), to develop a 13-acre wildlife habitat and restored wetland area in the lower stretches of the Kapa'a Stream, on land directly adjacent to the proposed site and within the parcel TMK 4-2-15:006. In the time following publishing of the FEA, the applicant had commissioned a design study to establish the basic design for the 13-acre wildlife habitat and wetland restoration and to evaluate possible impacts on the environment and water quality in the Kapa'a Stream. The design team cooperated with the State Department of Health in determining the water quality related issues of the project since a 401 Clean Water Act water certification would be required (sine the construction activity would be carried out inside a wetland area). The design process for the 13-acre wildlife habitat and wetland restoration concluded the following:

The main development objective for the wildlife habitat and wetland restoration project was to provide an appropriate environment for water birds, including endangered water birds which populate the areas inside and around the Kawainui Marsh. Preferred habitat conditions include shallow and deeper ponds, areas with exposed soil and mud flats, and low vegetation with occasional larger trees or shrubs. Figure 2-13 illustrates the type of such habitat conditions. Figure 2-14, alternatively, shows the present vegetated condition of the wetland area in the Kapa'a Stream corridor, which would be the site of the proposed wildlife habitat and wetland restoration project (refer to Figure 2-15 for the location and orientation of the camera for the picture shown in Figure 2-14). Figure 2-15 shows a schematic depiction of the final design concept of the formerly proposed wildlife habitat.



Aerial photo of current situation of drainage canal



Detail of drainage canal

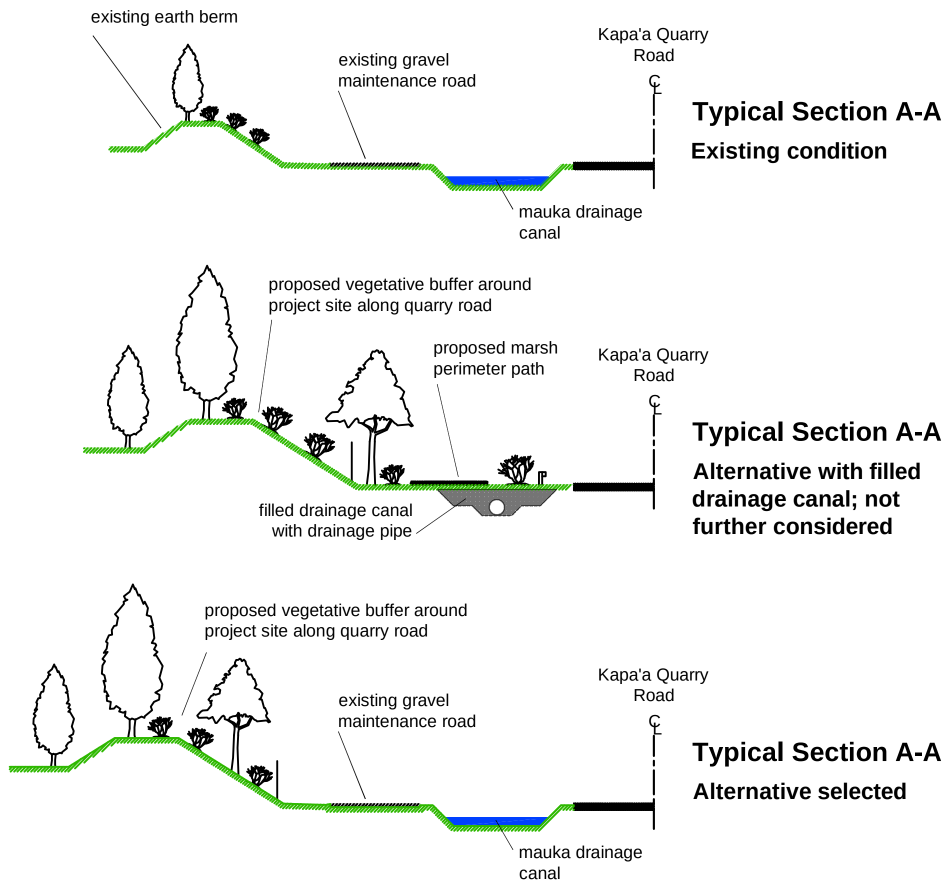


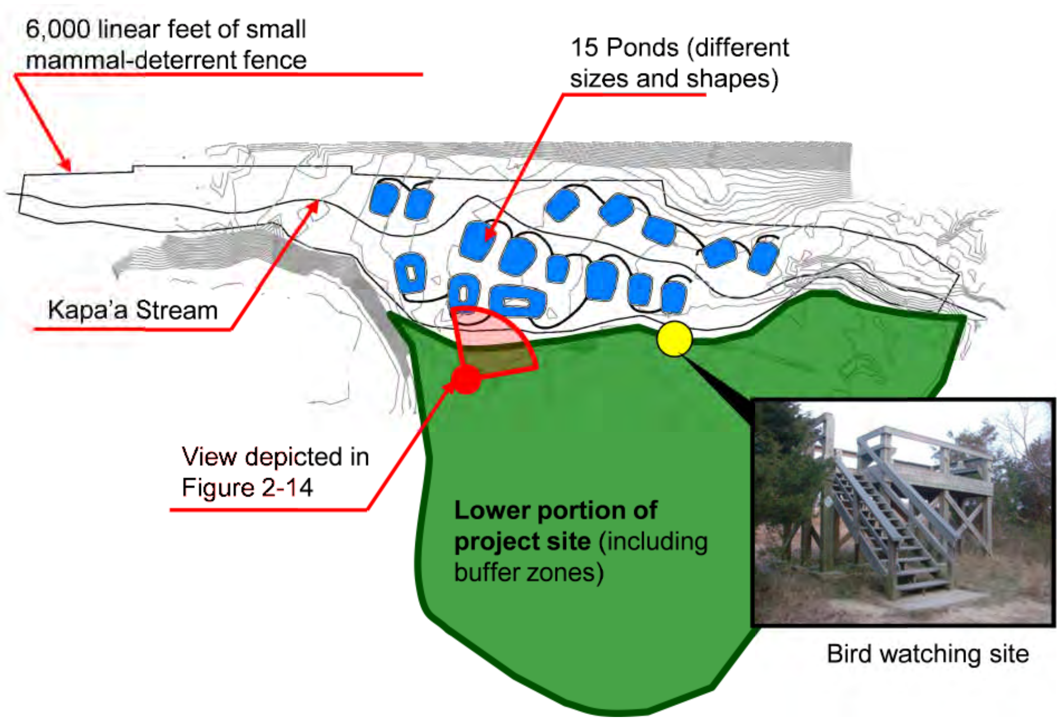
Figure 2-13 Type of habitat conditions planned for the proposed but cancelled wildlife habitat

Figure 2-15 illustrates major design components of the now abandoned wildlife habitat and wetland restoration project:

- An area of approximate 13-acres within the lower stretches of the Kapa’a Stream where area would be cleared of vegetation and planted with native wetland plants to create the landscape dominated by mudflat and shallow ponds, as depicted in Figure 2-14. By comparing Figures 2-13 and 2-14 it can be noted that the development of the wildlife habitat would have to involve clearing a significant area of wetland of existing vegetation.
- A 6,000 linear feet of special small mammal-deterrent fence was planned to surrounding the developed habitat. The fence had the purpose to control the movement of small non-native predators, such as feral cats, which prey on the birds.
- A total of 15 shallow cascading ponds to provide habitat for water birds. The ponds would have obtained water from runoff and no water would have been diverted from the Kapa’a Stream to fill the ponds.
- A bird watching platform or site was planned to give the public opportunity to engage in bird watching.
- After construction, a park preservation program was planned, which called for cooperation with local community groups in the park maintenance and educational offerings.

Figure 2-14 Present vegetation at the site of the proposed habitat
(see Figure 2-15 for definition of view)

Figure 2-15 Schematic layout of the planned but cancelled 13-acre wildlife habitat project



One significant requirement for obtaining the required State and federal permit was the proof of no deterioration in water quality after the vegetation in the area was cleared. In general a wetland with thick vegetation, such as the one adjacent to the proposed site and in the Kapa'a Stream corridor, contributes to the removal of pollutants from water by a filtering function and aerobic as well as anaerobic treatment processes. Based on existing cases reviewed in the technical literature and on an analytical flow model created for the area, it could not be conclusively established that the Kapa'a Stream capacity of removing organic and inorganic loads in its water would not be negatively affected by constructing the wildlife habitat.

Although the applicant had committed significant funds for the development of the habitat and applied for supplemental funding of NRCS. The applicant decided to stop the plans to develop the habitat as a result of the uncertainties of water quality issues. The applicant still believes that the wetland area could be improved from its present state and could add more value to the region and community as it does at the present time and in its present state. Therefore the applicant will restart efforts in the future that will evaluate how to improve the wetland area, not as a wildlife habitat as planned, which requires large scale clearing of the vegetation, but in an improved water treatment function. The applicant will commit funds that were planned for the 13-acre wildlife habitat to the restoration of open space around the lower portion of the proposed project site. The open space that will be restored to a habitat surrounds the development footprint in the lower portion of the proposed site and excludes an delineated wetland and surface water area. Future references in this DEIS to "restoring habitat" reflect this new approach.

2.9.4 Development of Only the Upper Portion of the Proposed Site

The development of only the upper portion of the site would involve building out the already I-2 zoned parcel TMK 4-2-15:008 and applying for a zone change for the parcel 4-2-15:001 (portion of). Limiting the development to only the upper portion would reduce the amount of new industrial space in the proposed light industrial park by 337,000 square feet, which represents 56% of the planned total new area under the Preferred Alternative. As stated, the objective of the proposed action is to provide a significant amount of space that is properly zoned for limited industrial use. As the results of the market study have revealed, there is a significant undersupply of industrial zoned land in the Koolaupoko region and the proposed site is one of the very few parcels in the region that could be rezoned to industrial land use. In fact, industrial land within the Koolaupoko region is increasingly lost due to conversion to higher yield residential and commercial land uses.

Developing only within the upper portion of the site would reduce impacts such as reducing traffic volume, reducing demand on municipal utilities infrastructure (e.g. electricity and water), reducing the volume of wastewater for onsite treatment, reducing noise and air pollution sources, reducing the amount of converting pervious to impervious land, to name the most important impacts that are typically generated by the proposed type of industrial development.

A reduction of impact created by stormwater runoff by not developing the lower portion of the site cannot, however, be inferred by only looking at the areas that are not being developed. The present runoff situation at the lower portion of the site is characterized by a former landfill are where the rainwater readily percolates into the soil and soil erosion happens in significant quantities, since most of the former landfill area does not have any seeding or other surface vegetation. Under the Preferred Alternative, the development of the lower portion of the site would include implementing a comprehensive system for stormwater treatment, both in terms of quantity and quality improvement of the runoff, and establishing a complete system of measures to avoid for soil erosion. The Preferred Alternative furthermore would use a range of mitigation measures for light pollution mitigation, advanced wastewater treatment to effectively remove nutrients from the wastewater, and add extensive vegetative buffer zones around the development.

It cannot be denied that some environmental impacts would be avoided by not developing the lower portion of the site; however, under the Preferred Alternative much of the impact would be effectively mitigated, and as stated, soil erosion would be reduced. Furthermore, the present state of the lower portion of the site, which basically represents a large area of barren land that was created by a former landfill, is not satisfactory. The appearance of this land is not agricultural in nature nor does it have a favorable appearance of a vegetated open space.

The land use within the lower portion of the site can be converted to serve the community in a better way, such as developing the area for light industrial uses, which fits the regional demand for small, local industrial service. Leaving it undeveloped, i.e. unimproved from its present state, would not be a viable alternative. The alternative of only developing the upper portion of the site was therefore not considered further.

The key to a successful realization of the proposed action lies in implementing a comprehensive approach of effective impact mitigation for the development, especially for the lower portion of the site. The approach under the Preferred Alternative of using low impact development and designing the proposed light industrial park in accordance to LEED Silver certification requirements offers an effective environmentally sensitive approach.

2.9.5 Developing the Entire Development in Accordance to LEED

The alternative of developing the entire proposed light industrial in accordance to LEED certification requirements was evaluated but not further considered. Instead it was decided to focus efforts of building "green" on a comprehensive and effective low impact approach for the lower portion of the site. The lower portion of the site is closer to the important wetland area than the upper portion of the site, and the proposed development footprint of the lower portion of the site is within the Special Management Area district, a condition that by itself necessitates an environmentally sensitive development approach. In accordance with this design decision, the approach selected is to develop the lower portion of the proposed site to LEED Silver certification requirements (e.g. an advanced level to develop with sustainable design and technology) and develop the upper portion along conventional industrial park standards, but still implementing certain low impact technologies.

When considering the planned development approach for the upper portion of the site, much of the planned building design, construction and outfitting features would contribute to a basic LEED certification, such as the following:

- Abiding by all requirements to minimize impacts on the environment during effective construction activity pollution prevention.
- Brownfield Redevelopment - the area that is used for the development of the proposed park can be considered a Brownfield since it is a former landfill area. The development of the light industrial park will therefore use not use any green field that was previously undeveloped, thereby conserving precious land for open space or agricultural uses.
- Effective stormwater design that includes the collection and responsible drainage of stormwater. Installing a stormwater drainage system and detention ponds for flood control and basic treatment of the runoff (e.g. removal of sediments and all floatables from the stormwater before discharge)
- Incentivizing alternative transportation by providing bicycle racks and preferred parking for low emitting cars and car pools.
- Reduction of the heat island effect by using high solar reflective index (SRI) pavement around the warehouses. Light colored concrete will be used in lieu of dark bituminous pavement. The building envelope will have a high SRI finish to increase the building thermal performance and reduce the heat island effect.
- Water Use Reduction through the use of high performance faucets - The lower water consumption will result in smaller wastewater volume to be treated onsite.
- Effective energy performance of the warehouses by following the prescriptive recommendation of energy efficient warehouses - A comprehensive energy modeling and verification program would be created for the lower portion of the site, resulting in verifiable energy savings of at least 30% for these warehouses. For the

upper portion, a comprehensive verification will not be performed, and therefore the resulting energy savings of the upper portion warehouses will be less, though still more efficient than typical industrial warehouses.

- On-Site Renewable Energy has been installed on some of the existing warehouses. The applicant plans to install more PV panels, thereby lowering the peak electricity demand.
- Storage and Collection of Recyclables will be implemented in both portions of the site.
- Construction Waste Management will be performed and recycled, and inert building material will be used to the extent possible
- Recycled content and Regional Materials will be used to the extent possible.
- Low-Emitting construction materials will be used for the construction of the warehouses.
- Light Pollution Reduction will be implemented in accordance to the lighting zone LZ2, rather than LZ1 (“dark”) that will be used for the lower portion of the site.

Adopting low impact development practices for the upper portion of the site will result in efficiency and reduced impact. The scope and level of the planned low impact development measures for the upper portion of the site might not fulfill all the credit thresholds to obtain LEED certification, but it will be directionally consistent with LEED. And, if it can be shown upon completion that the development in the upper portion of the site does indeed fulfill basic LEED certification, the applicant plans to seek basic LEED certification.

2.9.6 Development of the upper portion without approved zone change

An additional alternative, the No-Rezoning Alternative was considered but not further evaluated. This alternative describes the hypothetical development scenario of the proposed site in the absence of the sought land use zone change for two of the three parcels.

The No-Rezone (for “no rezoning”) Alternative describes a second “non-action” alternative. For this alternative the term “non-action” refers to a more limited scope of development only in the parcel TMK 4-2-15:008, which is already zoned I-2 (Intensive Industrial), and thus would not require a zone change as a prerequisite for the construction of warehouses. Therefore this second “non-action alternative” would entail adding a certain amount of floor space to the existing warehouse space. While the No-Action Alternative represents a baseline for the environmental impact of the status quo, the No-Rezone Alternative represents a baseline of a realistic development outcome, even if the zone change is denied.

Figure 2-16 shows the schematic site plan of the No-Rezone Alternative. The 6.2 acre area that is presently graded, non-vegetated and pervious land would be converted to impervious and paved land on which approximately nine new warehouses with a total added floor space of 182,000 square feet would be constructed. The entire 22.4 area developed area within parcel TMK 4-2-15:008 would be impervious area, containing the buildings, roadways, parking and all ancillary facilities.

The two other parcels of the proposed site would remain in the current state, e.g. graded, not vegetated and pervious. The present land uses, such as exterior equipment storage, inert building material storage and processing as well as green waste processing would continue, if consistent with the county land use ordinances or any land use variances that could be granted in the future. The No-Rezone Alternative differs from the No-Action Alternative since under the No-Action Alternative no further development of the site would occur.

The proposed action is to develop the Kapa’a Light Industrial Park on three contiguous land parcels, which will require a zone change from General preservation (P-2) to Limited Industrial (I-1) for two of the parcels, TMK 4-2-15:001 (portion of) and 006, while the parcel TKM 4-1-15:008 is already zoned as I-2. In the event that zone change is not granted for parcels TMK 4-2-15:001 (portion of) and 006, the applicant plans to continue developing the parcel TMK 4-2-15:008 with industrial warehouses and use the parcels TMK 4-2-15:001 (portion of) and 006 in a way that is consistent with county land use ordinances and any variances that will be applied in the future.

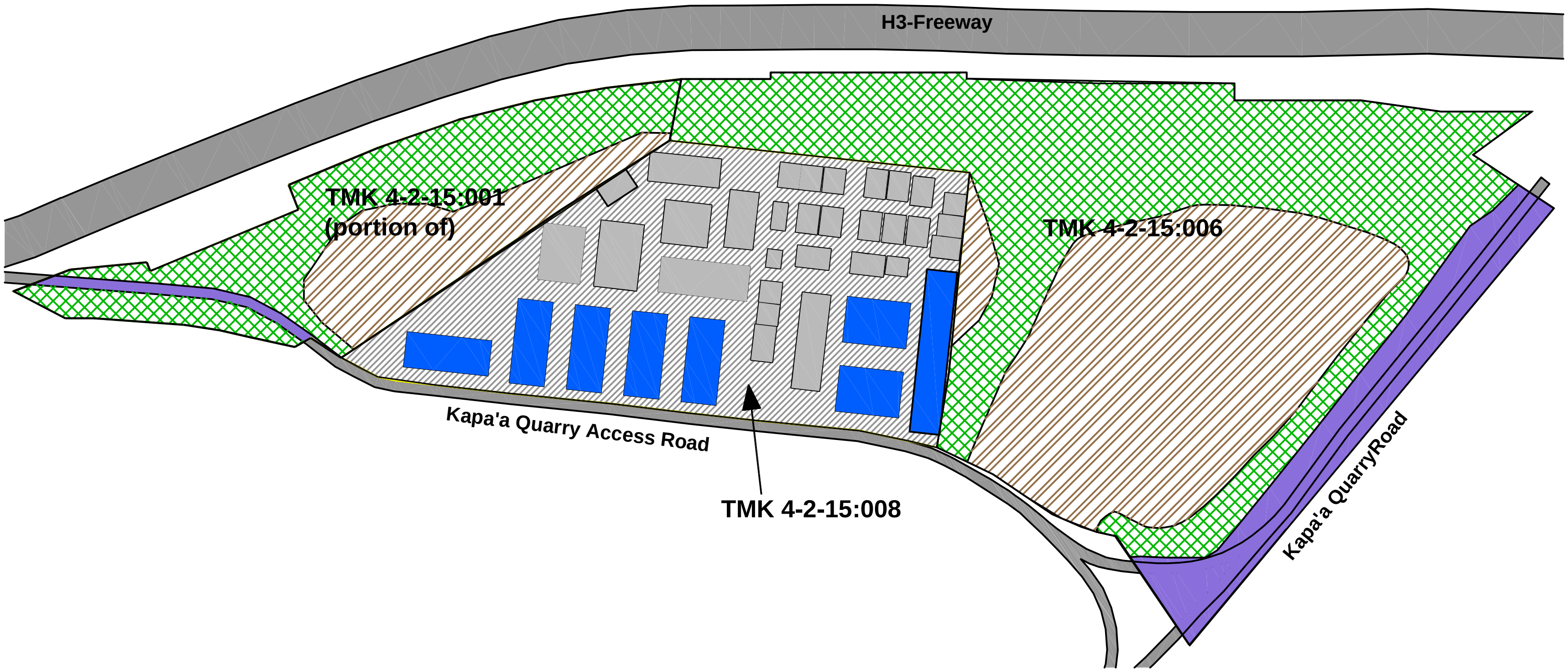
Table 2-10 and 2-11 compare the No-Rezone Alternative with the three alternatives that are evaluated in this DEIS in terms of land use and warehouse space added.

Figure 2-16 and Table 2-10 indicate that the entire parcel TMK 4-2-15:008 would be developed to the extent possible. The current 6.2 acres of graded but not paved area would be paved and warehouses would be added at this location. Table 2-11 indicates that in the “No-Rezone” situation for the parcels TMK 4-2-15:001 (portion of) and 006, 182,000 sq. ft. of warehouses would be added in the current zoned I-2 sections for a total planned square footage of 465,000 including current buildings.

The No-Rezone Alternative is therefore a more differentiated baseline of a “no-action” alternative. For the evaluation of impacts in this DEIS, the Re-zone Alternative will not be further evaluated.

Table 2-10 Comparison of No-Rezone with three alternatives

Comparison of alternatives - land use	No-Action Alternative acres	**No-Rezone** acres	Alternative B acres	Preferred Alternative acres
Upper portion:				
TMK 4-2-15:001 (portion of)				
Open space vegetated (outside development footprint)	8.1	8.1	8.1	8.1
Graded and pervious but not vegetated	4.4	4.4	0.0	0.0
Development area, impervious	0.0	0.0	4.4	4.4
Other area (i.e. roadway, drainage canal)	0.5	0.5	0.5	0.5
sum	13.0	13.0	13.0	13.0
TMK 4-2-15:008 (portion of)				
Open space vegetated (outside development footprint)	0.2	0.0	0.0	0.0
Graded and pervious but not vegetated	6.2	0.0	0.0	0.0
Development area, impervious	16.0	22.4	22.4	22.4
Other area (i.e. roadway, drainage canal)	0.0	0.0	0.0	0.0
sum	22.4	22.4	22.4	22.4
Lower portion:				
TMK 4-2-15:006 (portion of)				
Open space vegetated (outside development footprint)	20.1	20.1	20.2	22.3
Graded and pervious but not vegetated	18.9	18.9	0.7	0.0
Development area, impervious (development footprint)	0.0	0.0	18.0	16.7
Other area (i.e. roadway, drainage canal)	4.8	4.8	4.8	4.8
sum	43.8	43.8	43.8	43.8



	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetated area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	4.4	None	None	N/A	0.4
TMK 4-2-15:006	20.1	18.9	None	None	N/A	4.8
TMK 4-2-15:008	0.0	0.0	22.4	283,000	182,000	0.0

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 2-16
Likely layout of the industrial development under the No-Rezone Alternative

Table 2-11 Comparison of No-Rezone alternative with three Alternatives – building footprint

Comparison of alternatives - building footprint	No-Action Alternative sqft	No-Rezone sqft	Alternative B sqft	Preferred Alternative sqft
Upper portion: TMK 4-2-15:001 (portion of) and 4-2-15:008				
Existing buildings	283,000	283,000	283,000	283,000
Added buildings	0	182,000	269,000	269,000
Lower portion: TMK 4-2-15:006				
Existing buildings	0	0	0	0
Added buildings	0	0	337,000	337,000
Total space added to current space in upper and lower portion of the site	0	182,000	606,000	606,000
Total building footprint at the site	283,000	465,000	889,000	889,000
Total building footprint at the site added to the No-Rezone Alternative	N/A	N/A	**424,000**	**424,000**

building footprint rounded to the next thousand

CHAPTER THREE - CURRENT (EXISTING) ENVIRONMENT

The proposed project site is located on the windward site of the Island of Oahu. The project site is composed of three contiguous land parcels, TMK 4-2-15:001 (portion of), 006 and 008, all of which are owned by the applicant. The project site is located in the lower stretches of the Kapa'a Valley, directly adjacent to the H3-Freeway and the Kapa'a Quarry Road. The environmentally and culturally important Kawainui Marsh is located to the east and adjacent of the project site. Figure 3-1 shows the vicinity map of the project site. The following sections evaluate and discuss the existing environment at the proposed project site.

3.1 Geology, Topography, and Soils Existing Environment

3.1.1 Geology and Topography

The proposed industrial park site is situated in the Kapa'a valley, flanked by the Ulumawao mountain ridge in the southeast and the Mahinui mountain ridge in the northwest. The geological formations of the hills surrounding the valley are mainly defined by very dense rock formations of volcanic origin. A geologic map of Oahu depicted in Figure 3-2 shows that at higher elevations, the geology is mostly defined by volcanic rock of Kailua volcanic series characterized by massive basaltic flows which contain numerous dike structures filled with secondary minerals. In contrast, in the proposed project site, located in the lower reaches of Kapa'a Stream, the geology is defined by terrigenous alluvium and fine organic mud. In this lower part of the watershed much of the surface has been impacted by quarry and land filling operations, which have resulted in deposits of more than 20 feet of quarry tailings and municipal solid wastes.

The existing topography at the proposed site is characterized by gently sloping terrain from southwest to the northeast and towards the Kapa'a Stream. The natural topography at the site has historically been heavily impacted by quarry and landfill operations from the 1940's through the 1960's. The topographic map of the proposed site is depicted in Figure 3-3. The site topography is characterized by a relatively flat eastern section of the site separated from the lower section by a narrow sloped section with a 25 to 30 foot drop. Ground elevations in the western section of the site range from 80 to 95 feet above Mean Sea Level (MSL), and gently slope towards the Kapa'a Stream. The northern section of the site is formed by a relatively flat plateau bounded in the north by Kapa'a Stream and in the west by a drainage ditch which runs along Kapa'a Quarry Road and drains into the stream. Ground elevations in this section range between 20 and 50 feet above MSL with a gentle slope in the easterly direction.

Figure 3-1 Vicinity map

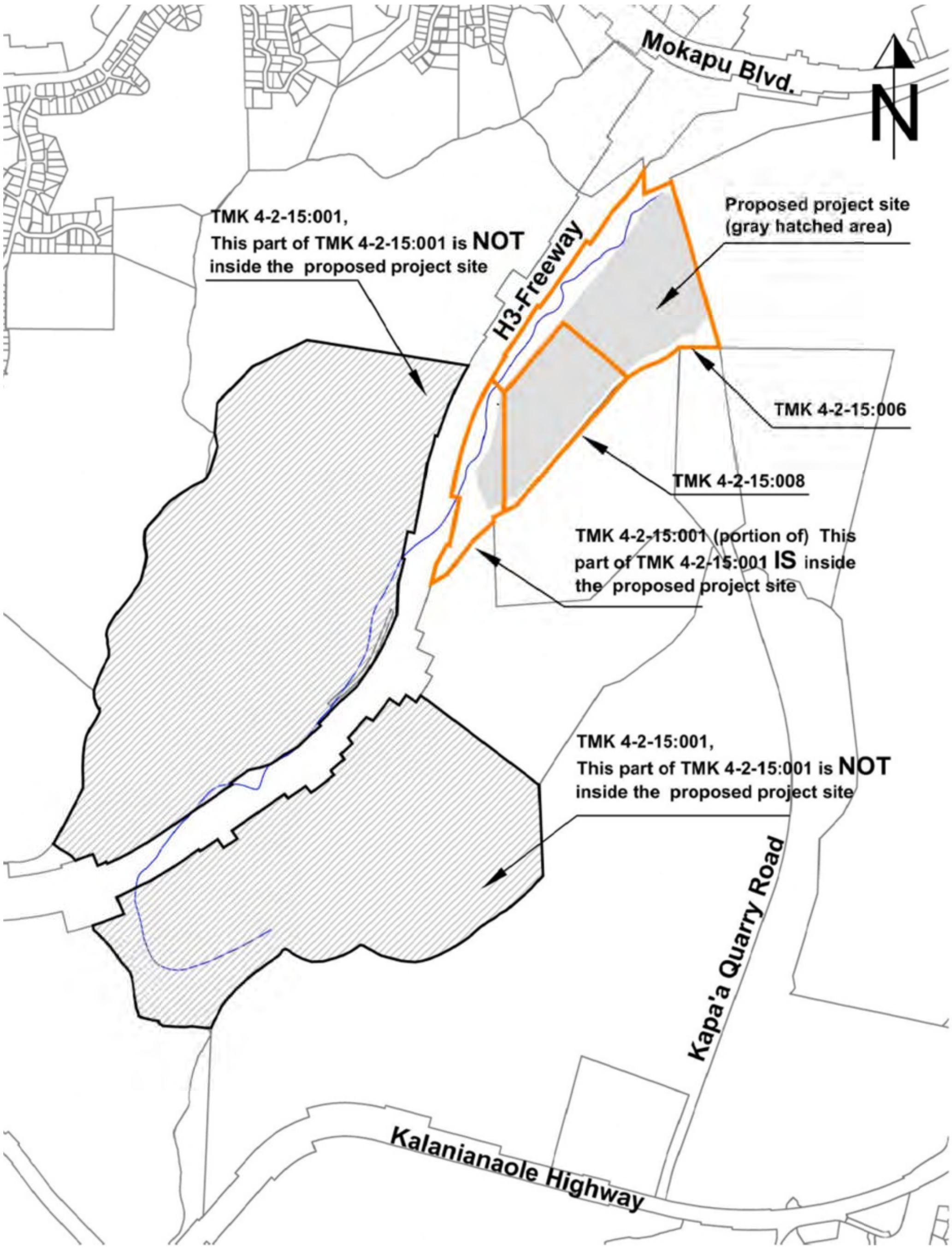
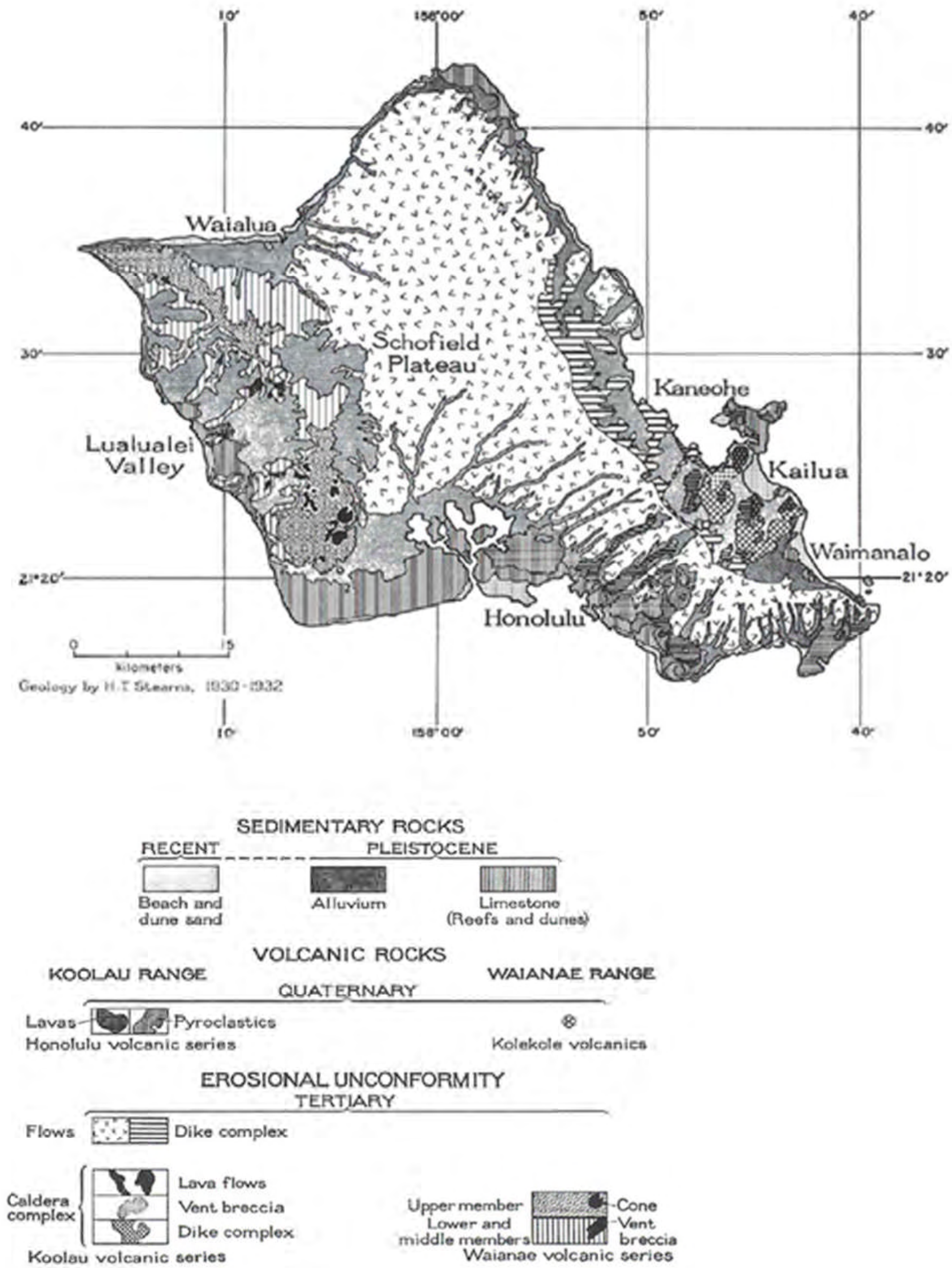
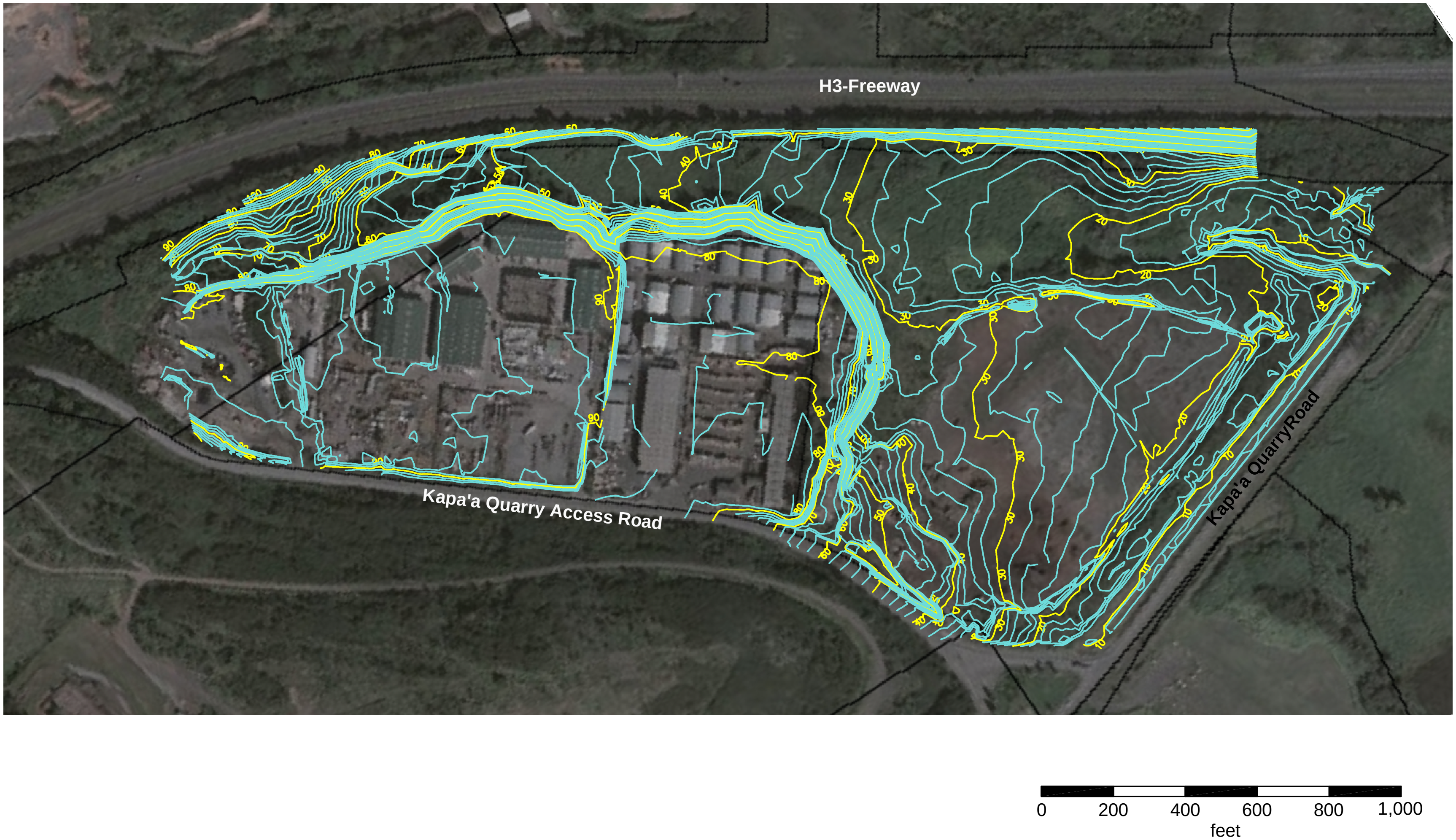


Figure 3-2 Main geological formations of Oahu





Sustainable Design
& Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 3-3
Topography at project site

3.1.2 Soils

A description of the soils within the project area was obtained by using the web Soil Survey of the U.S. Natural Resources Conservation Service (NRCS). (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). The soil map obtained represents an area dominated by one or more major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soils. In the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Soils with profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in the texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics.

The following soils are represented at the proposed site:

ALF—Alaeloa silty clay:

Parent material: Basic igneous rock

Properties and qualities; Slope: 15 to 35 percent; depth to restrictive feature > 80 inches; Well drained; Permeability moderately low to moderately high (0.06 to 0.20 in/hr); depth to water table > 80 inches

KlaB—Kawaihapai stony clay loam:

Landform: Alluvial fans; Parent material: Basic igneous rock

Properties and qualities: Slope: 2 to 6 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability moderately high to high (0.60 to 6.00 in/hr); depth to water table > 80 inches; Occasional flooding; no ponding.

Ph—Pearl Harbor clay

Landform: Coastal plains; Parent material: Alluvium

Properties and qualities: Slope: 0 to 2 percent; depth to restrictive feature > 80 inches; Poorly drained; Permeability Very low to moderately low (0.00 to 0.06 in/hr); depth to water table: About 18 to 48 inches; occasional flooding: frequent ponding.

QU—Quarry:

No description for generic quarry soil

rSY—Stony steep land:

Landform: Valleys; Parent material: Mass movement deposits

Properties and qualities; Slope: 40 to 70 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability High (2.00 to 5.95 in/hr); Depth to water table > 80 inches; no flooding; no ponding.

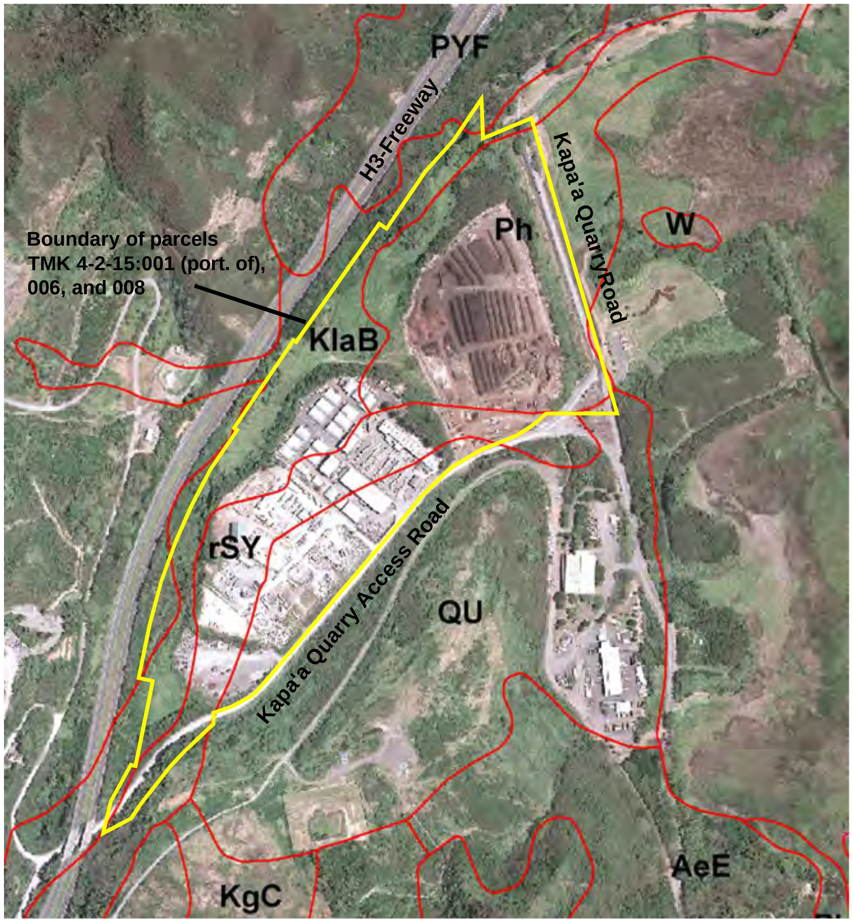
Table 3-1 shows the area of representative soils for the three contiguous land parcel s (TMK 4-2-15:001 (portion of), 006 and 008), within the development boundary of the upper portion of the project site (development TMK 4-2-15:001 (portion of), 006 and 008) and within the development boundary of the lower portion of the project site (TMK 4-2-15:006).

The intensive quarry and landfill operations in the area dating back to early 1950s have resulted in significant changes from the original soils at the site. Extensive deposits of quarry tailings and overburden materials, as well as residential solid wastes, have significantly changed the original soils at the site.

Table 3-1 Soils represented at project site

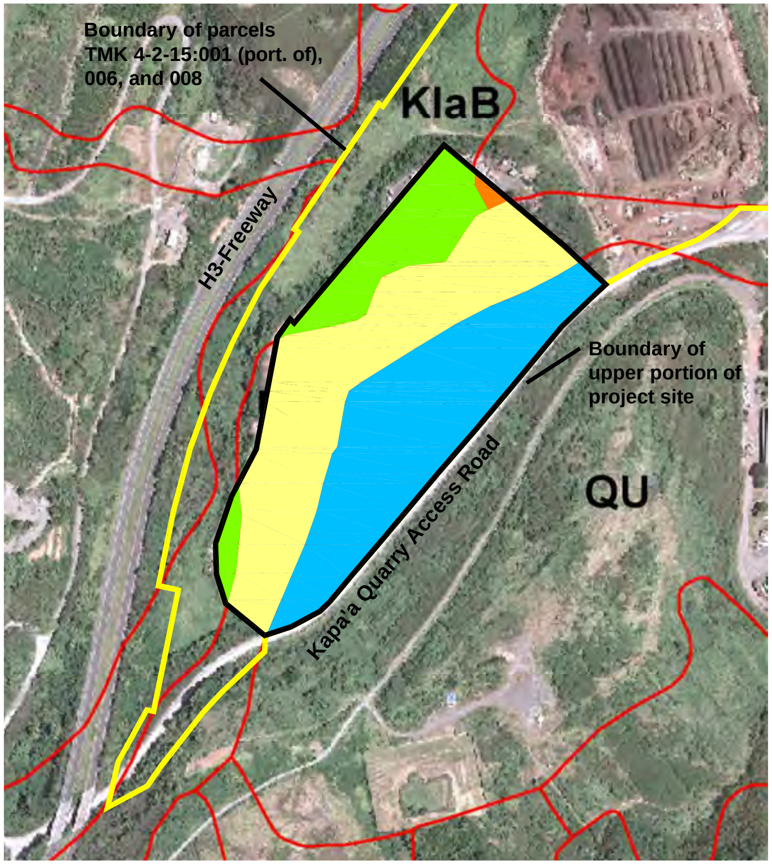
Map symbol	Map unit name	Three parcels of site TMK 4-2-15:001 (p.o.), 006 & 008		Upper portion of the site TMK 4-2-15:001 (p.o.) & 008		Lower portion of the site TMK 4-2-15:006	
		acres	% of total	acres	% of total	acres	% of total
AFL	Alaeloa silty clay	1.1	1.3%	0.0	0.0%	0.0	0.0%
KlaB	Kawaihapai stony clay loam	19.2	24.3%	4.4	16.2%	0.3	1.0%
Ph	Pearl Harbor clay	30.0	37.9%	0.2	0.6%	20.9	85.6%
QU	Quarry	11.4	14.4%	10.7	40.1%	0.6	2.4%
rSY	Stony steep land	17.5	22.1%	11.5	43.0%	2.7	11.0%
	sum	79.2	100.0%	26.8	100.0%	24.5	100.0%

Figure 3-4 depicts the soil map for the three land parcels that enclose the proposed project site. The figure is based on the current soil survey information obtained from the NRCS. The extent of the soil is indicated as actual area and percentage of total area. Figure 3-5 and 3-6 show the spatial distribution and relative size (e.g. in percentage of total area) of the representative soils for the development boundaries of the upper and lower portion of the site, respectively. Table 3-1 and Figures 3-4 through 3-6 suggest that the Pearl Harbor and the Kawaihapai soil series were the main original soils found at the site prior to quarry operations in the valley. The Pearl Harbor and the Kawaihapai soil series represent poorly and well drained soils, predominately found in the lower and upper portion of the project site, respectively.



Soil symbol	Area in parcels	Acres in parcels	% of total area in parcels
ALF	Alaeloa silty clay	1.1	1%
KlaB	Kawaihapai stony clay loam	19.2	24%
Ph	Pearl Harbor clay	30.0	38%
QU	Quarry	11.4	14%
rSY	Stony steep land	17.5	22%
	Sum in 3 parcels	79.2	100%

Figure 3-4
Soil map for three contiguous parcels of project site

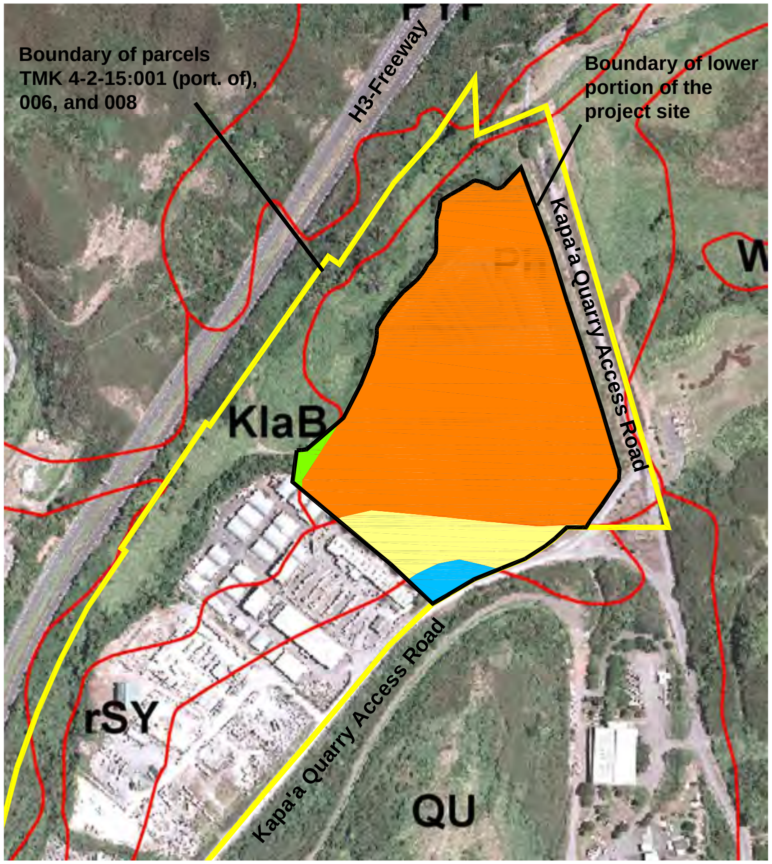


	Soil symbol	Title of soil series	Acres in upper portion	% of total area in upper portion
(white)	ALF	Alaeloa silty clay	0	0%
(green)	KlaB	Kawaihapai stony clay loam	4.4	16%
(orange)	Ph	Pearl Harbor clay	0.2	1%
(blue)	QU	Quarry	10.7	40%
(yellow)	rSY	Stony steep land	11.5	43%
	Sum in upper portion of project site		26.8	100%

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 3-5
Extent and proportion of soils within upper portion of the site



	Soil symbol	Title of soil series	Acres in lower portion	% of total area in lower portion
	ALF	Alaeloa silty clay	0	0%
	KlaB	Kawaihapai stony clay loam	0.3	1%
	Ph	Pearl Harbor clay	20.9	86%
	QU	Quarry	0.6	2%
	rSY	Stony steep land	2.7	11%
	Sum in lower portion of project site		24.5	100%

Figure 3-6
Extent and proportion of soils within lower portion of the site

3.2 Water Resources Existing Environment

The following sub-sections provide a description of the general conditions and characteristics of water resources found at the project site. Types of water resources investigated include surface water, wetlands, floodplains, watershed considerations and current stormwater management. Appendix 7 presents the results of a literature review and a field survey of relevant water resources at the project site and a discussion of whether the proposed action will impact navigable waters under the jurisdiction of the United States.

3.2.1 General Climate and Rainfall

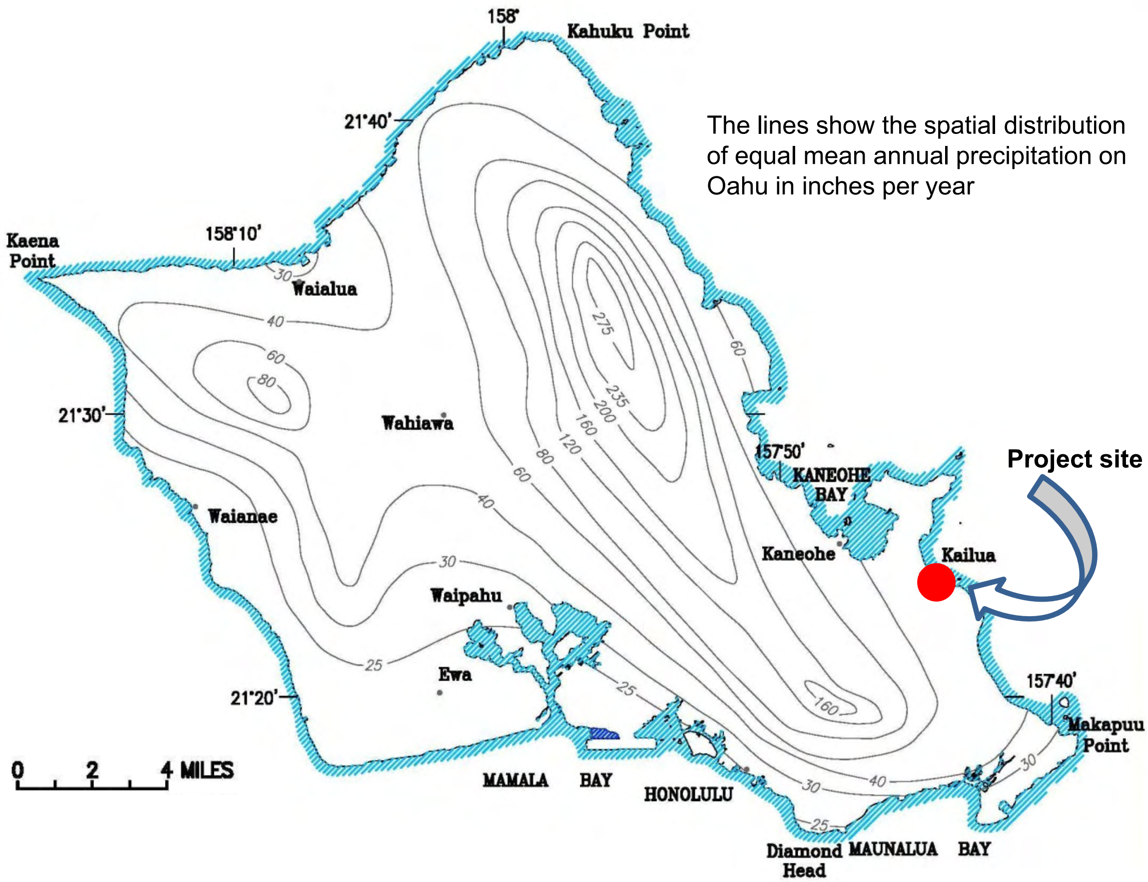
The proposed site for the Kapa'a Light Industrial Park is located on the windward side of Oahu, approximately one mile from the ocean. With the exception of a few months in the winter, like most areas of windward Oahu, the climate in the project area is characterized by its elevation above sea level, distance from the ocean and exposure to the prevailing trade winds. The general climate is sunny and relatively uniform year-round. Day time temperatures range between 73 to 80 ºF, whereas at night the temperatures can dip into 60's ºF.

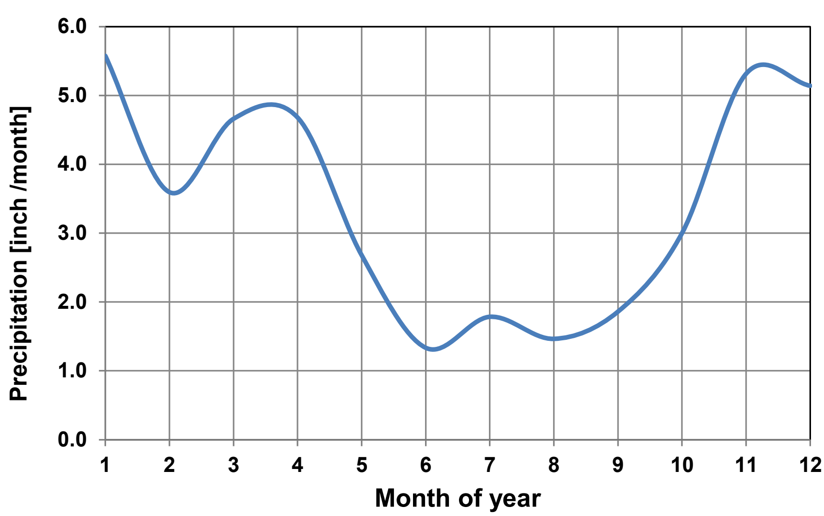
The rainfall map of Oahu as shown in Figure 3-7, depicts the spatial distribution of mean annual precipitation on Oahu. The figure indicates mean annual precipitation for the Koolaupoko region ranging between 60 and 120 inches. Higher rainfall occurs in higher elevations of the Ko'olau range due to orographic lift caused by the Koolau mountain ranges. The rainfall at the project site is due mostly to non-thermally induced trade wind showers or large weather systems over the entire island. Figure 3-7 shows mean annual rainfall at the project site is between 40 and 50 inches.

Figure 3-7 also shows the annual distribution of mean monthly precipitation values. The representative (e.g. average) monthly precipitation data was calculated from a 30 year record (1961-1990) obtained at Kailua Weather Station 791, Hawaii (512683). Most of this rainfall occurs during the "wet season", e.g. November through April.

3.2.2 Surface Waters

Figure 3-8 shows four main surface water features on or adjacent to the project site. With the exception of drainage culvert discharging to a percolation field on the site (No. 4 in Figure 3-8), all the surface water features are outside the development boundary and are therefore not directly affected by the proposed action. The results of a water resources assessment are presented in Appendix 7. The four identified main surface water features are as follows:



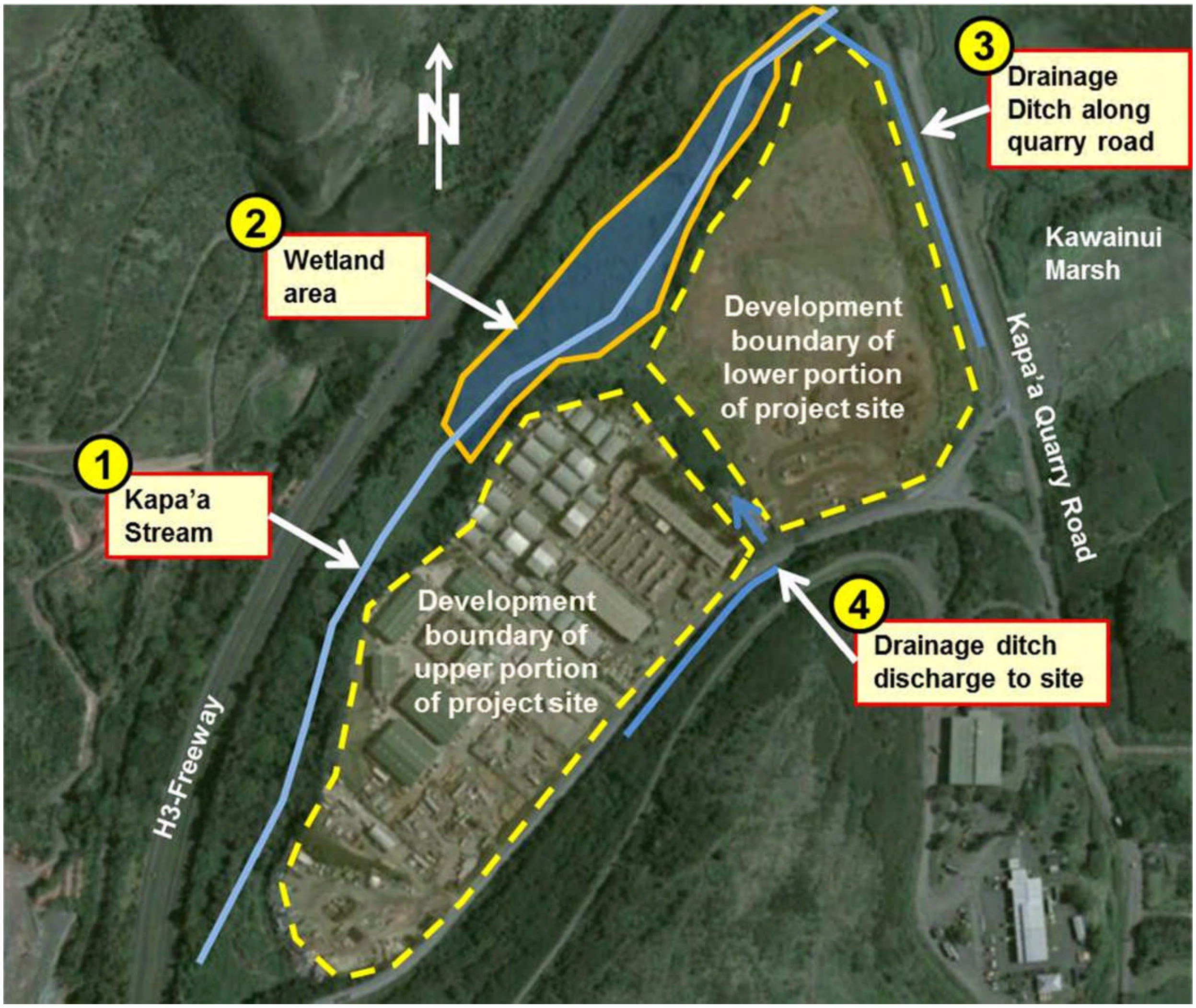


Average monthly precipitation values; based on a 30 year record (1961-1990) obtained at Kailua Station 791, Hawaii (512683)

Figure 3-7

Spatial distribution and monthly variation of rainfall at project site

Figure 3-8 Description of surface water features at project site



Description of surface water features:

1 **Kapa'a Stream:** runs through the property boundaries but remains outside the development boundary of project; total stream length is 1.9 miles with about 0.7 mile on the property of the applicant.

2 **Wetland area**: approximately 15 areas of delineated wetland outside the development boundary; Kapa'a Stream flows through wetland area

3 **Drainage Ditch along quarry road:** mostly stagnant water from surface runoff and seepage, drainage canal is outside development boundary

4 **Drainage ditch along quarry access road with discharge on to the site:** discharge from ditch through culvert under the quarry access road to a percolation field on project site, no surface flow downstream of discharge point of culvert

1. **Kapa'a Stream:** The relatively short Kapa'a Stream is the main drainage way for the Kapa'a Valley watershed. The stream drains into Kawainui Marsh and ultimately to the Pacific Ocean via Oneawa Canal and Kailua Beach. The stream's total length is approximately 1.9 miles, of which the stream flows through the property of the applicant for 0.7 miles. The average base flow at the confluence of the stream with the Kawainui Marsh is 1.2 cbft/sec during the wet season (Nov. 1 to April 30) and .9 cbft/sec during the dry season (May 1 to Oct. 30). During the rainy season and after heavy storms, the base flow increases significantly and during rare storm events, the stream level raises high enough to inundate the quarry road in the vicinity of the culvert under the quarry road. Kapa'a Stream is on the List of Impaired Waters of Hawaii. The list was prepared under provisions of the Clean Water Act §303(d). The Kapa'a Stream exceeds the dry season turbidity standard and nutrients; where turbidity, suspended solids and metals are stated as predominant pollutants. Figure 3-9 shows the lower reaches of the Kapa'a Stream with the only wider perennial stream sections (just upstream of the culvert under the quarry road through which the stream flows into the Kawainui Marsh). For a significant part of the year the stream is covered with Salvinia Molesta and has none, or very small patches of free water surface.

Figure 3-9 Lower Reach of Kapa'a Stream corridor covered with salvinia molesta

2. **Wet land area:** An area of about 15 acres has been delineated wetland following the criteria of wetland soil, vegetation and flooding conditions. The Kapa’a Stream flows through the wetland area. At present the wetland area has a dense cover with California grass and no apparent larger open water surfaces. The wetland area is entirely outside the development boundary of the proposed industrial park. The applicant has worked with the NRCS on the design of a 13 acre wetland restoration and wildlife habitat project; this project is now put on hold indefinitely. The goal of the wetland restoration and wildlife habitat project was to create a wetland environment specifically for endangered water birds that populate the Kawainui Marsh and adjacent land through wetland restoration measures. Based on findings of an initial master plan design study of the 13-acre wildlife habitat the applicant has decided to defer the and wildlife habitat project pending a conclusive evaluation into how the removal of large quantities of wetland vegetation would affect water quality in the Kapa’a Stream and what mitigation measures would be acceptable to the State agencies responsible for wetlands.

3. **Drainage ditch along Kapa’a Quarry Road:** There are two drainage ditches, one on each side of the quarry road over the length of the section of the quarry road that is adjacent to the proposed project (e.g. the lower portion of the proposed site). Only the mauka (e.g. on the mountainside) ditch is considered at this point. The mauka drainage ditch is typically stagnant water, which originates from surface runoff and seepage of water from the lower portion of the proposed site. For much of the year the ditch is completely covered with algae and/or water plants. During a field survey in September 2010 (see Appendix 7 for the results of a water resources assessment of the site) the ditch had no free water surface and the canal was basically filled with mud. During severe stormwater events the canal drains into Kapa’a Stream and subsequently into the Kawainui Marsh. The proposed layout of the industrial park would not affect the canal since the development boundary is set back about 20 feet from the top of bank of the canal. Figure 3-10 shows the canal on the mauka side of the quarry road. The drainage canal is shown with a continuous cover of Salvinia Molesta (green water plant floating on the water surface). The vegetative buffer around the lower portion of the proposed site would commence at the foot of the existing earth mounds about 20 feet mauka of the top of bank of the canal.

4. **Drainage ditch along quarry access road with discharge on to the site**: The drainage flow in the ditch along the Kapa’a Quarry Access Road enters the project site through a culvert under the access road and is then distributed in an existing percolation filed in the lower portion of the site. A portion of the drainage volume in the ditch along the access road originates from runoff of the project site. The ditch conveys runoff eastwards towards a marsh until the flow in the ditch enters a drain inlet structure and from there the runoff is conveyed through a culvert under the access road to the site. Downward of the discharge

point of the culvert water readily infiltrates within a percolation field, which is located within the lower portion of the site, but outside the development footprint.

Figure 3-10 Existing drainage canal alongside Kapa'a Quarry Road

3.2.3 Kapa'a Watershed Considerations

The Kapa`a watershed is an area of approximately 850 acres on the windward side of the Island of Oahu. Figure 3-11 illustrates the location of the Kapa'a watershed. Figure 3-11 shows Oahu divided into six districts. Based on early Hawaiian land division and governance, the islands of Hawaii are divided into *moku*, or separate districts. Mokus are further subdivided into smaller sections called *ahupua'a,* which are fundamental unit of community subsistence and political organization. An ahupua'a basically indicates a section of land running from the mountain (mauka) into the sea (makai). With resources extending from the mountains to the ocean, an ahupua'a provided the community with the life's essentials such as wood for canoes and housing, food grown in irrigated fields in the valley and seafood obtained from the near shore waters. Streams formed the center of many ahupua'a. Streams are the most important and protected resource of the ahupua'a, revered as sustainers of life and sacred to the land. The Kapa'a watershed is located in the Koolaupoko district.

Figure 3-11 Location of Kapa’a watershed on the Island of Oahu

The Kapa’a Stream is the main drainage pathway for the Kapa’a watershed and drains directly to Kawainui Marsh, while infiltrated water from the Kapa’a watershed drains indirectly to the marsh. The Kawainui Marsh, with a total area of about 1,000 acres, is the largest freshwater wetland in the State, habitat for four of Hawaii’s endemic and endangered water birds, and a place sacred to Native Hawaiians. Kawainui, with its adjacent Hamakua Marsh, is a designated “Wetland of International Importance”.

The Kapa’a Stream has a total length of approximately 1.9 miles. Along its way through the watershed it meanders through different parts of the Kapa’a Valley that been significantly altered by industrial and other developments in the past 60 years. From its source the stream flows through several pools until the stream enters a perennial stream section not far from where it flows into the Kawainui Marsh.

In 2007 the Hawaii State Department of Health (DoH) performed an evaluation of the water quality in the Kapa'a Stream (DOH, 2007). The evaluation involved a model of the water discharge and pollutant loads of the stream, for both typical wet and dry seasons. The hydraulic model comprised 13 sub-basins, which were characterized by different hydrographical properties, drainage characteristics and land uses. The sub-basins had various sizes. With the applied assumptions of rainfall, infiltration rates, runoff rates and stream morphology assimilation rates, the sub-basins produced different flow rates and loads of various pollutants in the Kapa'a Stream.

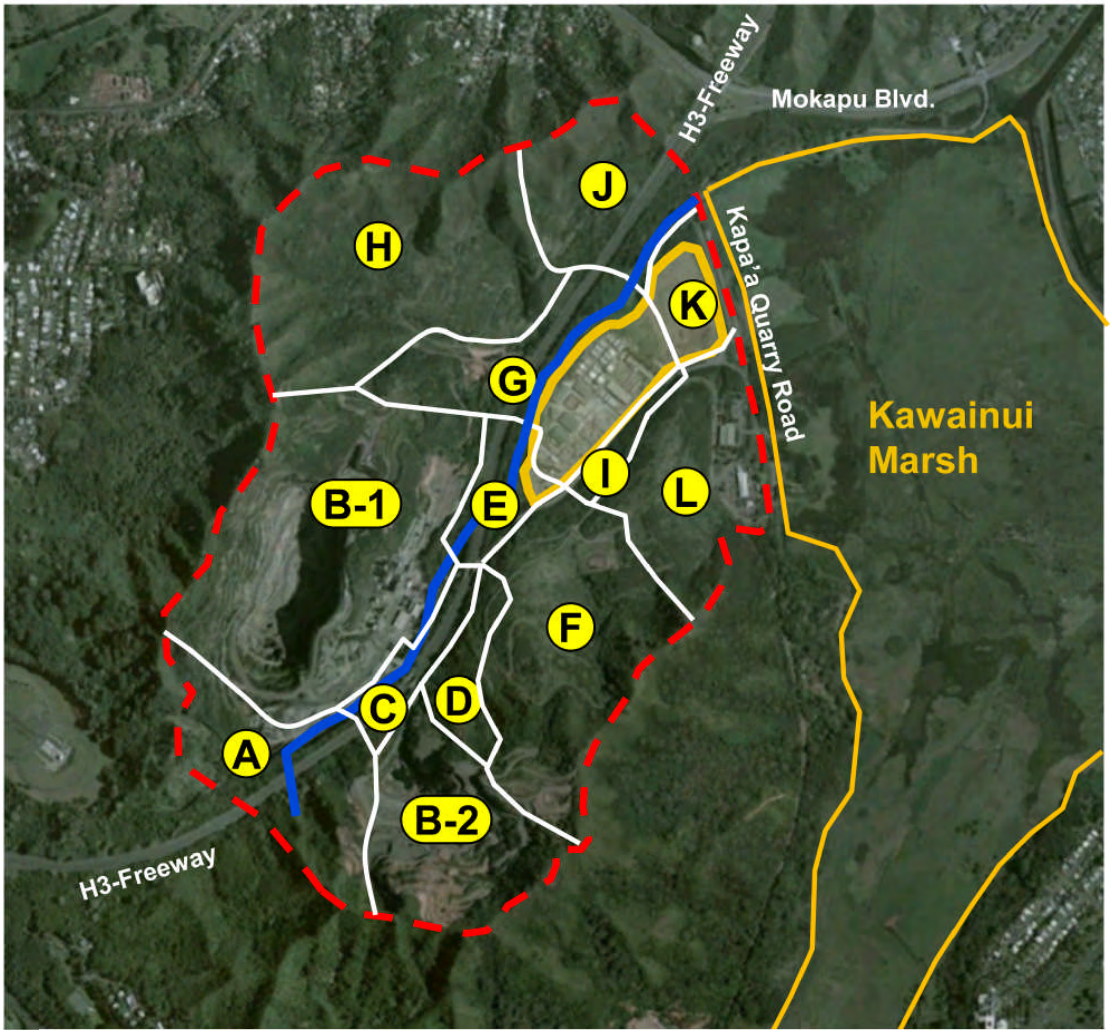
Figure 3-12 shows the extent of the Kapa’a watershed, and the location and size of the 13 sub-basins used in the DoH model. Table 3-2 delineates the 13 sub-basins used in the DoH hydraulic model. It should be noted that in the DoH model all sub-basins, with the exception of sub-basin L, drain into the Kapa'a Stream. Runoff from Sub-basin L drains directly into the Kawainui Marsh through an outlet under the Kapa'a Quarry Road. In addition to surface drainage through the Kapa'a Stream and the different direct outlets into the Kawainui Marsh, underground flow contributes to the total drainage of the watershed to the marsh.

The sub-basins in the DoH model are further subdivided into areas of different land uses, such as forest/brush, industrial, roads, highway, quarry and landfill. The area with different land uses within the sub-basins have their individual impervious factors, such as roads, highways and industrial, with respective imperviousness factors of 0.4 to 0.75, 0.57 and 0.80. Furthermore, each sub-basin has its own dry and wet season and annual precipitation rate, with the lower stretches in the east of the valley having lower precipitation rates than the west end of the valley where there is higher elevation. The differences between maximum and minimum precipitation values in the east and west of the Kapa’a watershed is 4.7 and 6.9 inch per annum for the dry and wet season, respectively.

Of the 825 acres of the Kapa’a watershed considered in the DoH model, 94 acres of land within the sub-basins have imperviousness greater than 40%, and about 20 acres are connected to existing drainage systems. Table 3-2 lists the average imperviousness of the entire watershed and the individual sub-basins, which are calculated as the weighted mean of the areas with different land uses. The model suggests that the proposed site, which is composed of portions of sub-basins E, G and K, has a compound imperviousness of 42%

The DoH analysis considered a wet season baseline scenario and a 2% flow event scenario, with the resulting flow rates and pollutant load levels in the Kapa’a Stream. The baseline case refers to drainage conditions, where the flow rate and resulting pollutant load level in the stream is caused by the release of groundwater from the watershed. The 2% event refers to the highest 2% of the average rainfall events in the dry or wet season. The 2% data suggests water quality effects due to high flow rates and resulting high loads of pollutants discharged into the Kapa’a Stream.

Figure 3-12 Kapa'a Watershed with sub-basin definition for hydrological model



Proposed site of KLIP
Boundary of Kapa'a watershed
Kapa'a Stream
X Sub-basin of watershed area in DOH 2007 study

Table 3-2 Description of sub-basins used in DoH Kapa’a watershed model

Sub-basin ID	Area (acre)	Avg. Impervious-ness (%)	Description of Sub-basin
A	96	3%	Sub-basin A is the headwater tributary drainage area for Kapa’a Stream.
B (I) and B(II)	218	9%	Sub-basin B is divided into sub-basin B(I) and B(II). The sub-basins B(I) and B(II) represent the Ameron Phase I and Phase II quarry operations. The two sub-basins are divided by the H3-Freeway. The run-off from Sub-basin B(II) is conveyed to the sub-basin B(I). Sub-basin B(I) has a retention pond that accommodates a 10-year, 24-hour rain event.
C	17	13%	Sub-basin C consists of the right-of-way for the H-3 highway and is located between the sub-basins B(I) and B(II).
D	29	3%	Sub-basin D is a steeply sloped area that drains toward the H-3 highway. Runoff from this area is collected and point-discharged into the Kapa’a Stream through a culvert.
E	24	25%	Sub-basin E is an immediate tributary drainage area for the Kapa’a Stream. The sub-basin is divided by the H3 Freeway. This sub-basin is directly to the south of the Kapa’a Light Industrial Park.
F	98	2%	Sub-basin F drains the City & County of Honolulu Kapa’a Landfill (Phase II) and relatively undisturbed slopes up to the ridgeline. Drainage is collected in a circumferential drainage swale constructed around the inner landfill. Drainage is conveyed to sub-basin E.
G	60	41%	Sub-basin G is an immediate tributary drainage area for Kapa’a Stream. The sub-basin encompasses area to both sides of the H3-Freeway and the Kapa’a Stream. Sub-basin FG is divided into an eastern and western part. The western part drains through several culverts under the freeway. The eastern part includes a part of the proposed Kapa’a Light Industrial Park.
H	126	1%	Sub-basin H includes the Kalaheo Landfill, which is surrounded by larger sloped scrub-covered areas. The municipal landfill is no longer in operation. The sub-basin drains into the Kapa'a Stream through a large

Sub-basin ID	Area (acre)	Avg. Imperviousness (%)	Description of Sub-basin
			culvert under the H3-Freeway. The sub-basin has a retention pond to control the drainage and sedimentation discharge.
I	8	23%	Sub-basin I is a small area that drains into the Kapa’a Stream through a pipe that passes under the Kapa’a Quarry Access Road and terminates in Sub-basin K
J	59	5%	Sub-basin J drains slopes to the west of the H3-freeway and the stream valley adjacent to sub-basin K. The area west of the H3-Freeway is drained into the Kapa’a Stream through several culverts under the freeway.
K	28	2%	Sub-basin K is a landfill area that consists of quarry deposits. The sub-basin drains into a drainage canal that separates Sub-basin K from the Kapa’a Quarry Road. Sub-basin K is the area that will be used for the lower portion of the Kapa’a Light Industrial Park.
L	62	33%	Sub-basin L contains the lower Phase I part of the Kapa`a landfill, which is also the site of the old first Ameron quarry. A drainage swale collects the runoff and conveys it to a retention pond. The Sub-basin L is the only sub-basin of the Kapa'a watershed that drains directly into the Kawainui Marsh and not into the Kapa'a Stream.
Sum	**825**	**10%**	Total area of Kapa’a watershed considered in the model; with 763 acres of sub-basins A through K draining into the Kapa’a Stream through Kapa’a Stream and 62 acres draining through sub-basin L into the Kawainui Marsh.

Using wet season flow rates and pollutant loads in the Kapa’a Stream provides a conservative representation of the contribution of the proposed project site to the overall water quality of the Kapa’a Stream. The amount of total suspended solids (TSS) is used to describe the water quality of the stream in different scenarios.

The resulting flow rates and pollutant load rates for the wet season baseline and 2% event are presented for the existing conditions at the proposed site. Twelve of the 13 sub-basins contribute to the water quality of the Kapa’a Stream; Sub-basin L does not drain into the Kapa’a Stream, but drains directly into the Kawainui Marsh through culverts under the Kapa’a Quarry Road.

Table 3-3 and Figure 3-13 indicate estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season baseline case as percentages of total flow and loading. Under baseline conditions, Sub-basins B (sum of B(I) and B(II)) combined are the largest contributors to both the water flow rate and the pollutant loading in the Kapa’a Stream. Other large contributors are sub-basins A, F, G and H, though sub-basin A contributes less TSS than the other three sub-basins in this group of four. The sub basins E, G, I and K, which include the flows and pollutant loads under existing conditions at the proposed site, contribute more TSS than water flow. This is due to the high TSS contributions of the industrial part of sub-basin G, which represents the existing warehouse development on parcel TMK 4-2-015:008, and the sub-basin K, which is the landfill area with Green Waste processing, both of them having either no or partially stabilized soil sections or pavement.

Table 3-4 and Figure 3-14 indicate estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season 2% event as percentages of total flow and loading. The contributions of sub-basins B and H are significantly reduced due to the effect of sedimentation ponds, which hold back TSS loads from these two sub-basins. In the DoH analysis, the runoff from sub-basin B and H does not contribute to the water flow and TSS loading of the Kapa’a Stream is greatly reduced, respectively. Sub-basin D is by far the biggest contributor in regard to TSS loading, followed by Sub-basin F. The proposed site, in the present condition, contributes more water flow than TSS. This is partly due to the fact that in the 2%-event the industrial part of sub-basin G discharges more flow than TSS. It can be seen that the TSS loading of the lower part of the proposed site, the landfill area of sub-basin K, contributes most of the TSS loading. This suggests that the landfill area in sub-basin K, which currently does not have sufficient measures against surface erosion, is a main contributor of TSS loading to the Kapa’a Stream from land that represents the proposed project site.

Table 3-3 Wet Season baseflow and pollutant load; present contribution from proposed site

Subbasin	Flow (cfs)	TSS (kgd)	Flow % of total	TSS % of total
A	0.17	20	14%	8%
B	0.40	91	33%	34%
C	0.03	4	2%	2%
D	0.04	5	3%	2%
E	0.04	8	3%	3%
F	0.14	38	11%	14%
G	0.12	36	10%	14%
H	0.18	33	15%	12%
I	0.01	4	1%	2%
J	0.07	16	6%	6%
K	0.03	11	2%	4%
sum	1.23	266	100%	100%
Proposed site contribution from:				
subbasin E; Industrial	0.00	2	0%	1%
subbasin G; Industrial	0.08	30	7%	11%
subbasin I; Landfill	0.01	3	1%	1%
subbasin K; Landfill	0.03	10	2%	4%
sum	**0.12**	**45**	**10%**	**17%**

Note: Subbasin L does not contribute to flow and pollutant load of Kapa'a Stream

Figure 3-13 Wet Season Base flow and Pollutant Load; Present Contribution from Proposed Site

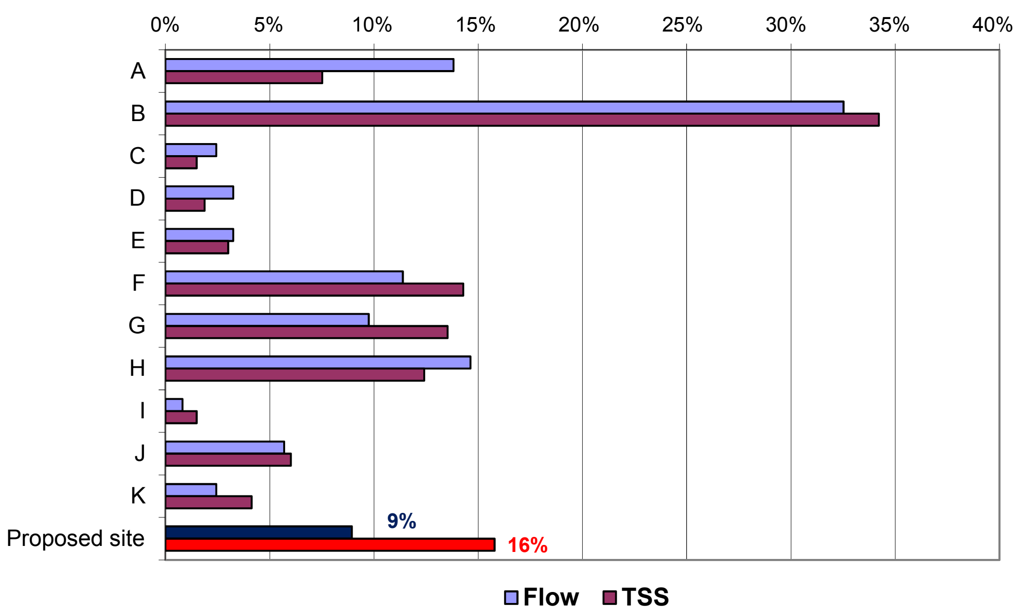
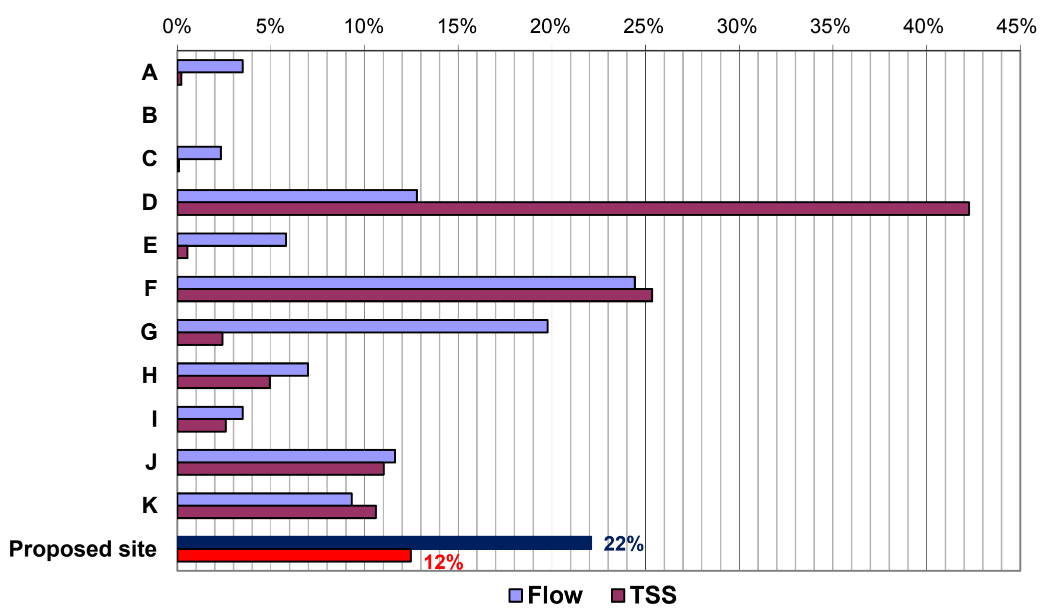


Table 3-4 Wet season 2% Event and pollutant load; present contribution from proposed site

Subbasin	Flow (mcf)	TSS (kgd)	Flow % of total	TSS % of total
A	0.03	140	3%	0%
B	0	0	0%	0%
C	0.02	61	2%	0%
D	0.11	27,031	13%	42%
E	0.05	344	6%	1%
F	0.21	16,212	24%	25%
G	0.17	1,538	20%	2%
H	0.06	3,155	7%	5%
I	0.03	1,659	3%	3%
J	0.1	7,044	12%	11%
K	0.08	6,779	9%	11%
sum	0.86	63,963	100%	100%
Proposed site				
contribution from:				
subbasin E; Industrial	0.01	60	1%	0%
subbasin G; Industrial	0.1	1179	12%	2%
subbasin K; Landfill	0.08	6728	9%	11%
sum	**0.19**	**7967**	**22%**	**12%**

Note: Subbasin L does not contribute to flow and pollutant load of Kapa'a Stream
mcf = million cubic feet

Figure 3-14 Wet Season 2% Event and Pollutant Load; Present Contribution from Proposed Site



For the assessment of the contribution of different sub-basins to the total flow and pollutant loading in the Kapa’a Stream, it is helpful to compare the relative size of the sub-basin, e.g. its percentage of the total size of the watershed, to the relative flow and pollutant loading which originates from that sub-basin. As can be seen from the data, different sub-basins contribute more than can be expected if only relative to their size.

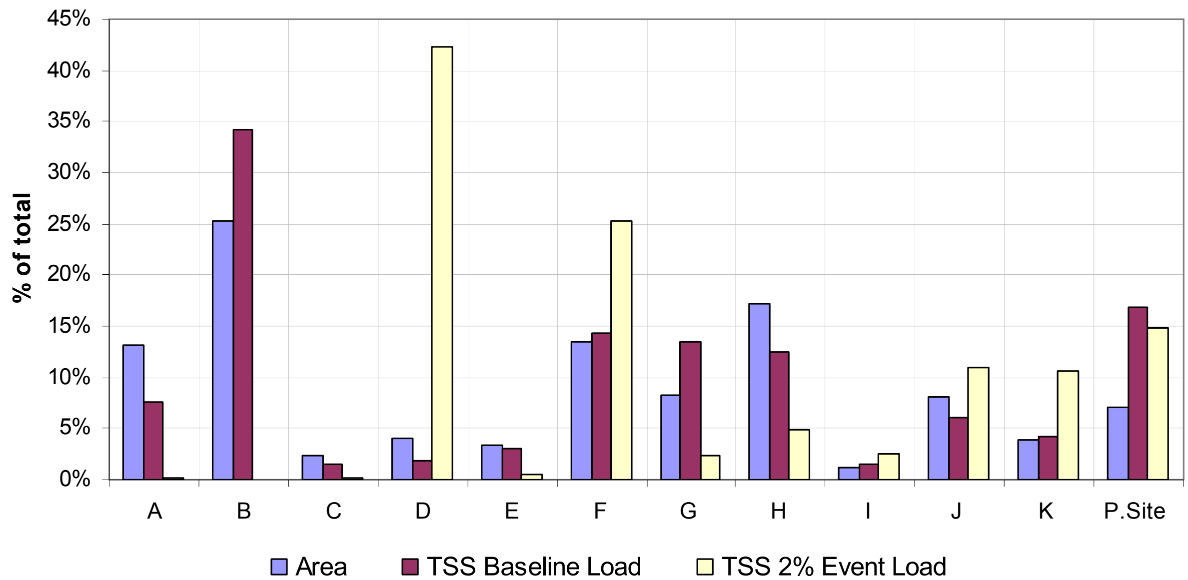
Figure 3-15 depicts a correlation of the percentage contributions of size of sub-basins and TSS loadings for the wet season baseline and 2%-event scenario. Figure 3-15 shows that the DoH study concluded sub-basin D is being the biggest contributor of TSS loading in the 2%-event case. The relative small size and high TSS loading of sub-basin D is striking, but can be readily explained from the fact that sub-basin D has 28 acres or 95 percent of its total area designated as “eroded”. Sub-basin B, while being the largest sub-basin in the watershed, does not have any TSS loading in the 2%-event, since its sedimentation pond are expected to retain all TSS loading. Furthermore, the relative size and TSS loading under the 2%-event deviates significantly for sub-basin F. The existing conditions of the proposed site suggest that the relative baseline and 2%-event TSS loading is larger than its relative size, suggesting that current conditions of the proposed site could be improved to lower the impact of peak run-off and associated pollutant loading.

The contribution of the proposed site under the existing conditions in regard to water quality (represented by TSS load) and flow rate in the Kapa’a Stream can be evaluated by considering the runoff scheme in the watershed, e.g. where along the Kapa’a Stream are sub-basins contributing to the flow rate and TSS load of the stream. Figure 3-16 illustrates the Kapa’a watershed runoff schematic. Portions within the sub-basins E, G and K represent the areas of the proposed site which contribute to the runoff flow rate and TSS loading in accordance with their specific hydrological characteristics. Figure 3-16 indicates the area percent values of the sub-basins E, G and K which represent the proposed site; as an example 48 percent of the sub-basin G is identified as “industrial;” in the DoH model and thus 48 percent of the proposed site contributes to the runoff.

Figures 3-17 illustrates the quantitative contributions for flow rates and TSS loading originating from the proposed site in relationship to the entire Kapa’a watershed, for the wet season baseline and peak (2%) flow events. The x-axis represents the Kapa’a Stream sections as defined in Figure 3-16.

The results in Figure 3-17 suggest that the existing TSS loading under base flow condition from the portions in sub-basin G and K that are within the proposed site are 75 and 25 percent, respectively. For the peak flow event (2%-event), however, the TSS runoff contributions of the area potions in sub-basins G and K are 15 and 85 percent, respectively. These results suggest that the runoff from the landfill area in sub-basin K produces high TSS loading in strong rain events, which can be attributed to the fact that the landfill surface in sub-basin K is largely composed of unstabilized and unprotected soil, which facilitates erosion.

Figure 3-15 Comparison of size and TSS loading for baseline and 2%-Event contributions



3.2.4 Existing drainage system at proposed site

Figure 3-18 shows the existing drainage system within and in the vicinity of the proposed project site. Most of the onsite storm runoff flows to the Kapa’a Stream corridor by means of surface flow and is discharged from the site either through an existing detention pond or through a series of drain outlets. This site drainage also includes runoff from off-site sources that are directed into the site, namely through an existing 30-inch drainage pipe under the quarry access road, which conveys runoff from an drainage ditch along the southern side of the quarry access road to a percolation field within the lower portion of the project site.

Figure 3-16 Kapa’a watershed runoff schematic (from DoH 2007, modified)

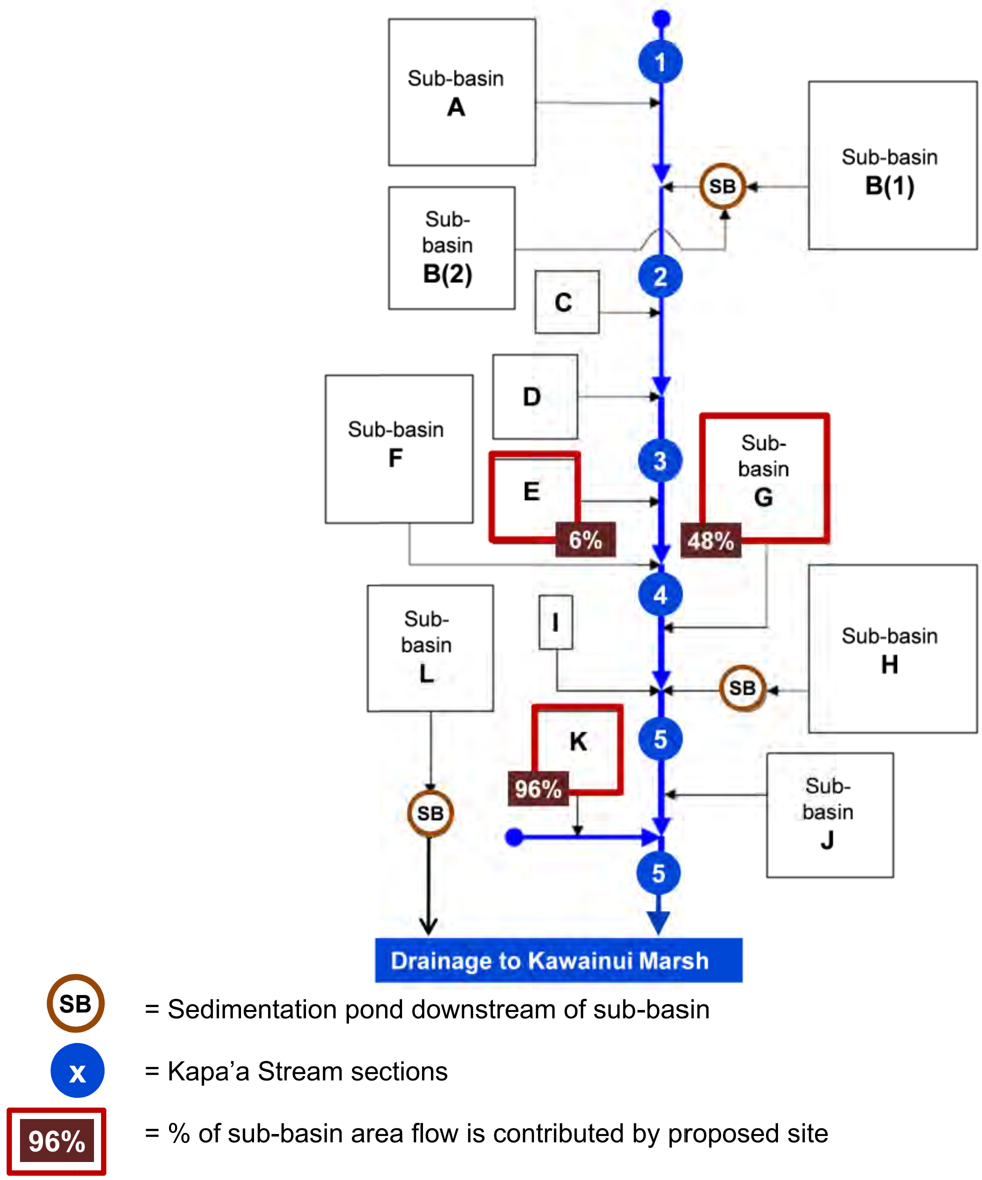
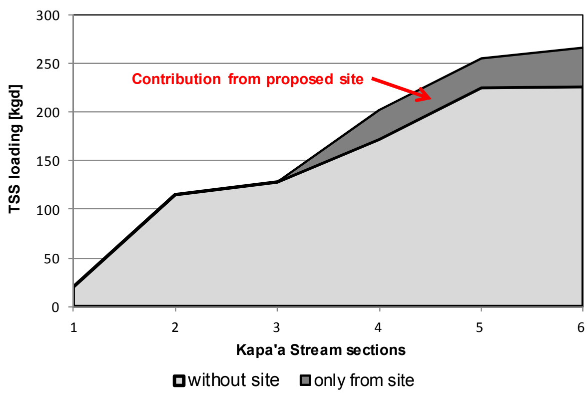
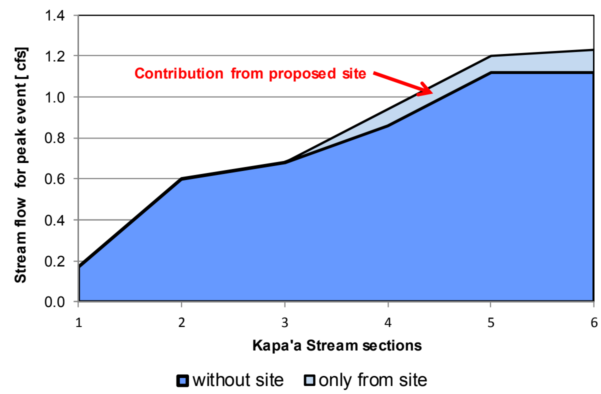


Figure 3-17 Existing flow and TSS contribution of proposed site to runoff on Kapa'a watershed

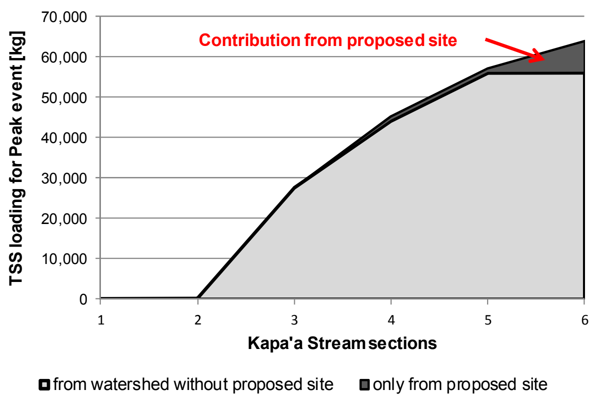
Existing contribution of proposed site to overall runoff in Kapa'a watershed



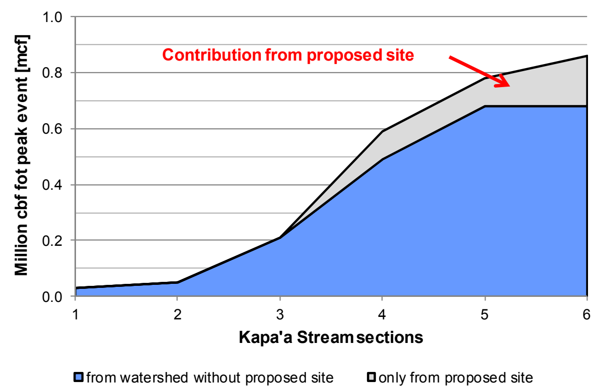
Watershed Baseload runoff; TSS loading



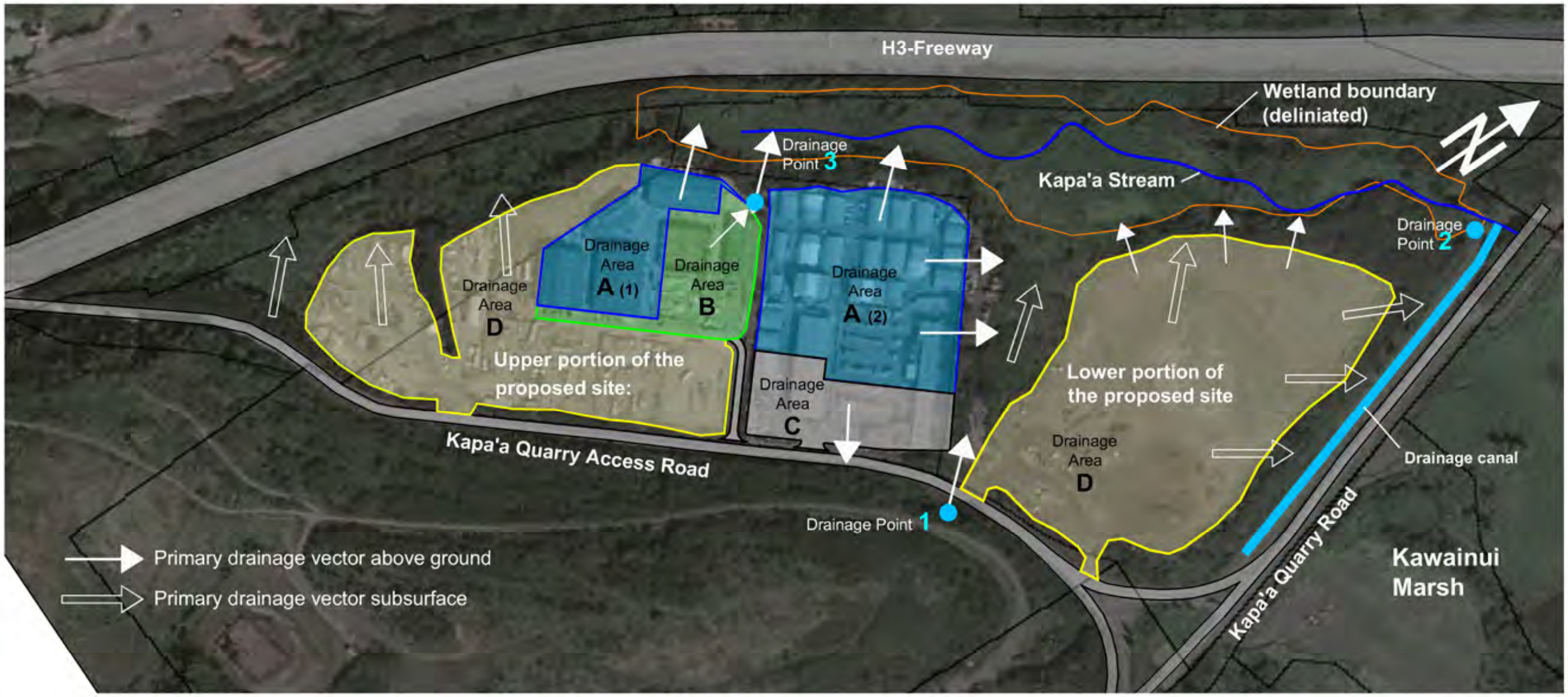
Watershed Baseload runoff; Flow rate



Watershed Peak (2%) runoff; TSS loading [kg]



Watershed Peak (2%) runoff; Flow rate [mcf]



Drainage Area	Description of drainage area
A	Drainage to stream corridor (directly)
B	Drainage to existing detention pond
C	Drainage to roadway with exist. drainage
D	Drainage by percolation into graded surface

Sustainable Design & Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 3-18
Existing drainage system of proposed site.

Figure 3-18 differentiates between four types of existing drainage areas within the proposed site. Table 3-5 defines these four types of existing drainage areas:

Table 3-5 Components of the existing site drainage system

Drainage area (note**)	Primary type of drainage in area	Description of drainage area; land use and surface conditions	in UPPER portion of the site (acres)	in LOWEWR portion of the site (acres)
A	Drainage to stream corridor (directly)	Industrial warehouses; concrete pavement between buildings covers the entire area	**9.4**	**N/A**
B	Drainage to existing detention pond	Industrial warehouses; concrete pavement between buildings covers the entire area	**2.5**	**N/A**
C	Drainage to roadway with exist. drainage	Industrial warehouses; concrete pavement between buildings covers the entire area	**2.8**	**N/A**
D	Drainage by percolation into graded surface	Industrial use, no permanent structures; pervious gravel pavement covers the entire area	**10.0**	**17.5**

Figure 3-18 shows the existing drainage system within and in the vicinity of the proposed project site.

<u>Drainage Area A</u> represents the part of the upper portion of the project site that drains to the Kapa'a Stream corridor either through drain inlet structures or by simple site runoff over the edge of the pavement into the pervious and vegetated site perimeter. The total size of Drain area A, composed of two separate areas, is 9.4 acres. The entire area has an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore the entire area contributes to the runoff volume, including the runoff from the warehouse roof surfaces. The stormwater collects by sheet flow towards shallow swales which are formed within the concrete surfaces and which convey the stormwater to the drainage outlets at the site perimeter.

<u>Drainage Area B</u> is that part of the site that drains through an existing detention pond. The detention pond's main function is flood control and primary treatment before discharge to the stream corridor. The outfall of the detention pond is an armored spillway to curb erosion of the downward slope to the stream corridor. The outfall of the detention pond is defined as drainage point 3 in Figure 3-18. The size of Drainage Area B is 2.5 acres. Drainage Area B also includes the main internal concrete paved roadway of 600 feet length and 40 feet width that runs from south west to north-east. The entire area has an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore the

entire area contributes to the runoff volume, including the runoff from the warehouse roof surfaces. The stormwater collects by sheet flow towards shallow swales formed within the concrete pavement and is conveyed to an existing drainage swale, from where the stormwater flows to the detention pond. The existing drainage swale is about 400 feet long and is formed divided into a concrete and grass of equal lengths.

Drainage Area C represents a 2.8 acre part of the upper portion of the project site, which drains into the existing drainage system of the quarry access road. The entire area has an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore the entire area contributes to the runoff volume, including the runoff from the warehouse roof surfaces. The stormwater collects by sheet flow towards shallow swales which are formed within the concrete pavement surfaces and which convey the stormwater to the drainage of the quarry access road. The main drainage of the quarry access road is a drainage ditch at the southern side of the road. The runoff within the drainage ditch flows towards the east towards a drain intake structure of an existing 30”-culvert under the quarry access road. The culvert conveys the entire runoff from the drainage ditch to a percolation field within the lower portion of the project site.

Drainage Area D represents graded and pervious areas within the proposed project site that have no existing drainage. The several drainage areas that contribute the Drainage Area D are located both in the upper and lower portions of the site.

The drainage area D in the upper portion of the site has a total area of 10.0 acres, all of which is pervious and not vegetated. This area is used for equipment storage and inert material processing, but no permanent structures. The area is near flat or has a gentle downward slope averaging 1% towards the northern side of the upper portion of the site. The rainwater within this area readily infiltrates into the ground and typically no surface runoff can be encountered. At stronger storm events, rainwater may pond at places but typically infiltrates rather than runs off at ponding. The subsurface flow of the infiltrated water is towards the Kapa’a Stream corridor.

The drainage area D in the lower portion of the site measures a total area of 17.5 acres, all of which is pervious and not vegetated. All of the graded and pervious area is on landfill area that was created several decades ago, by deposits of quarry overburden and tailings and some quantity of domestic waste. The area has a gentle downward slope averaging 2% to 4% towards the northwest. The rainwater within this area readily infiltrates into the ground and typically no larger surface runoff features can be encountered. At stronger storm events rainwater may pond at places but typically infiltrates rather than runs off at ponding. The perimeter of the area is formed as earth dikes having different heights, about 6 – 8 feet high berms at the southern and western sides and 2 – 3 feet high berms at the northern perimeter. There are some visual indications that some volume of surface runoff may occur over the northern perimeter towards the wet land. The drainage of the entire area is mostly through infiltration, and subsurface flow is assumed to flow toward the wetland and a drainage canal along the quarry road. The drainage in the canal flows towards the Kapa’a Stream and from there into the Kawainui Marsh. The Drainage Point 2 designates the confluence of the drainage canal and the Kapa’a Stream.

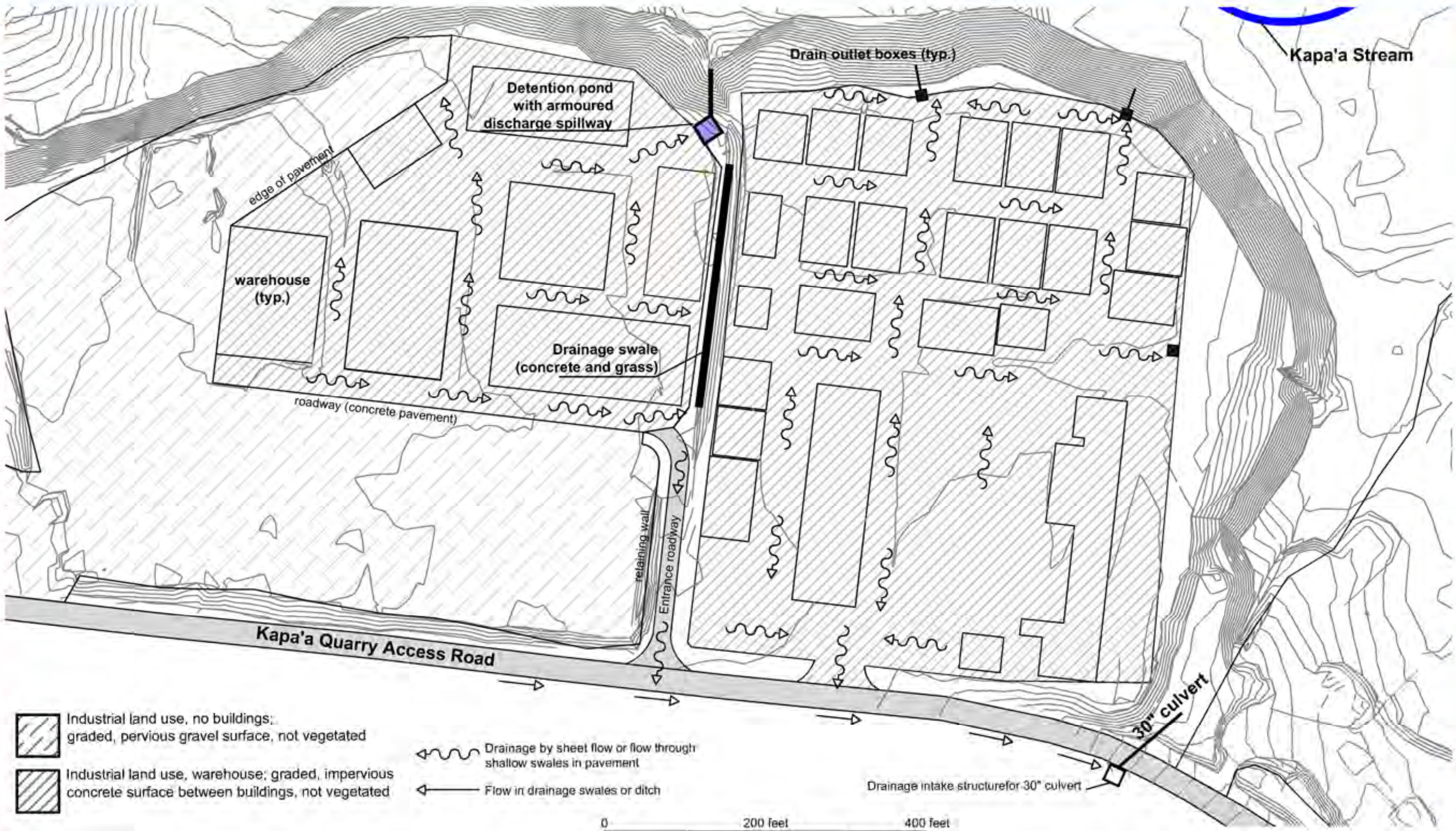
The lower portion of the site receives runoff from the drainage ditch along the southern side of the drainage canal. The runoff in the ditch flows into an intake structure which feeds an existing 30-inch culvert underneath the quarry access road. The culvert discharges to a percolation field that is located within the lower portion of the site at the foot of the sloped area between the upper and lower portion of the site. Downstream of the discharge point of the culvert, the runoff readily infiltrates within the percolation field and no surface stream features or ponding could be detected at a distance of about 100 feet from the culvert discharge point. After infiltrating, the subsurface flow is assumed to flow toward the Kapa’a Stream corridor.

Figure 3-19 shows the existing drainage system of the upper portion of the site in more detail.

3.2.5 Wetlands

Wetlands are defined by the United States Army Corps of Engineers (USCoE) and the United States Environmental Protection Agency (EPA) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and similar areas." While in the past wetlands were frequently filled or drained to make room for agriculture or other land uses, the significant ecological value of wetland is now recognized. This has resulted in comprehensive efforts to secure and restore wetlands.

The Kawainui Marsh is adjacent to the proposed site and represents one of the most important wetlands in the State of Hawaii. Some additional wetland areas are present within the lower reaches of the Kapa’a Stream corridor in the vicinity of the confluence of the Kapa’a Stream and the drainage canal adjacent to the Kapa’a Quarry Road. Since the Kapa’a Stream drains into the Kawainui Marsh, the stream’s flow conditions and water quality directly affect the marsh. Figure 3-20 shows the vicinity map to the proposed site the adjacent wetland areas. Figure 3-20 indicates that the proposed project site will be located entirely outside of wetland areas.

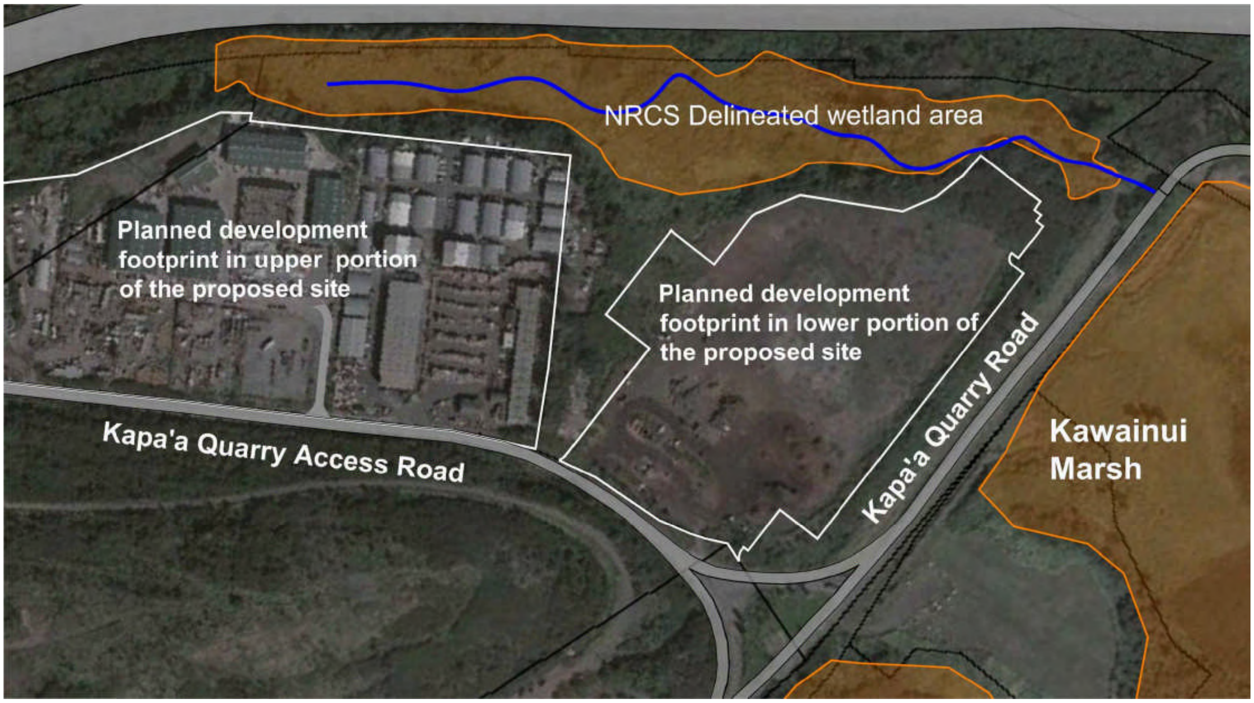


Sustainable Design
& Consulting LLC
www.sustain-HI.com

Kapa'a Light Industrial Park
Draft Environmental Impact Statement

Figure 3-19
Existing drainage of the upper portion of the site.

Figure 3-20 Wetland areas in vicinity to the proposed site



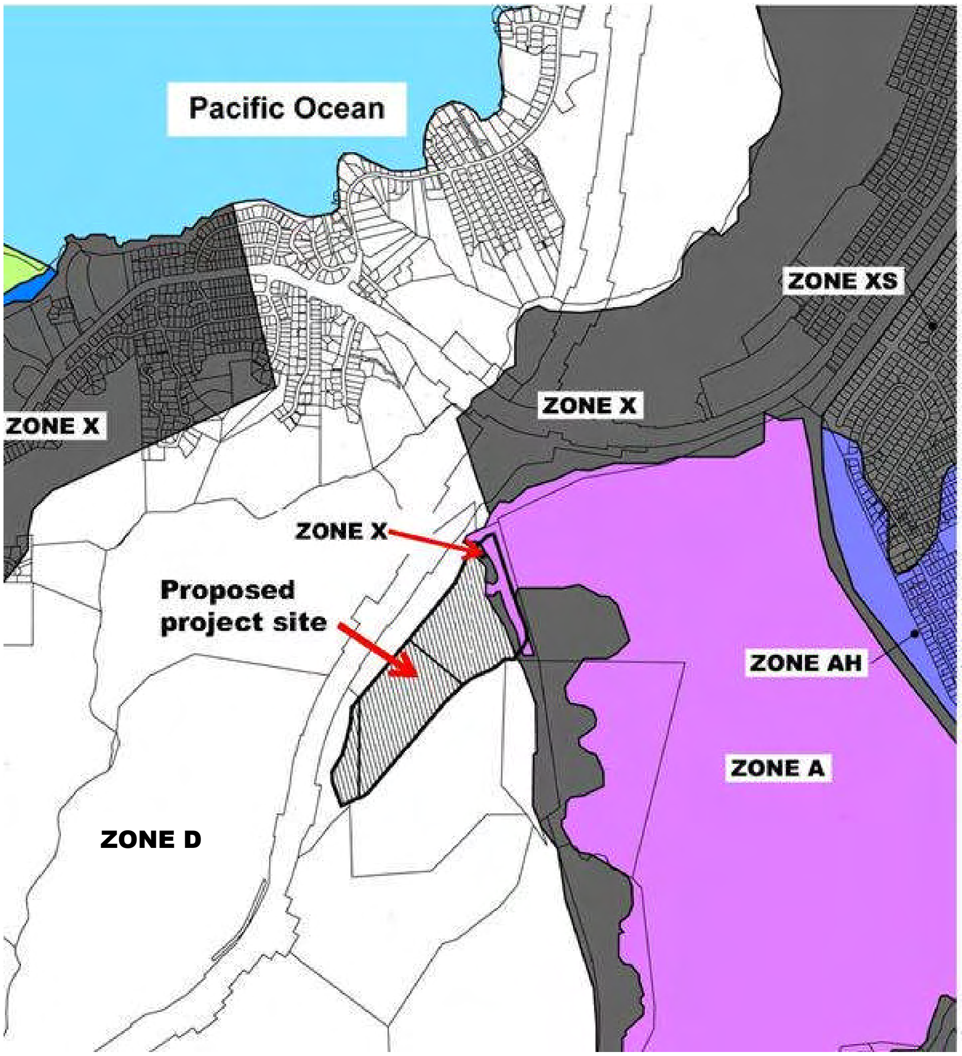
3.2.6 Flood and Tsunami Hazards

The project site is located outside of any potential tsunami inundation area. Figure 3-21 shows a portion of the Flood Insurance Rate Maps (FIRM) for the vicinity of the proposed project site. FIRM maps are used to determine the vulnerability of land to flooding. It has been observed that sections of the Kapa'a Quarry Road adjacent to the mouth of the Kapa'a Stream and the existing culvert under the Quarry Road are intermittently inundated at times of heavy rainfall. During such periods of flooding the Kapa'a Quarry road has to be closed for traffic.

Most of the land within the proposed site is in Flood Zone D, which indicates areas with possible but undetermined flood hazards. Figure 3-21 suggests that some low-lying areas of parcel TMK 4-2-015:006 adjacent to the Kapa'a Quarry Road are located within the flood zones X and A. The Flood Zone A refers to land, which is likely to be inundated by the flood event having a one-percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year" flood. Land that is within the Flood Zone X represents moderate to minimal flood hazards. Land designated as Flood Zone X has flood vulnerability of equal or less than the 0.2-percent-annual-chance or 500-year flood.

Land inside the property and inside flood zones A and X is limited to the existing drainage channel adjacent to the Kapa'a Quarry Road and to the mouth and lower sections of the Kapa'a Stream. No portion of the proposed development footprint is within flood zones A and X.

Figure 3-21 Map of flood zones in the vicinity of the proposed site



Description of Flood zones:

- A- 100 Year flood zone; no base flood elevation determined
- X- Beyond 500 years flood plain
- D- Possible but undetermined flood hazards
- AH- 100 Year flood zone; with 1 to 3 feet of ponding
- XS- 500 years flood plain

3.3 Biological Resources Existing Environment

The core of the proposed project site consists of developed land, which comprises approximately 55 percent or 43 acres of the total 79-acre property.

Presently, only the upper portion of the proposed site is developed with warehouse structures and base yards. There is less than an acre or 5% of landscaped area within this developed, graded and mostly paved and section of the site. The lower portion of the site is unpaved land covered with a pervious gravel surface and the land is used for a variety of low impact activities, such as green waste processing. The graded part of the lower portion of the site does not have any permanent or landscaped vegetation, but portions of the graded area have a temporary grass cover during periods of time when that area is not used by green waste processing or storage of inert material.

Of the total 79 acres of the property, 21 acres or 27% are impervious due to buildings, paved areas between the buildings, parking lots, or other development. Sections of the quarry access road and the quarry road are within the property and contribute 0.5 acres of impervious area that is outside the development footprint of the present and planned development.

Most of the vegetation of the property is within the undeveloped land surrounding the site and within the adjacent Kapa’a Stream corridor. These lands include natural areas and bodies of water, such as forested areas, stream beds and wetland area. The forested areas can be further divided into forested buffers and some mature, contiguous sections of forest in the Kapa’a Stream corridor. Forested buffers occur along the site perimeter and adjacent roads and account for about 13 acres. Aquatic resources on the property consist of the Kapa’a Stream, approximately 15 acres of delineated wetland and a drainage canal along the quarry road. The vegetated and undeveloped land provides some habitat for a population of urbanized birds and small mammals.

3.3.1 Vegetation

Landscaped areas

The landscaped area is less than one acre or less than 5% of the developed area. The landscaped area is along the site perimeter along the quarry access road and within some smaller areas inside the development foot print. The landscaped areas include turf lawns, flower beds, individual shrubs, hedges, groundcover areas and landscaped trees. Presently, maintenance crews mow and trim the lawn throughout the growing season, apply a pre and post-emergent herbicide, and fertilize. Leaves are raked and or blown. Flowers are sprayed, fertilized, and pruned. Beds are weeded, planted, and mulched. Where needed the landscaped areas are irrigated with a permanent sprinkler system. The landscaped vegetated areas provide aesthetic beauty to existing development as well as habitat to wildlife occurring in the area.

Natural Vegetation Areas

Areas of natural vegetation areas are situated around the proposed project site and in the Kapa'a Stream corridor, which is located on the property and directly adjacent to the north of the proposed site.

The existing vegetation in these areas includes overgrown vegetation and shrubberies and sometimes dense growth of:

- Haole koa (Leucaena leucocephala)
- Guava (Psidium guajava)
- Chinese banyan (Ficus microcarpa)
- Monkeypod (Samanea).
- Hau (Hibiscus tiliaceus)
- Overgrown umbrella sedge (Cyperus alternifolius)
- Elephant grass (Pennisetum purpureum)
- California grass (Brachiaria multica)

Figure 3-22 shows the natural vegetated areas around the proposed site. The natural vegetated area is grouped in different land categories according to the vegetation found within these areas. Table 3-6 lists the size of the different designated areas.

Figure 3-22 Natural vegetated areas found adjacent to the proposed site

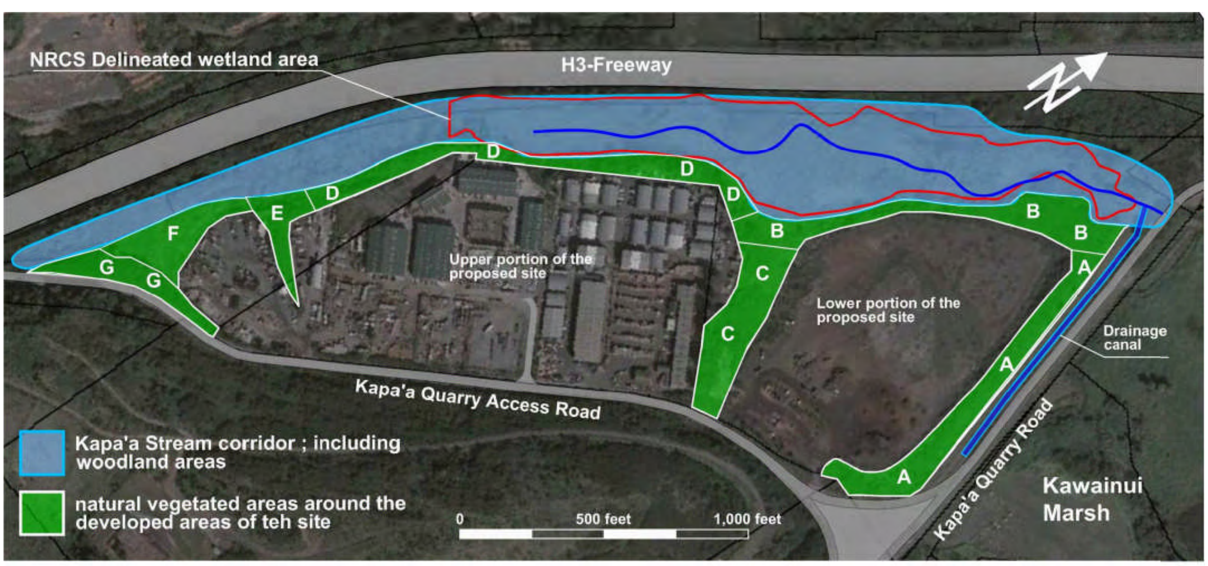


Table 3-6 Natural vegetated areas found adjacent to the proposed site

Type of vegetated area: Subzones		Total size acres	Subtotal acres
Kapa'a Stream corridor		19.5	
Delineated wetland (approximate)			15.0
rest of stream corridor			4.5
Vegetated area with mixed vegetation:		12.7	
A	On earth berm along the quarry road and drainage canal		2.5
B	Woodland along upland boundary of wetland area		2.5
C	Sloped area between upper and lower portion of the site		2.1
D	Woodland on sloped areas between upper portion of site and stream corridor		2.4
E	Vegetated earth dike within and at perimeter of upper portion of the site		0.8
F	Former siltation pond vegetated with grass and shrubs		1.3
G	Mature woodland along the quarry access road		1.1
Drainage canal		0.5	

The natural vegetated areas as depicted in Figure 3-22 are briefly described in the following:

1. <u>Kapa’a Stream corridor:</u> The stream corridor is located within the property, between the H3-Freeway and the developed areas, and has a total area of 19.5 acres. The flow path of the Kapa’a Stream through the property has a length of approximately 3,800 feet, entering the property at the culvert under the H3-Freeway in the and leaving the property through the culvert under the quarry road, where the stream flows into the Kawainui Marsh. The stream meanders through the stream corridor and is at length an intermittent stream and becomes a perennial stream in the last approximately 2,000 feet before the stream ends at the culvert under the quarry road. The width of the stream corridor increases towards the end of the stream and ranges from 150 to 350 feet, being the widest in the wetland areas in the lower stretches of the stream. The stream corridor has a mixed vegetation, including mature trees, which are more frequently located on the northern side of the stream corridor, e.g. away from the development footprint, shrubs and dense stretches of wetland vegetation. The size of the delineated wetland area within the stream corridor is approximately 15 acres.

2. <u>Natural vegetated area – Section A:</u> Section A is situated at the eastern perimeter of the

lower portion of the site along the quarry road. The section has an approximate length of 1,200 feet, an average width of 100 feet and an area of about 2.5 acres. Within Section A an earth dike with a width of approximately 60 feet and a height ranging between six and eight feet accommodates smaller trees, a variety of shrubs and a range of invasive grasses. The foot of the earth dike starts at a distance of about 20 feet from the mauka bank of the drainage canal.

3. Natural vegetated area – Section B: Section B is located between the graded plateau, which is the proposed lower portion of the site, and the wetland in the stream corridor. Section B is the 2.5 acres upland of the adjacent wetland. Section B stretches from the drainage canal to the foot of the sloped area of the upper portion of the site. The section has a length of approximately 1,200 feet and ranges in width between 200 feet in the north east to 60 feet in the west of the section. The section has a variety of smaller trees, shrubs and invasive grasses.
4. Natural vegetated area – Section C: Section C is located on a sloped area between the lower and upper portion of the site. The 2.1 acre section has an approximate length and width of 600 and 150 feet, respectively. In the steepest areas in the section slopes range between 50% and 90%. The vegetation consists of a number of free standing trees, shrubs of different sizes and a variety of grasses. Mature trees are located in the upper part of Section C at the border between parcels TMK 4-2-15:006 and 008.
5. Natural vegetated area – Section D: Section D is the steeply sloped area that separates the developed upper portion of the site from the stream corridor. Section D has a size of 2.4 acres. The natural vegetation area starts immediately past the paved and stabilized developed area and merges with the vegetation of the stream buffer. The slopes in this section average about 50 percent. The elevation difference between the developed area on the graded plateau and the stream corridor of 40 to 45 feet within about 90 feet. The section has a thick vegetation of trees, shrubs and bushes and is devoid of stabilizing ground cover over a part of the sloped area within the section.
6. Natural vegetated area – Section E: Section E is a smaller, less than an acre, natural vegetation area that starts at the site perimeter and stretches approximately 300 feet towards the interior of the developed land within the upper portion of the site. At the core of this small section is an earth berm with a height of 3 to 5 feet and a width of 10 to 30 feet which holds smaller trees and some shrubs.
7. Natural vegetated area – Section F: Section F is a near triangular plateau with a base length of 250 feet and a height of 350 feet. The area measures approximately 1.1 acres. The section is a former siltation pond for quarry runoff. The section contains mostly smaller plants, grasses and small shrubs and no trees.
8. Natural vegetated area – Section G: Section G is a stretch of mature trees along the quarry access road in the western most part of the property. The section has an area of 1.1 acres and a length and average width of 650 and 80 feet, respectively.

9. The existing drainage canal along the quarry road: The function of the canal is to convey runoff, mostly seepage from the lower portion of the site, towards the Kapa'a Stream and the Kawainui Marsh. The canal has an average width of 20 feet and a length of approximately 1,150 feet, from the beginning at the intersection of quarry and access road to the confluence with the Kapa'a Stream. The canal is often entirely covered with invasive algae (e.g. Salvinia Molesta). At times no free surface can be detected underneath the algae cover and during these durations taller grasses can be observed growing inside the canal (see Figure 3-23). The banks of the canal have vegetation of different grasses, and no larger trees or shrubs line the canal over its length.

Figure 3-23 Water surface in existing drainage canal alongside Kapa'a Quarry Road covered with algae

Generally, both action alternatives evaluated for this DEIS will not use previously undeveloped land to build the proposed industrial development. Under both alternatives the development footprint will be outside existing natural vegetated area and, specifically, outside the stream corridor and wetland areas. The two alternatives evaluated in this DEIS will impact the natural vegetated areas as follows:

The Preferred Alternative will alter the size, topography and type of vegetation within the sections A, B, C and E. These modifications will not destroy the existing natural vegetation areas to make room for the development footprint; rather, the Preferred Alternative will restore sections A, B and C with native and adaptive plants under the "restore habitat and open space" credit of the sustainable development approach. In Section A, the width and height of the earth berm will be increased to plant a significant number of trees and shrubs, to establish a vegetative buffer zone, mainly for visual mitigation. In Section B, the mature trees will be retained and the slopes of the upland area will be stabilized and trees will be added. In Section C, numerous trees and shrubs will be added on the sloped area and at the perimeter of the upper portion of the site. A continuous ground cover will be established for added soil stabilization. The earth berm in Section E will be removed, graded and will become part of the development. Sections D, F and G will not be affected by the Preferred Alternative. In the same way, no parts of the stream corridor and wetland area will be modified under the Preferred Alternative. The drainage canal will likewise not be altered under the Preferred Alternative although the planned extended detention pond will discharge into the canal, therefore requiring minor changes of the mauka bank over a length of about 20 feet to allow installation of an armored spillway for the discharge of the detention pond.

Alternative B will only alter Section E, in the same way as under the Preferred Alternative. Sections A, B and C will not be altered under Alternative but left in their present state, with the exception of some minor improvements to selectively add some trees and shrubs. The drainage canal will not be altered under Alternative B although the planned extended detention pond will discharge into the canal, therefore requiring minor changes of the mauka bank over a length of about 20 feet to allow installation of an armored spillway for the discharge of the detention pond.

3.3.2 Wildlife

Due to historic use of the property for various industrial activities in the past 50 years, the upper tier of the site is devoid of any avifaunal (bird) habitat mostly because of removal of natural vegetation cover and ongoing human activities. The open space within the lower tier and at the mouth of Kapa'a stream, however, provides habitat for a range of birds, mammals and aquatic species. Observations suggest that the feral cat population in the area has been a main predator for the bird population. Birds and mammals sighted or observed around and within the proposed project site include:

Birds:

Common name	Scientific name
Cardinal	Cardinalis cardinalis
Cattle egret	Bubulcus ibis
Barred dove	Geopedia striata
Mynah	Acridothera tristis
Lace-necked dove	Streptopedia chinensis
Sparrow	Passer domesticus
Japanese white-eye	Zosterops jaonica
Shama thrush	Copsychus malalaricus

Mammals:

Common name	Scientific name
Mongoose	Herpestes auropunctatus
Mice	Mus musculus
Rat	Rattus rattis, norvegicus
Feral Cat	

The adjacent Kawainui Marsh is an important habitat for birds and other wildlife. The number and variety of birds observed in the Kawainui Marsh has varied over time. When the Kawainui Marsh was an open lake, before vegetation overgrowth and sedimentation had reduced the habitat area, a large number of endemic birds made their habitat there. Over time the number and variety of birds have decreased. The following birds have been sighted by different investigators in and around the Kawainui Marsh:

Common name	Scientific name
Cardinal	Cardinalis cardinalis
Pintail	Anas acuta
Mynah	Acridothera tristis
Pacific Golden Plover	Pluvialis dominica fulva
Japanese White-eye	Zosterops jaonica

Black-crowned Night Heron	Nycticorax nycticorax hoactli
Hawaiian Duck (*)	Ana wyvillienu
Hawaiian Coot (*)	Fulica americana alai
Hawaiian Stilt (*)	Himantopus himantopus knudseni
Hawaiian Gallinule (*)	Gallinula chloropus sandvicensis
Shoveler	Anas clypeata
Frigate Bird	Fregata minor

(*) = endangered birds

The following aquatic fauna has been sighted by different investigators in waters in and around the Kawainui Marsh:

Common name	**Scientific name**
Pelagic milkfish or awa	Chanos chanos
Aholehole	Kuhlia sandvicensis
Mullet	Mugil cephalus
Papio	Caranx sp.
Barracuda	Sphyraena
Nehu	Encrasicholina purpurea
O'opu	Eleotris sandwicensis
Rice eels	Monopterus sp.
Hawaiian river shrimp	Macrobrachium grandimanus
Crenate swimming crab	Thalamita crenata
Worm	Tendipes

In order to enhance and restore the natural habitat and encourage remigration and nesting indigenous fauna to the area, there have been recent initiatives to reintroduce some of the species of birds and restore appropriate habitats within the Kawainui Marsh or on adjacent land.

3.3.3 Threatened & Endangered Species and Species of Special Concern

Communication with the U.S. Fish and Wildlife Service (USFWS) has determined that the proposed project site is in the vicinity of the Kawainui Marsh and the Kapa'a Stream, which is habitat for the federally endangered Hawaiian stilt (Himantopus mexicanus knudseni), Hawaiian moorhen (Gallinula chloropus sandvicensis), Hawaiian coot (Fulica alani) and Hawaiian duck (Anas wyvilliana) as well as populations of migratory waterfowl and shorebirds protected under the Migratory Bird Treaty Act as amended (MBTA). While endangered species find habitat in the vicinity of the proposed site, the site is currently not a habitat for federally listed water birds or for listed migratory waterfowl and shorebirds. There is no designated critical habitat within the proposed project site.

The USFWS indicated concerns about the previously planned wildlife habitat, including taking measures to ensure that water birds attracted to the restored wetland are not exposed to predators. With the plans of restoring 13 acres wetland area within the Kapa'a Stream corridor and building an enclosed wildlife habitat <u>no longer pursued</u> by the developer the concerns of the USFWS which addressed the wildlife habitat project therefore no longer apply.

The remaining concern of the USFWS is about the possibility that the planned detention ponds might attract breeding water birds, although the design calls for "dry" detention ponds. The applicant will work with the USFWS to ensure that appropriate measures are developed to ensure that the detention ponds will be less desirable habitat for water. Furthermore, the sustainability design approach plans to utilize covered rainwater catchment for use in irrigation of the project site. With the planned large volume underground cisterns that will retain stormwater during frequent normal rain events, the chances of establishing a permanent body inside the detention ponds become even less likely.

3.4 Cultural Resources Existing Environment

As has been mentioned in the preceding section, the proposed site for the project has been heavily impacted by industrial activities in the past fifty years. The proposed site is devoid of any archaeological or cultural resources and the proposed site is exclusively located on land that was covered by layers of landfill from quarry operations or municipal waste several decades ago. A comprehensive archaeological survey conducted by Cultural Surveys Hawaii, Inc. (CSH) (Cultural Survey Hawaii, 2000) indicates that most of the historical or culturally significant sites in the vicinity of the proposed development are found around the southern perimeter of Kawainui Marsh. Figure 3-24 shows the locations of significant historical finds close to the Kawainui Marsh, as presented in the CSH study. The Pahukini Heiau is the closest major historical site to the proposed site for the Kapa'a Light Industrial Park. The Pahukini Heiau is a 120 by 180 feet stone structure and is on the site of a landfill within TMK 4-2-15:003, adjacent to the proposed site. According to the website of the Office of Hawaiian Affairs the Heiau was built by the Chief Olopana and was used in important state functions. The Heiau is completely surrounded by Kapa'a landfill and was badly neglected for many years, until it was restored and rededicated in the late 1980s. Other historical sites close to the Kawainui Marsh are shown on Figure 3-24 and are briefly described in Table 3-7. The column indicated as "State Site #" in Table 3-7 refer to the Hawaii State Register for Historic Places.

Figure 3-24 Cultural resources existing environment

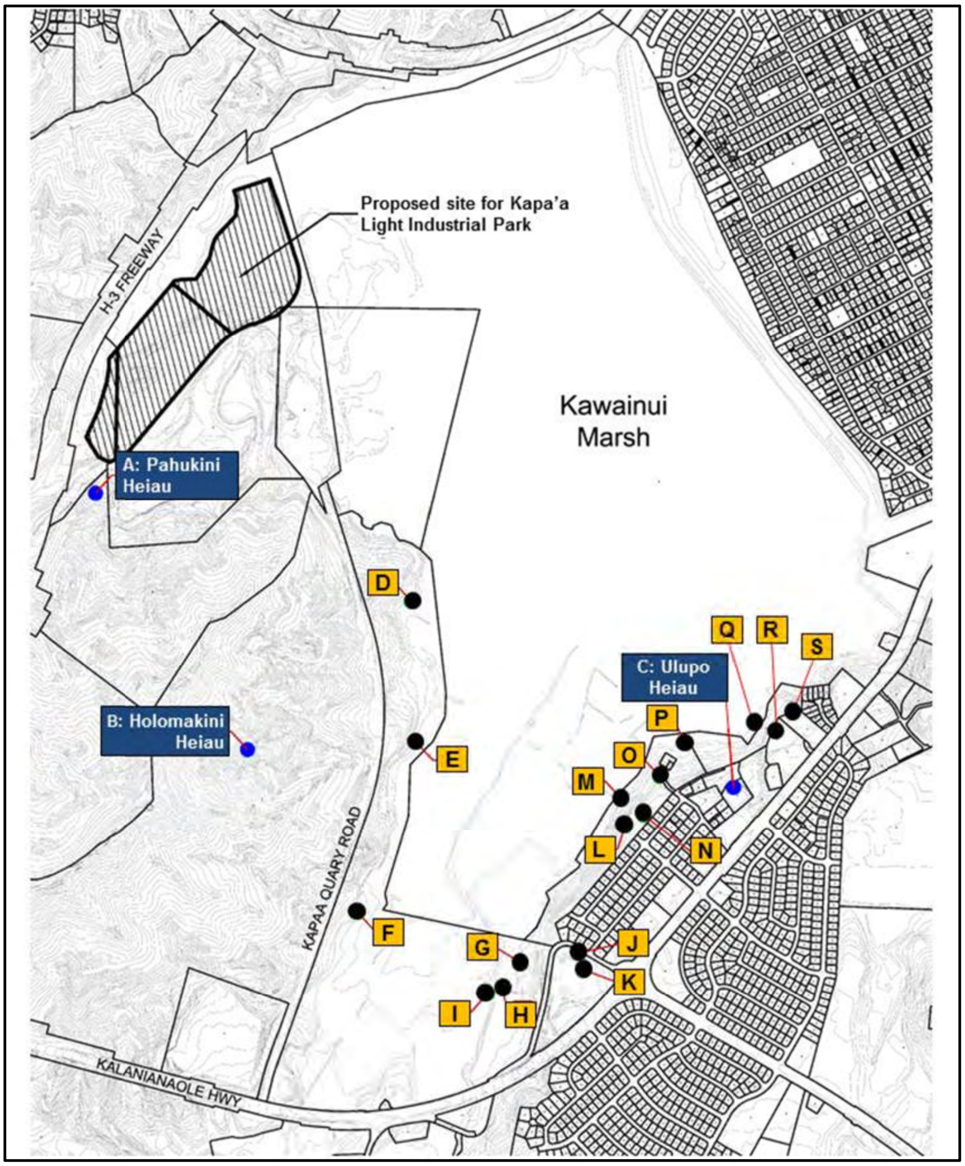


Table 3-7 Historical state sites around the Kawainui Marsh

ID of State site in Figure 3-24	State Site #	Site Description
A	50-80-11-359	Pahukini Heiau; in the middle of landfill in Kapa'a Quarry. Heiau also called Mo'okini Heiau; said to be built by High Chief Olopana in the 12th century; heiau is a Luakini or state-class heiau , where important state matters, including preparation for war were conducted.
B	50-80-11-360	Holomakini Heiau; supposedly built by high chief Olopana in the 12th century; the heiau was long thought to be destroyed when the land it occupied was cleared for agriculture; the indicated location is the presumed location of the Holomakini Heiau.
C	50-80-11-371	Ulupo Heiau; heiau was thought to be built mystically in one night by the Menehune; heiau had significance in preparing animal sacrifice; the site is a State park.
D	50-80-11-2023	Remnants with retaining walls, alignments of rocks, terraces and platforms
E	50-80-11-3865	Low stone wall and terrace
F	50-80-11-2026	A large agricultural terrace
G	50-80-11-2024	Mounds, wall remnants, a terrace
H	50-80-11-3962	Three historical building
I	50-80-11-3962	Earthen mounds
J	50-80-11-3960	A large lo'i, stone and earthen platform, stone lined channel, mound
K	50-80-11-2028	Wall remnants
L	50-80-11-2029	Large agricultural complex with rectangular fields

M	50-80-11-3959	Large number of mounds, agricultural terraces, walls, historical house foundation, etc.
N	50-80-11-2031	Several surface artifacts, evidence of prehistoric occupation
O	50-80-11-3961	Stone mounds, stone-edged canal, terraces, retaining walls
P	50-80-11-3957	Agricultural terraces, mounds, walls, remains of historical structure
Q	50-80-11-2022	Series of terraces, long retaining wall, remnants of historical house, a spring
R	50-80-11-3958	Terrace, walls
S	50-80-11-2027	Stone-walled enclosure, piles of rock, terrace

3.5 Air Quality

Air pollution in the vicinity of the proposed site can be attributed to anthropogenic and natural sources. Air quality impacts due to human activities mainly result from various commercial and industrial activities and from traffic. Relevant sources of air pollution are:

- Motor vehicles, cars and trucks, around the proposed site. There are a considerable number of heavy vehicles that serve the quarry and landfill operations, the refuse transfer station, the existing warehouse development and other industrial activities in the area. Commuters from Kailua and Kaneohe use the Kapa'a Quarry Road to travel to and from the central part of Oahu. The H3-Freeway directly passes the proposed site on its northern boundary and represents a significant contributor for release of air pollutants from motor vehicles.
- Dust from quarry, landfill and Green Waste operations, which represent earth moving activities.
- Dust set free by the outdoor equipment storage and building material processing activities which are presently ongoing on parcels TMK 4-2-15:001 (portion of)
- Waste decomposition in landfills, which generate methane.
- Fumes from paint, varnish, aerosol sprays and other solvents used in industrial and commercial activities in the Kapa'a Valley.

A relevant natural source for air pollution in the area is dust emitted from areas of land with little or no vegetation cover. Past land use in the area has resulted in extensively denuding of the site from natural vegetative cover facilitating erosion and soil loss.

In addition to release of airborne pollutants directly to the atmosphere, indoor air pollution is an increasingly important aspect to characterize the impact of air pollutants to occupants of buildings. Low Indoor Air Quality (IAQ) is generally attributed to poor ventilation and the elevated internal release of pollutants such as building materials emitting gaseous ingredients, paints and solvents emitting volatile organic compounds (VOCs), particulates and carbon monoxide. In addition, biological agents, either produced in the buildings or introduced by the ventilation system of imported materials, can accumulate in buildings and can cause significant health risks for the occupants.

Possible problems with indoor air quality in existing warehouses at the proposed site of the Kapa’a Light Industrial Park could result from older warehouse construction technology and inappropriate handling of materials. Indoor air pollution is an important consideration for the new warehouses development with environmentally friendly construction and operation.

3.6 Noise Characteristics

Noise pollution by definition is displeasing human or machine-created sound that has negative effects on human beings or animal life. The main current sources of noise at/near the proposed site are vehicular traffic, industrial and commercial activities and noise generated by recreational activities, mainly from model airplanes operated from the Kawainui Model Airplane Field.

The sources of noise in the vicinity of the proposed sites are augmented by distant noises, such as traffic noises from the H3-Freeway, noise from aircraft passing the site and noise from the urban developments in the north, west and south of the Kawainui Marsh.

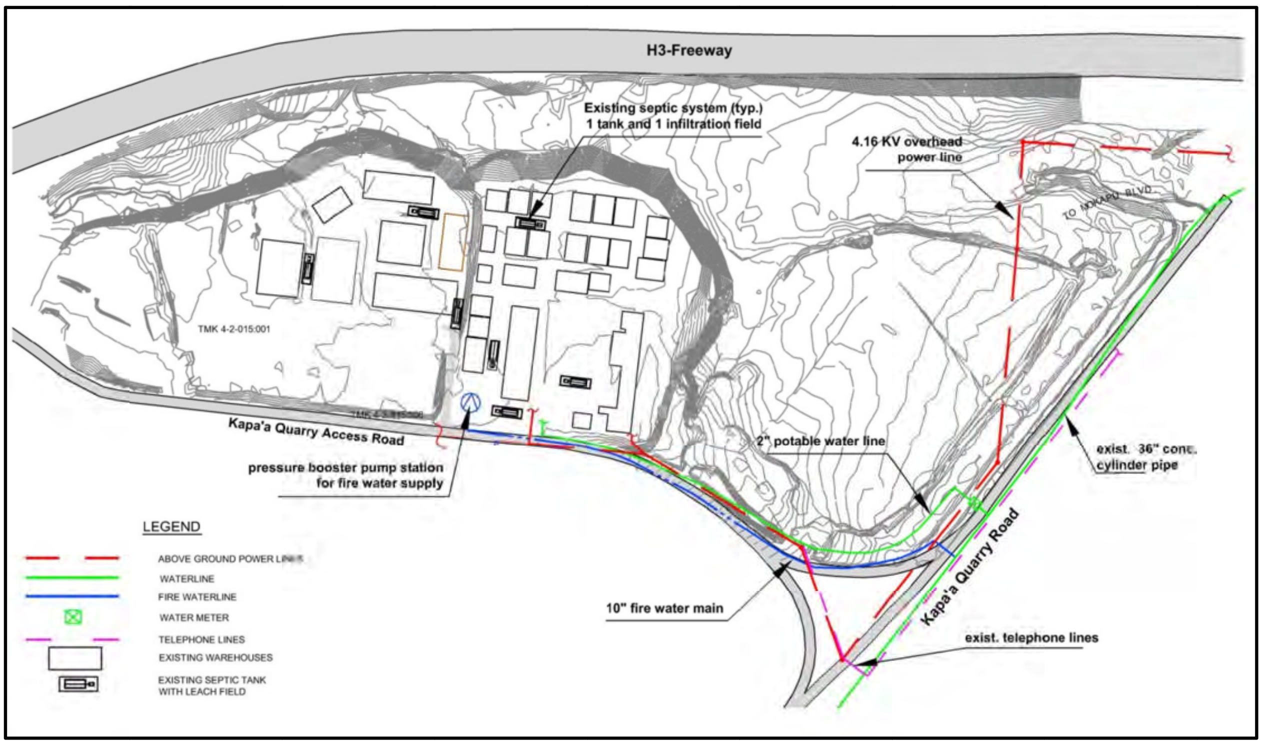
Current noise levels at the site are mainly caused by traffic passing the site on the Kapa’a Quarry Road. Minor sources of noises might be caused by light industrial activities. Based on peak traffic volume for cars and heavy trucks evaluated for this environmental review by a traffic impact assessment report (see Appendix 5) and considering an average speed of 30 and 25 miles per hour for cars and trucks on the Kapa’a Quarry Road, respectively, the traffic noise at the Kapa’a Quarry Road adjacent to the proposed site is estimated at 60 L_{dn} dB. The noise level of about 60 L_{dn} dB represents an average noise for urban residential area. As a general rule, traffic volumes must double or halve to produce a 3 dBA increase or decrease, respectively. A one or two dBA increase or decrease in noise level is not readily perceptible to the human ear.

The main recreational activities in the vicinity of the proposed project site are associated with operating model airplanes, an activity that inherently produces a certain level of noise since small, high-pitched engines are used in the model planes. Wildlife can be affected by elevated noise levels through interference with their use of sounds in communication and by causing stress. The main result of elevated noise on the animal world might be a reduction of usable habitat. Elevated noise levels could cause migration of animals away from the source of noise. Habituation, a behavioral pattern that causes animals to become familiar with noise levels and activities, might mitigate the migration of animals away from the source, especially if the noise levels are at background levels and not sharp noise peaks.

3.7 Utility Infrastructure Existing Environment

The existing utility infrastructure at the proposed site is depicted in Figure 3-25.

Figure 3-25 Utility infrastructure existing environment



3.7.1 Water System

The existing potable water infrastructure supplying potable water and firefighting water is depicted in Figure 3-25. An existing 36-inch water main runs along Kapa'a Quarry Road and supplies water to the site. A 2-inch water line connects the existing users at the site with the 36-inch water main in Kapa'a Quarry Road. There is a 2-inch water meter on the property next to the Kapa'a Quarry Road. A 10-inch firewater main also the 36-inch water main to an existing fire pumping station on parcel TMK 4-2-015:008. The fire pump station boosts the water pressure if firefighting water is needed. The current water demand at the existing warehouse development is estimated at about 20,000 gallons per day. The firefighting water demand is 4,000 gallons per minute for a three hour fire.

3.7.2 Wastewater System

The proposed site is currently not connected to the municipal sewer system since there is no gravity sewer or forced wastewater main serving the property or along the Kapa'a Quarry Road. Wastewater is presently treated on-site in seven septic systems, with each having one 1,250 gallons septic tank and one infiltration field (leach field) with average dimensions of 60 feet in length, 20 feet in width and 4 feet in depth. The sludge collected in the seven septic tanks is removed by private service companies every four to six weeks. Figure 3-25 shows the locations of the seven septic tanks within the parcel TMK 4-2-015:008. Presently there are no septic systems within the parcels TMK 4-2-15:01 (portion of) and 006.

3.7.3 Electricity and Telephone

The existing users of electricity on the proposed site are supplied via a HECO 4.16 kV line that connects to one 4.16 kV circuit on Mokapu Blvd. Figure 3-25 shows the alignment of the 4.16 kV line. From Mokapu Boulevard, the power line first runs southwest parallel to the H3-Freeway and then changes direction to the southeast. The line crosses the parcel TMK 4-2-015:006 and then runs parallel to the Kapa'a Quarry Road to the intersection of Kapa'a Quarry Access Road and Kapa'a Quarry Road. From there the power line again changes direction and runs westward along the Kapa'a Quarry Access Road to serve consumers of electric power in the Kapa'a Valley.

The existing 4.16 kV is the only electricity supply line to the Kapa'a Valley. According to HECO there is little spare capacity on the circuit from Mokapu Blvd. to serve new loads. Therefore in order to serve new loads a new circuit might need to be installed to the proposed site along Kapa'a Quarry Road from an existing 12.47 circuit at Kalanianaole Hwy.

Telephone service to the Kapa’a Valley is provided by an aboveground telephone line that runs along Kapa’a Quarry Road towards Mokapu Blvd., as illustrated in Figure 3-25.

3.8 Transportation Existing Environment

Section 3.8 describes the existing transportation system serving the proposed project site, including the local roadway network, traffic conditions, public transportation, parking and pedestrian and bicycle circulation.

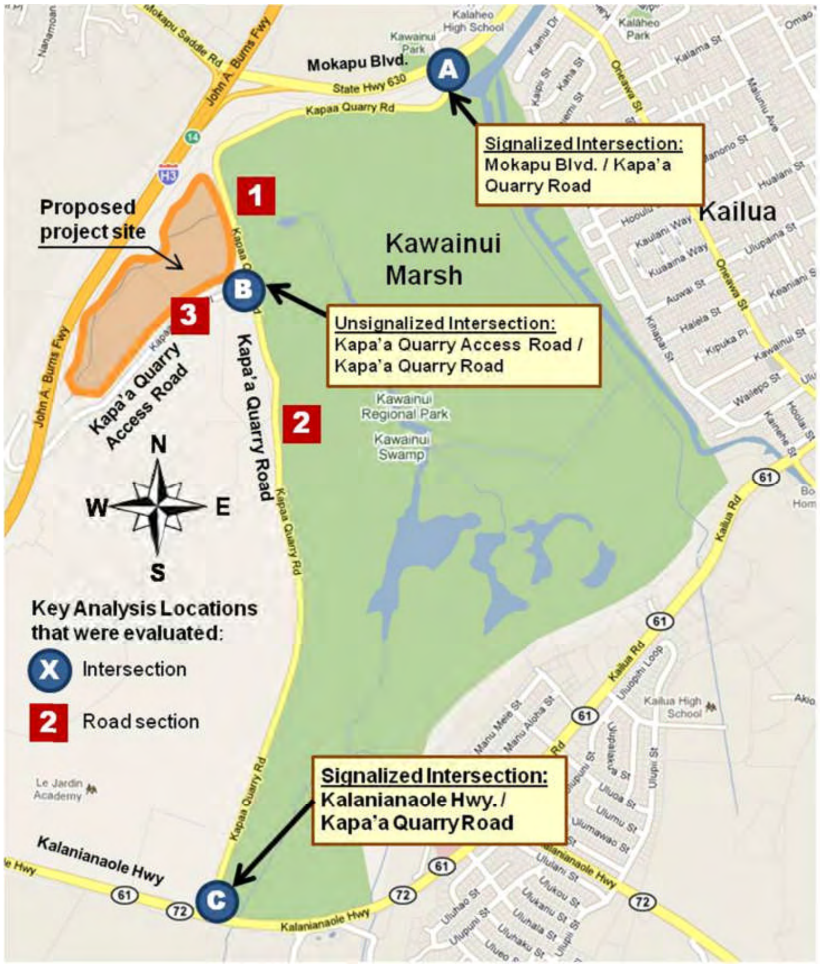
3.8.1 Roadway Network

The proposed project site is situated just south of John A. Burns Freeway (H3 Freeway) within Koolaupoko district of the Island of Oahu. Figure 3-26 shows the Kapa'a Quarry Road, a County road, which connects the Kapa'a Valley with the State highways Mokapu Blvd. and Kalanianaole Highway. The Kapa’a Quarry Access Road is a dead-end road which connects the industrial land uses in the upper Kapa’a Valley with the quarry road.

The Kapa’a Quarry Road is a Class II roadway. The length of the two-lane road is 2.5 miles and the lane-width is 11 feet. The road connects the proposed site and other facilities in the Kapa’a Valley to the regional roadway network south and north of the Kawainui Marsh. The Kapa’a Quarry Road runs along the western boundary of the Kawainui Marsh. Besides providing access to the Kapa’a Valley the road is also a popular shortcut road, connecting the two major roads, the Kalanianaole Highway, in the south and the Mokapu Boulevard, in the north. Vehicles traveling on the Kapa’a Quarry Road between Kalanianaole Highway and Mokapu Boulevard can bypass roads in Kailua and Kaneohe.

The Kapa’a Quarry Access Road is a Class II roadway. The length of the two-lane road is 0.7 miles, from the intersection with Kapa’a Quarry Road to the terminus of the road, which is the gate to the Ameron quarry. The lane-width is 11 feet. The road intersects with the Kapa’a Quarry Road and connects the installations in the Kapa’a Valley with the Kapa’a Quarry Road.

Figure 3-26 Region roadway network serving the proposed project site



The main commercial, industrial and recreational activities that generate current traffic volumes on the Kapa'a Quarry Access Road are as follows:

- Ongoing quarry and landfill operations (heavy truck traffic)
- Kapa'a Refuse Transfer Station (heavy truck traffic)
- Existing warehouses on parcel TMK 4-2-015:001
- Equipment storage and processing of construction material on parcel TMK 4-2-015:008
- Existing green wastes operations on parcel TMK 4-2-015:006 (heavy truck traffic)
- Model Plane Recreational Park (opposite the intersection of Kapa'a Quarry Road and Kapa'a Quarry Access Road

3.8.2 Key Analysis Locations

Figure 3-26 indicates the key analysis locations used in a traffic impact assessment report (TIAR; see Appendix 5) , which was conducted for this environmental review. The TIAR evaluates the existing traffic conditions at the site and predicts the future increase in traffic resulting from the proposed project.

The study area for transportation consists of three intersections located in the vicinity of proposed site (Table 3-8). Of the intersections to analyzed, two are signalized and one is unsignalized. These locations were selected for traffic analysis based upon their importance to connect the quarry and quarry access road to the regional roadway network, roadway traffic volumes and potential effect of the development scenarios and as a requirement by the reviewing agencies. The scope of the TIAR furthermore includes the evaluation of three roadway segments, two on the Kapa’a Quarry Road and one on the Kapa’a Quarry Access Road.

Table 3-8 Intersections evaluated

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

Table 3-9 Roadway sections evaluated

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

3.8.3 Traffic Volume Assessment

In order to assess traffic conditions at the intersections and on the roadways within the study area, the TIAR included a comprehensive traffic data collection program that was performed during the weekday morning and evening peak periods. The traffic data collected consisted of manual turning movement counts and identification of vehicles type. The traffic data was used as the basis for analyzing the existing operating conditions.

The traffic data collection considered the following:

- Vehicles counted included cars, trucks, buses, trucks, motorcycles, mopeds and heavy vehicles. Heavy vehicles are defined as vehicles with more than four tires. Bicycles and pedestrians were not counted. Pedestrian activity was negligible during traffic count.
- The intersections and roadways were counted from 6:30 am to 8:30 am (AM peak) and from 3:30 pm to 5:30 pm (PM peak) on both Tuesday and Thursday.
- Traffic count was conducted manually and included vehicle type identification.

3.8.4 Level-of-Service Concept

Level of service (LOS) is a common way of defining intersection and roadway capacity. In this approach, LOS ratings range from A to F, where A represents minimal delays and F represents roadways and intersections that operate over capacity, resulting in excessive delays with longer queues due to over-saturated conditions. Generally LOS ratings of A – D are acceptable while E, which is approaching capacity, is either acceptable or not depending on the jurisdiction. Level F, which represents severe congestion and is thus over capacity, is always unacceptable. Level D is typically considered acceptable for peak hour conditions in urban areas; the proposed site is located within the urban distinct.

For this DEIS, the level-of-service was assessed for three categories - signalized intersection, unsignalized intersection and roadway segments. These three roadway categories have specific methods to determine the level-of-service, as is delineated in more detail in the TIAR.

3.8.5 Existing Level-of-Service

The results of existing level-of-service analysis for the two signalized intersections and one unsignalized intersection are presented in Table 3-10. The results of existing level-of-service analysis are presented in Table 3-11.

Table 3-10 Existing level-of-service for intersections

ID	Intersection location	type of signal	Level-of-service LOS	
			AM Peak	PM Peak
A	Mokapu Blvd. & Kapa'a Quarry Road	signalized	B	C
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	B**	B**
C	Kalanianaole Hwy & Kapa'a Quarry Road	signalized	B	B

Note B**: The LOS for the unsignalized intersection reflects the minimum of LOS for the movements of the intersection

Table 3-11 Existing level-of-service for roadway sections

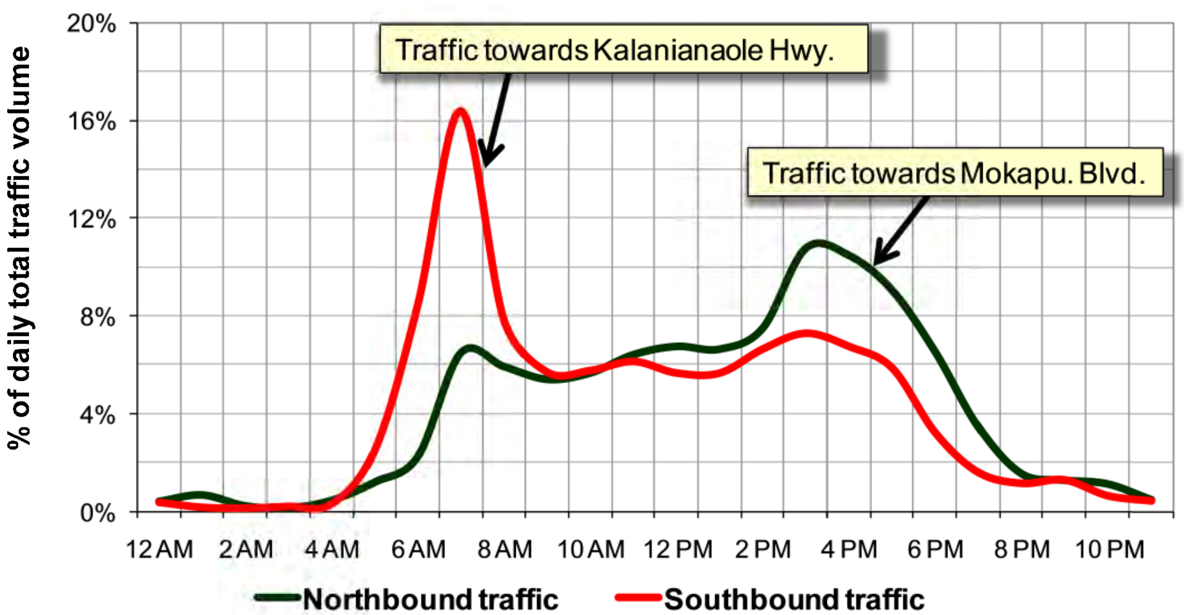
Nr.	Roadway sections locations	Level-of-service LOS	
		AM Peak	PM Peak
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	C	B
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	B	B
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	B	B

As the existing level-of-service analysis indicates, the three intersections and roadway segments that were investigated have satisfactory LOS.

3.8.6 Characteristics of Directional Traffic on the Roadways Investigated

The directional traffic on Kapa’a Quarry Road has a pronounced difference between the morning and afternoon traffic. Figure 3-27 shows the data analysis of an automatic traffic count (which was unrelated to the traffic assessment for this DEIS), on the northern section of the quarry road. The traffic volume on the y-axis indicates the percentage of the directional traffic in relationship with the time of the day. The traffic volume distribution for the south and northbound traffic in Figure 3-27 suggest pronounced morning and the afternoon peak for the southbound and northbound traffic on the quarry road, respectively. This can be interpreted as commuters using the quarry road driving from Mokapu Boulevard to Kalanianaole Highway in the morning and returning via the quarry road in the afternoon.

Figure 3-27 Diurnal distribution of traffic volumes on northern roadway section of quarry road



3.8.7 Existing roadway access to the proposed site

At present the three parcels that would constitute proposed site are accessed from Kapa’a Quarry Access Road by five road entrances, as shown in Figure 2-73.

Entrance No. 1 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:001. This is an unpaved entrance.

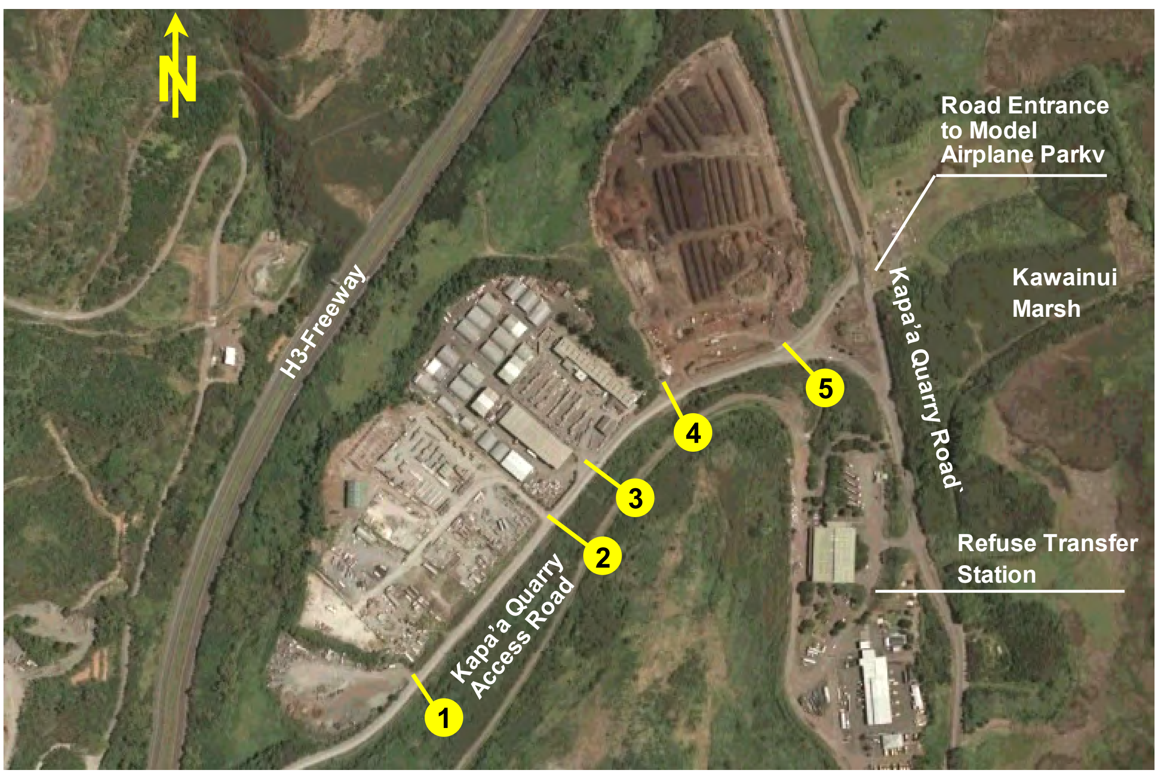
Entrance No. 2 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:008. This is a paved entrance.

Entrance No. 3 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:008. This paved entrance provides access to existing warehouses and outdoor equipment storage areas in the south-western part of parcel TMK 4-2-015:008.

Entrance No. 4 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:006. This is an unpaved entrance.

Entrance No. 5 provides access from to the Kapa'a Quarry Access Road to parcel TMK 4-2-015:006. This is an unpaved entrance.

Figure 3-28 Existing road entrances to the proposed site



X = No. of Present Road Entrance to Proposed Site

3.8.8 Public Transportation

At present there is no public transportation service to the proposed site. The two nearest bus stops are on Kalanianaole Highway and Mokapu Boulevard.

The bus stop on Kalanianaole is at the intersection with Auloa Street, for both westbound and eastbound buses. This bus stop is at a distance of 1.3 miles from the proposed site. This bus stop is served by six bus lines (TheBus routes 56, 57, 70, 77, 85, and 89).

The bus stop on Mokapu Blvd. is at the intersection with Oneawa St., for both west and east bound buses. This bus stop is at a distance of 1.9 miles from the proposed site. This bus stop is served by three bus lines (TheBus routes 56, 85, and 86).

3.8.9 Parking

Parking at the proposed site is entirely off-road on parking spaces provided by the operator of the warehouse development. The number of parking spaces is concurrent with the applicable city ordinances of one parking space per 1,500 square feet of warehouse space.

3.8.10 Pedestrian and Bicycle Facilities and Circulation

There is negligible pedestrian activity around the proposed site. The roadways do not feature dedicated sidewalks or even shoulders.

From informal interviews it was learned that a few employees who work in the existing warehouse development use bicycles to commute to work. The Kapa’a Quarry Road cannot be deemed as a safe road for bicycles since the road has no shoulders. The road is, in sections, covered with thick foliage of trees which produce shade and sometimes dim lighting conditions. Furthermore the road has several turns and dips, which affect visibility.

The proposed marsh perimeter pathway (refer to Section 3.10.6) would provide a safe and pleasant venue for both bikers and pedestrians to reach the proposed site from Mokapu Blvd. and Kalanianaole Hwy.

3.9 Existing Views of Proposed Site

Industrial and commercial activities have significantly affected the appearance of the Kapa’a valley where agriculture and cattle ranching once thrived until the late 1940s. The topography of the valley has been significantly affected by quarry and landfill operation, which started about 60 years ago. The deep changes in the appearance of the valley include large quantities of earth moving, exposed rock formations, large quarry or landfill equipment, warehouse structures and the refuse transfer station in the lower and southern. Construction of the H3-Freeway has further resulted in major changes in the appearance of the valley. Seven views of the site and adjacent land are presented hereafter to exemplify the appearance of the proposed site in the current state. Figure 3-29 defines the views 1 through 7 in terms of location and direction of the camera. Figures 3-30 through 3-36 show the views defined in Figure 3-29 in annotated pictures.

Figure 3-29 Definition of existing views of the site

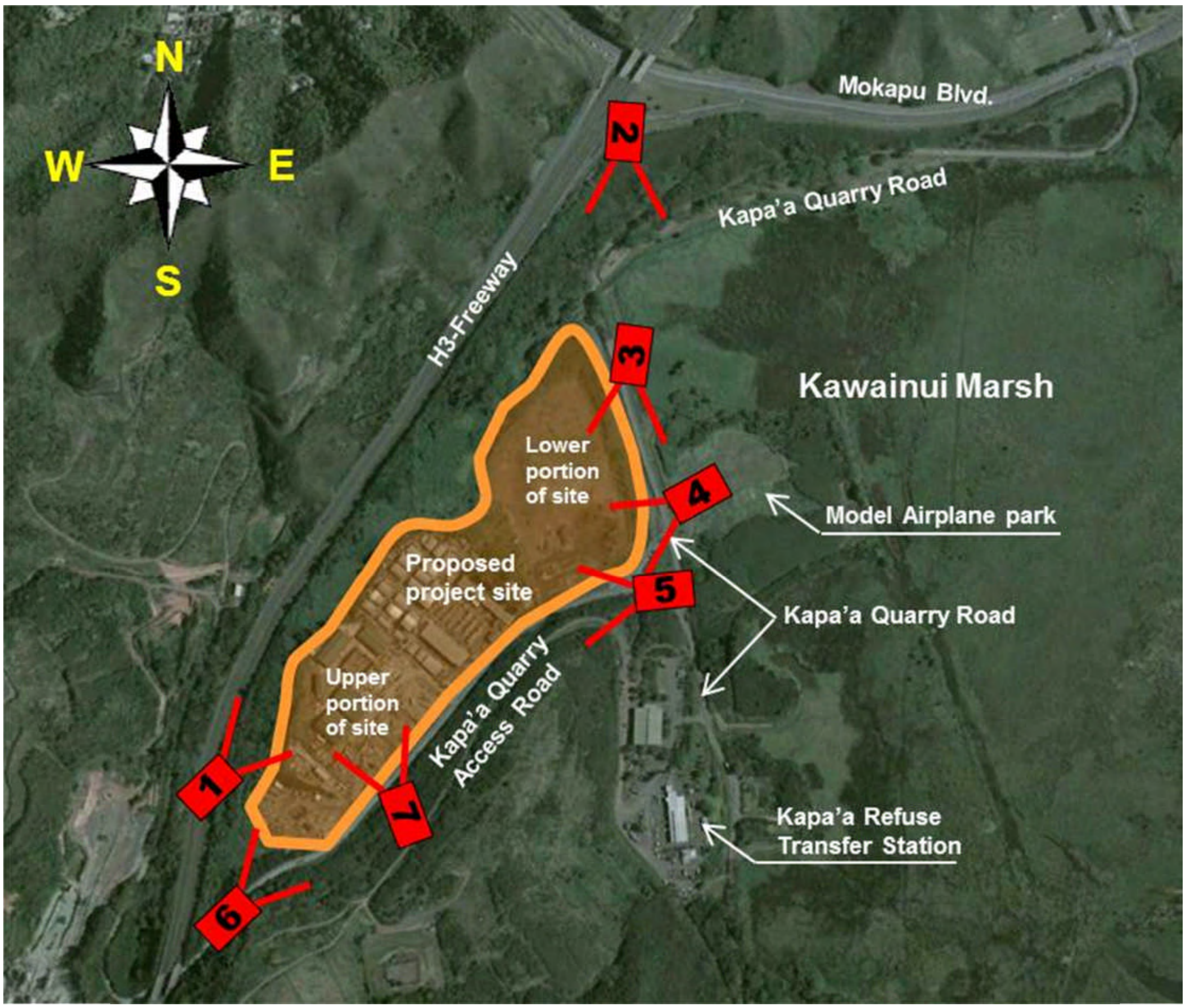


Figure 3-30: Existing view 1
View from H3-Freeway traveling northbound. The proposed site is on the right, obstructed by thick vegetation; as indicated by the yellow arrow.

Figure 3-31: Existing view 2
View from the H3-Freeway traveling northbound; at the exit to Mokapu Blvd. The lower portion of the proposed site is visible in the center and the upper portion is on the right of the picture; as indicated by the yellow arrows.

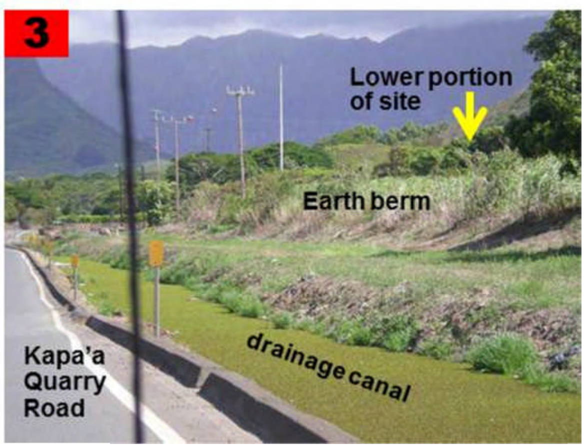


Figure 3-32: Existing view 3
View from the Kapa'a Quarry Road southbound, passing the lower portion of the site; the earth berm is shown beyond the existing drainage canal along the quarry road.

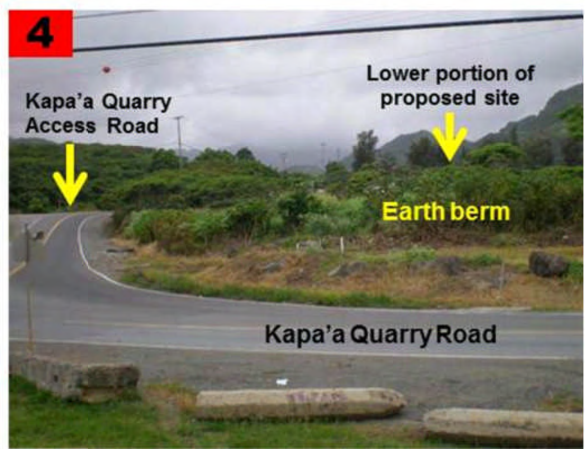


Figure 3-33: Existing view 4
View from the Kawainui Model Airplane Park towards the lower portion of the proposed site, the intersection of the Kapa'a Quarry Road and Kapa'a Quarry Access Road in seen in the left foreground. The lower portion of the proposed site is located behind the earth berm.

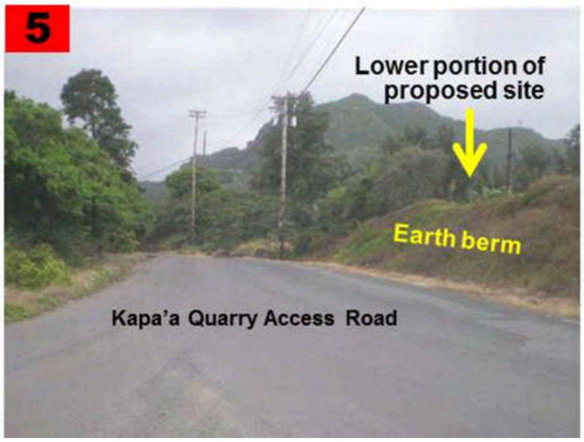


Figure 3-34: Existing view 5
View from Kapa'a Quarry Access Road traveling westbound. The lower portion of the proposed site is obstructed by the berm on the right.

Figure 3-35: Existing view 6
View from Kapa'a Quarry Access Road traveling eastbound. The upper portion of the proposed site, is beyond the trees on the left.

Figure 3-36: Existing view 7
View from Kapa'a Quarry Access Road traveling eastbound, existing warehouses are seen in the photo.

3.10 Land Use and Zoning Existing Environment

This section discusses the historical and existing land uses and the existing land use zoning of the proposed site and surrounding land.

3.10.1 Land Use and Ownership

The Kapa’a Valley within which the proposed project site of the Kapa’a Light Industrial Park is located has been subject to significant commercial and industrial developments during the past fifty years. Historically, agriculture was the prime land use in the Kapa’a Valley from the time of early settlement of the Hawaiian Islands through the mid 1900’s. For example, cattle ranching operations were important in Kapa’a Valley until the 1940’s.

Quarry operations started in the valley in the early 1950’s. This significantly changed the primary land use and the general appearance of the valley. The lower plateaus of the valley changed appearance as the quarry operations expanded. While the lower stretches of the valley were agricultural landscapes, this land was converted to serve industrial uses. Significant deposits of quarry tailings and overburden altered the topography of the valley. One of the overall changes of the valley was a raised roadway that subsequently became the Kapa’a Quarry Road. The roadway ran across the valley mouth and segregated the Kapa’a watershed from the Kawainui Marsh. While the Kapa’a watershed previously drained into the marsh through numerous water conveyances, the drainage of the watershed became concentrated to a limited number of openings through the raised roadway. The Kapa’a Stream subsequently acquired the present streambed, which is located between the landfill plateau created by landfill deposits and the H3-Freeway raised roadway.

The 1960’s and 1970’s brought about an increase in quarry related activities to the area. As quarry operations ceased in different locations, due to the end of cost effective processing, municipal solid waste landfill operations followed in its place. A large municipal landfill was operated in the valley through 1990. Today, there are still municipal waste related activities going on in the valley, though not in the form of landfills but in form of the Kapa’a Refuse Transfer Station, where waste collected in windward communities is transferred to larger transfer vehicles and is then transported to the leeward site of Oahu. Construction of the H3-Freeway and the associated earth moving and mass grading introduced another significant change to the Kapa’a Valley starting in the 1970’s.

In the mid-1970’s the development of an industrial park in the lower portion of the valley started with the construction of several warehouses on land that was created by landfill deposits. These warehouses are located on a near-level plateau. The number of warehouses has continuously increased over the years in response to a strong demand for industrial warehouse space in the Kailua and Kaneohe regions.

In summary, the Kapa’a Valley has been subject to intensive industrial activities over the past decades, which have caused significant impact on the environment. Earth moving and deposition activities have changed the original natural topography and visual vistas. Noise and air pollution have been introduced to the area due to land filling and other commercial and industrial activities. And finally, surface run off and erosion have contributed to degradation of water quality in Kapa’a stream. Although the proposed Kapa’a Light Industrial Park would expand the existing warehouse development by about twice the present size, the proposed warehouse park would not significantly increase the general industrial characteristics of the entire Kapa’a Valley.

3.10.2 City and County of Honolulu Land Use Zone Designation

All land within the City and County of Honolulu is classified into specific zoning districts. The site of the proposed Kapa’a Light Industrial Park encompasses portions of three land parcels. Two of which, TMK 4-2-015:001 (portion of) and 4-2-015:006 are presently classified as General Preservation District (P-2). The third parcel, TMK 4-2-015:008 is classified as Intensive Industrial District (I-2). Figure 3-37 shows the General Location Map of the proposed site.

Most of the land parcels in the vicinity of proposed project site are classified as either Restricted Preservation District (P-1) or General Preservation District (P-2). Figure 3-38 illustrates the land use zoning districts in the vicinity of the proposed site.

3.10.3 State Land Use Classification of Proposed Site

All lands in the State of Hawaii are classified into one of four land use districts; Conservation, Agricultural, Rural and Urban Districts. Urban districts include lands that are now in urban land use or represent a sufficient reserve area for foreseeable urban growth. Urban districts allow certain land use activities which are regulated by ordinances of the counties. The proposed Kapa'a Light Industrial Park would be within the State Urban District. Figure 3-39 shows the State Land Use Districts in the vicinity of the proposed site. A small, less than one acre portion in the southwest of parcel TMK 4-2-015:001 (portion of) is within the State “Conservation” District. This small portion of parcel TMK 4-2-015:001 would not be part of the development footprint and would remain open space. The requested zone change for the parcel TMK 4-2-

015:001 would not include this small land portion and therefore the requested zone change would not require a State land use zone change from Conservation to Urban district.

Figure 3-37 General location map

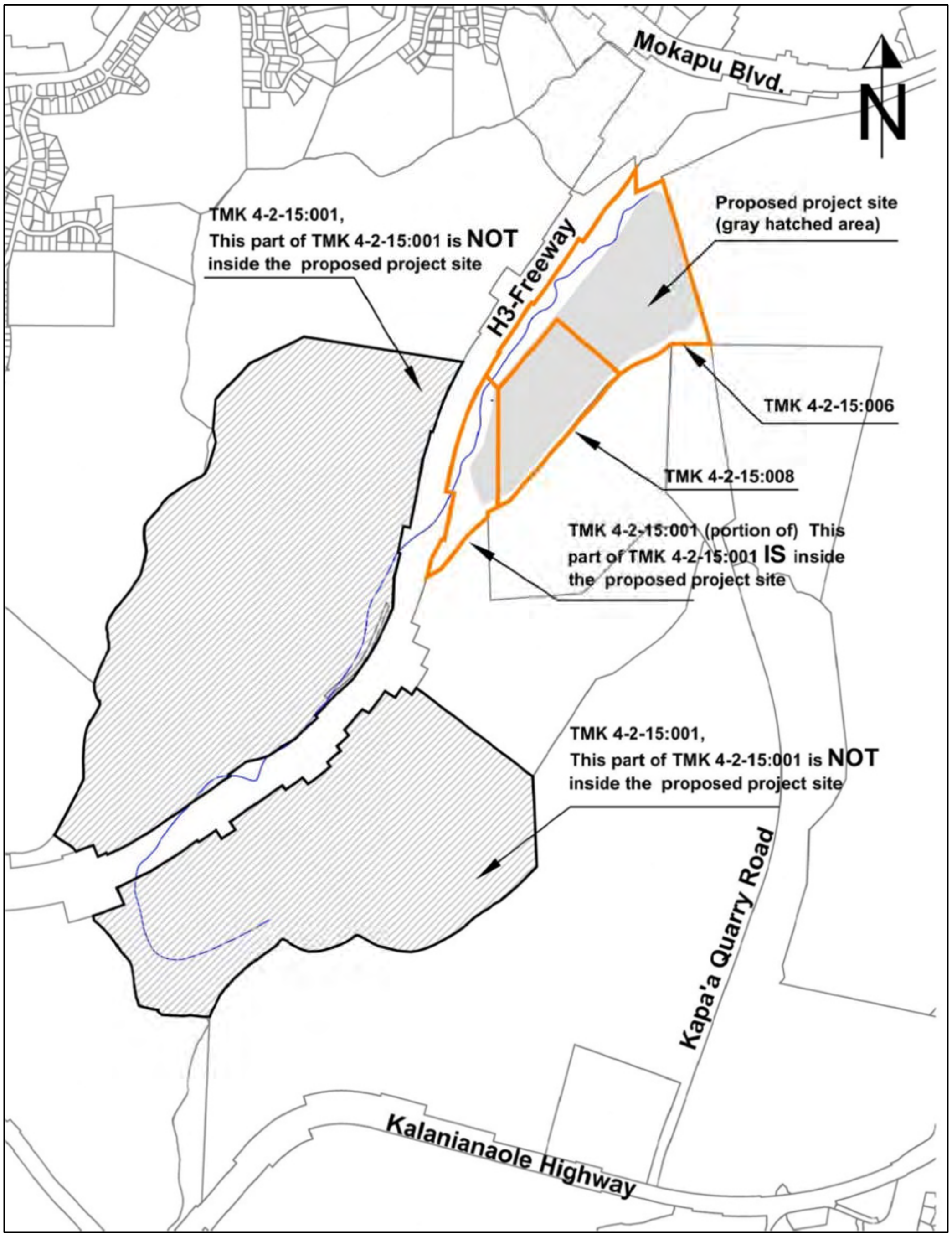


Figure 3-38 City & County land use zone designation in vicinity of project site

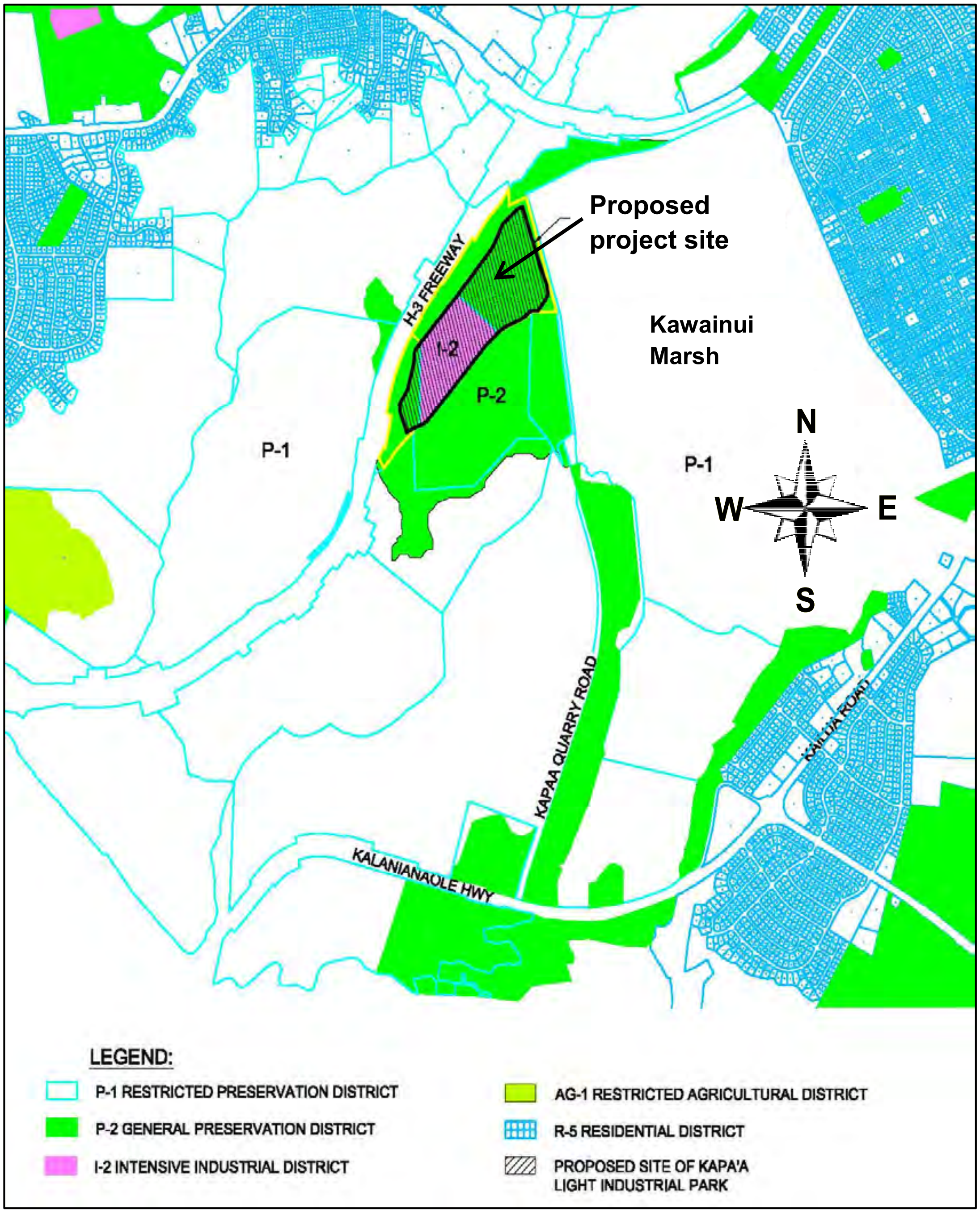
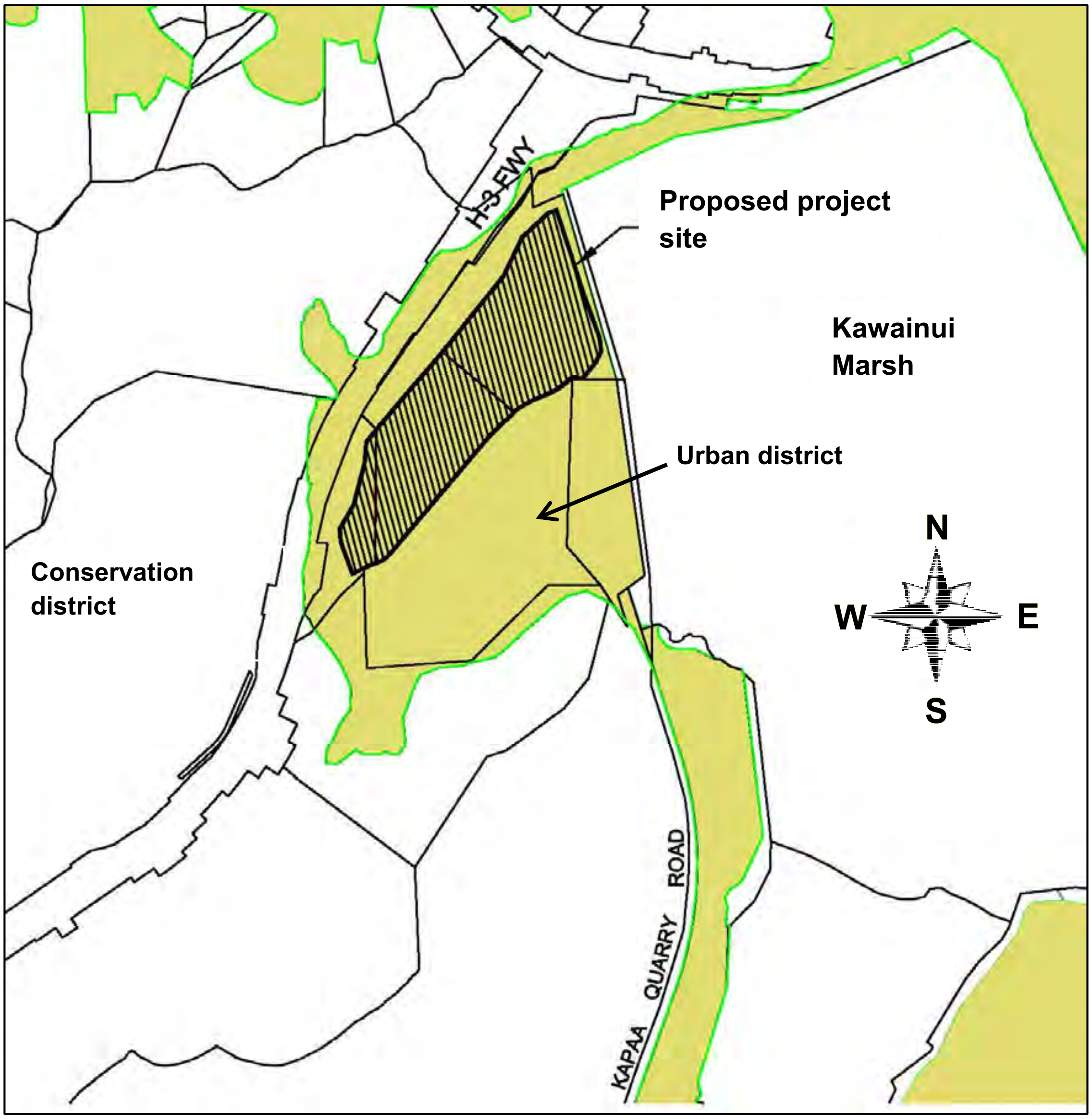


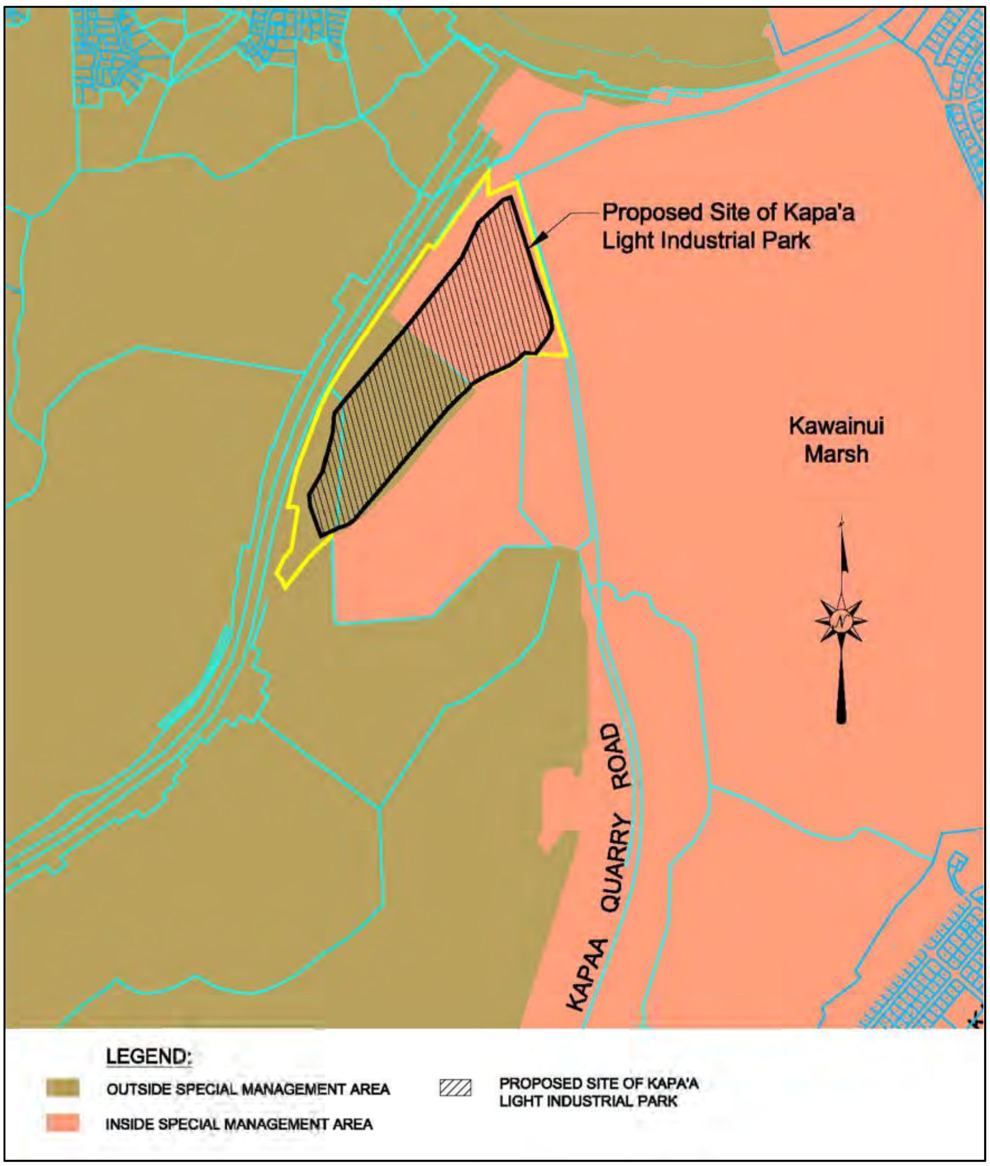
Figure 3-39 State land use districts in vicinity of project site



3.10.4 Special Management Area

According to Hawaii Revised Statutes (HRS) Chapter 205-A the City and County of Honolulu has the authority to regulate land use in Special Management Areas (SMA). As depicted in Figure 3-40, parts of the proposed site of the Kapa'a Light Industrial Park are within the SMA District. Therefore the proposed development will be subject to regulatory procedures, permit requirements, and review under the City's SMA regulations.

Figure 3-40 Special Management Area (SMA) district in vicinity of project site



3.10.5 Land Uses Surrounding the Proposed Site - Kawainui Marsh

Kawainui Marsh is the largest wetland in the Hawaiian Islands. The total area of the marsh with all associated wetland areas is approximately 850 acres. In 2005 the Kawainui Marsh together with the Hamakua Marsh Complex was introduced into the international Ramsar List, a list of Wetlands of International Importance. According to the Ramsar guidelines, " wetlands included in the list acquire a new status at the national level and are recognized by the international community as being of significant value not only for the country, or the countries, in which they are located, but for humanity as a whole…".

Approximately 4,000 years ago the marsh was an inland sea, which was divided from the ocean by a sediment barrier. The marsh accommodated a large fishpond and an agricultural field system that sustained the Hawaiian population in the area. The marsh is part of the ahu pua'a of Kailua, a section of land that stretched from the mountains to the ocean and encompassed a diversity of natural resources, which supplied the life essentials of the Hawaiian population.

The marsh played an important role in the Hawaiian culture. The marsh supported a 400-acre fishpond and an agricultural field system that provided to the people. Several heiaus and other gathering place were constructed in the area. Several of them are preserved to date and provide a rich educational and cultural experience to the people living and visiting the area. Most of the cultural assets are located in the southern part of the marsh, approximately 2 miles away from the site, on average.

A rich wildlife of birds, fish and aquatic animals use the Kawainui Marsh as their home. The marsh is also habitat for the federally endangered Hawaiian stilt, Hawaiian moorhen, Hawaiian coot and Hawaiian duck as well as populations of protected migratory waterfowl and shorebirds protected. The extent of the natural habitat for wildlife has been shrinking in the marsh due in part to a decrease of open water area caused by sedimentation and encroachment of non-wetland vegetation. Measures to restore important wetland throughout the marsh have been ongoing, though at times with different scope and intensity. The goal of such efforts is restore the capacity of the marsh to serve as quality wildlife habitat and effective flood control.

The marsh plays an important hydrological function for the Kailua watershed. During heavy stormwater events runoff, associated suspended solids and nutrients are held back in the marsh resulting in lower runoff impacts on Kailua Bay. Four decades of increased urbanization of the Kailua watershed increased soil erosion and sedimentation that have resulted in a decreased usable volume of the marsh and its ability to hold back water. Increased influx of nutrients into the marsh has caused an increase of free-flowing vegetation that has resulted in a decreased amount of free water surface.

The Kawainui Marsh has been an important area for recreation and repose for the population of Kailua, the Windward community and Oahu as a whole. Several recreational parks are rimming the marsh. A Model Airplane Field at the north-eastern edge of the marsh provides recreational opportunities for fans of model flying aircraft. The marsh furthermore offers scenic views of wetlands and mountains.

3.10.6 Land Uses Surrounding the Proposed Site - Proposed Kawainui Marsh Perimeter Trail System

The construction of a multifunctional pathway, e.g. a combined pedestrian walkway and bikeway around the perimeter of the Kawainui Marsh, has been promoted by State and County agencies and residents of the Kailua region for more than a decade. A combined pedestrian and bicycle pathway around the marsh is recommended as a part of the efforts to preserve, protect and enhance the ecological and historic/cultural resources of the marsh.

Plans of the Kawainui Marsh Pathway that have evolved over the years envision several segments of paths stretching around the entire perimeter of the Kawainui Marsh. Figure 3-41 shows the proposed six segments of the pathway.

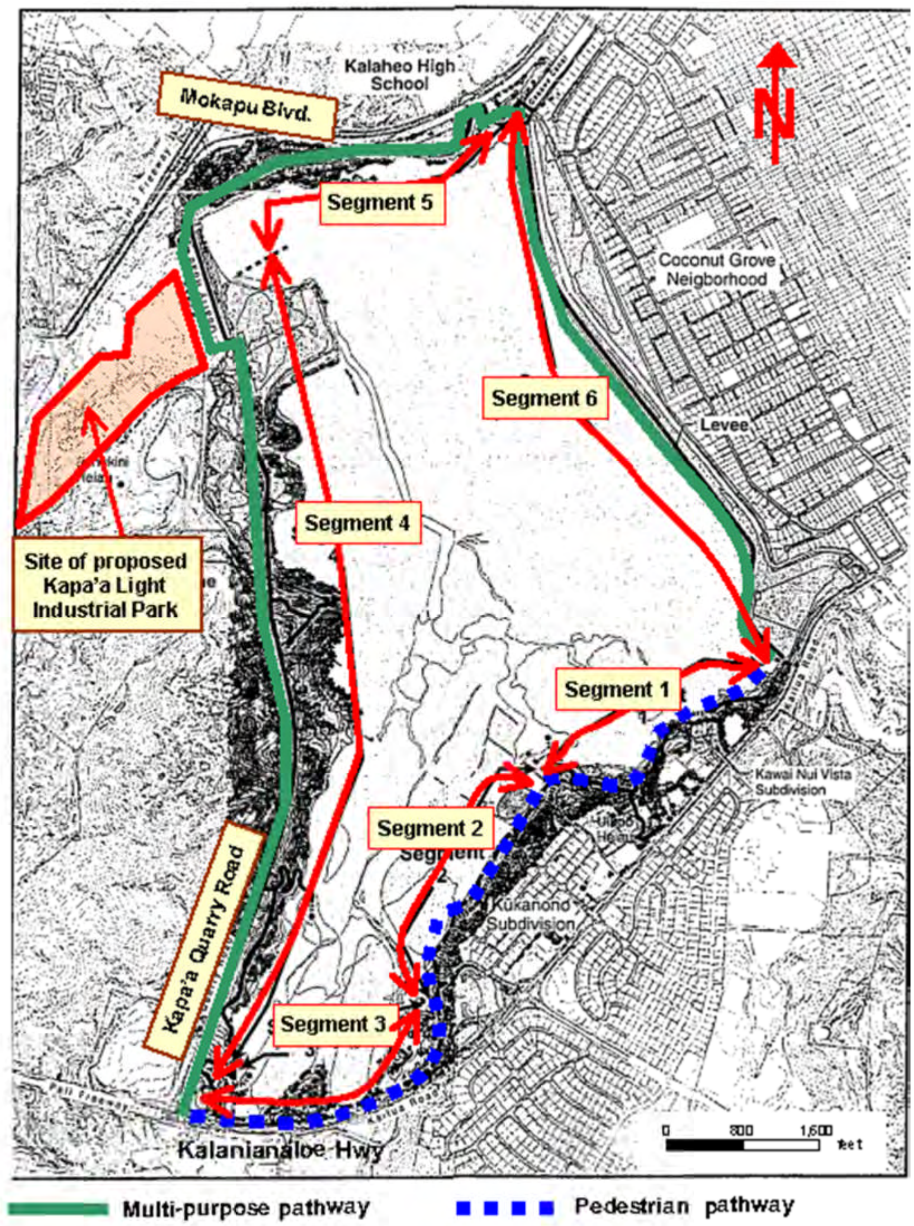
<u>Segment 1, 2 and 3 would be located at the southern boundaries of the Kawainui Marsh:</u>
Segment 1 would be a pedestrian-only pathway along the slopes of the marsh. The path would be within an area that features several archeological and historic sites. Segment 2 would be basically a continuation of Segment 1 and would be a pedestrian-only pathway. The alignment would be finalized after the completion of a proposed water bird habitat restoration project. This segment of the pathway would offer some archeological and natural features and would have excellent marsh viewing. Segment 3 would connect the pathway Segment 2 with the trail system that commences at the intersection of Kalanianaole Hwy and Kapa’a Quarry Road. Construction of Segment 3 might be contingent on the construction of ponds for wildlife habitats and the relocation of cattle grazing in this area.

<u>Segment 4 would be located along the western boundary of the Kawainui Marsh:</u> Segment 4 would stretch from the intersection of Kalanianaole Hwy to the Model Airplane Park. Segment 4 would be the longest part of the proposed pathway system. It would feature a multi-purpose pathway for pedestrians and bicyclists. The proposed alignment of Segment 4 is on the marsh side of the Kapa’a Quarry Road. The proposed design of the pathway would place a small median between the multi-purpose pathway and the Kapa’a Quarry Road in

order to separate vehicles from pedestrians and bicyclists, increasing safety along the pathway.

Figure 3-41 Segments of proposed Kawainui Marsh Pathway

(source: Helber, Hasters and Fee, Planners (2003), enhanced graphics by the author)



Segment 5 would be located at the northern boundary of the Kawainui Marsh: Segment 5 would extend from the Model Airplane Park to a location on Mokapu Blvd. across Kalaheo High School. This segment of the perimeter pathway would feature a multi-purpose pathway for pedestrians and bicyclists. The pathway would cross from the marsh side to the mauka (mountain) side of the Kapa'a Quarry Road at the intersection of the quarry road and the quarry access road (close to the entrance to the Model Airplane Park). The pathway would cross the Kapa'a Stream with its own bridge alongside the existing overpass of the Kapa'a Quarry Road over the Kapa'a Stream.

Segment 6 would be located along the eastern side of the Kawainui Marsh: Segment 6 would be an existing multi-purpose pathway for pedestrians and bicyclists along the levee.

Relevance of Perimeter pathway to the proposed Kapa'a Light Industrial Park:

- Segments 4 and 5 of the planned Kawainui Marsh Pathway could benefit from the proposed Kapa'a Light Industrial Park. The applicant plans to offer alternative means of transportation that would promote the use of bicycles to commute to the industrial park and visit the park. In its existing configuration the Kapa'a Quarry Road presents traffic conditions for pedestrians and bicyclists that are far from safe. A multi-purpose pathway that is separated from the quarry road by a median would significantly improve the safety for bicyclists and pedestrians along the Kapa'a Quarry Road as they travel between Mokapu Blvd, Kalanianaole Hwy. and the proposed Kapa'a Light Industrial Park.

- The proposed alignment of Segment 5 would locate a 1,300 foot portion of the pathway on the mauka side of a section of the Kapa'a Quarry Road that borders the proposed site of the Kapa'a Light Industrial Park. For the construction of the multi-purpose pathway in this location, the existing drainage canal along the Kapa'a Quarry Road would have to be modified to make room for the pathway. The proposed site layout for Kapa'a Light Industrial Park envisions a vegetative buffer to be constructed along the existing drainage canal, which would leave little room for the proposed multi-purpose pathway, since at the present the space between canal and site perimeter accommodates a dirt road for the maintenance of the canal. One option to provide space for the marsh perimeter pathway would be to fill the drainage canal with pervious rock and install an underground pipe to convey drainage to the Kapa'a Stream. Since the amount of water that needs to be drained by the drainage canal along the quarry road would significantly be reduced under the new drainage infrastructure, the drainage canal could be reduced in size. Either a reduced or filled drainage canal would create enough room for the construction of the multi-purpose pathway. As was discussed earlier in the DEIS, filling or altering the drainage canal is not a part of the proposed project; any activities that affect the drainage canal would be part of a subsequent development project.

3.10.7 Land Uses Surrounding the Proposed Site - Kapa'a Valley

The Kapa'a Valley has gone through many significant changes over the past centuries; from agricultural cultivation starting several centuries ago, when the valley was home to the first settlements, to cattle ranching and last to industrial uses.

In the middle of the last century industrial uses started in the valley with quarry operations on the slopes of the Ulumawao ridge in the south of the valley. The quarry operations later expanded also to the upper parts of the valley. A dike supporting a raised roadway was installed in the lower part of the valley, which effective segregated approximately 40 acres of wetland from the Kawainui Marsh. This raised roadway became the Kapa'a Quarry Road. While quarry operations expanded in the valley, there still were farming activities ongoing in the valley.

The start of the quarry operations also resulted in the deposits of overburden and tailings on wetland areas on both sides of the raised roadway. The deposits on the makai (ocean side) side of the Kapa'a Quarry Road and located on the fringes of the marsh resulted in the creations of landfill area that today is used, among others, for the Model Airplane Park and a City & County of Honolulu base yard.

In the mid-1960s the 40-acre wetland area was filled to become a landfill area, displacing the remaining farming operations from the Kapa'a Valley. The upper half of the 40 acres became a refuse dump, which was eventually covered with quarry overburden, and the lower half of the area was filled with quarry overburden to create an approximately level plateau. Due to the obstruction of the landfill, the Kapa'a Stream streambed changed, moved further to the north and assumed its present location.

In addition to the quarry and landfill operations in the Kapa'a Valley, the construction of the Interstate H-3 Freeway created another impact.

With ongoing and expanding quarry operations, larger portions of the valley were used for landfills. Landfill operations in the lower stretches were completed in the mid 1970. The landfills were then used to start other industrial uses in the lower stretches of the Kapa'a valley. About 23 acres of the area generated by landfill was converted to industrial land use and industrial warehouses have been built on this land over the past three decades. The remaining landfill area directly adjacent to the Kapa'a Quarry Road is presently used for green waste processing. Other industrial uses at the southern fringes of the valley include a refuse transfer station.

The proposed Kapa'a Light Industrial Park would be built exclusively on land that was created from deposits of refuse and quarry tailings overburden and would not be built on land that was previously undisturbed.

The Kapa’a Valley has gone through extensive changes over the past century changing from farming to industrial uses and significant changes in the valley’s landscape. The changes reflect the scope of urbanization in the Kailua region and growth on Oahu. These changes have placed a burden on the natural resources in the valley. Recent efforts of the public and business community try to reverse the impacts that were started decades ago and mitigation measures, such as restoration of wetland area and more environmentally responsible construction and operation will bring about more balanced land uses in the Kapa’a Valley in the years to come.

3.10.8 Land Uses Surrounding the Proposed Site - Federal H3-Freeway

The H3-Freeway connects central Oahu with the windward side and is an important part of the freeway system on Oahu. The freeway is about 15 miles long and features a tunnel system of about one mile length and numerous viaducts that elevate the roadways and support the freeway structure over significant lengths.

The idea of the linking central Oahu and the windward part of Oahu by the H3-Freeway was conceived as part of the Statehood Act and initial federal planning started in 1963 to select a route of the freeway. On the Honolulu side of the Koolau Mountain range, the initial design considered the Moanalua valley route. On the windward side the route of the H3-Freway passes through the Kapa’a Valley. By the year 1972 the construction of the freeway through the Kapa’a Valley was in full process.

In the face of mounting public opposition to the construction the U.S. District court issued an injunction halting most design and construction work in 1972. By 1976 the route through Moanalua Valley was blocked and the State proposed a new route through Halawa Valley, which, in 1981, was confirmed by the Federal Highway Administration. Court injunctions were lifted and construction work resumed, but work was then stopped again and further delayed by more public and court interventions.

Further into the construction schedule of the H3-Freeway the route was again slightly relocated in order to avoid some cultural and historic sites. In 1997, almost four decades after being proposed, the H3 opened. The H3-Freeway now has become an important part of Oahu’s freeway system. Due to numerous delays, re-designs, relocation of the route and the need to build a roadway over viaducts over long distances, the H-3 has ended up as one of the most expensive (on a cost per unit distance basis) of any Interstate constructed. Its final cost amounted to 1.3 billion dollars or more than 80 million dollars per mile of freeway.

The construction of the H3-Freeway though the Kapa’a Valley has had considerable impact on the valley and its watershed. The roadway crosses the valley in East-West direction and its embankment basically segregates the valley into a northern and southern part. Since the road embankment affects the drainage of the valley watershed, drainage openings had to be installed for the Kapa'a Steam and other smaller drainage ditches.

In addition to affecting the watershed, the H3-Freeway has also altered the visual appearance in the valley and has caused other impacts, such as increased noise and light. The H3-Freeway is located directly adjacent to the land parcels that will constitute the site of the proposed industrial warehouse development.

3.10.9 Land Uses Surrounding the Proposed Site - Le Jardin Academy

The Le Jardin School is a private school that has served the Kailua and Kaneohe region since its founding almost 50 years ago. The school has seen significant growth since and in 1999 the school campus moved to a new location at the intersection of Kalanianaole Highway and Kapa'a Quarry Road, at the site of the former Kailua Drive-in. The Le Jardin Campus is located 1.6 miles away from the site of the proposed industrial warehouse park.

3.10.10 Land Uses Surrounding the Proposed Site - Kapa'a Refuse Transfer Station

The Kapa'a Transfer Station is located at the Kapa'a Quarry Road south of the site of the proposed Kapa'a Light Industrial Park.

The Kapa'a transfer station serves two functions:

1. It serves as one of three refuse transfer stations on Oahu, where the volume of refuse is consolidated and transferred from locally operating refuse collection trucks to larger hauling trucks, for cost effective transport of combustible and non-combustible refuse to the waste incinerators or landfills on the leeward side of the island, respectively.
2. It operates as one of 10 locations on Oahu that serve as drop-off convenience centers for Refuse and Recycling. At these locations residents can dispose of their household rubbish. Containers are provided onsite for the separate collection of different types of materials: combustibles are processed at H-POWER, non-combustibles are taken to landfill; organic waste is hauled to mulching and composting sites; and large appliances, tires and auto batteries are taken to recycling facilities.

The Kapa'a Transfer Station is open every day, including Saturday and Sunday. The transfer Station is located about 0.4 miles away from the proposed site.

3.11 Population and Community Services and Facilities Existing Environment

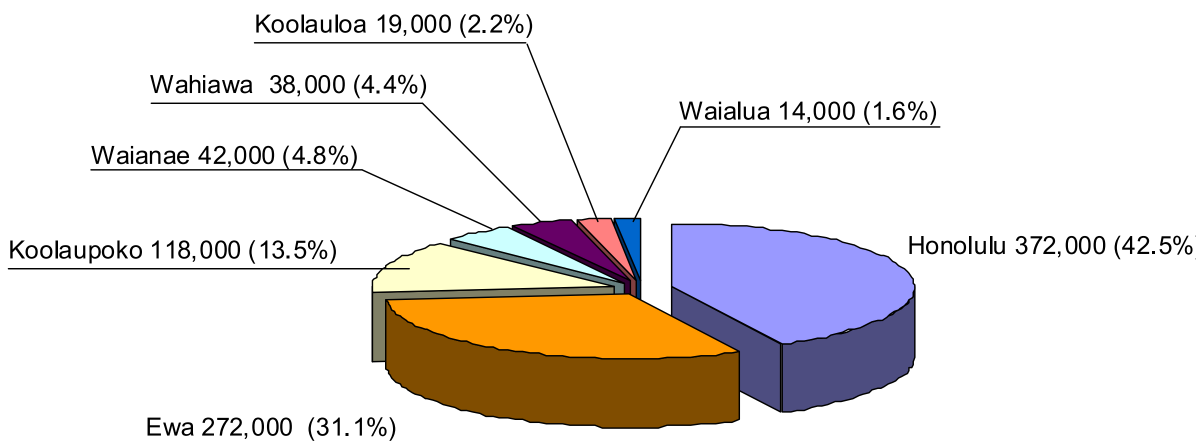
This section discusses socioeconomic characteristics of the existing environment within the Koolaupoko region.

3.11.1 Population Characteristics

The Koolaupoko region has the third largest population among the seven main districts of the City & County of Honolulu. Figure 3-42 indicates the distribution of population on Oahu. As indicated about 13.5 percent of the Oahu population lives in the Koolaupoko region. Figure 3-43 indicates that the main population centers in the Koolaupoko region are the Kailua and Kaneohe neighborhoods, which together account for approximately 70% of the population of the Koolaupoko region.

Figure 3-42 Population distribution in City & County of Honolulu

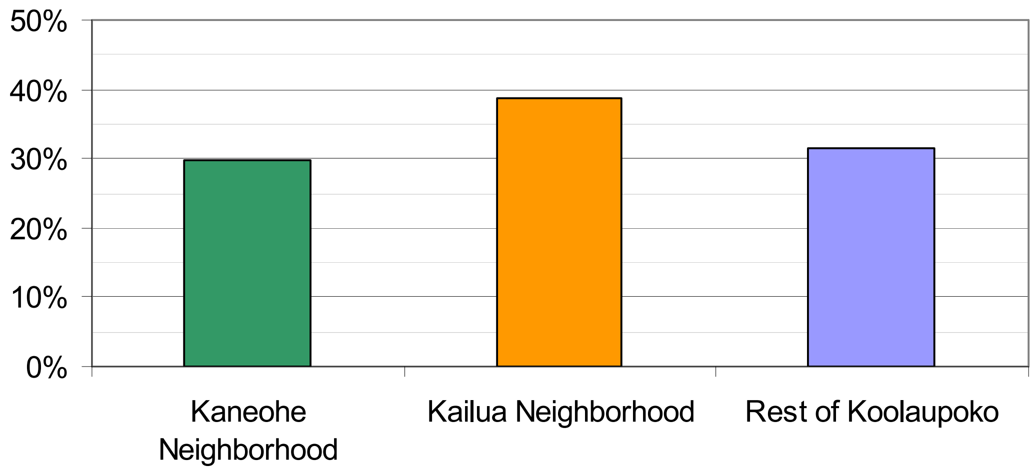
(Data from DBEDT 2007 State Data Book)



Note: District xxx,xxx = absolute population ; (xx.x%)= present of C&C of HNL

Figure 3-43 Main population centers in Koolaupoko region

(Data from DBEDT 2007 State Data Book)



Existing policies and future visions of the region call for measures that retain a constant population density in the Koolaupoko region and discourage significant population growth in the region over the next decades. For the period from 1980 through 2000, Figure 3-44 indicates that the Koolaupoko region has shown little growth. While the total population within the City & County of Honolulu has been growing, the population in the Koolaupoko regions has remained essentially constant. For the year 2030 it is predicted (DBEDT, 2006) that the population in the Koolaupoko region will decrease by about 3 percent relative to its current number, while Oahu's total population is expected to increase by 22 percent. The Koolaupoko region is the only region on Oahu which is predicted to have a negative population growth in the years to come.

The urban areas of Kailua and Kaneohe are generally categorized as "bedroom" communities. The bulk of the population in these two regions commutes everyday to employment centers in the central part of Oahu. The development of the labor force on Oahu shows that it has been growing at a faster rate than the population, suggesting that Oahu provides a favorable employment environment. Figure 3-45 indicates the development of the labor force and population relative to the year 2002.

According to State Department of Business and Economic Development, 2007 Data Book, the median income per household in the area which is primarily affected by the proposed development, is $66,000 to $72,800. The median income per household for the County of Honolulu, in comparison, is $51,900.

Figure 3-44 Comparison of population in City & County of Honolulu Koolaupoko Region

(data from DBEDT 2007 State Data Book)

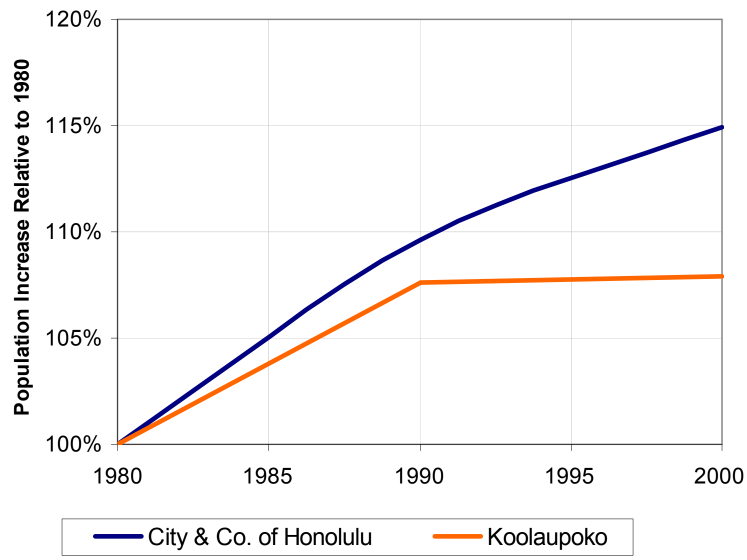
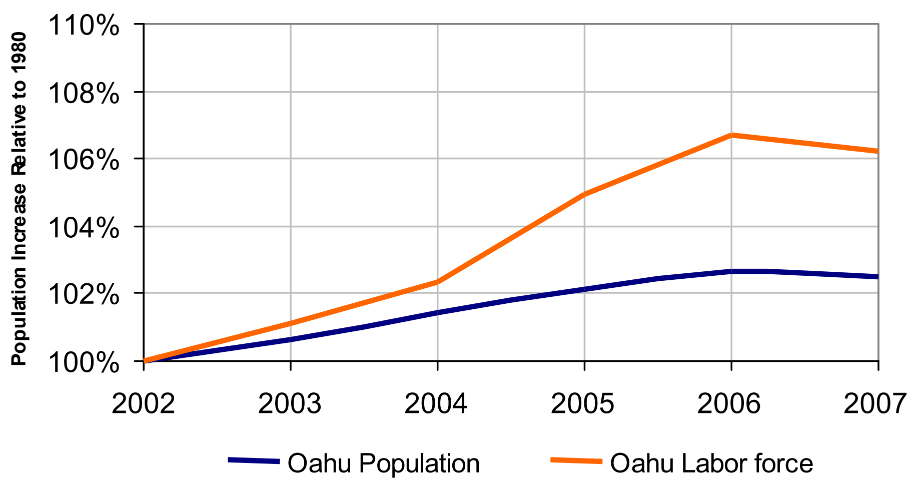


Figure 3-45 Development of Labor Force and Population on Oahu

(Data from DBEDT 2007 State Data Book)



3.11.2 Police and Fire Department

Fire stations: There are three fire stations that serve the Kailua area and would also serve the proposed Kapa'a Light Industrial Park. These fire stations and the approximate distances to the proposed site are as follows:

(1) Main Kailua fire station on Kuulei Road, at a three mile distance from the proposed site,
(2) Fire station on Kaneohe Bay Drive at the Aikahi Park Shopping Center, at a two mile distance,
(3) Olomana fire station on Kalanianaole Hwy., at a two mile distance.

Police Stations: The police station that would serve the proposed Kapa'a Light Industrial Park is located next to the Kailua main fire station on Kuulei Road, about three miles from the proposed site.

3.11.3 Medical Facilities

There are two major medical facilities within five miles of the proposed site:

- Castle Medical Center - 2.5 mile distance from proposed site
  640 Ulukahiki Street, Kailua, HI
  Castle Medical Center is a non-profit medical facility owned by the Seventh-day Adventist Church and operated by Adventist Health. This 157-bed primary health care facility is located next to Kawainui Marsh on the Windward side of Oahu. The clinic serves the entire island of Oahu. The medical facility provides a wide range of inpatient and outpatient services. The clinic has a 24-hour emergency department.

- Hawaii State Hospital - 5.0 mile distance from proposed site
  45-710 Keaahala Rd., Kaneohe, HI
  Hawaii State Hospital is a 194-bed hospital located in Kaneohe on the windward side of Oahu. The hospital provides integrated and evidence-based psychiatric treatment and rehabilitation to individuals suffering from mental illness and co-occurring disorders. It is the only hospital in Hawaii which is dedicated to serving adults with serious mental illnesses.

3.11.4 Recreational Facilities

Currently, there is one community park within a one-mile distance from the proposed site. Plans call for potentially two future recreations venues, one park and one trail system:

The Kawainui Model Airplane Park is located on the western edge of the Kawainui Marsh and directly adjacent to the proposed site. The Kapa’a Quarry Road separates the “airplane” park from the proposed site of the Kapa’a Light Industrial Park.

The future Kawainui Gateway Park will be located east of the intersection of Mokapu Boulevard and Kapa'a Quarry Road and will be located within one mile of the proposed site.

In addition, the future Kawainui Marsh Trail will provide a perimeter trail around the marsh. The trail would pass the proposed site of the Kapa’a Light Industrial Park and would run in south-north direction along the eastern side of the Kapa’a Quarry Road.

3.11.5 Schools

There are several public and private schools within a two mile distance from the proposed site. The closest school campus is the Kalaheo High School & Windward Community School, which is about one mile from the proposed site. This school is the only educational institution within walking distance to the proposed site. The Kapa’a Quarry Road does not serve any residential areas between the proposed site and the school and students would not normally walk past the proposed site.

Other schools that are within a two mile distance from the proposed site are Le Jardin (a private School), Kailua High School, Maunawili Elementary School, Kailua Elementary School, Aikahi Elementary School and Kainalu Elementary School.

3.11.6 Refuse Collection and Disposal

There is presently no municipal refuse collection at the proposed site. Refuse is collected and disposed of by private waste management companies. City and County solid waste transfer station is less than a quarter of a mile from the proposed development site.

3.12 Existing Supply and Demand for Industrial Space in the Region

A market study was conducted to evaluate the existing supply of industrial space in the Koolaupoko region and the ability of the region to absorb the planned expansion of approximately 600,000 square feet of industrial warehouse space, which would be created by the proposed Kapa’a Light Industrial Park. The market study is presented in full in Appendix 2. The market study suggests the following conclusions about the existing supply and demand of industrial space in the Koolaupoko region:

- A comparison of the four counties of the State of Hawaii indicates that the supply of industrial space in the state differs significantly between the islands. The City & County of Honolulu has a per capita allowance of industrial space, e.g. the available industrial space in each county divided by the county population, of 39.3 square feet per capita, which is slightly below the statewide average of 44.9 square feet per capita. Maui and Kauai counties have both per capita allowances that are well above the state average (see Figure 3-46).

- The comparison of per capita allowances for industrial space in the major trade areas on Oahu, urban Honolulu, Ewa/Waianae and Central Oahu with the Koolaupoko region is illustrated in Figure 3-47. The comparison suggests that the Koolaupoko region contains only approximately 21 percent of the industrial space demand created by the resident population. Therefore the region is significantly undersupplied with industrial space. In another comparison, while urban Honolulu has 54 percent of the population, it has 59 percent of the industrial space of Oahu. In contrast, the Koolaupoko region has 13 percent of Oahu's population but only 3 percent of the industrial space.

- Historically, the majority of demand created by windward (including Koolaupoko region) areas has been oriented to other areas of the island, notable Honolulu, for most industrial uses. While the lack of industrial space, notably those of intensive industrial uses and those that serve island wide market, is in accordance with development plans for Koolaupoko, the region is also significantly undersupplied with industrial space that accommodates neighborhood/ local and sub-regional industrial types of services, such as neighborhood-oriented contractors, suppliers, repair shops, craftsmen/woodworking businesses.

- This lack of suitable space for local businesses in the Koolaupoko region results in increasing time and costs for serving the windward side of Oahu from locations elsewhere in the island. Furthermore, providing the needed services from locations outside the region results in escalating traffic.

- Due to the significant problems with commuting into Honolulu, for example, small business owners are looking to relocate their business operations closer to their residences and / or employees.

Figure 3-46 Comparison of per capital allowance of industrial space between islands

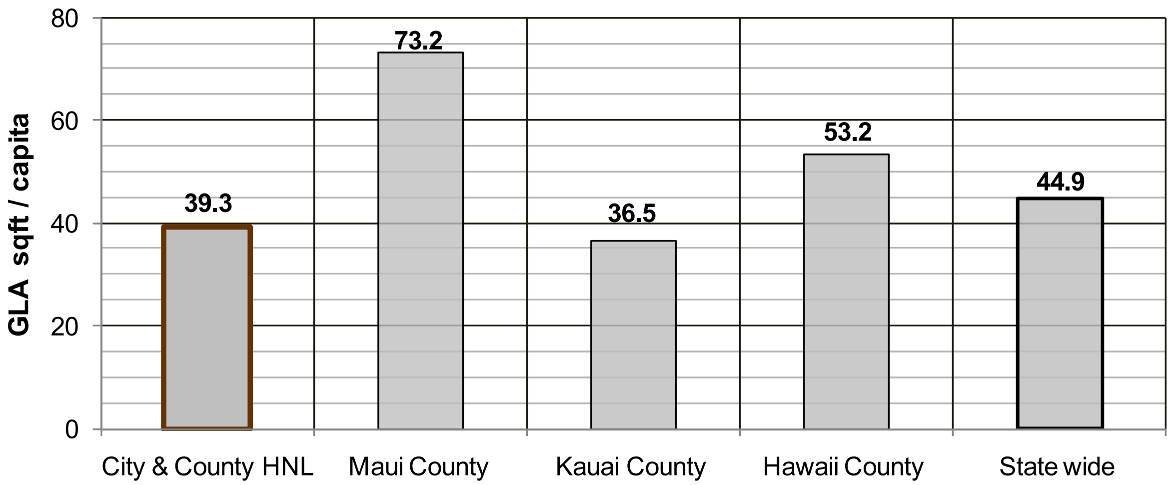
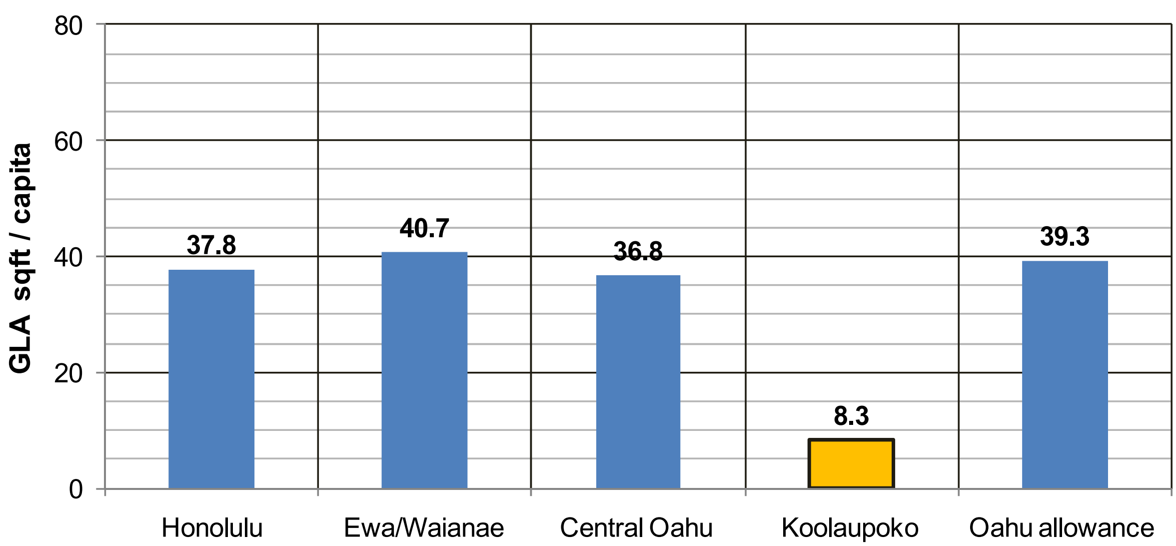


Figure 3-47 Comparison of per capital allowance of industrial space between major trade areas on Oahu



- The Koolaupoko region presently contains about 992,000 square feet of finished floor space, which represents 3 percent of Oahu's total industrial space. The market study suggests that the region can readily absorb approximately 832,000 square feet of industrial space in the planned duration of project full build-out. This addition of 832,000 to the existing 992,000 square feet of finished floor space would still only represent only about 40 percent of the average allowance for the region. In other words, even with the addition of 140 percent of the planned maximum capacity of the proposed Kapa'a Light Industrial Park, the Koolaupoko region would still remain significantly undersupplied with industrial space when compared with the island-wide Oahu supply of industrial space. It should be noted that the prediction of the region's ability to absorb the planned amount of space is based on providing industrial space and land businesses to businesses that would serve the local and sub-regional market and not the Oahu island-wide market. Thus, the character of the businesses using future space in the region would not be intensive, but limited industrial land uses. This is consistent with the long-term development plans for the region and with the sought land use change to I-1.

- In addition, a significant amount of industrial space is lost in the region due to conversion of industrial zoned land to commercial and other uses, i.e. the rezoning of industrial lands in Kailua Town to more profitable mixed-uses. The adds to the long-term undersupply of industrial space in the Koolaupoko region.

- Excluding the proposed project site, the amount of available industrial space/land is extremely limited in Koolaupoko. There is very little suitable land within Koolaupoko that offers the same favorable site conditions, including being centrally located within the Kailua and Kaneohe trade area, good access to the regional roadway, being located within the State "urban" land use district and therefore designated for urban development and the existing industrial uses within the Kapa'a Valley. Therefore the proposed site is uniquely suited to the proposed use.

This page is left blank intentionally

CHAPTER FOUR - ENVIRONMENTAL IMPACTS AND MITIGATIONS

The implementation of either the Preferred Alternative or Alternative B has the potential to affect various environmental resources at the proposed site of the Kapa'a Light Industrial Park, as well as the potential to affect certain resources beyond the boundaries of the project site. Chapter Four identifies and evaluates the anticipated environmental impacts associated with each alternative. Besides the Preferred Alternative and Alternative B, Chapter Four also evaluates the No Action Alternative. After evaluating the possible and/or anticipated impacts, this section presents mitigation measures that are selected to mitigate the impacts to the extent possible.

4.1 Impact Mitigation though Low Impact Development for Lower Portion of the Site

The differentiating factor between the Preferred Alternative and Alternative B is the development approach used for the lower portion of the project site. Alternative B utilizes conventional building designs and technologies while the Preferred Alternative uses a low impact development approach; the sustainable design approach for the proposed project is presented in Appendix 4 of this DEIS.

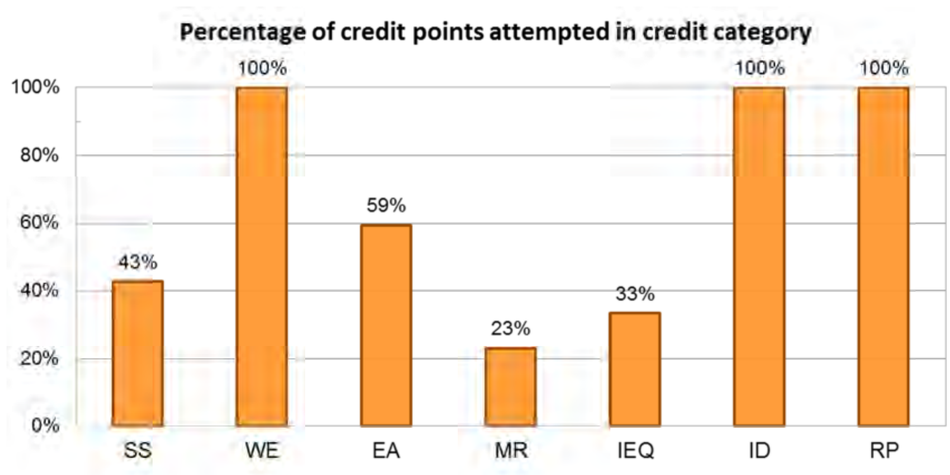
The proposed development will be designed and constructed to conform to requirements under the Leadership in Energy and Environmental Design (LEED) green building certification system of the U.S. Green Building Council. The LEED green building certification program recognizes sustainable green building and development practices and awards levels of compliance to projects that implement strategies for better environmental and health performance. The lower portion of the proposed project site will be designed and constructed to achieve the required number of credits to qualify for LEED Silver certification upon completion of the project. Under the LEED Silver certification level the project must qualify, confirmed by third party audit, that more than 50 percent of the 100 possible credit points (plus 10 possible bonus points) have been achieved by the design and completed construction.

The rationale to concentrate on developing the lower portion of the site to LEED standards rather than seeking LEED certification for the entire project, including the new developments in the upper portion of the site, is that environmental consequences resulting from the lower portion of the site can impact the surrounding environment more directly and to a larger extent, due to the proximity to important wetland areas.

The sustainable development plan for the lower portion of the site uses a strategy to emphasize on those LEED credit categories which can effectively mitigate such impacts that matter most for the proposed site. Figure 4-1 shows the proposed distribution of LEED credits among seven LEED credit categories for the project. As can be seen, the mitigation of water related impacts is emphasized by attempting all, actually surpassing the maximum LEED credit points for water efficiency. In addition the credit category Sustainable Sites reflects the applicants plan to attempt most of those credits which apply to the proposed project, considering the fact that some credits are not readily achievable due to the location of the proposed site (not close to existing residential areas, high density developments and connected to public transportation). Under the credit area Sustainable Sites, however, important mitigation of stormwater runoff and light pollution is implemented.

Table 4-1 shows important LEED credit points that have been strategically selected to mitigate significant impact categories on the environment, and particularly the wetland areas directly adjacent to the lower portion of the site. In Table 4-1, the use of the term “LEED project site” or “development footprint” refers to the development in the lower portion of the project site and does not include the new development area in the upper portion of the site.

Figure 4-1 Percentage of attempted to available credit points for credit category



SS	-	Sustainable Sites	IEQ	-	Indoor Environmental Quality
WE	-	Water Efficiency	ID	-	Innovation in Design
EA	-	Energy & Atmosphere	RP	-	Regional priority
MR	-	Materials & Resources			

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
Credit category - Sustainable sites	
Alternative Transportation - Bicycle	Lowering the amount of traffic on the roadways to the project and directly adjacent to the marsh by promoting the use of bicycles to commute. The present traffic situation on the quarry road is not conducive to bikers; the proposed marsh perimeter pathway would provide an excellent approach to combine bicycle friendly traffic condition with making the marsh more accessible in regard to recreation and enjoyment of nature.
Restore habitat	The areas around the development footprint are restored with native or adapted plants and the present invasive vegetation will be removed. These areas will serve as vegetative buffer zones around the development site, thereby mitigating visual impact, noise impact and air pollution. Furthermore the buffer zones will provide some habitat for wildlife and will serve as infiltration areas for stormwater and treated wastewater, thereby mitigating runoff and providing for better onsite wastewater treatment.
Maximize open space	The areas within and at the perimeter of the development footprint will contain the maximum amount of open space which is achievable for the planned layout of the warehouse development. The open space will be vegetated and pervious; open space also includes open grid pavement, which contains some vegetation and has a perviousness of at least 50 percent.
Stormwater design - quantity	The installation of detention ponds will act as flood control and will mitigate high runoff volume that could cause erosion impacts on the stream beds and associated sedimentation in the receiving waters. The design of detention ponds will consider measures to avoid attracting endangered water birds to the open water within the detention ponds, which could expose the birds to enhance predator threats. The use of stormwater recycling and rainwater harvesting will furthermore mitigate the frequency of runoff event that will fill the detention ponds.

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
Stormwater design – quality	The stormwater runoff will be treated to an enhanced standard by using a comprehensive treatment approach that will contain stormwater filter units and one extended detention pond. The filter units are located upstream of the detention pond and serve as settlement tanks that remove all floatable debris, sediments and oil and grease from the runoff. The extended detention ponds have a design residence time of 24 to 48 hours and provide treatment capacities to further remove sediments, nutrients and suspended solids. The combined pollutant removal rate of the filter units and detention ponds is estimated of well over 80 percent, which is the required threshold for this LEED credit. With implementing this comprehensive stormwater treatment system impacts from stormwater runoff to the receiving waters, e.g. the Kapa'a Stream, the adjacent wetland area, the Kawainui marsh and the drainage canal along the quarry road can be effectively mitigated.
Heat island effect – non roof	The use of pavement with high Solar Reflectance Index (SRI) material, the planting of trees and the use of open grid pavement decreases the heat island effect within the development, therefore improving the thermal performance of the buildings. The use of trees inside the development will also mitigate visual impacts from.
Light pollution reduction	Light pollution is excessive lighting that can impact wildlife in the adjacent wetlands, diminish night sky enjoyment and produce glare, which could be detrimental to motorists passing the development. Implementing effective reduction of exterior and interior lighting are effective measures to mitigate this impact.
Credit category WE - Water Efficiency	
Water Use Reduction	The reduction of water use by at least 40 percent directly reduces the impact on the municipal infrastructure and reduces the amount of wastewater that needs to be treated onsite. The mitigation of all water related impacts resulting from the proposed development are a high priority for the proposed project.

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
Water Efficient Landscaping	Avoiding potable water for irrigation reduces the impact on the resources of the municipal water supply and also reduces impacts of runoff, since stormwater can evaporate from plants and infiltrate into the ground rather than be discharged directly into the receiving waters. The use of native and adaptive plants within the development and in the buffer zones surrounding the developments reduces the demand for irrigation water, but also reduces the requirements for fertilizers and pesticides.
Innovative Wastewater Technologies	The use of advanced onsite wastewater treatment effectively reduces the emissions of biological oxygen demand (BOD), total suspended solids, nutrients, metals and harmful bacteria in the effluent of the development. The advanced treatment furthermore makes it possible to use the treated wastewater for below ground irrigation, furthering the treatment of the wastewater and producing a sewage effluent that will surpass the typically achievable pollution removal rates in domestic and commercial sewages effluent. The removal of high amounts of pollutants from the effluent of the development is effectively reducing impacts on the receiving waters and is protecting the adjacent wetlands.
Credit category - Energy & Atmosphere	
Optimize Energy Performance	The planned significant reduction of energy consumption, at least 30 percent, and power demand in the proposed development will mitigate impacts on the energy supply of the state. By providing modern, environmentally friendly and energy efficient warehouses to replace older inefficient industrial buildings has an important benefit for the environment and for Hawaii's residents. At the present Hawaii obtains about 80 percent of its electricity from imported oil, making it one of the most oil dependent locations in the developed world. Saving electricity equates to saving importing oil which mitigates impact on the environment and the economy.
On-Site Renewable Energy	Implementing renewable energies to power the proposed development reduces the energy consumption and also

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
	reduces the peak power demand. By reducing the power demand the public utilities are less burdened by the new development and thus less new infrastructure has to be built and maintained, thereby directly reducing impacts on the environment and the community.
Measurement & Verification	Verification that the ambitious energy and power reduction plans are met by the tenants is important to continuously assure that the environmentally friendly and energy efficient design goals are met during operation of the proposed industrial park.
Credit category - Materials & Resources	
Storage and Collection of Recyclables	The handling of waste will be an important aspect of environmentally friendly operation of the proposed industrial park. Well planned and maintained waste management and recycling programs will increase the awareness of the occupants to engage in responsible handling of waste and avoid littering, thus mitigating the possibility that waste can pollute the adjacent wetland and other environmentally important areas.
Construction Waste Management	Construction waste management will reduce the amount of waste that has to be transported to landfills. Thus traffic impacts are reduced, by lowering the amount of construction related heavy-truck traffic, and impact on the community are reduced be avoiding dumping into municipal landfills.
Recycled Content	Recycled, and reused, content reduces the impacts on the community and the transportation energy demand on the islands.
Regional Materials	The use of regional material reduces the need to import materials to the state and supports the community by supporting local businesses.
Credit category - Indoor Environmental Quality	

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
Construction IAQ Management Plan - During Construction	By using strict rules about construction material handling and the use of low emitting materials impacts on the indoor and outdoor environment can be lowered.
Low-Emitting Materials	By using only adhesives & sealants as well as paints & coatings with low concentration of harmful components a good indoor and outdoor environment is maintained. Furthermore, beside the direct avoidance of harmful agents in construction or maintenance, the active encouragement to the occupants to use only environmentally friendly adhesives, sealants, paints or cleaning agents helps to mitigate further impacts to the environment during operation of the proposed industrial park.
Daylight & Views	The use of daylighting will reduce the electricity demand and related impacts on public infrastructure. By implementing the extensive use of daylighting, the building design needs to address mitigating measures for light pollution from internal lighting that might arise when building openings (e.g. those used for daylighting) can transmit light at night and thus contribute to light pollution.
Credit category - Bonus credits from Innovation & Design, Exemplary Performance and Regional Priorities	
Educational program	The applicant will develop and implement an educational program about the environmentally and culturally important Kawainui Marsh. The program will endeavor cooperation with schools and environmental groups to develop, produce and maintained the educational program. This effort will increase community involvement and will assist to identify and mitigate concerns of the community.
Electric vehicles for maintenance vehicles	The use of electric vehicles for maintenance of the proposed park helps to lower noise and air pollution. The use of renewable energy for the maintenance vehicles (either through onsite renewable energy generation or through tradable renewable energy certificates) will reduce impacts on the environment and the community.
Legally binding performance	Making provisions of the sustainable development

Table 4-1 Using LEED credits to mitigate significant impacts to the environment and community

Type of LEED credit / prerequisite	Types of environmental impact that are mitigated
criteria for tenants	approach contractually binding, rather than voluntary, will help to achieve the goals for an environmentally friendly and energy efficient industrial park.
Exemplary Performance for stormwater system	The project will implement a comprehensive stormwater treatment system that goes far beyond conventional stormwater treatment technologies. In doing so the project will qualify for exemplary performance credits. By using advanced stormwater treatment to treat 100 percent of the stormwater runoff in regard to quantity and quality environmental impacts associated with runoff will be effectively and greatly mitigated, thus significantly reducing impacts on important water resources adjacent to the project, including the Kawainui Marsh.
Exemplary Performance in innovative wastewater technologies	Adding advanced sewage treatment process steps to the conventional septic systems (such as aerobic biological treatment, denitrification by conversion of nitrates to atmospheric nitrogen, phosphate removal through absorption in the filter bed, sand filters and below ground irrigation fields), results in high removal rates of harmful pollutants in the wastewater effluent. The effective removal of a high portion of harmful pollutants significantly reduces environmental impacts.
Regional priorities	By implementing design and construction measures and technologies that are deemed important for the region, the project contributes to lowering impacts to the environment and the community.

4.2 Geology, Topography, and Soils Existing Environment

4.2.1 Impacts on Geology and Mitigation

In both the Preferred Alternative and Alternative B, the proposed project would be developed within previously disturbed soil areas and thus the project would not impact local geology. Implementation of the No-action Alternative would not alter the current characteristics of geologic resources at the project site and therefore, there would be no adverse effect.

No mitigation measures would be required under both action, e.g. the Preferred Alternative and Alternative B and the No-action Alterative.

4.2.2 Impacts on Topography and Mitigation

Topography within the proposed project areas is generally flat, as a result of past landfill operations which created two distinct topographic features, e.g. the lower portion of the site with elevations between about 15 and 45 feet and an upper portion of the site, which is practically flat, with an average elevation of 85 feet and a maximum height difference of 10 feet between the western and eastern boundaries of the upper portion of the site. The upper and lower portions of the site are separated by a steep sloped area with slopes between 40 and 100 percent.

Implementation of the Preferred Alternative would result in negligible alterations of existing topography in the upper portion of the site. All of the land in the upper portion of the site has been previously graded and has topography that is suitable for the planned development. Implementation of the Preferred Alternative would result in minor alterations of existing topography in the lower portion of the site. Alteration of existing topography in the lower portion of the site would be expected as a result of grading and associated cut and fill necessary to accommodate the buildings, roadwork and landscaped areas. The existing earth berms around the lower portion of the site in the south, east and north would be modified by widening the berms and increasing their height in order to accommodate the vegetative buffers at the site boundaries at the south, east and north. The topography of the sloped areas between the upper and lower portions of the site would not be altered, except for some grading to accommodate the landscaped areas and some minor structures, such as retaining walls for new buildings close to the sloped areas or infiltration fields for the treated wastewater.

Implementation of Alternative B would result in the same impact as under the Preferred Alternative, except that under Alternative B¸ the existing earth berms at the site boundaries in the south, east and north would not be altered but would remain as is.

Because no ground disturbing activity would occur under the no-action Alternative the topography within the proposed project site would not be impacted.

No mitigation measures would be required under the two action and the no-action alternatives.

4.2.3 Impacts on Soils and mitigation

This section evaluates potential effects of the alternatives on soil resources at the proposed site and the potential for soil characteristics to affect proposed uses.

The Preferred Alternative would directly affect soils as a result of construction/demolition activities (i.e., grading, excavation, placement of fill, compaction, mixing, and augmentation) on approximately 10.6 and 16.7 acres in the upper and lower portion of the site, respectively. Of these combined 27.3 acres all construction would occur on currently graded and pervious land. All land that is used for the development of the proposed industrial park is presently graded and no open space, outside the land created by former landfills, will be used for the development.

The presently graded surfaces used for the development are not vegetated and are either practically flat or have small slopes, therefore impacts from erosion and associated sedimentation would be limited. The total amount of open space, e.g. vegetated and pervious areas, within the three land parcels of the proposed project site, would actually increase by approximately two acres due to the fact that land which presently has no vegetation cover or have sparse, primarily invasive plant cover would be converted to landscaped areas within and at the perimeter of the development footprint as well as restored habitat. The total area that would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings) is 11.1 and 10.6 acres in the lower and the upper portion of the site, respectively, thus the total area converted from presently pervious area to impervious area equals 21.7 acres. Soil productivity, (i.e., the capacity of the soil to produce vegetative biomass), would be eliminated in disturbed areas that are converted to impervious surfaces.

As part of the sustainable development approach, rainwater and stormwater runoff will be collected from a portion of rooftops and impervious roadway sections and be used for irrigation, thus converting these impervious surfaces to quasi pervious areas. It is assumed that about 50 percent of the roof tops and roadways within the lower portion of the site will be used for rainwater harvesting, thus about 5.5 acres would be converted to quasi pervious area. In effect this means that the total amount of land converted from pervious to impervious surfaces is lowered from 21.7 to 16.1 acres.

Heavy machinery would be used to prepare the site for construction of the proposed buildings and facilities and for digging trenches for utility lines. As a result, soils would be compacted, soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion.

Potential building limitations for soils at the proposed project site might include limitations to the load-supporting capacity of soil within the lower portion of the site and the ease and amount of excavation required for the proposed construction. The soil layers found within the landfill area of the lower portion of the site might contain municipal waste from previous landfill operations. Appropriate soil engineering studies prior to construction would be conducted at the project site to assure proper design and building location.

Prior to construction, a sediment and erosion control plan would be developed for the proposed development, in accordance to the governing local ordinances and the requirements of the sustainable development approach (which goes beyond the measures required by local code). The sediment and erosion control plan would, among other things, define appropriate site-specific Best Management Practices (BMPs) for controlling runoff, erosion, and sedimentation during construction activities. Sites specific BMPs would be developed based on proper run-off calculations, slope factors, soil type, topography, construction activities involved, and proximity to water bodies. BMPs could include, but are not limited to protective devices preventing surface drainage flows, erosion control matting, rip-rap, and sediment traps. The application of any or all of these BMPs, or other appropriate BMPs, would depend upon precise, specific ground conditions in the areas disturbed by construction.

Areas disturbed outside of the footprint of the new construction would be aerated and reseeded or replanted with native or adaptive vegetation following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity. With soil erosion and sediment control measures, the actions proposed under this alternative would likely result in minor adverse impacts to soils from construction occurring in open areas.

Alternative B would directly affect soils as a result of construction/demolition activities (i.e., grading, excavation, placement of fill, compaction, mixing, and augmentation) on approximately 10.6 and 18.0 acres in the upper and lower portion of the site, respectively. Of these combined 28.6 acres all construction would occur on currently graded and pervious land. All land that is used for the development of the proposed industrial park is presently graded and no open space, outside the land created by former landfills, will be used for the development.

The presently graded surfaces used for the development are not vegetated and are either practically flat or have little slopes, therefore effect from erosion and associated sedimentation would be limited. The total area that would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings) is 11.1 and 18.0 acres in the lower and the upper portion of the site, respectively. Therefore the total area that will converted from presently pervious area to impervious area measures 28.6 acres. Soil productivity, (i.e., the capacity of the soil to produce vegetative biomass), would be eliminated in disturbed areas that are converted to impervious surfaces.

Heavy machinery would be used to prepare the site for construction of the proposed buildings and facilities and for digging trenches for utility lines. As a result, soils would be compacted, soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion.

Potential building limitations for soils at the proposed project site might include limitations to the load-supporting capacity of soil within the lower portion of the site and the ease and amount of excavation required for the proposed construction. The soil layers found within the landfill area of the lower portion of the site might contain municipal waste from previous landfill operations. Appropriate soil engineering studies prior to construction would be conducted at the project site to assure proper design and building location.

Alternative B would implement a sediment and erosion control plan that would abide by but not exceed the requirements of local codes. Areas disturbed outside of the footprints of the new construction would be aerated and reseeded or replanted with native or adaptive vegetation following construction activities, which would decrease the overall erosion potential of the site and improve soil productivity. With soil erosion and sediment control measures, the actions proposed under this alternative would likely result in minor adverse impacts to soils from construction occurring in open areas.

No-action Alternative: Implementation of the No-action Alternative would not alter the soil resources at the proposed site and thus no adverse impacts would occur.

4.3 Impacts on Water Resources

This section assesses the potential effects of the alternatives on water resources at and surrounding the proposed site. Such water resources include surface and ground waters and consider impacts of the proposed project on the Kapa'a watershed, floodplains and wetlands. Possible impacts by the drainage system, construction activities and leaching of the landfill are also considered.

4.3.1 Impacts on Surface Water and Mitigation

This section discusses potential effects of the alternatives on surface water resources both on and downstream of the proposed site. Effects of construction and operation of the alternatives on surface water characteristics are considered, including effects of increased impervious surfaces and stormwater flows and their potential effects on surface water quality.

The Preferred Alternative would affect 29.5 acres of presently graded and pervious land. The resulting development footprint , which includes landscaped and other pervious areas, would be 27.3 acres, thereby converting 2.2 acres of presently graded but nor vegetated land to open space, e.g. as part of the habitat restoration measures outlined in the sustainable design approach, presented in Appendix 4.

During construction, soils would be exposed, which could create increased potential for erosion and/or transport of surface pollutants into adjacent water bodies. A sediment and erosion control plan would be developed, as part of the permit requirements, to reduce surface erosion and control runoff of pollutants, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter downstream water flow. Site conditions will determine site specific BMPs to reduce potential impacts to adjacent land and waters. These BMPs could include the following measures:

- Erosion containment such as silt fencing and sediment traps to avoid runoff of sediment from the site.
- Utilize sedimentation basins, to allow for settling of sediments from stormwater volumes,
- Covering disturbed soil or soil stockpiles with suitable cover material, i.e. , plastic sheet, place hay, grass, woodchips, straw or gravel on the soil surface to cover and hold soils Scheduling the construction progress and applying the BMPs so that soil exposure remains minimal.
- Regular inspection of the erosion and sediment control BMPs and especially after each rainfall.
- Preventive measures to avoid exposure of hazardous materials, i.e. fuel or chemicals used in the construction and contain all rainwater that has been in contact with such material.
- Under the Preferred Alternative runoff from the site will further be mitigated by the construction of the earth berms (e.g. the berms will be developed as the vegetative buffers zones) before the grading of the lower portion of the site commences. The berms will serve as effective containment in addition to the other containment measures.
- For entry/exist to the site use stabilization gravel to avoid soil and dirt to be carried onto public roadways.

Under the Preferred Alternative, the planned BMPs and other measures of the sediment and erosion control plan, which will be implemented during construction, would effectively mitigate impacts to the water quality of the receiving waters surrounding the site. If impacts would occur from construction activities, these are expected to be minor and of short duration, occurring primarily during storm events.

In addition to mitigating impacts on surface waters during construction the Preferred Alternative will reduce stormwater runoff through structural and non-structural management practices during operation of the industrial park. Non structural BMPs would include natural area conservation, disconnection of rooftop and non-rooftop runoff, grass channels, and conserving or augmenting infiltration areas.

As part of the low impact development approach used in the lower portion of the site rainwater would be collected from a significant portion of the roof of warehouses and from portions of the roadways and would be stored in underground cisterns . The harvested rainwater would then be used for irrigation of the restored habitat areas at the perimeter of the site. Using the harvested rainwater for irrigation results in the infiltration of water into the ground and reduces the loss of rainwater through evapotranspiration from the plants. The storage capacity of the cisterns will be determined in accordance with the irrigation needs. It is estimated that under normal precipitation conditions, e.g. excluding more severe storm events, most of the rainwater would be captured by the cisterns and would not be discharged through the drainage system. Non-structural BMPs that are part of the environmentally sensitive development used for the proposed industrial park and are described in more detail in Appendix 4.

The Preferred Alternative would also employ structural stormwater management practices such as new stormwater detention pond, stormwater infiltration areas and filtration systems. The stormwater management practices used would exceed conventional practices and those required under local code. In the lower portion on the site the stormwater management practices would include the use of a two tired treatment process for the runoff from impervious surfaces thereby effectively lowering the pollutants in the runoff by at least 80 percent.

The Preferred Alternative would implement measures to mitigate impacts on all surface water resources surrounding the proposed development footprint. No untreated runoff from the development would be released into the surface water bodies. The development would not alter the streambeds of the Kapa’a Stream, the wetland areas in the Kapa’a stream corridor and the existing drainage canal along the quarry road. There would be minor construction at the banks of the drainage canal to build the discharge structure for the detention pond of the lower portion of the site. Any impacts from the construction would be mitigated by appropriate measures.

The existing infiltration field for the stormwater discharge on the lower portion of the site through the existing 30-inch culvert under the quarry access would be modified as part of the habitat restoration of the natural vegetation areas between at the sloped land between the upper and the lower portions of the site. This measure would result in the improved ability to infiltrate the runoff within the restored natural vegetation areas.

<u>Alternative B</u> would affect 29.5 acres of presently graded and pervious land. The resulting development footprint , which includes landscaped and other pervious areas, would be 28.6 acres, thereby converting 0.9 acres of presently graded but nor vegetated land to open space, e.g. landscaped area at the perimeter of the development footprint.

The proposed stormwater management practices under Alternative B would abide by the applicable code requirements and would mitigate impacts on the surface water resources during construction.

A sediment and erosion control plan would be developed, as part of the permit requirements, to reduce surface erosion and control runoff of pollutants, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter downstream water flow. Site conditions will determine site specific BMPs to reduce potential impacts to adjacent land and waters. These BMPs could include the following measures:

- Erosion containment such as silt fencing and sediment traps to avoid runoff of sediment from the site,
- Utilize sedimentation basins, to allow for settling of sediments from stormwater volumes,
- Covering disturbed soil or soil stockpiles with suitable cover material, i.e. , plastic sheet, place hay, grass, woodchips, straw or gravel on the soil surface to cover and hold soils Scheduling the construction progress and applying the BMPs so that soil exposure remains minimal,
- Regular inspection of the erosion and sediment control BMPs and especially after each rainfall.
- Preventive measures to avoid exposure of hazardous materials, i.e. fuel or chemicals used in the construction, to stormwater and contain all rainwater that has been in contact with such material of its containment.
- For entry/exist use stabilization gravel to avoid soil and dirt to be carried onto public roadways.

Under Alternative B the planned BMPs and other measures of the sediment and erosion control plan, which will be implemented during construction, would effectively mitigate impacts to the water quality of the receiving waters surrounding. If impacts would occur from construction activities these are expected to be minor and of short duration, occurring primarily during storm events.

In addition to mitigating impacts on surface waters during construction, Alternative B will reduce stormwater runoff through natural area conservation and conserve or augment infiltration areas, wherever possible . Alternative B would employ stormwater detention pond and preserve stormwater infiltration areas, which presently exist at the site.

Alternative B would implement measures to mitigate impacts on all surface water resources surrounding the proposed development footprint. No runoff from the site would be directed to the surrounding surface water bodies without at least basic treatment, such as drainage inlets and conventional detention ponds for flood control. Under Alternative B the streambeds of the Kapa'a Stream, the wetland areas in the Kapa'a stream corridor and the existing drainage canal along the quarry road would not be altered. There would be minor construction at the banks of the drainage canal to build the discharge structure for the drainage of the detention pond of the lower portion of the site. Any impacts from the construction would be mitigated by appropriate measures.

Under Alternative B the existing infiltration field for the stormwater discharge on the lower portion of the site through the existing 30-inch culvert under the quarry access would be modified as required under the plans for site grading.

No-action Alternative: Implementation of the No-action Alternative would not alter the current condition of surface water resources on NNMC, and no additional effects to the resource would occur.

4.3.2 Impacts on Ground Water and Leachates from the Landfill Body

Groundwater is an accumulation of water within underground soil structures. Groundwater recharge results from infiltration of surface water through surface layers and into underlying aquifers. The capacity of aquifer recharge is typically affected by a variety of factors such as rainfall, topography, soil types, geologic structure, and ground surface cover. In the absence of significant disturbances to soil and topography resulting from construction, the capacity to recharge is usually affected by changes of ground surface cover, specifically resulting from the conversion of previous to impervious surface cover.

While, in general, groundwater recharge is desirable there are instances when groundwater quality can be negatively affected from leaching of material that is either deposited or is exposed due to excavation. The landfill area which will serve as development area for the proposed industrial park was created several decades ago by deposits of quarry overburden and tailings and some quantity of municipal waste. The landfill area thus predates more recent standards of landfill development that protects the groundwater from landfill leachate by means of a sealing agent, either soil with low permeability, plastic filter membranes or other installed impervious barrier between the land fill body and the underlying groundwater.

As can be observed at the existing site, water percolates readily from the non-paved areas into the ground and practically no runoff is created during normal rain events. The water therefore is readily absorbed into the landfill body and it is assumed that groundwater movement is controlled by the indigenous soil composition, below the landfill material. The groundwater movement in the upper portion of the site is assumed to be towards the Kapa'a Stream corridor. The groundwater movement within the lower portion of the proposed site is assumed to occur towards the east, following the natural slope, where the groundwater eventually flows underground towards the Kawainui Marsh or seeps into the existing drainage canal and flows as surface flow to the Kapa'a Stream and further into the Kawainui Marsh.

The impacts of leaching of the landfill material to the groundwater depends on the type and age of deposits, the residence time of the water in the landfill body and the amount of water that infiltrates into the landfill body. Absorption of pollutants from buried material occurs when the surface of the material is not in equilibrium with the surrounding water, e.g. when there are physical or chemical processes that promote the release of material into the water. With time, equilibrium conditions are attained under which driving forces are not effective enough to promote the release of pollutants from the material particles to the water that seeps through the landfill. In the case of organic material, an equilibrium condition occurs when enough organic material is decomposed. In the case of organically inert materials, the equilibrium condition is attained when the capacity of the water to dissolve and entrain organic material has diminished under a certain threshold level.

With regard to allowing water to enter the landfill body, there are two opposing design strategies to protect groundwater around landfills. The first strategy is the so-called “sealed tomb” approach, where measures are implemented that limit the amount of water to enter the landfill body. With less water entering the landfill body, less water can be polluted by the landfill material and less polluted water is seeping out of the landfill. An alternative approach is to facilitate the infiltration of water into the landfill. Often this approach augments the amount of water entering the landfill though precipitation by collecting the leachate and distributing the leachate on the landfill surface, e.g. recirculating the leachate. One benefit of the second approach, e.g. allowing water into the landfill body, is the accelerated process of decomposition of organic material inside the landfill in the presence of ample water. Since decomposition of organic waste requires water, it follows that keeping water out of the landfill, such as in the “sealed tomb” approach, actually decreases the effectiveness of the decomposition process and lengthens the time that is required to convert most of the organic waste in the landfill.

In the case of the proposed site, most of the landfill material is from organically inert material and thus is not subject to considerations of supplying enough water for decomposition of organic material. Furthermore, the deposits of municipal waste are several decades old and decomposition of organic material should have already occurred over a long time period while enough water was available through infiltration into the landfill body. Therefore it is assumed that sealing of the landfill areas might be beneficial to reduce potential groundwater contamination from landfill material. In the proposed project, this would mean that the benefits of sealing the landfill surface area and avoiding water percolation into the ground might outweigh the benefits of groundwater recharge with potentially contaminated water and the subsequent flow of the groundwater towards the Kawainui Marsh, the receiving water for the Kapa’a watershed.

Under the Preferred Alternative, 21.7 areas would be converted from pervious to impervious surface. This would include 10.6 acres in the upper portion of the site and 11.1 acres in the lower portion of the site. Precipitation and runoff from impervious surfaces in the upper portion of the site would be directed to the Kapa’a stream corridor where the water would infiltrate and recharge the groundwater table in the wetland area. An alternative to releasing the water to the Kapa’a stream corridor would be to convey the runoff from the newly developed area to the drainage field that is located to the west of the landfill area, at the western perimeter of the graded area in parcel 4-2-15:001 (portion of). This area is a former siltation pond for runoff from the landfill areas in the upper Kapa'a valley and releasing runoff from the developed site in this area would result in infiltration and subsequent underground flow towards the Kapa'a Stream

Under the Preferred Alternative, 11.1 acres of the 16.7 acres development footprint would be impervious, with the remaining 5.6 acres of the development footprint being pervious pavement or landscaped area. A significant portion of the roof tops and roadways within the lower portion of the site would serve as collection areas for rainwater which would be collected and stored for irrigation. The irrigation water would be distributed on the landscaped and natural vegetation areas within the restored habitat, either within the development footprint, at the perimeter of the development footprint of in the vegetative buffers zone that would surround the lower portion of the site.

By applying the harvested rainwater on plants for irrigation, most of the applied irrigation water would remain in the top soil or would be lost to the atmosphere through evapotranspiration from the irrigated plants. Therefore less water would infiltrate into the landfill body and less chances would exist that the infiltrated water would entrain and discharge pollutants from the landfill to the surrounding groundwater and surface water resources.

Under Alternative B, 28.6 areas would be converted from currently pervious land to impervious area. All precipitation and runoff from the 10.6 acres that would be converted from pervious to impervious land in the upper portion would be conveyed for discharge into adjoining land for infiltration. All precipitation and runoff from impervious surfaces from the 18.0 acres in the lower portion of the site would be collected and conveyed to detention ponds, from which the runoff would be discharged into the existing drainage canal. Under Alternative B no runoff or precipitation would be used for irrigation and therefore all of the runoff would be excluded from infiltrating and would be discharged to the receiving waters.

Implementation of the No Action Alternative would not change the current situation at the proposed site regarding groundwater resources and would not change impact on groundwater resources. It should be noted that under the No-action Alternative possible leaching of water percolating through the landfill would occur with the stated possible impacts. It is assumed that the No-action Alternative might therefore result in a less desirable situation than the Preferred Alternative that would collect rainwater and distribute it on newly formed top soil and plants and thereby lower the amount of water percolating through the landfill body. In this sense the No-action Alternative would result in more possible impacts that the recommended development approach under the Preferred Alternative.

4.3.3 Floodplain Impacts

Potential impacts to the floodplains were evaluated using floodplain information and criteria established by the Federal Emergency Management Agency (FEMA).

Under the Preferred Alternative no parts of the proposed development footprint would be located within the designated 100-year floodplain zone. As a result, no adverse impacts to floodplains would occur from the actions proposed under this alternative.

Under Alternative B no parts of the proposed development footprint would be located within the designated 100-year floodplain zone. As a result, no adverse impacts to floodplains would occur from the actions proposed under this alternative.

Implementation of the No-Action Alternative would not alter the current condition or alter the current flood plain delineation.

4.3.4 Impacts of Proposed Site Drainage System and Mitigation Measures

Drainage systems collect stormwater from impervious surfaces and convey the stormwater to discharge location to the receiving water. Drainage systems safeguard the avoidance of flooding on developments and are designed to handle the design rain event, typically an assumed storm event of certain length and recurrence interval, i.e. a “10 year” storm event.

At the present time, the drainage infrastructure on the property consists of grass and concrete swales, drain inlets and one conventional detention pond. This infrastructure is limited to portions of parcel TMK 4-2-015:008 where all existing warehouses are located. The rest of the property has primarily pervious gravel cover and lacks structural drainage components. Stormwater runoff from these areas is readily infiltrating into the ground and flows underground following the groundwater movement.

The drainage system of the proposed development would differ from the present system by adding drainage system components which would minimize the impact of runoff to receiving surface waters. The drainage system of the proposed project would incorporate structural and non-structural stormwater management strategies and would collect and treat all stormwater from impervious surfaces before discharge to the receiving waters. The design approach of the proposed drainage system would also include some pervious surfaces, preferably vegetated pervious areas, to stimulate loss of stormwater through evapotranspiration.

Under the Preferred Alternative, the drainage system approaches in the upper and lower portions of the site differ. The drainage system in the upper portion of the site would collect all stormwater from impervious surfaces and convey the stormwater to detention ponds which serve as flood control, before the water is discharged to the Kapa’a Stream corridor through armored spillways in order to avoid scouring and erosion. An alternative drainage strategy in the upper portion of the site would incorporate discharge into the former siltation basin which is located at the western boundary of the development footprint in parcel TMK 4-2-15:001 (portion of) and directly adjacent to the planned development. The benefit of discharging the drainage collected from the new development in the upper portion of the site into the vegetated area at the western development boundary would be that the discharged stromwater would be treated in a quasi wetland environment and suspended solids would be eliminated before the stormwater eventually flows underground to the Kapa'a Stream. A detailed drainage study would determine what approach results in the better drainage systems for the upper portion of the proposed site.

Under the Preferred Alternative (upper portion), 10.6 acres would be converted from pervious gravel surface to impervious paved surface. The sum of 10.6 areas of impervious areas is composed of 6.2 acres of warehouse roofs and 4.4 acres of impervious paved surface between the warehouses. Drainage from these 10.6 acres would be conveyed in a combination of shallow swales in the paved areas or concrete channels which would collect the drainage of shallower swales and provide more drainage capacity and decrease the amount of drainage conveyed by the shallow swales.

The stormwater would then either enter one or more detention ponds before being discharged to the Kapa'a Stream corridor or would be discharged to the drainage basin at the western boundary of the proposed development, as described before. In the final design the selected drainage system might include the installation of stormwater filtration units, which would be located upstream of the detention ponds or the drainage basin. The type of filtration units envisioned would be able to remove from the stormwater all floatables, a percentage of suspended solids, sediments and oil and grease.

Under the Preferred Alternative, the drainage system in the <u>lower portion</u> of the site would result in a more thorough reduction of possible impacts, as part of the low impact development approach used for the lower portion of the site (See Appendix 4 for more details on the proposed stormwater system). As proposed, the 18.9 acres of presently graded and pervious gravel surface would be converted to a development footprint of 16.7 acres, while 2.2 acres which is presently graded, pervious but not vegetated would be included in the planned habitat restoration. Of the 16.7 acres of development footprint about 5.6 acres would have pervious surface, either landscaped area or pervious pavement, including open grid pavement. The rest of the development footprint of 11.1 acres would be impervious surface, such as roadways, truck loading areas and rooftops.

Drainage from the impervious areas would be collected in swales and concrete channels and be conveyed to one extended detention pond from which the drainage eventually would flow into the existing drainage canal at a location that would be near the confluence of the canal with the Kapa'a Stream. As part of the LEED development strategy, stormwater would be collected from a portion of the rooftops and roadway sections and stored for subsequent use in irrigation of the restored habitat areas and the landscaped areas within the development. The exact size of the surfaces that would be used for rainwater harvesting would be determined in the detailed design phase of the project, and would depend on the irrigation needs for landscaping and on the extent of other non-potable water application which would also make use of the harvested rainwater. It is assumed that about 50 percent of all impermeable surfaces, including rooftops and roadway sections, would be used for rainwater harvesting. Several underground cisterns would be constructed at the perimeter of the development footprint to take advantage of gravity flow of the stormwater to the storage and to decrease the length of the irrigation lines and required pumping energy for the irrigation pumps.

If more stormwater runoff occurs than can be accommodated in the underground storage taverns, the overflow would be conveyed to the detention ponds and be discharged along with the portion of the stormwater that runs off areas that are not connected to the rainwater harvesting system.

Stormwater runoff would be collected and conveyed to detention ponds before discharging into the existing drainage canal. Even though the overall runoff volume generated in the proposed development would be higher than the current runoff rates, the nature of stormwater collection, conveyance to detention ponds detention and timed release of the flood waters would result in effective flood control and better effluent quality, and would directly and positively impact the water quality in the receiving water. The detention and timed release of collected stormwater would allow settlement and removal of suspended solids in the extended detention ponds and ensures that the release of treated stormwater would occur after the storm event. In addition, installation of pre-treatment units upstream of the detention ponds oil water separators would increase the overall removal rate of the stormwater treatment.

The proposed type of “detention” system is a “dry extended detention pond”, which would provide two basic functions, stormwater flood control and removal of pollutants in the stormwater. The proposed detention pond system has the following components:

- Pre-treatment: Pre-treatment units would be installed upstream of the detention pond, e.g. stormwater would run through the pre-treatment units before entering the detention pond. The pre-treatment units would remove a significant portion of sediments, nutrients and oil-grease contained in the stormwater. (note the short discussion of the anticipated removal rate at the end of this section)

- Treatment inside the detention pond: Treatment features in the extended detention ponds can remove a portion of pollutants and settleable agents from the stormwater

- Conveyance of the stormwater in detention pond: The proposed type of detention pond is “dry” during dry weather periods. Since the detention volume is designed to accommodate and store a “design storm event”, according to County rules, smaller flows of runoff stormwater from lesser storm events would need a preferred flow path through the detention pond. Therefore a “pilot channel” inside the detention pond would be provided that ensures adequate conveyance into, through and out of the detention pond when flow rates are produced by small rain events rather than the “design” stormwater event

- Landscaping around and in detention ponds: Landscaping would use a vegetated buffer around the pond and would select plants that could withstand both wet and dry periods

- Discharge outlet system: The discharge outlet from the detention pond to the Kapa’a Stream would be through a discharge structure that allows a certain “safe discharge” from the detention pond into the Kapa’a Stream. The outlet structure could be a pipe or a weir structure. The goal of the detention pond is that the water in the pond should be held long enough to ensure a certain amount of treatment and to “flatten” out discharge rates to the Kapa’a Stream, e.g. to avoid high peak flow discharge rates, during strong storm events.

It is assumed that the overall removal rate of stormwater pollutants by the combined system of pre-treatment units and extended detention ponds would exceed 80 percent. The overall pollutant removal for stormwater drainage from the proposed site is a combination of two successive structural BMPs: (1) extended detention ponds and (2) so-called nutrient separating baffle boxes, which are the proposed pre-treatment units and which would be installed upstream of the detention ponds.

(1) The removal rate in the extended detention ponds is assumed to be at least 50% of the loads contained in stormwater. (according to the Stormwater Management Resource center, (www.stormwatercenter.net) average pollutant removal rates of dry detention ponds for selected agents are as follows; TSS 61%, TP 20%, TN 31%, Metals 29%-54%, Bacteria 78%).
(2) The stormwater would run through in-line pre-treatment units before flowing into the detention ponds. The inline treatment units would be designed to catch most, if not all, of the floatable debris and remove a significant amount of suspended solids and oil / grease contamination. The reported effectiveness of these types of treatment units are as follows (referencing the manufacturer): Pollutant removal efficiency: Trash & Debris 99%, TSS 76% to 93%, Fine TSS (d50 63 μm) 67%, Metals Up to 57%, Total Nitrogen 38% to 63%5, Total Phosphorus 18% to 70%.

Anticipated overall removal rate was evaluated using TSS as an indicator pollutant:

- Pre-treatment: Removal rate for TSS: 67% to 93%, depending on particle size, est. 70%
- Remaining after pre-treatment 30% from original TSS load
- Detention ponds: Removal rate for TSS: 60%

- Remaining after pre-treatment 12% from original TSS load
- Therefore the calculated overall removal rate for TSS would be approximately 88%.

For the stormwater treatment analysis a conservative estimate of 80 percent overall removal rate of pollutants for the stormwater is considered. The proposed development would improve run-off water quality and reduce storm discharge peak runoff rates into the receiving waters due to retaining and releasing stormwater in a controlled manner.

As pointed out, the pervious areas within and at the perimeter of the development footprint would be vegetated. Therefore a significant portion of the stormwater would be retained in the topsoil and lost through evaporation rather than infiltrated into the soil. A part of the pervious areas would be used for parking and temporary traffic areas; these pervious traffic areas would either have a gravel surface or open grid pavement (e.g. pavement with at least 50 percent pervious and vegetated surface).

Drainage during construction would occur in such a way to avoid entrainment and erosion of significant amounts of exposed soils on the site. Structural and non-structural stormwater management practices during construction would include the following:

- Pre-construction planning to determine scope of erosion control: development of an erosion and sediment control plan (would be required for permit).
- Preserving existing vegetation wherever possible: Established populations of trees, bushes, and grass could help keep erosion to a minimum.
- Limiting disturbed areas through phasing. No disturbed surfaces should be left without erosion control measures in place.
- Providing primary and secondary containment for fuel and other hazardous materials, would be placed around any storage tanks.
- Installing clean water diversions, sediment traps/ basins and stabilizing drainage channels with grass, liners, and silt check dams before excavation, fill, or grading work begins. Diversion berms or ditches could avoid upland runoff from flowing through the construction site.
- Installing construction entrances and controlling dust to avoid mud tracked on paved roads. Mud on roadways that originates from construction is annoying and also unsafe.
- Dewatering operations and discharges: sediments should be removed from water before they discharge into storm sewers, streams, lakes, or wetlands. Silt fence enclosures or use of bag filters or other devices should be applied to remove sediments. If possible, water generated as part of construction dewatering should be discharged onsite and should not be discharged to surface waters.

- Installing vegetated buffers above and below the construction site to avoid volume sheet flows from moving across cut or fill areas, and helping to filter and trap sediment before it can move into ditches, channels, and streams, respectively.
- Protecting soils with seed, mulch, or other products (e.g. erosion control blankets, turf reinforcement mats, temporary plastic covers).
- Using silt fences and other sediment barriers below (downhill from) areas of bare soil to avoid sediments from escaping the construction sites and flowing into downhill areas of receiving waters.
- Temporary downdrains using plastic pipe or rock lined downdrain channel should be used to stabilize sloped faces of temporary channels that carry water down slopes.
- Using steep slope protections: rock-filled, stacked gabion baskets or retaining walls should be used to protect steep slopes that cannot be effectively protected with other measures.
- Protecting Culvert and Ditch Inlets and Outlets; Sandbags, stone aprons or other measures should be placed around inlets and outlets to allow ponding for energy.

Under Alternative B, the upper and lower portions of the site would have similar drainage system; this means in direct comparison to the Preferred Alternative, Alternative B would have a less comprehensive stormwater management system. Under Alternative B the proposed drainage system for the upper portion of the site would be the same as in the case of the Preferred Alternative. This means that 10.6 acres would be converted from pervious gravel surface to impervious paved surface. The sum of 10.6 areas of impervious areas is composed of 6.2 acres of warehouse roofs and 4.4 acres of impervious paved surface between the warehouses. The stormwater would then either enter one or more detention ponds before being discharged to the Kapa'a stream corridor, or would be discharged to the drainage basin at the western boundary of the proposed development, as described earlier. In the final design the selected drainage system might include the installation of stormwater filtration units, which would be located upstream of the discharge to the detention pond or the drainage basin. The type of filtration units envisioned would be able to remove from the stormwater all floatables, a percentage of suspended solids, sediments and oil and grease.

Under Alternative B the drainage system of the lower portion of the site would be similar to the drainage system in the upper portion of the site. A total of 18.9 acres of existing graded but not vegetated area would be used to construct the 18.0 acres of development, including warehouses, roadways, truck loading areas and parking areas. All of the 18.0 acres of the development would be impervious surfaces, which would be drained by conveying the runoff to one detention pond that provides of flood control. The stormwater in the detention pond would then be released to the drainage canal in a time lagged manner to shave off high peak discharge flow rates. In the final design the selected drainage system might include the installation of stormwater filtration units, which would be located upstream of the discharge to the detention pond or the drainage basin. The type of filtration units envisioned would be able to remove from the stormwater all floatables and a percentage of suspended solids, sediments and oil and grease.

Under the No-action Alternative the existing drainage system on the site would not be altered.

4.3.5 Wetland Impacts

It is anticipated that the proposed project will not result in loss of wetlands, since the development footprint I entirely outside delineated wetlands. If wetlands were impacted, according to the Department of the Army, Section 404 Clean Water Act, an Individual Permit or Nationwide Permit issued by the Corp of Engineers would be required for unavoidable impacts. Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support vegetation that is typically adapted to life in saturated and/or partially anaerobic soil conditions. The determination if an area is delineated as jurisdictional wetlands is based on three criteria: the presence hydric soils, the frequency of inundation or other wetland hydrology features, and the presence of typical hydrophytic vegetation. Section Three of this DEIS describes the delineation of wetland within the land parcel TMK 4-2-15:006, which is part of the property containing the proposed project site.

Under the Preferred Alternative, wetland habitats would not be affected as a result of developing the proposed industrial site. The proposed development footprint of the Preferred Alternative does not contain wetlands. All permanent structures, including buildings, roadways, parking areas and truck loading are outside the delineated wetland. The development within the lower portion of the site would encroach on the wetland boundaries, but would not use any part of the wetland itself. Construction of the vegetative buffer zones and restored habitat areas which surround the lower portion of the site and which border the wetland in the Kapa’a stream corridors would occur exclusively within upland areas.

During construction at this site vegetation would be removed and soils would be exposed, creating an increased potential for erosion and/or transport of surface pollutants into adjacent water bodies affecting aquatic habitat quality. Prior to construction at the proposed site, the permit procedure would include the completion and implementation of an approved sediment and erosion control plan. The implementation of site-specific stormwater management practices which would be part of the erosion and sediment control plans would reduce erosion of exposed soils, slow the rate at which water leaves the site, and capture eroded soils and associated pollutants before they enter the downstream water flow, thereby reducing reduce potential impacts to adjacent wetlands.

Under the Alternative B, wetland habitats would also not be affected as a result of developing the proposed industrial site. The proposed development footprint of Alternative B does not contain wetlands. All permanent structures, including buildings, roadways, parking areas and truck loading are outside the delineated wetland. The development within the lower portion of the site would encroach on the wetland boundaries, but would not use any part of the wetland itself. As in the case of the Preferred Alternative possible impacts from erosion and runoff from the site would be effectively mitigated with appropriate measures.

Under the No-action Alternative there would be no encroachment on wetlands and therefore no impacts to wetlands would occur.

4.3.6 Impacts on Kapa'a Watershed

The impacts of the alternatives on the Kapa'a Watershed are evaluated through the contribution of the alternatives to the total watershed TSS load. As described in Section Three, which describes the existing environment, the Kapa'a watershed water quality has been investigated by a recent State of Hawaii Department of Health report (DoH, 2007). The anticipated impacts of the proposed project for the alternatives have been evaluated based on the results of the hydrological model contained in the DoH study.

Under the Preferred Alternative, measures would be implemented that significantly lower the amount of TSS in the stormwater runoff. Under this alternative a 60 percent and 80 percent reduction of TSS in the runoff are assumed for the upper and lower portions of the site, respectively, as a result of implementing a two-tiered stormwater treatment process, which includes stormwater pre-treatment units upstream of extended detention ponds for the lower portion of the site. The 80 percent reduction in TSS loading for the lower portion of the site is a conservative assumption, since the actual TSS of the two-tiered treatment system of pre-treatment units and extended detention ponds should be higher than 80 percent. The 60 percent reduction in TSS discharge assumed for the upper portion considers regular detention ponds for flood control working in concert with pre-treatment stormwater units. Furthermore, the 60 percent TSS reduction in the upper portion of the site assumes that stormwater would be released into the Kapa'a stream corridor. If the discharge would occur from the upper portion of the site to the drainage field at the western boundary of the development, the attainable removal rate could easily be higher than 60 percent. The resulting contributions of the entire project site to the TSS load of the Kapa'a watershed for the base load and peak flow conditions are indicated in Figures 4-2 and 4-4, respectively.

Under Alternative B, measures are implemented that lower the amount of TSS in the stormwater runoff. Under Alternative B a 45 percent reduction of TSS in the runoff is assumed for both the upper and lower portions of the site, respectively, due to the stormwater treatment system that is less effective than used in the Preferred Alternative. The resulting contributions of the entire project site to the TSS load of the Kapa'a watershed for the base load and peak flow conditions are indicated in Figures 4-3 and 4-5, respectively.

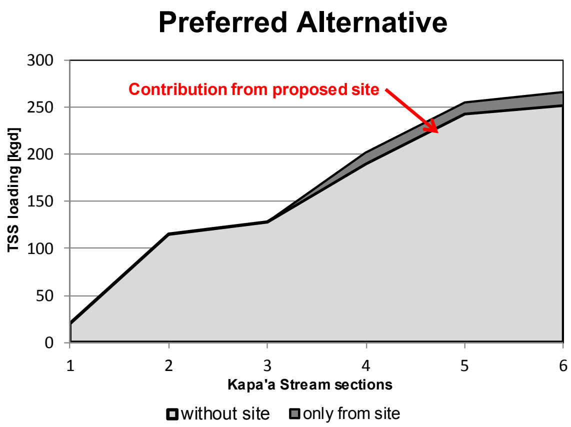


Figure 4-2 TSS contribution of site to watershed in base flow condition under the Preferred Alternative

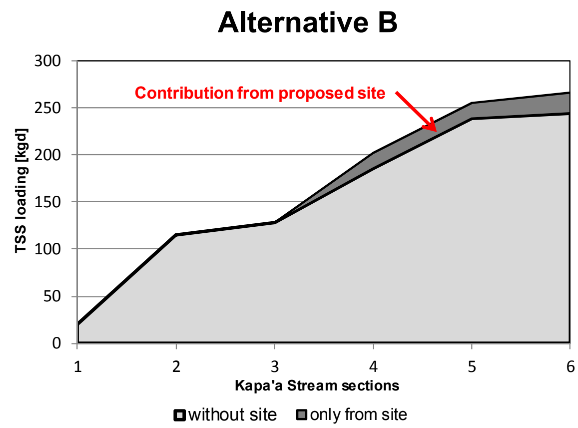


Figure 4-3 TSS contribution of site to watershed in base flow condition under Alternative B

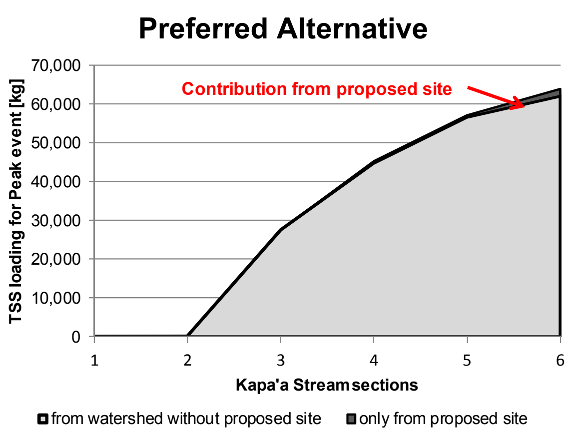


Figure 4-4 TSS contribution of site to watershed for peak flow (2%) condition under the Preferred Alternative

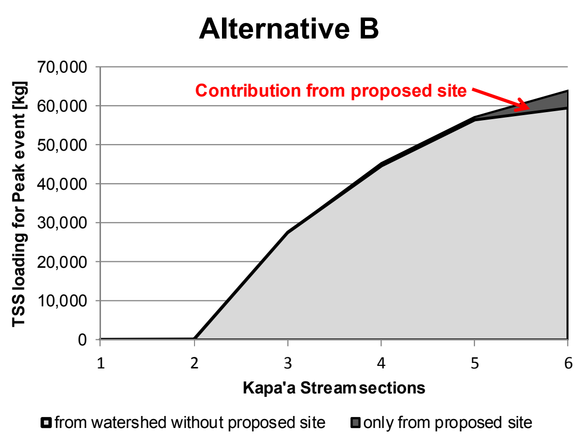
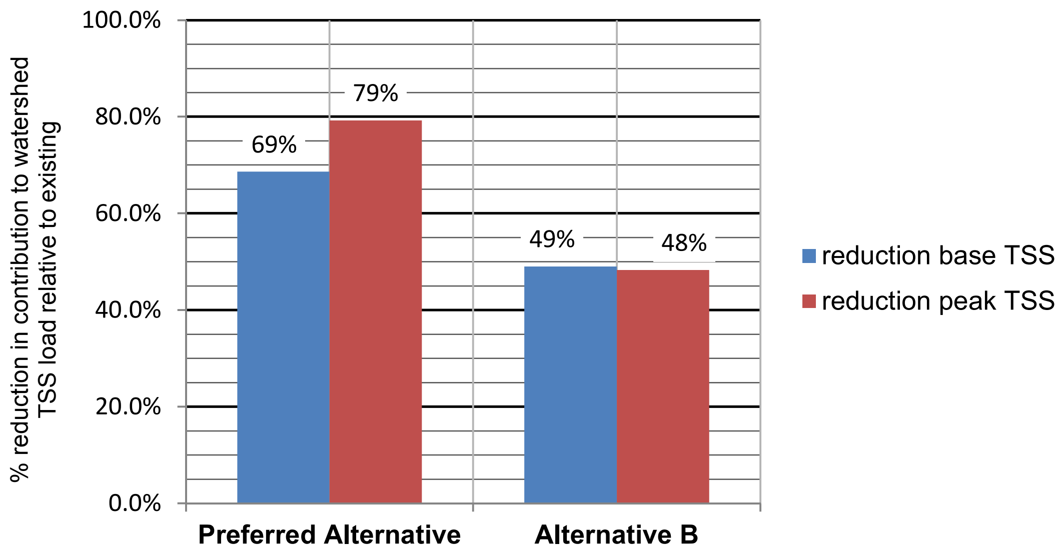


Figure 4-5 TSS contribution of site to watershed for peak flow (2%) condition under Alternative B

Under the No-action Alternative the contribution of the proposed site to the TSS loading of the watershed would remain unchanged.

Figure 4-6 shows a direct comparison between the two action alternatives. Figure 4-6 shows the reduction in TSS discharge by the Preferred Alternative and Alternative B relative to the existing conditions, which is the No-action Alternative. Figure 4-6 suggests that the existing TSS load from the proposed site can be effectively lowered by implementing effective stormwater treatment systems, such as proposed for the two action alternatives. Figure 4-6 furthermore suggests that the magnitude of the TSS loads reduction of in the runoff from the proposed site is significantly higher for the Preferred Alternative than for Alternative B. Therefore, TSS related impacts from the proposed site would be lower under the proposed two action alternatives than under the present condition.

Figure 4-6 Comparison of alternatives for magnitude of reductions in TSS discharge from the proposed site



4.4 Impacts on Biological Resources and Proposed Mitigation Measures

This section discusses possible impacts of the proposed project on vegetation, wildlife and threatened and endangered species. Under both action alternatives the development footprint for the proposed project would only use land that was created by landfill and which presently has no vegetation. With the exception of a small, less than one acre area within the upper portion of the site, no land that is presently vegetated would be used for the development, including buildings, roadways, parking areas and truck loading areas. Only land that is graded and is covered with a pervious gravel surface would be used for the development footprint.

4.4.1 Impact on Vegetation

The current landscaped areas would not be affected by the proposed development. Only impacts on natural vegetation are evaluated. Figure 4-7 shows the existing natural vegetation areas that surround the proposed site. The two action alternatives would impact the existing natural vegetation areas as described below.

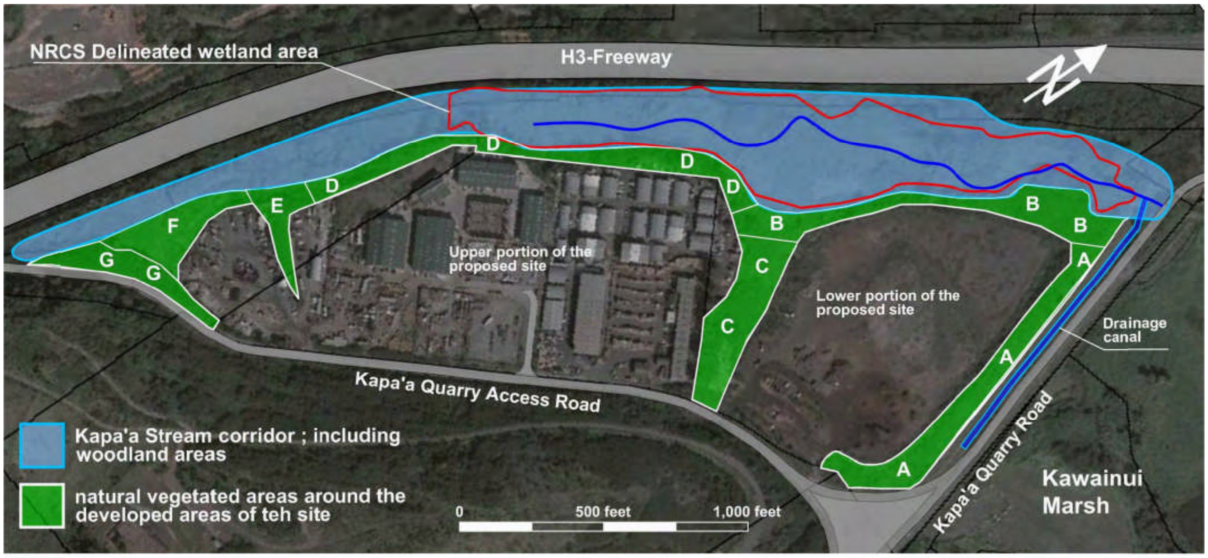
Under the Preferred Alternative, natural vegetation areas sections A, B C and D, depicted in Figure 4-7, would be affected, which represent a total vegetated area of 7.9 acres. Of these 7.9 acres only 0.8 acres of subsection E, located in the upper portion of the site, would be converted to impervious developed land. The sections A, B and C, all located at the perimeter of development footprint in the lower portion of the site, would be restored with native or adaptive plants, and about 2.2 acres of presently graded but not vegetated land would be included in the habitats restoration that surrounds the lower portion of the site, where open space is planted with native and adaptive plants. With the removal of the 0.8 acres vegetated area in the upper portion a net addition of 1.4 acres of vegetated area would occur under the Preferred Alternative in regard to the entire. Using native and adaptive plants in lieu of introduced plants has the significant advantage that typically less irrigation is used as well as less fertilizer and pesticides.

Under the Preferred Alternative the earth berm within section A would be increased in size and height to function as an effective vegetative buffer zone separating the lower portion of the site from the quarry road and the western parts of the Kawainui Marsh. Under this alternative the improved earth berm in Section A would be replanted with native or adaptive plants, including larger trees to provide a wind break on the new earth berms, which would also mitigate visual impacts. Under the Preferred Alternative, Section B would be augmented with native and adaptive plants to form an effective buffer between the adjacent wetland area in the stream corridor and the development footprint. Section C would likewise be improved by restoring the area with native and adaptive plants. There are a few larger trees within section C, which would be preserved in the habitat restoration effort. Under this alternative, the existing earth berm with some vegetation cover (i.e. some smaller trees and shrubs) within section E (0.8 acres) in the upper portion of the proposed site, would be removed and converted to developed and impervious land. In addition to converting the existing vegetation to a restored habitat, there would be about 3.7 acres of landscaped land within and at the perimeter of the development footprint.

Existing natural plant communities in sections A, B and C have rather low vegetative diversity.

The only exiting mature forested areas are in section G (see Figure 4-6) and the stream corridor. Under the proposed low impact development of this alternative, no impacts to forests would occur from new construction. Therefore no significant adverse effects to vegetation would be expected from new construction under the Preferred Alternative. Rather, planting native shrub and tree species in the areas of habitat restoration efforts would provide a positive impact on the vegetation around the proposed site.

Figure 4-7 Natural vegetated areas found adjacent to the proposed site



Under Alternative B, the 0.8 acre large section E within the upper portion of the site would be removed and converted to developed and impervious land. In the lower portion of the site 18 acres of the presently 18.9 areas of graded, pervious and not vegetated land would be converted to developed and impervious land. The remaining 0.9 acres at the perimeter of the development footprint would be converted to landscaped area. The sections A,B and C would not be altered under this alternative. Therefore, Alternative B would result in a net increase of 0.1 acres of vegetated area, relative to the entire project site. Under this alternative no landscaped area would be created within the development footprint nor would open space be improved at the site perimeter. The only exiting mature forested areas are in section G (see Figure 4-6) and the stream corridor. Therefore no significant adverse effects to vegetation would be expected from new construction under the Preferred Alternative.

Under the No-action Alternative no adverse effects would be expected to vegetation since no new facilities would be constructed on the proposed site.

4.4.2 Impacts on Wildlife

The proposed project site is not considered to have important wildlife habitat value, since these areas have been previously developed, graded and are practically void of existing vegetation.

Under the Preferred Alternative, it is assumed that a small population of urbanized small mammals and birds can be found within or, with more probability, at the perimeter of the proposed development, inside vegetated areas. It can be expected that these birds or small mammals would be temporarily displaced during the construction but would return after construction is completed and the open space would again be available as habitat. Under this alternative, the area around the lower portion of the site would be restored with native and adapted shrubs and tree species and the vegetation density would be increased. The vegetative buffer zones which would be developed from the sections A, B and C (see Figure4-6) would particularly serve as improved habitat for wildlife that is presently found on the site, and it is expected that new wildlife would be attracted to these newly created natural vegetation areas. No forested or natural vegetation area would be converted to developed land and therefore impacts to migratory birds are not expected.

The fact that waterfowl might be attracted to wet ponds needs to be considered in the design of the planned stormwater detention ponds. Communication with the U.S. Fish and Wildlife Service has indicated the possibility of an impact on the water bird community, especially attracting endangered water bird species to water ponds, even to those ponds which have only intermittent free water surfaces. The final design of the detention ponds would consider mitigation and avoidance measures to counter attraction to the detention ponds.

Impacts on wildlife at the proposed site under Alternative B would be similar to the Preferred Alternative, however, since the open space at the perimeter of the development footprint in the lower portion of the site would not be improved with the same scope and quality as restored habitat efforts under the Preferred Alternative, the positive impacts on wildlife habitat would be limited under Alternative B.

Under the No-action Alternative no adverse impact would be expected to wildlife. Under the existing conditions, however, there seems to be an overpopulation of feral cats. Such non-native predators are a serious threat to endangered bird species which nest in outer sections of the Kawainui Marsh and in the wetland area adjacent to the proposed site. Under both action alternatives, a program to control small non-native predators would be advantageous in order to improve the habitat for birds.

4.4.3. Impacts on Aquatic and Wetland Habitat

Under the Preferred Alternative by implementing the proposed stormwater management practices, no significant adverse impacts to aquatic and wetland habitat would be expected. The proposed project sites would not develop any portion of wetland areas, the Kapa'a Stream or the drainage canal along the quarry road, all surface water features that provide habitat for aquatic species. The proposed low impact development approach in the lower portion of the site would generally provide ample buffer zones between the development footprint and the aquatic habitat. Since a significant area is converted from presently pervious to future impervious area, the runoff peak rates and the amount of sediments and pollutants transported to the receiving waters could affect aquatic habitat conditions in the receiving waters adjacent to the proposed site. These potential adverse impacts must be mitigated by appropriate stormwater management practices, which are considered for this alternative. The construction of the vegetative buffer zones around the lower portion of the site would occur before grading of the site. The buffers, which include earth berms and dense vegetation, would serve as organic filter which would effectively diminish the amount of sediment that is transported to the receiving waters during construction but also during operation of the proposed industrial development.

During construction soil would be exposed and there would be an increased potential for erosion and transport of sediments into the adjacent receiving water, which could negatively affect aquatic habitat conditions. Under the Preferred Alternative comprehensive erosion and sediment control plans would be implemented to significantly reduce erosion of exposed soils, slow the stormwater discharge rate, and capture and contain eroded soils and concentrated nutrients before they enter the receiving waters. The possible attraction of water birds to ponds with free surface area would be considered in the design of the detention pond of the lower portion of the site, and suitable mitigation and avoidance measures would be implemented where it would be advisable or required by agencies.

Under Alternative B by implementing the proposed stormwater management practices, no significant adverse impacts to aquatic and wetland habitat would be expected. The proposed project sites would not develop any portion of wetland areas, the Kapa'a Stream or the drainage canal along the quarry road, all surface water features that provide habitat for aquatic species. Mitigation of possible runoff of stormwater and transport of sediment to the receiving waters would be similar to the Preferred Alternative. The scope and effectiveness of the stormwater management plan under Alternative B would be somewhat smaller than under the Preferred Alternative, due to the absence of the newly constructed vegetative buffer zones around the lower portion of the site.

Under the No-action Alternative no adverse effects would be expected to the aquatic and wetland habitat since there would be no new construction activities.

4.4.4 Impacts on Endangered Species

Any possible impact to federally listed or endangered species requires communication with the U.S. Fish and Wildlife Service (USFWS), as well as mitigation measures. The proposed project site is not considered habitat for endangered species, but the USFWS has determined that four federally listed water birds have a habitat in the adjacent Kawainui marsh and the wetland area in the Kapa'a Stream corridor. The four endangered water birds are the Hawaiian stilt, Hawaiian moorhen, Hawaiian coot and Hawaiian duck. The USFWS has communicated that recommended mitigation measures should be considered in the DEIS in order to minimize negative impacts to water birds. Out of the four recommended USFWS measures to avoid adverse impacts to water birds for the proposed development project, three measures were concerned with the previously planned 15-acre wildlife habitat project that was planned in conjunction with the wetland restoration. The wildlife habitat project is now no longer pursued by the applicant and therefore these three mitigation measures no longer apply. The remaining measure required by USFWS addresses possible adverse impacts to water birds from detention ponds which might feature permanent or intermittent water ponds. Water birds might be attracted to these water features, which would make them more prone to predators at the proposed site. Following the recommendation the final design of the detention ponds will incorporate suitable avoidance measures.

Under the Preferred Alternative one larger extended detention pond would be constructed at the eastern boundary of the lower portion of the site. Extended detention ponds have a longer residence time for stormwater runoff than regular detention ponds and therefore could have intermittent water pools more frequently than the regular detention ponds which would be considered for the upper portion of the site. Under the Preferred Alternative a significant volume of the storm water runoff in the lower portion of the site would be collected and stored in an underground cisterns to provide irrigation water for the open spaces and restored habitat areas surrounding the development footprint. By storing a part of the stormwater in underground tavern, the probability of creating water ponds in the detention pond in the lower portion of the site is significantly reduced.

Under Alternative B, several regular detention ponds will be constructed to serve as flood control and for lowering the rate speed at which the stormwater leaves the project. The regular detention ponds have a shorter residence time than in extended detention ponds, which also provide some treatment processes for the detained stormwater runoff. The probability of creating water pools and attracting water birds is therefore lower in regular detention ponds than in extended detention ponds.

Under the No-action Alternative, no added adverse impact to water birds would occur since at present there is no permanent of intermittent water pond which could attract water birds and make them subject to an elevated risk to predators.

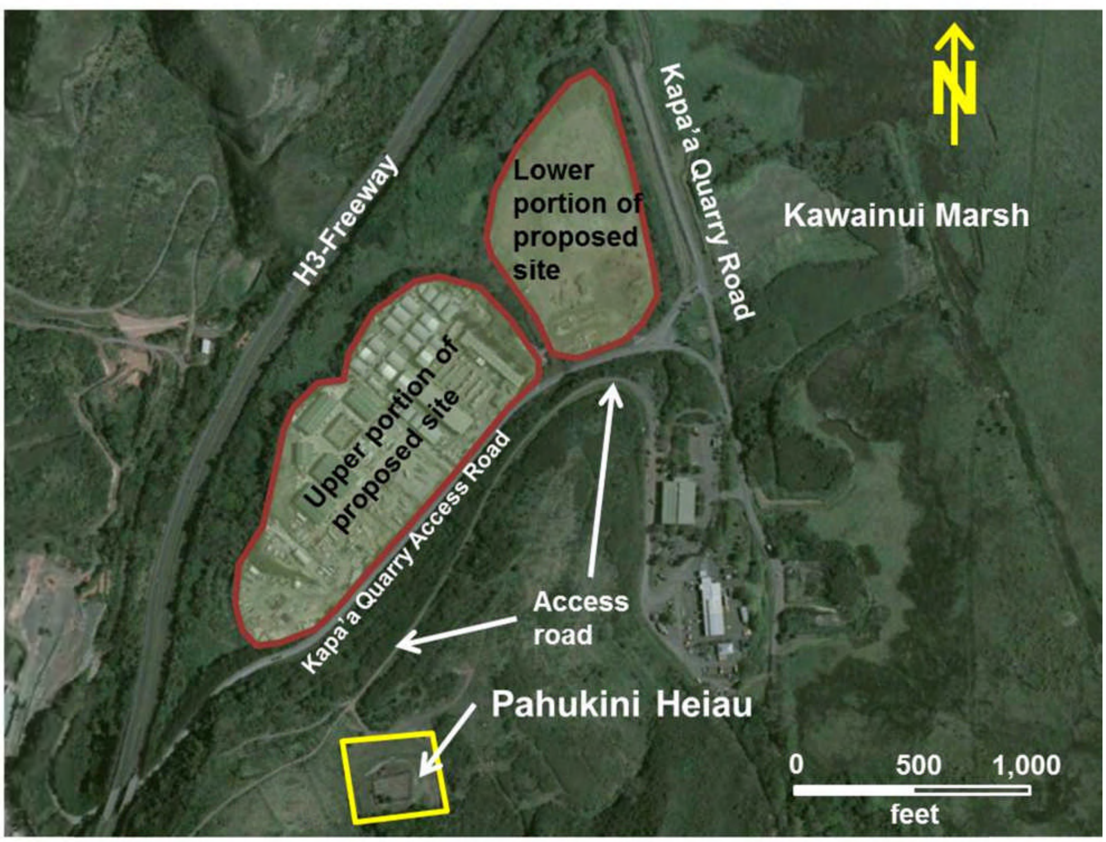
4.5 Impacts to Cultural Resources

Prior communication with the State Historic Office has established the fact that no places of cultural or archeological significance are within the development footprint of the proposed project. The proposed site is a landfill area that was established several decades ago and the construction of buildings and the development of the industrial park on these man-made areas will therefore not have directly adverse effects on historical places.

As delineated in Section 3.4 of this DEIS, most of the sites of historical and cultural significance in the vicinity of the proposed site are located in the southern part of the Kawainui Marsh, with most of these identified sites being more than one mile away from the proposed site. Therefore the proposed project would have no adverse effect on these sites.

The only site of historical and cultural significance that is in close proximity to the proposed site is the Pahukini Heiau. Figure 4-8 shows the vicinity map of the Heiau to the proposed project site. The Pahukini Heiau is said to be built by High Chief Olopana in the 12th century. The Heiau is a Luakini or state-class Heiau , where important state matters, including preparation for war were conducted. The Heiau is now located on the site of the landfill in Kapa'a Quarry. The access to the Heiau is restricted but a visit can be arranged through the office of the Kapa'a Refuse Transfer Station where the access gate is located. The closest distance from the Heiau to the property is approximately 700 feet. The representative distances to the centers of the upper and lower portions of the proposed project sites are 1,400 feet and 2,600 feet , respectively. The proposed project would not limit access to the Heiau nor would in any way affect the physical site of the Heiau.

Figure 4-8 Vicinity map of Pahukini Heiau



A site visit to the Heiau has determined that the existing warehouses within parcel TMK 4-2-15:008 are out of the direct line of sight. The existing warehouse development is hidden behind a screen of mature trees and a dense vegetation of shrubs. A more detailed analysis of the visual impact, or better the absence of any visual impact by the proposed project site, is delineated in the visual impact assessment presented in Appendix 8 of the DEIS. It can be expected that the proposed project will have no adverse effect on the Heiau.

The appearance of the planned warehouse structures would not have to conform to any historical buildings at or near the site. The appearance of the valley is determined by the ongoing industrial activities and the planned warehouse development or industrial park would fit in the established surrounding.

Under the Preferred Alternative, the proposed development would be shielded from direct view by means of the planned vegetative buffer zone which would include taller trees and dense vegetation or shrubs for visual impact mitigation around the lower portion of the site, the part of the development which would be more visible to passing motorists on the quarry road. Since the Preferred Alternative would be constructed in the previously developed area, there would be a low probability of finding unexpected archeological deposits. In the unlikely event that archeological effects would be discovered during construction all work would be stopped and all reasonable efforts would be made to avoid and mitigate any adverse effects while contacting a cultural resources manager. Upon consultation between the project team and the resource manager, design decisions would be made if and how changes to the construction progress would be necessary.

Under Alternative B, the buffer zones around the lower portion of the site are not as extensive as under the Preferred Alternative; therefore the lower portion of the proposed site would be more visible than under the Preferred Alternative. The appearance of the planned structures in Alternative B would, however, still conform to the surrounding industrial appearance of the Kapa’a valley.

Under the No Action Alternative, there would be new construction and no adverse effects on historical sites would occur.

4.6 Impacts to Air Quality

Impacts to air quality can be categorized as follows:

- Air quality impacts during construction
- Air quality impacts during operation
- Indoor air impacts

Air quality impacts during construction vary with the scope and length of construction activities. Typical air quality impacts during construction would primarily be from exhaust of heavy machinery used in excavation, grading and other activities, from exhaust by construction related heavy truck traffic on adjacent roadways, and from added dust during earth moving and periods when lighter soil fractions are exposed to wind born entrainment and transport.

The construction schedule for the development features activities that stretch over several years, with periods of more intensive construction efforts during site development. The periods of more intensive construction efforts for grading, roadway construction and installation of all infrastructures would be followed by the construction of the individual warehouse structures. The most adverse impact would occur during a short duration of site development. Impacts on air quality associated with construction of the individual warehouse structures would include the time that is needed to build the outer shell of the warehouses, followed by finishing of the interior work inside the buildings. The following are air impact mitigation measures, which would be implemented:

- Control dust (e.g. fine water sprays), avoid entrainment of dust by wind through appropriate means such as fine water sprays or placing of fine mesh screening close to the dust source, or cover piles of building materials like cement, sand and other powder.
- Continuously inspection of sources of dust from exposed earth and building materials and implement targeted mitigation.
- Cover trucks loaded with construction materials.
- Prevent spills and exposed surfaces of agents which could generate air impacts, especially from hazardous agents such as VOCs.
- Proactive measures to prevent site contamination by and atmospheric exposure of fuel, solvents and other agents.
- Vegetative buffer zones with berms around the proposed site can mitigate air quality impacts since they act as wind breaks that reduces the probability of stronger winds entraining and transporting dust and hazardous particles from the site.
- Use low-emission diesel fuel and construction vehicles that incorporate particulate filters and catalytic converters; ensuring that engines are well tuned and other maintenance is carried out to limit unnecessary burning of fuel.
- No burning of any materials on site.
- Implement waste management control to limit the heavy truck traffic required to transport waste off the site and deliver material that could also be reused at the site.
- Recycle organic waste in form of green waste to produce top soil for the restored habitat or landscaped areas, thus avoiding the removal of organic waste or marginal top soil from the site and transport of top soil to the site.

- Contractors to offer shuttles of employees during construction rather solely relying on individual transport of all construction personnel.

With implementing the proposed construction plan and schedule, it is expected that adverse impacts on the air quality from the site during construction is limited.

The two action alternatives differ very little in the planned amount of new warehouse space and therefore air quality impacts during construction might differ only slightly. The Preferred Alternative, however, features some development approaches that will be more effective to mitigate air quality impacts, such as waste management plans, reuse of material on site, and more extensive buffer zones around the lower portion of the site during parts of site development and construction of individual warehouse structures. Under the No-Action Alternative, no additional air quality impacts would occur, since no new construction would be carried out.

Air impacts during operations of the proposed industrial park would be limited and the primary contributor of adverse air quality impacts would be through increased traffic on the adjacent roadways, where heavy truck traffic is expected to add most of the new air quality impact. Other air quality impacts would be through release of harmful agents such as solvents, paints and other agents, especially those containing VOCs. The proposed industrial development will not burn any fuel on the site to power machines or generate electricity or process heat, except the diesel operated fire pump in the fire water booster pump house.

Measures to mitigate air impacts during operation would include advising businesses leasing space in the new industrial development about maintaining and tuning the engines of their vehicles (e.g. heavy trucks, forklifts. The amount of discharge of exhaust in heavy trucks is a function of the power applied and the duration of operation. The amount of exhaust from internal combustion engines can be reduced if engines are not idling unnecessarily and if trucks avoid strong acceleration and high speeds. Air impacts from cars and light trucks can equally be reduced by advising the occupants of the park and customers not to idle the engine unnecessarily and keep their engines well-tuned.

Under the Preferred Alternative the following measures would be implemented:

- Attune and educate occupants of the proposed industrial development to follow low impact development and operation in an effort endeavor the lowest air quality.
- Prevent open burning of any material on the site.
- Prevent the exposure of harmful agents that could be released to the atmosphere.
- Prevent the inappropriate and unsafe handling of any fuels, solvents and any other harmful agents.

- Advise businesses that lease space to operate their commercial cars vehicles with well-tuned engines in and encourage employees to do the same with private vehicles.
- Promote car-pooling and the use of low emitting cars by providing incentives such as preferred parking.
- Promote the use of bicycles transportation and provide shuttles to lower the amount of individual automobile use.
- Use electric operated maintenance vehicles.

Under Alternative B, businesses would be asked to encourage employees to maintain their vehicles with well-tuned engines, and refrain for from unnecessarily idling the vehicle's engine. Furthermore, the operating guidelines of handling hazardous agents would be distributed to remind business and occupants to adhere to local codes and responsible use of such agents.

Under the No-action Alternative there would be no new adverse impacts on air quality and no new measures would be implements.

Indoor air quality impacts are an often neglected or insufficiently considered feature in the construction and operation of commercial and industrial developments. The importance of indoor air quality has been gaining more attention within the past few years, and indoor air mitigation is becoming a more important issue.

The Preferred Alternative in fulfillment of the LEED certification requirements, implements effective mitigation to adverse impacts on the indoor air quality. The goal of providing good indoor air quality is the avoidance of exposure of harmful agents to occupants, either through elimination of harmful agents inside the buildings or through sufficing ventilating the indoor spaces. The sustainable design approach in Appendix 4 describes the measure that would be implemented under the Preferred Alternative.

4.7 Impacts from Noise and Noise Mitigation

Noise sources considered are construction noise and noise during operation. Noise sources are very similar between the two action alternatives, since both alternatives require site development work using heavy equipment and delivery of construction materials to the proposed site. In a comment to the EISPN the Department of Health, Indoor and Radiological Health Branch states that "Project activities shall comply with the Administrative rules of the Department of Health; Chapter 11-46 Community Noise Control".

Noise impact during construction: The planned construction work would see two primary phases of noise impact. First, the site development activities would be carried out as the initial work that would include the use of heavy machinery such as backhoes and trucks for clearing, grading and excavation. Once the entire site, or parts of the site, is/are prepared, individual warehouse structures would be erected. It is expected that between one and two standard warehouses (e.g. about 24,000 square feet each) would be constructed on the prepared site per year, on average. The construction of the warehouse structure would also include the use of heavy equipment, such as cranes and trucks, but the noise level created by these activities would be significantly less than during the first phase of construction.

It is expected that the first phase of the construction, the site preparation, would be completed within approximately a three to four month window. The follow-on phases of construction of the individual warehouses and the traffic areas and utilities in the immediate vicinity of the warehouses would be carried out over a long duration of several years. Warehouse space will be added to the development in accordance with the absorption of the available warehouse space by the local market. This does not imply that construction noise would occur continuously over a span of several years. Rather it is expected that construction noise from individual warehouses would only be noticeable during about 20 weeks of the year.

It should be noted that the noise receptors – occupied buildings – are located in an industrial park where the occupants are used to noise levels, which are higher than in residential areas.

The type of noise sources that would be used during construction at the proposed site would involve heavy equipment such as backhoe, trucks, grader and other equipment. These types of equipment are typically generating maximum equipment noise level and noise levels 50 feet from the source of between 80 and 70dBA, depending on the equipment used . With increasing distance from the noise source the noise level declines. As a general rule, the noise level decreases approximately 6 dBA with the doubling of the distance; this means that as an example a truck that generates 72 dBA at a distance of 50 feet generates 66 dBA at a distance of 100 feet. Table 4-1 lists expected noise levels for heavy equipment that would likely be used in construction at the proposed site

Since the construction site is not located near a residential area or other locations with sensitive noise receptors, the anticipated noise levels are expected to be within allowable levels. If it is deemed that the construction related noise is high enough to warrant noise reduction measures the following measure could be considered:

- Limit the type of noise to certain times during the day
- Temporary noise barriers to shield sensible receptors or noises sources that are operating close to occupied buildings
- Schedule operations that are especially noisy operations to occur at the same time during the day
- Use low noise emission equipment, such as encapsulated compressors.

Table 4-2 Expected noise levels of heavy construction equipment

Type of construction equipment	**Noise Levels at 50 feet, dBA** hourly equivalent	**Noise Levels at 100 feet, dBA** hourly equivalent
Backhoe	78	72
Front loader	76	70
Bulldozer	79	73
Heavy dump truck	73	67
compressor	75	69
Vibrator roller	77	71
Concrete pump	78	72
Flatbed truck	72	66

Since the construction will occur adjacent to environmentally sensible area wildlife might be affected by elevated noise levels. It is expected that urbanized wildlife that is presently finding habitat at the proposed site would temporarily leave the area where the construction takes place and would return once the construction noise stops.

Traffic related noise: The impact due to traffic related noise would occur in an area that is already experiencing traffic related noise. The representative location to compare adverse impacts between existing traffic noise levels and future increase noise levels is at the Kapa’a Quarry Road north of the intersection with the quarry access road and close to the entrance to the model airplane park.

Table 4-3 compares the predicted increase of traffic volume at the reference location for the 2016 and 2026 project development milestones. The 2016 project development milestone indicates the completion of the development in the upper portion of the site, and the 2026 project development milestone indicates the completion of the lower portion of the site, which would also represent the development at full build out. Table 4-3 indicates the increase of traffic volume as an average over the south and northbound traffic for the AM and PM peak hours. In Table 4-3 the term “background” suggest the increase in traffic due to natural growth expected for the region; e.g. this growth in traffic could be expected under the No-Action Alternative.

The data in Table 4-3 suggests that at the completion of development of the upper portion of the site, the traffic at the reference location on the quarry road would increase by about 39 percent compared with the existing traffic volume. Without the proposed development, e.g. under the No-Action Alternative, the traffic volume would have risen by 8 percent. In comparison the increase of traffic volume compared with the existing traffic volume would be expected to rise by 107 percent at full build out in 2026, and 23 percent in the No-Action Alternative, or without the proposed development.

Table 4-3 Expected increase in traffic volume on quarry road next to propose project site

project development milestone >>> year >>> Traffic volume increase scenario	**Upper portion of project site fully developed** **2016** increase over existing [%]	**Lower portion of project site fully developed; project at full build out** **2026** increase over existing [%]
Only background traffic, without project (or under the No-action Alternative)	**8%**	**23%**
Project plus background traffic (both Preferred Alternative and Alternative B	**39%**	**107%**

The increase of traffic volume can be used to assess the anticipated increase in traffic noise impact. As a general rule, traffic volume must double to produce a three dBA increase in traffic related noise. The level of 3 dBA is the level that is discernable to the human ear.

As suggested in Table 4-3, the net increase in traffic volume by the proposed project would be about 30 percent (39% - 8%) after completion of the development in the upper portion of the site and about 84 percent (107% - 23%) after completion of the entire project. Applying the general rule of an increase in traffic noise with doubling of the traffic volume and an increase of about 3 dBA being within the threshold for perception of increase in noise, it can be expected that slight adverse noise level changes might be noticeable after the completion of the entire project. Since the present traffic induced noise at the reference location is estimated at about 60 dBA, the noise level at project full build out after 2026 would be equal or less than 63 dBA. This level of noise is about average for urban traffic conditions. At the time of completion of the development in the upper portion of the site, no adverse traffic noise would be discernable to the human ear. It should be noted that the traffic impact assessment study used a trip generation rate that does not consider possible reduction of traffic due to efforts to promote alternative transportation. The Preferred Alternative, however, would implement several measures to lower the amount of individual traffic as part of the LEED design approach. Such measures would include incentivizing carpooling, shuttle service and the use of bicycles to visit the proposed industrial park. The actual traffic volume at project full build out could therefore be somewhat less than expected under the traffic impact assessment report for this DEIS.

It is expected that the traffic related noise level of about 63 dBA would not require mitigation measures since the proposed location is not close to residential areas and sensitive noise receptors. If noise mitigation measures would, however, seem necessary as the project approaches completion, the following measures might be appropriate to lower any traffic related adverse noise impacts:

- Lowering the speed limit on the quarry road since traffic noise increases rapidly with speed.
- Implementing sound adsorbing surfaces along the road (e.g. a line of trees along the makai side of the quarry road to mitigate propagation of sound towards the marsh).
- Resurfacing the road.
- Implementing dedicated left turn lanes on the quarry road to the quarry access road to avoid deceleration and subsequent acceleration for northbound traffic on the quarry road.

In addition to the primary noise sources, the traffic noise generated on the quarry road and quarry access road, noise sources during industrial park operation might affect people and animals. The proximity of the lower portion of the proposed site to the Kawainui Marsh could exacerbate the impact of additional noise generated by the proposed development on the environment. Therefore, responsible noise reducing construction and operations would be especially important for the lower portion of the site.

The following noise abatement measures could lower or eliminate impacts of noise sources for activities in the lower portion of the site and reduce the propagation of noise:

- Install buffer zones made of vegetated berms to reduce the noise that is a normal byproduct of industrial and commercial activities.
- Use of aerated concrete or similar material in lieu of corrugated metal walls as construction material for the warehouse structures. The aerated concrete wall segments have a large mass that impedes the transmission of noise energy through the walls.
- Orient warehouse structures in such a way that direct emission of indoor noise (e.g. through large rolled gates) is directed away from the areas that are sensitive to noise.
- Promote the use of low noise emitting machinery (e.g. shielding noise sources).
- Promote that all vehicles operating in the park are in good operating condition (e.g. mufflers should work efficiently).
- Install insulation for machinery noise, such as acoustic barriers, noise dissipation walls and vegetative buffer zones in the proposed development. The planned detached loading dock for trucks in the vicinity of the wetland area could be surrounded by sound absorbing vegetation and/or a sound absorbing wall. In addition to noise abatement these measure would also aid in mitigating visual impacts and lower impacts of avoidance.

- Mandate enforcement of guidelines and procedures to reduce noise levels such as guidelines against unnecessary idling engines.
- Locate noise generating commercial and light industrial activities to the interior of the development and away from sensitive areas.
- Prohibit noise generating activities at night or over the weekend.
- Educate tenants in the importance of acting proactively to lower noise generation and abatement.

4.8 Impacts on Utility Infrastructure

This section evaluates the anticipated impacts of the proposed project on the utility infrastructure that is presently serving the existing warehouse development. While the planned increase in industrial space would be practically the same under the Preferred Alternative and Alternative B, the two action alternatives differ greatly in their demand characteristics for water and electricity as well in their discharge characteristics for wastewater and solid waste.

For the comparison between the two action alternatives, conventional per square foot or per function demand and discharge volumes are assumed for Alternative B, which represent baseline assumptions for conventional warehouses. The demand and discharge volume under the Preferred Alternative, which is based on a low impact development approach described in the sustainable design approach for the desired LEED Silver certification, is represented with the targeted percent reduction over the conventional baseline demand and discharge rates.

4.8.1 Impact on Water Supply

The proposed development would increase the amount of water needed for the operation of warehouses, supporting office functions (only in a business support function and not as a dedicated office function) and possibly retail functions. The estimated increase in water use at the site would not necessarily be the same increase in water use on an island-wide level. Some businesses would relocate to the proposed site from industrial warehouse space that is slated for conversion or otherwise no longer serves such industrial operations. Therefore the demand would be shifted to new locations on the island and not all of the increase in water use for the new development would be new net demand.

Table 4-4 shows the expected increase in water demand at the site in comparison to the existing water use. In order to compare the different alternatives unit water use rates expressed in gallons per day per one thousand square feet are used. For the No-Action Alternative, an average unit rate of 29.5 gallons per day and per one thousand square feet is assumed. This daily rate is a mixed use rate established from daily rates for warehouses, offices and retail operations, which are assumed to contribute 85, 10 and 5 percent to the area, respectively. It is also assumed that 20 percent of the water use rate is used for irrigation. The 20 percent is at the lower range of what is typically used for irrigation since the landscaped area in the existing warehouse development and the planned new development in the upper portion of the site would have only limited landscaped area. Most of the landscaped area in the upper portion of the site is at the perimeter along the quarry access road and the existing entrances to the upper portion of the site.

Table 4-4 Expected increase in water use for the alternatives

Description	unit	Existing warehouse development; No-action Alternative	Preferred Alternative	Alternative B
Existing leasable space	sqft	283,000		
Added leasable space	sqft		606,000	606,000
Total leasable space	sqft	283,000	889,000	889,000
Water use in buildings	gpd	8,300	20,700	23,600
Water use for irrigation	gpd	1,700	2,900	4,700
Total water use	gpd	10,000	23,600	28,300
Increase ofer present	**gpd**	**N/A**	**13,600**	**18,300**

Under the Preferred Alternative, the water use is the sum of the upper and lower portion of the site. In the upper portion of the site a 10 percent reduction on the water use rate of the No-action Alternative is applied. A 20 percent allowance for irrigation of the total water use is assumed. For the lower portion of the site, a 40 percent reduction and no potable water use for irrigation are assumed. The 40 percent reduction below the current baseline, considered for the lower portion of the site would be achieved by comprehensive water conservation strategy delineated in the sustainable design approach in Appendix 4. The 10 percent reduction below the current baseline, considered for the upper portion of the site, would be achieved through the use of more effective water fixtures and faucets.

It should be noted that under the Preferred Alternative, irrigation needs would be significantly more substantial for the lower portion of the site than under Alternative B. Under the Preferred Alternative, significant areas at the perimeter and within the development footprint would be landscaped and would need irrigation, although the selection of native or adaptive plants rather than introduced plants species, such as turf grass, would somewhat reduce the irrigation needs. In addition, the low impact development approach for the lower portion of the site includes the “restoration of habitat” measures which will replace and/or augment the existing vegetation within about eight acres around the development footprint with native or adaptive plants. This habitat restoration measure would require irrigation, although most of the habitat would not need irrigation. The source of the irrigation water would be harvested rainwater, which would be collected from the roofs of warehouse structures and section of the roadways. The collected rainwater would then be stored in underground taverns for subsequent use in irrigation. There would be several underground taverns in order to take advantage of gravity flow of the collected rainwater and to shorten the supply lines for the irrigation system. More details about the efficient irrigation systems can be read in the sustainable design approach in Appendix 4 of this DEIS.

Harvested rainwater would also be used for sewage conveyance and selected custodial water needs in the warehouse structures in the lower portion of the site. The rainwater for these applications would be collected from the roofs of the warehouses and fed directly into smaller rainwater tanks which would be located next to the warehouses.

Under Alternative B, a 10 percent reduction of the water use rate of the No-Action Alternative and a 20 percent allowance for irrigation on the total water use is assumed for both the upper and the lower portion of the proposed site. Table 4-4 indicates the resulting daily water use for the alternatives.

Previous communications with the Honolulu Board of water Supply (BWS) have indicated that the BWS is able to provide the water supply to the proposed project. From an initial review of the existing water supply system, it appears that the BWS has a water main with significant supply capacity at the quarry road. The final determination of whether the water demand for the proposed project can be supplied through the existing system will be made during final design. Table 4-4 does not list the demand for firefighting, which will remain the same as the existing allowance for a 3-hour fire water supply at a rate of 4,000 gpm.

The distribution of water to the buildings in the new development would be accomplished by extending the distribution systems. Presently the existing warehouse development is supplied through a 2-inch water line, which connects the warehouses in the upper portion of the site with the 36-inch water main at the Kapa'a Quarry Road. An existing 10-inch line is a dedicated firewater line that connects the 36-inch water main with the firewater pumping station (e.g. the fire water booster pumps). It is expected that the existing 2-inch water line might not have enough capacity to provide the baseline and peak supply to the upper portion of the site. A detailed design study will determine if a new larger water line or keeping the existing water but adding a storage tank, which would serve peak demand, is the most cost effective design approach. The water supply to the lower portion of the site would be part of the new water supply system. A new firewater distribution line would connect the fire water pumping station with fire hydrants within the lower portion of the site. Alternatively, a new firewater pumping station would be installed if necessary or if this would be more cost effective than serving the firewater through the existing firewater pumping system. The installation of the new water lines would result in short-term minor adverse impacts caused by trenching and burial of lines.

4.8.2 Impacts on Wastewater System

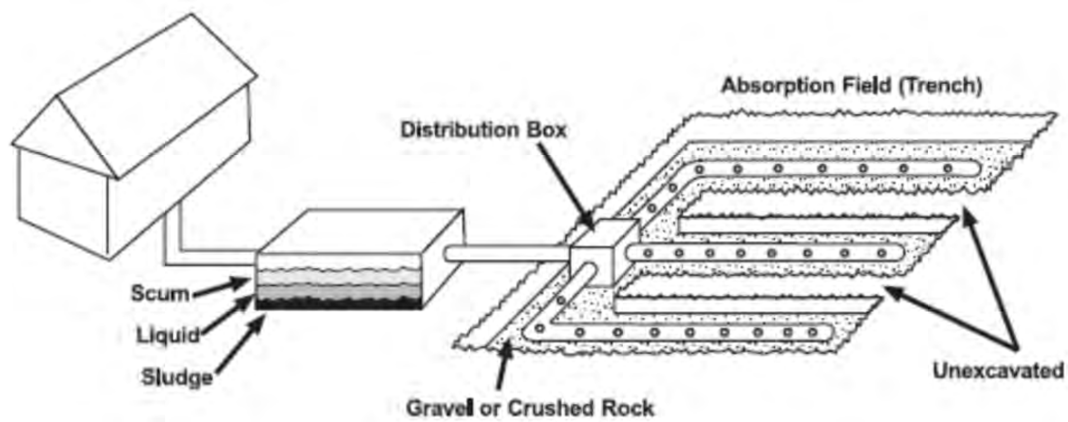
The proposed site, as well as all installations and buildings in the Kapa’a valley, are not connected to the municipal sewer system. Connecting the proposed site to the Kailua sewer system would require the installation of a forced sewer line of about 1.2 miles in length, measured between the upper portion of the site and the assumed take-over-point of the existing sewer system in Mokapu Boulevard. The expected comparatively low quantity of the wastewater, the long distance of the forced sewer and the required pumping power render a connection of the proposed site to the existing sewer system as not advantageous in economic and ecological terms.

The proposed project would therefore use onsite wastewater treatment units to treat the wastewater and dispose of it onsite. The selected wastewater treatment process would be conventional and alternative septic systems, depending on the location and the alternatives. According to the U.S. Environmental Protection Agency (EPA), about 25 percent of households in the U.S. dispose of their wastewater through septic systems. The EPA indicates that septic systems, when adequately installed and operated as decentralized wastewater systems, are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas.

The conventional septic system consists of a two-stage treatment process. The wastewater first flows into a septic tank where solids are separated from the water by settling or by floating in a foamy scum layer at the surface of the water inside the tank. Anaerobic decomposition of organic matter reduces the amount of sludge that accumulates in the tank. The tank has to be pumped, e.g. the sludge has to be removed from the tank periodically when the storage volume of the tank is removed. The liquid effluent, after initial treatment in the anaerobic septic tank overflows by usually passing through a filter, and flows to an underground infiltration field, the so-called leach field, where aerobic decomposition of the organic matter continues the treatment process, added by filtration and absorption processes, as the water percolates into the ground. Figure 4-9 shows a typical configuration of a septic system, comprised of a septic tank followed by a subsurface infiltration system (e.g. leach field).

In establishing a well performing septic system, the design of the septic tank system is as important as the design of the infiltration field. The septic tank has to be designed, manufactured and installed to avoid leakage of raw sewage due to corrosion, uneven settling or other failure modes of the tank. Leaking septic tanks can lead to a catastrophic failure of the entire septic system. Typically, good design, construction and installation practices exclude total failures of the tank; but it is always a prudent maintenance approach to have the tank periodically checked by a certified wastewater professional.

Figure 4-9 Conventional subsurface wastewater infiltration system (EPA, 2002)



The failure of the leach fields is typically more often the responsible mechanism that determines total or partial failures onsite treatment and disposal systems of wastewater. A leach field has to be designed and sized in conformance with the design flow and organic loads. While the sizing of the leach field based on hydraulic loading rates is typically used to assess the required size of the leach field, the sizing of the field size on the basis of organic load is a more conservative design assumption, since it results in larger leach field dimensions for wastewater with higher BOD concentrations. The leach field is an important part of the treatment process in a septic system since after distribution of the septic tank effluent, filtration, microstraining, and aerobic biological decomposition processes in the biomat and infiltration zone can remove up to 90 percent of the BOD and suspended solids and 99 percent of the bacteria

Leach fields can fail in their intended function if the distribution of the effluent is not uniform, the organic loads are too high to stimulate clogging by a proliferating biomat (e.g. bacteria overpopulations) or when the leach field has a tight surface cover, e.g. resulting in insufficient aeration to maintain aerobic treatment processes and to allow water loss through evaporation. If the pollutant concentration of the septic tank is too high for the configuration of the leach field, sewage infiltration and treatment in the field might be insufficient and sewage with too high concentration of pollutants can reach the ground water. Furthermore, if the distance between the bottom of the infiltration field (e.g. the point of injection) and groundwater table is too small, treatment in the wastewater infiltration field does not occur in unsaturated soil conditions and can lead to unwanted release of insufficiently treated wastewater into the groundwater or seeping of polluted water into surface waters.

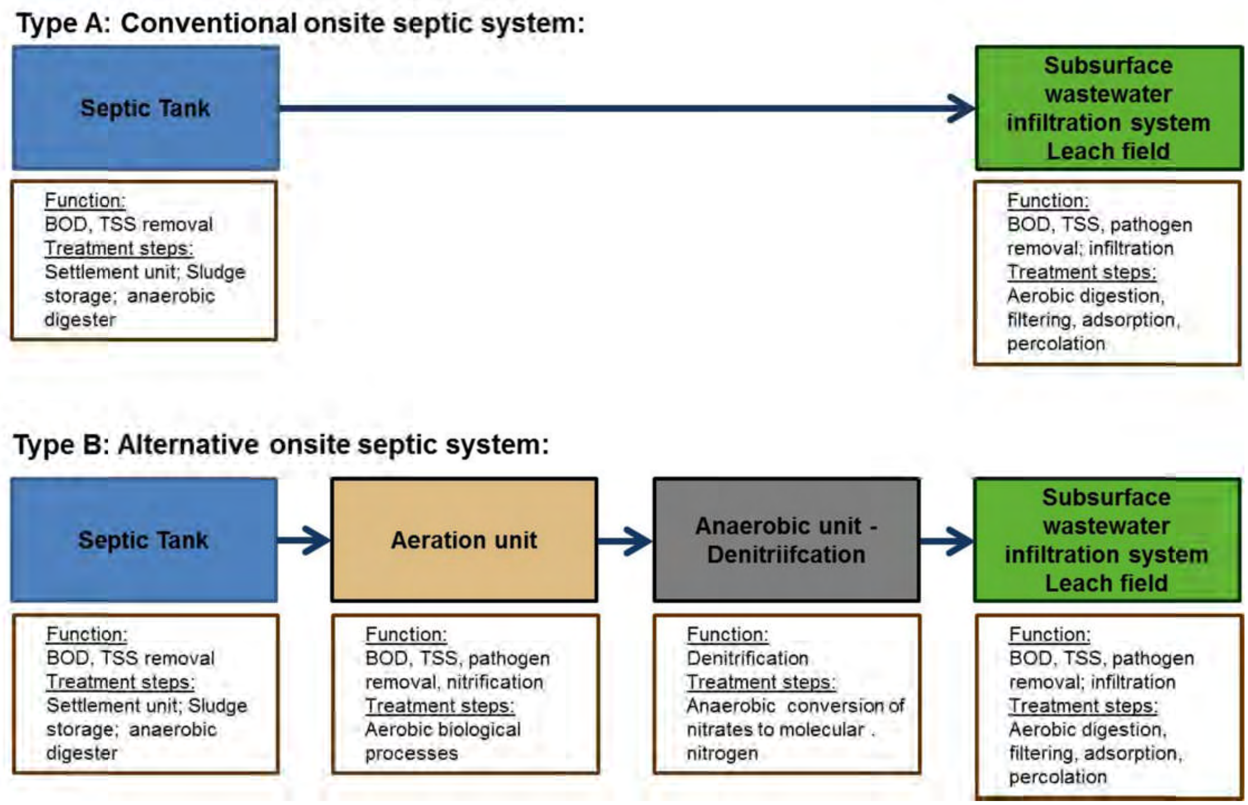
At locations close to important surface or groundwater resources, the effectiveness of conventional onsite sewage systems might not be sufficient to treat and dispose of wastewater enough to effectively mitigate all adverse impacts. The lower portion of the proposed site is deemed such a location where wastewater treatment is required that goes beyond conventional septic systems. Onsite wastewater treatment systems in the lower portion of the proposed site would be closer to surface and ground water than such systems in the upper portion of the site. The infiltration points of several leach fields in the lower portion of the site would have short vertical and horizontal distances to travel, and there would be a probability of insufficiently treated wastewater reaching the ground table and/or seeping into the Kapa'a stream corridor or drainage canal. The upper portion of the site, on the other hand, has a significant vertical distance between infiltration points and water resources, e.g. the underground path of the injected wastewater is longer, and renders more time for effective removal of pollutants until the effluent reaches the groundwater table to seep out into the stream corridor and enter the wetland or Kapa'a stream.

While septic systems as onsite wastewater systems can achieve reasonable removal rates of biological oxygen demand (BOD), total suspended solid (TSS) and pathogens, most conventional septic systems have a limited capacity to reduce the organic load to such low concentration as is required for larger treatment facilities and to cause a significant removal of nutrient. In cases where higher removal rates of nutrients are required, for example, alternative septic systems should be used which add aerobic and denitrification treatment steps to the conventional septic system process. There are a number of commercially available alternative septic systems which use different treatment methods and process vessel dimensions. The detailed design of the proposed project will select the most cost effective treatment technology. For the assessment of impact and possible mitigation in this section, an alternative septic system approach is considered that would be comprised of septic tank (with and without aerobic treatment steps), aerobic (recirculating) sand filter, anaerobic recirculation pump chamber and subsurface infiltration field.

Figure 4-10 compares the treatment process steps of the proposed alternative septic system with a conventional septic system.

As illustrated in Figure 4-10 the alternative onsite septic system would include an aerobic treatment step and an anaerobic denitrification process step upstream of the subsurface infiltration field. Table 4-5 compares expected removal effectiveness of BOD, TSS and Total TN for the proposed alternative septic systems (e.g. recirculating sand filter with recirculation into anaerobic tank) with that of conventional septic tanks. The numbers presented in Table 4-5 represent a range of effluent concentrations and removal rates for the conventional septic tank effluent and the alternative septic systems considered for the proposed project. Table 4-5 further provides an estimate on how high the typical removal rates are after the effluent of septic tanks percolates for about five feet through well aerated sand layers.

Figure 4-10 Comparison between candidate alternative septic systems and conventional septic systems



The EPA (EPA, 2002) suggests an approach to value and vulnerability assessment of sensitive surface and ground water resources by considering the following components:

- Value of ground and surface water as a public water supply or resource
- Vulnerability of the water supply or resource
- Control measures for addressing hazards

Applying this approach to the lower portion of the proposed site suggests the following wastewater treatment requirements:

Assumed water resource value:	Surface water resource which is nutrient sensitive, such as lakes, ponds, rivers, etc. where surface water are sensitive to eutrophication or loss of shellfish or finfish nursery area die to nutrient input (considering important wetland areas)
Vulnerability rating	High
Vertical separation distance between point of release and water table or impermeable soil layer	1 – 3 feet (it must be considered that the total depth of the infiltration field is in the order of 4 to 6 feet below surface). The considered range of 1-3 feet is a conservative estimate

Proposed onsite system treatment performance standards for lower portions of proposed site:

BOD (mg/L) : <= 10
TSS (mg/L) : <= 10
Total N (% removed) : >=50%

Table 4-5 Comparison of typical wastewater effluent from septic system and recirculating filters

Description of wastewater or effluent	BOD		TSS		Total N	
	concentration mg/l	removal %	concentration mg/l	removal %	concentration mg-N/l	removal %
Representative domestic wastewater						
representative influent	150 - 290		150-330		40-75	
typical concentration	250		200		60	
Conventional septic tank effluent:						
typical range	140 - 200	10%-30%	50-100	40%-60%	45-60	5% - 10%
typical concentration	180	25%	90	55%	52	13%
Alternative septic system RSF effluent						
typical range	5 - 10	96% - 98%	3 - 9	96% - 99%	15 - 30	50% to 75%
typical concentration	6	98%	6	98%	20	70%
Subsurface water injection systems after 5 feet percolation in well aerated sand layer	~25	>90%	~20	>90%		~40%

As can be concluded from the expected effluent concentrations of conventional septic systems, comprised of septic tanks and leach fields, in Table 4-5, the treatment performance of conventional septic systems might not be sufficient for the lower portions of the proposed site, even if the septic tank effluent is released in a well suited thick layer of sandy and well aerated soil. Since the vertical distance between point of release (e.g. bottom of leach field) and saturated soil layers (e.g. groundwater table or soil layer with low permeability, such as Pearl Harbor Clay) might be smaller than required for sufficient treatment in the lower portion of the site, a prudent approach to onsite wastewater treatment would be to select an alternative septic system rather than conventional septic systems.

For the upper portion of the site it is assumed that conventional septic systems would be sufficient, since the vertical distance between point of release and saturated soil layers is considered to be in the range of at least 10 to 15 feet and the point of release is further separated from the wetland areas in the Kapa’a stream corridor and the Kawainui Marsh. This substantial vertical and horizontal distance between point of release of effluent at the leach fields in the upper portion of the project site and sensitive water resources would provide a wide enough safety envelope for the use of conventional septic systems.

In considering the above discussion about the expected applicability of wastewater treatment technologies the following systems are considered for the alternatives:

Under the Preferred Alternative about four to five conventional septic systems would be installed to serve the new warehouses in the upper portion of the site . Each septic system would comprise a septic tank of 1,250 gallon volume and a leach field of about 1,500 square feet and would typically serve two warehouses. The septic systems would be installed as needed, e.g. at the pace at which warehouses would be constructed. The septic tanks would be pumped in intervals of several months, of as needed, by a licensed pumping company. The sludge removed from each septic tank would be disposed of offsite in safe way according to local codes.

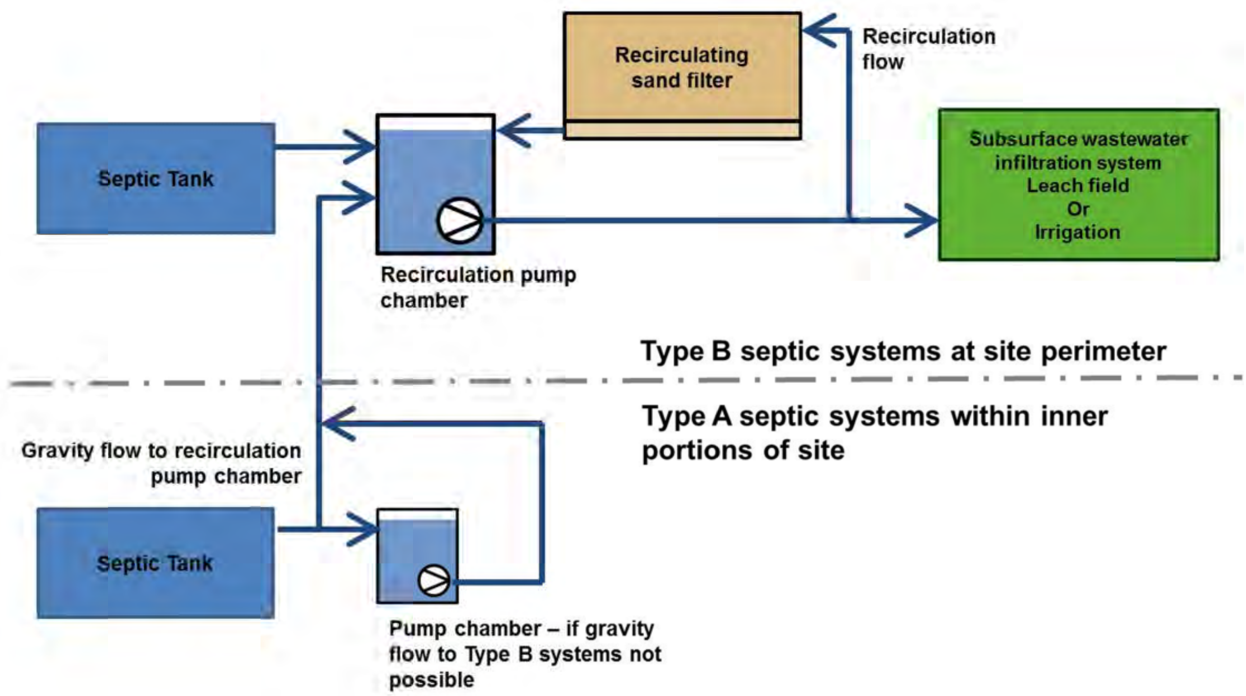
Under the Preferred Alternative, onsite wastewater treatment would occur with an alternative septic system, most likely with the recirculating sand filter units which were considered for the discussion above. The proposed system is illustrated in Figure 4-11. The overall system would comprise about six septic tanks without leach fields and three systems that contain recirculating sand filters. The six septic tanks (e.g. standard size of about 1,250 gallons) without a leach field would be located directly adjacent to the new warehouses and each septic tank would serve up to two warehouses. The effluent of these septic tanks would flow to three alternative septic systems with recirculating sand filters and infiltration field. These three more comprehensive septic systems would be located at the perimeter of the development footprint. The effluent of these three systems at the site perimeter would be distributed in subsurface infiltration fields which would preferably be subsurface irrigation fields (e.g. with drip irrigation) serving landscaped areas at the perimeters. (Refer to Appendix 4 for more details on the spatial arrangement of the septic systems in the lower portion of the project site).

As mentioned earlier, Figure 4-11 shows a sample diagram of the advanced onsite wastewater treatment for the lower portion of the site. The effluent of the septic tanks within the inner portions of the site would either flow as gravity flow to the septic system at the perimeter or would be pumped. The septic systems at the site perimeter would distribute the effluent of their own septic tanks and the effluent received from the septic tanks without their own leach fields on sand filters. By percolating through the sand filter body, the wastewater would be treated by aerobic, filtration and adsorption processes. Enough oxygen would be available for BOD removal and nitrification of organic matter. The effluent of the sand filter would enter the recirculation tank, which is anaerobic, where denitrification would occur. From the recirculation pump chamber the treated water is pumped to the top of the sand filter and the surplus effluent is distributed on the infiltration field. The details of the alternative septic system would be determined in the final design phase.

With adopting this system design, the Preferred Alternative would use a design approach that ensures that sensitive water resources adjacent to the proposed site would not be adversely affected. During installation of the septic systems, excavation for the tank, leach fields and interconnecting piping would cause temporary impacts from excavation.

Figure 4-11 Proposed Advanced Onsite Wastewater Treatment System

(for the lower portion of the site under the Preferred Alternative)



Under Alternative B, a more conventional approach to the onsite wastewater treatment would be implemented. Alternative B would use about four to five conventional septic systems to serve the new warehouses in the upper portion of the site. Each septic system would comprise a septic tank of 1,250 gallon volume and a leach field of about 1,500 square feet and would typically serve two warehouses. The septic systems would be installed as needed, e.g. at the pace at which warehouses would be constructed. The septic tanks would be pumped in intervals of several months, of as needed, by a licensed pumping company. The sludge removed from the septic tanks would be disposed of offsite in safe way according to local codes.

Alternative B would use about nine conventional septic systems in the lower portion of the site to serve the new warehouses. Each septic system would comprise a septic tank of 1,250 gallon volume and a leach field of approximately 1,500 square feet and would typically serve two warehouses. The installation and maintenance of the septic systems would be identical to the septic systems in the upper portion of the site. If needed, fixed activated sludge treatment (FAST) systems would be added to every septic tank in order to increase the removal rates for BOD, TSS and especially for total nitrogen. If the vertical distance between surface and saturated soil layer would be too small for conventional infiltration fields, a mounded leach field (e.g. leach field is installed above the finished grade within a mound of sand) might be installed for the systems that are closest to the wetland areas in order to ensure good vertical separation from the point of release to the saturated soil layers. During installation of the septic systems excavation for the tank, leach fields and interconnecting piping would cause temporary impacts from excavation.

Under the <u>No-Action Alternative</u> no new septic systems would be installed and there would be no added impacts associated with onsite wastewater treatment.

For both action alternatives, septic tanks would be installed underground at suitable locations close to the warehouses they would serve. On average, one septic tank would serve about 38,000 square feet of warehouse space each, which means that on average one septic system would serve two warehouses. The specific progress of the construction of warehouses in accordance with the expected absorption of industrial space might require deviations from the number of septic tanks that would need to be installed. The location of the septic tanks and leach fields systems would be well marked above ground and would also be documented. The septic systems would not be located under structures, and the leach fields would have measures to assure appropriate ventilation and exposure of the soils to the atmosphere. Since sludge has to be periodically extracted from the septic tanks, the manholes of septic tanks would have to be accessible and in reach of larger service trucks. In normal operation the leach fields do not need to be accessible for maintenance.

There are various design and operational measures that would safeguard against sewage overflow or spill from the septic systems. The soils in the vicinity of underground infiltration fields would have to have a suitable permeability to ensure percolation of the wastewater and avoid backing up of the sewage caused by clogging or insufficient distribution. The septic system would have to be large enough to accommodate the projected wastewater load of the warehouses that are served by the septic system. After construction of the septic system no construction would be permitted that would damage septic systems. With adequate maintenance septic systems function well. Indications that septic systems are overloaded or structurally damaged would require immediate attention. The septic tanks would require regular pumping by a licensed pumper. The area around the septic system would have to be regularly inspected for signs such as foul odor, slow or clogged drains, wet, spongy ground or lush plant growth, algae blooms and excessive weed growth in nearby streams.

No adverse environmental impacts are anticipated from the installation and operation of new septic tanks and leach fields in the proposed development. The septic systems proposed under the two action alternatives are expected to treat common wastewater discharge from the proposed warehouse development and ensure disposal of the wastewater that is environmentally safe and would not cause adverse impacts. The close proximity to adjacent sensitive wetland areas and Kapa’a Stream would require a more sensitive treatment process, as indicated in the above discussion.

4.8.3 Impact on Telecommunication

The proposed action alternatives would increase the demand for telecommunication services at the proposed site. New infrastructure would be required in the some parts of the upper portion of the site and within the entire lower portion of the site. Installing these improvements on the site would not likely result in a significant impact. Presently, the telephone service to the Kapa’a Valley is provided by an above-ground telephone line that runs along Kapa’a Quarry Road towards Mokapu Blvd. It is expected that the existing line would have sufficient capacity for the expansion of services. If required new conduits could be installed at the utility pole to increase capacity. This installation is not expected to pose significant problems or impacts.

4.8.4 Impacts on Electricity Supply

The proposed development of the industrial park is expected to increase the current electric demand and energy consumption as more industrial space is added. It is expected that the existing feeders would not be to handle the load increase in the upper portion of the site. For the lower portion of the site an entire new distribution system would be required. The electrical distribution system within the proposed project site would use cable runs contained within a network of underground ducts. Further analysis of the individual building loads would be required to determine the improvements to the installation distribution system.

Table 4-6 indicates the expected increase in demand of the two action alternatives compared to the existing demand profile, which represents the No-action Alternative. The receptacle loads, peak loads and energy consumptions are determined for all three alternatives using unit demand data based on the assumed baseline against which the LEED credit for energy efficiency for the Preferred Alternative is evaluated (USGBC, 2009). The unit demand numbers are a function of occupancy type. With the assumed mix of new businesses in the proposed industrial development as 85% warehouses, 10% office (e.g. only in a auxiliary support function of businesses) and 5% for retail, the expected electricity demand and consumption is determined by multiplying the unit demand numbers by the planned leasable warehouse space. The results are indicated in Table 4-6.

Table 4-6 Comparison of electricity demand between alternatives

Description	unit	Existing warehouse development; No-action Alternative	Preferred Alternative	Alternative B
Existing leasable space	sqft	283,000		
Added leasable space	sqft		606,000	606,000
Total leasable space	sqft	283,000	889,000	889,000
Receptacle loads	kW	218	564	685
Peak loads	kW	327	786	1,027
Electric energy consumption	MWh/a	1,900	4,800	6,000
Electric energy consumption relative to present	%	100%	250%	320%

note: numbers for MWh/a rounded to the next one thousand

Under the Preferred Alternative the electricity demand and annual electric energy consumption is expected to increase from 1,900 MWh to 4,800 MWh, an increase of about 150 percent. Under the Preferred Alternative the lower portion of the site would implement energy efficient warehouse structures and the use of renewable energy in accordance to the sustainable design approach. The expected savings in energy consumption under the LEED Silver certification goals are at least 30 percent relative to the baseline. The overall industrial park peak load is expected to be lowered to approximately 75 percent of the assumed peak level of Alternative B. The sustainable design approach also incorporates the installation of renewable energy (e.g. photovoltaic and solar thermal collectors) as energy saving devices. While stringent energy efficiency measures would be implemented in the lower portion of the project site (e.g. in fulfillment of the LEED Silver requirements), some energy efficiency measures would also apply to the upper portion of the site, but to a lesser extent. The full list of energy saving measures are presented in the sustainable design approach in Appendix 4 of this DEIS.

Under Alternative B energy consumption would be following the defined demand numbers of the baseline, as indicated in Table 4-6. Under this alternative, the electric energy consumption would increase by approximately 220 percent of the current demand, e.g. the demand under the No-Action Alternative.

Under the No-action Alternative no new warehouses would be installed and there would be no new electricity demand.

The existing project site is supplied with electricity through a transmission line from Mokapu Boulevard. Communication with Hawaii Electric Company (HECO) suggests that anticipated load demand for the proposed warehouse development may exceed the capacity of the existing 4.16 kV circuit at Mokapu Boulevard. In the event that the future demand could not be met by the existing circuit, a new power line would be necessary to connect the proposed development with the existing 12.47kV circuit along Kalanianaole Hwy. At the present time there are no existing HECO utilities along Kapa'a Quarry Road and therefore approximately 10,000 linear feet of power line and associated appurtenances would need to be installed along Kapa'a Quarry Road from Kalanianaole Highway to the proposed site in order to supply additional power. The impact of such a new power line would be mainly due to construction activities during installation of new poles, including excavation, erosion and traffic obstructions. In addition to these temporary impacts, no adverse impacts are expected from installing additional transmission capacity along the existing transmission facilities.

The increase in electricity demand and energy consumption needs to be considered on the micro and macro level. At the micro level, e.g. for the proposed project development, an increase of demand would require the installation of additional electric distribution facilities within the development and a possible increase of capacity to transmit the increased load and energy to the proposed site from the regional substations.

On a macro level, e.g. the energy supply for the entire island, the increased demand at the proposed site would not necessarily result in the same increase in the island wide grid. A part of the businesses would be relocating from industrial space that would be retired in the process of converting presently industrial space to higher value land use. Therefore older warehouse space would be substituted by modern warehouses structures which are inherently more energy efficient that the older and abandoned warehouse structures. It is also expected that while relocating their place of operation, businesses might choose to upgrade energy consuming devices, such as lighting, machinery, and air conditioning, with more energy efficient devices, (e.g. Energy Star certified devices). Relocating to new locations would also increase the likelihood of implementing more energy responsible operations such as load management and commissioning. In summary, while the electricity demand and energy consumption are expected to increase at the project site, the impact on the island wide energy supply is positive since space required for economic development would be developed in a more environmentally and energy responsible manner.

4.8.5 Impacts on Solid Waste Disposal and Mitigation

A private company is presently contracted for the solid waste disposal at the proposed site. Waste receptacles are periodically (e.g. weekly) collected and the solid waste is disposed of at an offsite landfill. The contractual terms with the waste management company ensure that the waste is disposed of in an environmentally responsible way and in accordance with local codes and standards.

Under the Preferred Alternative a comprehensive recycling program would be implemented for the lower portion of the site, in accordance with the sustainable design approach and LEED certification requirements. There would be several easily accessible dedicated areas for the collection and storage of the recycled materials. Recyclable materials would include, at a minimum paper, corrugated cardboard, glass, plastic and metals. The separate collection of bottles and aluminum cans which carry a refundable deposit would be provided in each building. While the comprehensive recycling effort would be organized and verified only for the lower portion of the site, e.g. within the LEED project site boundary, collection and storage of recyclable material would also be offered in the upper portion of the site, in order to take advantage of synergy and increase the volume of recyclable material for the waste management company.

Under Alternative B there would be a basic recyclable program, comparable with that of the municipal solid waste collection service and the currently limited recycling at the project site

Under the No-action Alternative the present system of limited recycling at the project site would be continued.

Littering and non-conforming disposal of waste can result in a range of impacts, from simple annoyance to direct adverse impact. Waste that is improperly disposed of or abandoned can result in the release of hazardous agents that can directly impact the environment, human beings or wildlife, or could accumulate in terrestrial or aquatic soil and could pose a long-term threat when released, due to elevated concentration.

Littering and non-conforming disposal of waste would be mitigated during the construction and operation of the industrial park. The presence of ample waste receptacles and the education of tenants and their employees to refrain from any littering and assist in the avoidance would be effective mitigation measures. In addition the management of the industrial park would safeguard that no waste would be disposed of in a non-conforming and environmentally harmful way. The propagation of waste into the adjacent wetland areas and the Kapa’a Stream corridor would be mitigated by the fence at the perimeter fence of the property. Periodic survey and controls of the perimeter of the development footprint would also assist in maintaining the proper appearance of the proposed development, and reduce the chance that wildlife and plant life are adversely affect by inappropriate waste disposal.

4.9 Impacts on Traffic and Mitigation

This section evaluates expected impacts of increase traffic under the alternative on the traffic on the adjacent roadways and on three intersections, as listed in Tables 4-7 and 4-8, respectively. This section summarizes the findings and recommendation of the Traffic Impact Assessment report (TIAR), which was conducted for this environmental review and is attached to this DEIS in Appendix 5. The scope of the analysis considers scenarios as delineated in table 4-9. In Table 4-9 the Preferred Alternative and Alternative B are considered to generate the same traffic volume, since the projected trip generation volumes under both action alternatives are the same when consider the same trip generation unit rates (e.g. trips per 1,000 square feet of warehouse space) and the same leasable space in the warehouses. While this approach is valid in regard to the selected trip generation rates for the occupancy type, the Preferred Alternative would result in somewhat lower traffic volumes, since the sustainable design approach for the LEED certification promotes alternative transportation through measures such as incentivizing car pools, implementing shuttle services from the proposed site to public transportation bus stops and promoting the use of bicycles to commute. Therefore the suggested traffic volumes under the Preferred Alternative would be a conservative assumption and actual traffic volumes might be somewhat less than assume din the TIAR.

Communication with county and state traffic authorities suggest considering a reassessment of the traffic projections after a couple of years, e.g. after the completion of the development of the upper portion of the site, in order to compare the actual traffic volumes at that point in time and reassess the projections for the remaining completing of the project in a new TIAR at that time. Therefore, while the projections for the year 2026, which means the expected completion of the proposed development at full build, are covered in the TIAR it also has to be considered that the basis of the traffic projects might experience changes, such as modified trip generation, and increased acceptance of alternative modes of transportation, which would lower the individual traffic volumes.

In the course of the design of the proposed project, the planned amount of leasable space that would be developed under both action alternatives was reduced by about 10 percent from the 660,000 square feet, which was the basis of the TIAR, to about 606,000. This design adjustment of leasable space was due to the decision to demolish and or renovate part of the existing warehouse space under both action alternatives and a reduction of number of new warehouses. The net square footage for the added space reflects added space of new warehouses and demolition of older spaces. Furthermore, the configuration of the buildings was modified to result in a more effective layout and avoid encroachment of open space. The traffic assessment is thus based on a slightly higher leasable space than is actually planned at the moment, thus the projections made in the TIAR are conservative.

Notwithstanding the considerations discussed above , the TIAR lays out the expected traffic volume and associated impacts.

Table 4-7 Roadway sections evaluated in traffic impact analysis

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

Table 4-8 Intersection evaluated in traffic impact analysis

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

The scope of the analysis considers the scenarios delineated in Table 4-9.

4.9.1 Expected Impacts from Background Traffic

The growth of background traffic volume, that is the traffic volume that is expected to occur without the proposed project, represents the No-action Alternative. The expected background traffic volume was assessed by applying a compounded growth rate to the existing traffic. The selected growth rate that is compounded over the development schedule of the proposed project, e.g. from the present to the expected time of completion of the project development, represents a weighted average of historic growth rates on roads that would be affected by the project. In addition, projected increases in background traffic also have to consider possible projects that are planned for the area; there are none that were identified at the writing of this DEIS. The TIAR in Appendix 5 delineates the assumptions used in the projection of future background traffic grows.

Table 4-9 Scope of traffic impact analysis scenarios for alternatives

Description of alternatives	Traffic components considered	years of analysis	traffic indicators used	mitigation requirements identified
Existing conditions	traffic counts at three intersections	2009	AM, PM peaks volume; LOS at three intersections; LOS on quarry and quarry access roads	
No-action Alternative	considering projected growth of background; without proposed project\	2016 2026	AM, PM peaks volume; LOS at three intersections; LOS on quarry and quarry access roads	
Preferred Alternative and Alternative B	considering projected growth of background; and projected trip generation from the project (e.g. trips per 1k sqft of space)	2016 2026	AM, PM peaks volume; LOS at three intersections; LOS on quarry and quarry access roads	No mitigation required through the end of 2016; mitigation woud need to be in place before 2026

Notes:

2016 is the year in which the upper portion of the site would be fully developed

2016 is the year in which the lower portion of the site would be fully developed and the project would be at full build out

The Preferred Alternative and Alternative B are considered to generate the same trips based on the leasable areas added

Table 4-10 shows the expected level of service (LOS) for the background traffic volume at the three intersections and three roadway segments that are considered for the analysis. While the LOS of intersections has been identified for all movements through the intersections, one LOS is given for the particular intersection.

The results of the projection of the background traffic in Table 4-10 suggest that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of C or better. By the year 2026, or at the completion of the proposed project it is expected that mitigation would be required for the intersection of Kapa'a Quarry Road and Mokapu Blvd. Possible mitigation measures are discussed later on in this section.

Table 4-10 Expected LOS for background traffic

Intersection / roadway segments	signalized / unsignalized	backgorund traffic w/o proposed project 2016		backgorund traffic w/o proposed project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	**C**	**C**	**C**	**F**
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	**C**	**B**	**C**	**D**
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	**B**	**B**	**B**	**B**
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	**C**	**C**	**C**	**C**
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	**B**	**B**	**C**	**C**
Kapa'a Quarry Access Road	N/A	**B**	**B**	**B**	**B**

LOS level requires mitigation as unsatisfactory taffic conditions occur

4.9.2 Projected Trip Generation and Project Generated Traffic Volume

The traffic count conducted under this TIAR for the existing warehouse development determined the movement in and out of the project for the AM and PM peak periods. The identified traffic movements were than normalized to a trip rate per 1,000 square feet of space in the existing warehouse development. The resulting existing trip generation rates per 1,000 sq. ft. for the AM and PM peaks were calculated as 0.87 and 0.84, respectively. A comparison with the standard trip generation rates for warehouses under the Institute for Transportation Engineers (ITE) Trip Generation Manual (ITE, 2003) suggests that the existing trip generation rates are lower than the ITE AM and PM peak standard trip generation rates of 0.92 and 0.98, respectively. Since it is assumed that the occupancy type of the proposed industrial development at full build out would be the same as at present, the existing trip generation rates at the project site were used for the subsequent analysis.

Table 4-11 indicates the projected trip generation rates for the proposed project under both action alternatives for the years 2016 and 2026, which represent the completion of the development of the upper portion of the site and the completion of the development of the lower portion of the site, which would also be the project at full build out, respectively.

Table 4-11 Estimated project generated traffic volume

Time period	direction of traffic movement	expected trips in year **2016**	expected trips in year **2026**
AM peak	**total**	270	570
	into development	170	360
	out of development	100	210
PM peak	**total**	260	550
	into development	80	160
	out of development	180	390

The directional distribution of the projected trip generation is assumed to follow the same distribution as identified for the existing traffic condition at the proposed site. Figures 4-11 and 4-12 show the expected trip generation distribution for the Am and PM peak hours, respectively. The distribution rates in Figure 4-12 and 4-13 suggest that the northern segment of Kapa’a Quarry Road, e.g. the portion of the quarry road between Mokapu Blvd. and the quarry access road intersection, would experience more traffic volume than the southern part, e.g. portion of the quarry road between Kalanianaole Hwy and the quarry access road intersection. The identified asymmetric distribution of the trips between northbound and southbound traffic on the quarry road would suggest that northern portion of the quarry road would cause the larger proportion of traffic impacts.

Figure 4-12 AM peak distribution of generated trip for in and out bound project traffic

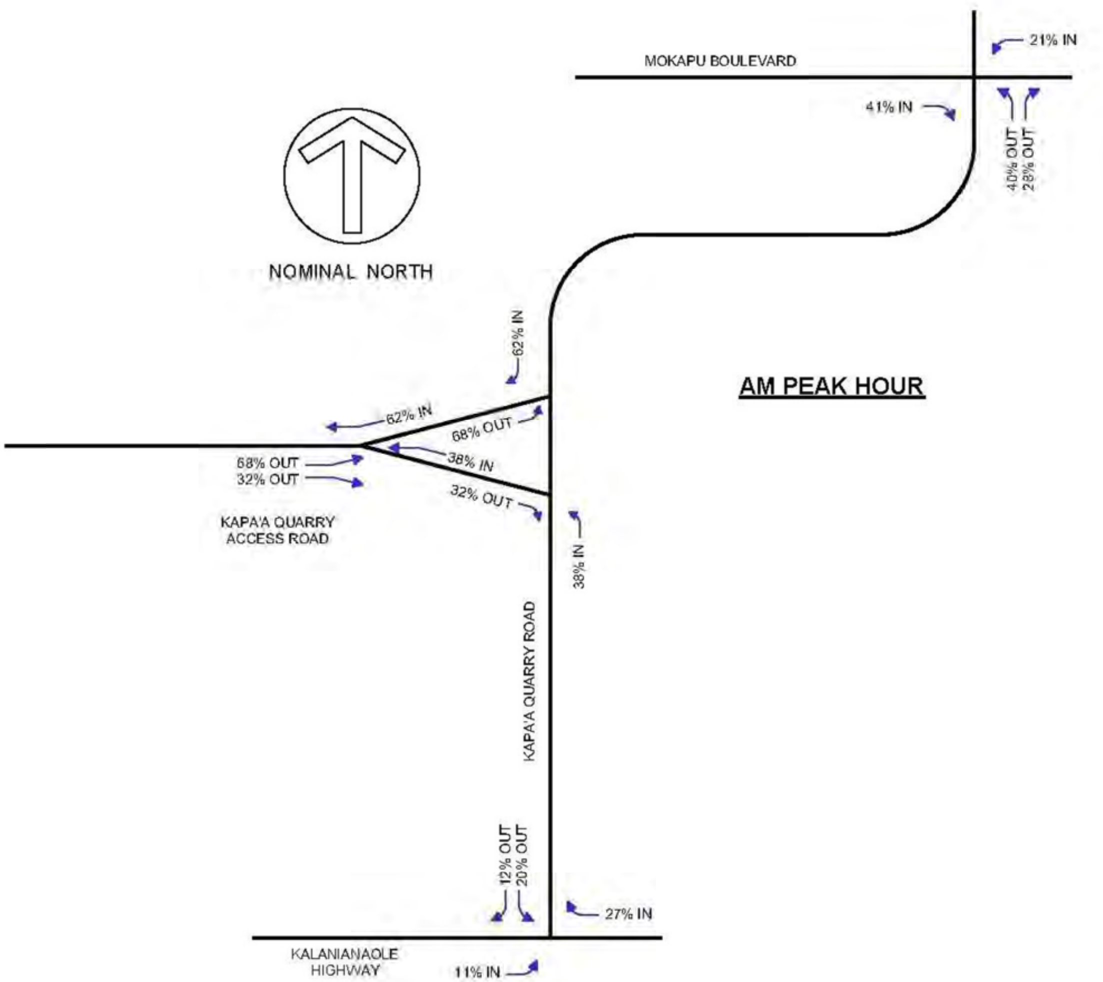
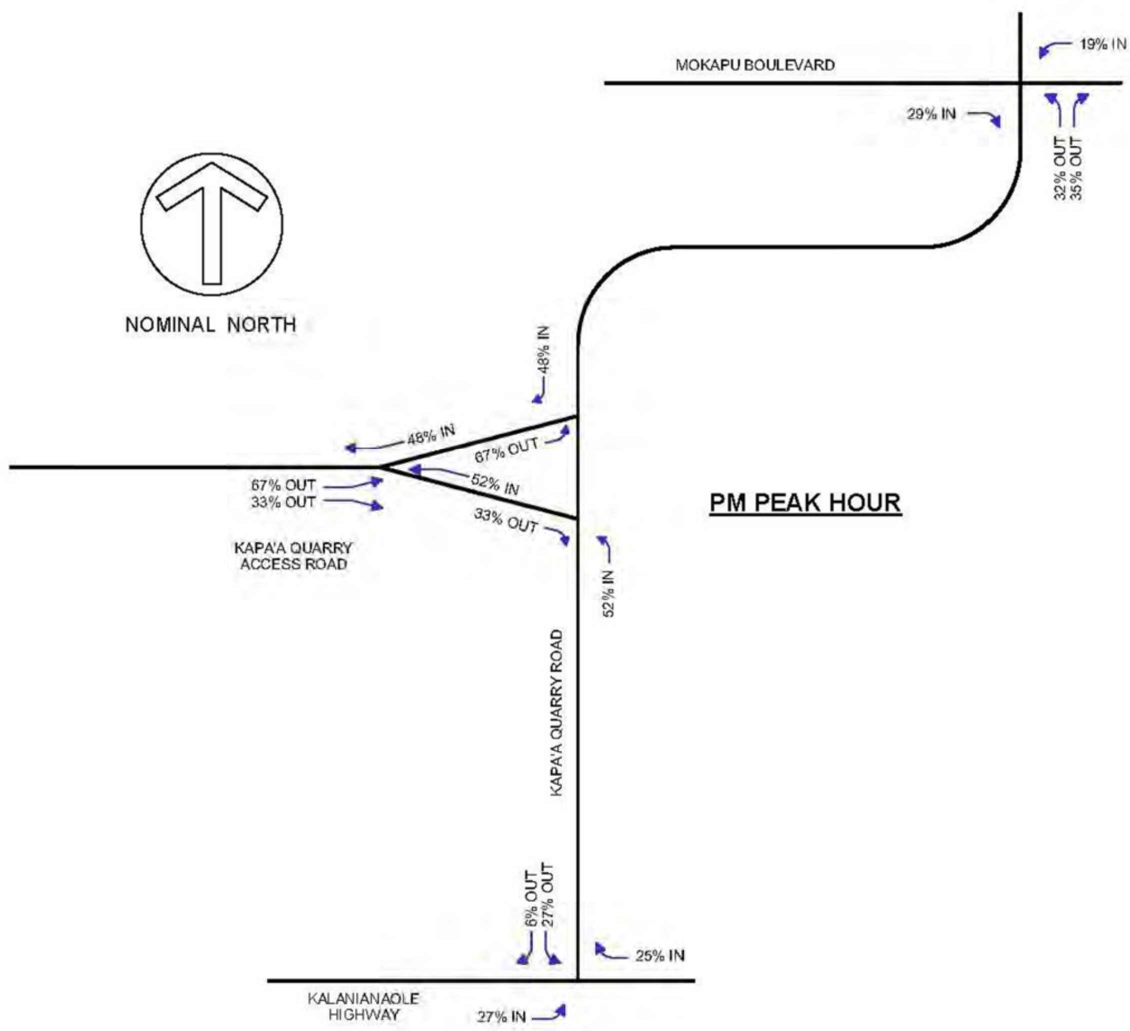


Figure 4-13 AM peak distribution of generated trip for in and out bound project traffic



4.9.3 Expected Future Traffic Volumes and Impacts

The expected future traffic volumes can be deduced from adding the project related traffic (e.g. from the trip generation analysis) to the projected background traffic volumes for the different phases of the proposed project. Table 4-12 shows the expected level of service (LOS) for the project's future traffic volume at the three intersections and three roadway segments that are considered for the analysis. While the LOS of intersections has been identified for all movements through the intersections, one representative LOS is given for each particular intersection.

Table 4-12 Expected LOS for background traffic plus project related traffic

Intersection / roadway segments	signalized / unsignalized	Future traffic volumes background + project 2016		Future traffic volumes background + project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	**C**	**D**	**C**	**F**
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	**B**	**B**	**E**	**D**
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	**C**	**C**	**D**	**E**
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	**C**	**C**	**D**	**C**
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	**C**	**C**	**C**	**C**
Kapa'a Quarry Access Road	N/A	**C**	**C**	**C**	**C**

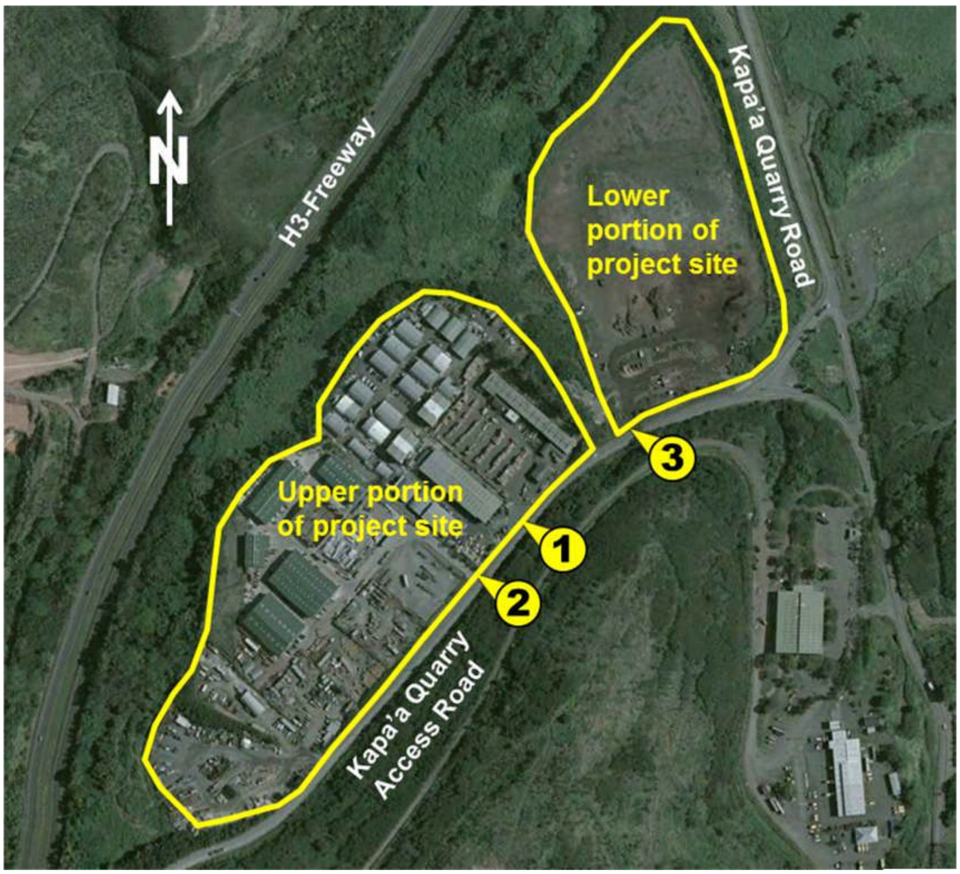
LOS level requires mitigation as unsatisfactory taffic conditions occur

The results of the projection of the future traffic in Table 4-12 suggest that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of D or better. Under urban area traffic conditions, which apply for the proposed site, mitigation measures are required when intersections and roadways are operating at LOS levels lower than D, e.g. at LOS E or F. For the traffic conditions in 2026, which implies at the propose project full build out, unacceptable LOS levels are expected for all three intersections that would be affected by the proposed project. Possible mitigation measures are discussed later on in this section.

4.9.4 Expected Traffic Condition at Proposed Project Driveways

The proposed project will have three driveways. Figure 4-14 shows the locations of the proposed project driveways. Driveways No. 1 and No. 2 are serving the upper portion, and driveway No. 3 is serving the lower portion of the project site. There are two more driveways, one for the upper and one for the lower portion of the site, which are intended for use by emergency vehicles only and are not regular driveways. Table 4-13 indicates that all three traffic driveways would operate at LOS levels of C or better, therefore traffic conditions would be satisfactory.

Figure 4-14 Project driveways



A sight distance analysis was carried out for the three project driveways. The sight distance analysis is presented in Appendix 5 of this DEIS. All sight distances for right-turn and left-turn maneuvers at the three driveways, Driveways No. 1, No. 2 and No. 3, would be adequate, considering the layout of the driveway, roadways as well as buildings, structures and vegetation adjacent to the driveways presented in this sight distance analysis. Figure 4-15 shows an example of the sight distance assessment for project driveway No. 3 (serving the lower portion of the site). The sight distance analysis suggests that all project driveways would have adequate sight distance and there would be no adverse traffic impacts due to insufficient sight distances. (A comprehensive sight distance assessment study is presented in Appendix 6 of this DEIS).

Table 4-13 Expected LOS of proposed project driveways

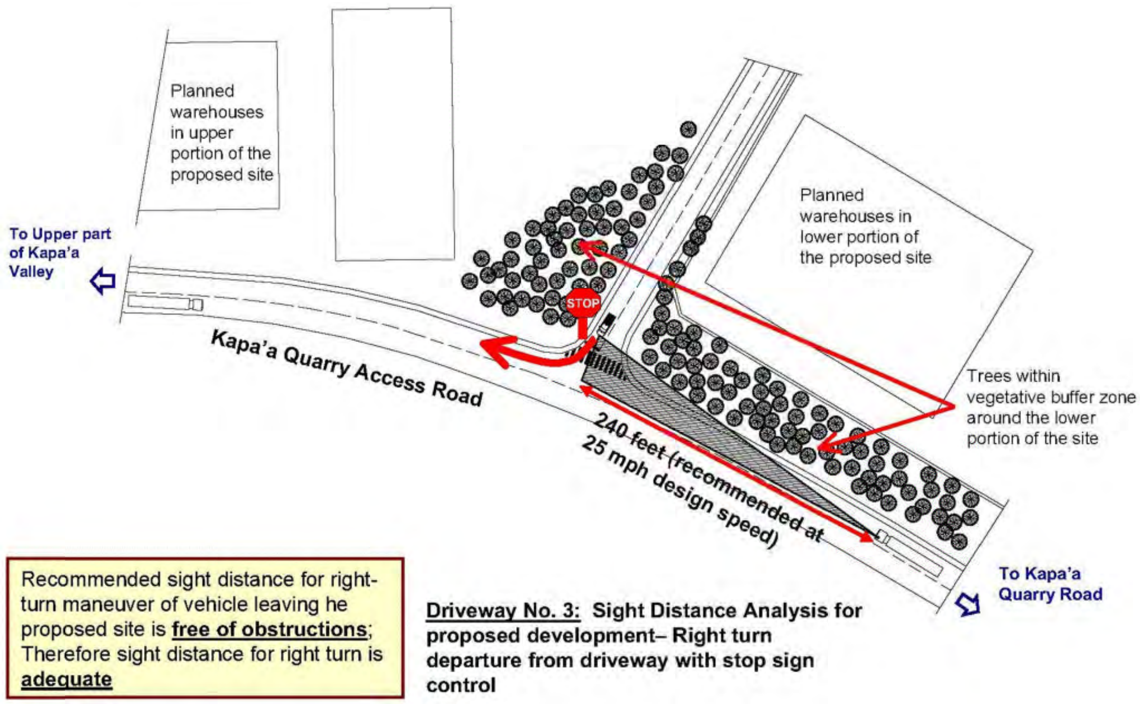
Driveway intersection & movement	Future traffic volumes background + project 2016		Future traffic volumes background + project 2026	
	AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Driveway No. 1: upper portion of the project site				
eastbound; left turn and through traffic	A	A	A	A
southbound; left turn and right turn	B	B	B	B
Driveway No. 2: upper portion of the project site				
eastbound; left turn and through traffic	A	A	A	A
southbound; left turn and right turn	A	A	B	A
Driveway No. 3: lower portion of the project site				
eastbound; left turn and through traffic	N/A	N/A	A	A
southbound; left turn and right turn	N/A	N/A	C	C

Note: Number of driveways are assigned in Figure 4-13

4.9.5 Traffic Impact Mitigation Measures

The traffic impact analysis suggests that the traffic conditions in the year 2016 would not warrant mitigation measures since all intersections and roadway segments that would be affected by the proposed project would be operating at LOS levels equal or better than D. LOS D is the lowest LOS level that does not automatically carry the requirements of mitigation. The expected traffic conditions in the year 2026, which represent the completion of the development in the lower portion of the site and the full build out of the proposed industrial park, would require mitigation measures, since the three intersections would operate at a LOS levels lower than D.

Figure 4-15 Sight distance analysis for project driveway No. 3



As stated, it is recognized that it might be not feasible to firmly consider specific mitigation measures since it seems advantageous to conduct a new traffic impact assessment study several years into the project. The completion of the development in the upper portion of the site, for example, could be an appropriate project milestone when a new traffic assessment could be carried out. At a later time in the development schedule of the project, a new traffic assessment would compare the projected traffic volumes with the actual occurring traffic levels at that time. This would make it possible to better define and design mitigation measures.

Considering that mitigation measures might be better defined at a later stage in the project after reassessing the traffic conditions several years into the project schedule, the following suggested mitigation measures indicate what scope of mitigation might be required as the worst case scenario by the end of the project development, expected in the year 2026:

1. During PM peak hour, the intersection of Kapa’a Quarry Road at Mokapu Boulevard would operate at LOS level F. This would require implementing mitigation measures. The proposed mitigation measure would be the addition of an eastbound to southbound right turn and deceleration lane.
2. The intersection of Kapa’a Quarry Road at Kalanianaole Highway would operate at an AM peak LOS level E. The proposed project, however, would not add traffic to the

movements within the intersection, which are responsible for the low LOS. The reduced level-of-service is the result of increased background traffic. An appropriate mitigation measure would be the addition of a second eastbound left turn lane which would mitigate the unacceptable level-of-service for the movement through the intersection.

3. During PM peaks, left turns at the intersection eastbound Kapa'a Quarry Access Road to northbound Kapa'a Quarry Road would operate at Level-of-Service E, which might cause long delays and long queues. Mitigation could be implemented in form of an added acceleration and merge lane for the northbound quarry road out of the quarry access road. This lane at the intersection of quarry and quarry access road would allow acceleration of the left turn traffic from the quarry access road without interfering in the movement of the northbound traffic on the quarry road.

Other recommendations of the TIAR are as follows:

- The project could provide shuttle bus service along Kapa'a Quarry Road between the project and Mokapu Boulevard and Kalanianaole Highway to provide transportation for employees to and from the public transportation bus stops. The Bus presently operates routes along Mokapu Boulevard and Kalanianaole Highway.
- Based on the LOS analysis, no improvements are required to accommodate project traffic volumes along Kapa'a Quarry Access Road and the projected traffic volumes of traffic between the various phases is minimal. However, the background traffic along Kapa'a Quarry Access Road would consist primarily of larger, heavy vehicles. The turning movements of larger and heavy vehicles into and out of the project driveways would have an adverse impact on the through traffic on the quarry access road. Therefore, the feasibility of a "frontage" road connection between the project drive ways might offer some mitigation. If frontage lanes are not feasible, left turn storage lanes should be provided. (Refer to the TIAR in Appendix 5 for a more detailed discussion)
- A sidewalk might be required along the property at the Kapa'a Quarry Access Road.
- The TIAR recommends that an update TIAR might be performed some years into the project, for example after the expected completion of the development in the upper portion of the proposed site and prior to the expected time of start of development in the lower portion of the site. As determined in the traffic impact assessment, some form of mitigation would be required before the full build out of the project, expected around 2026. The objective of an updated TIAR would be to confirm the background traffic growth estimates, confirm that trip generation rates are reflecting the actual situation and the quantify the reduction of peak hour traffic as a result of the traffic management plan, for example determine the scope of alternative transportation modes used by the park occupants.

4.9.6 Consideration of Impacts from Heavy Vehicle Traffic

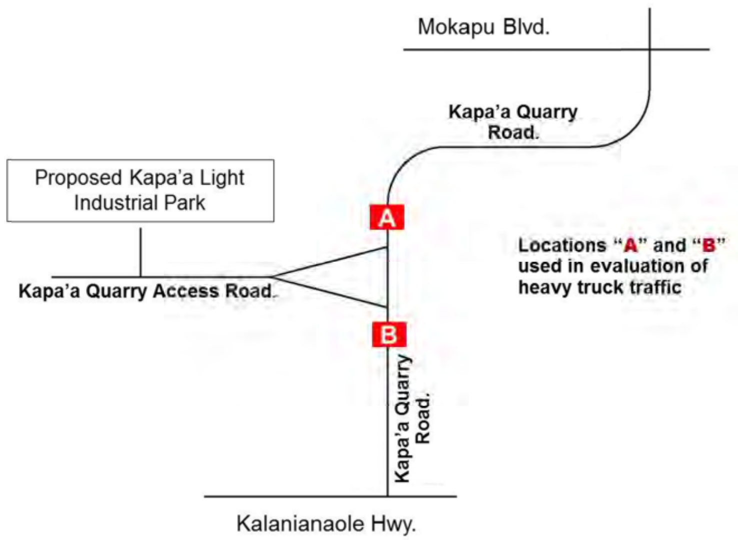
The data derived in the TIAR is used to evaluate the likely increase in heavy vehicle traffic on the quarry road. For this analysis the projected number of heavy vehicles is used. The percentage of heavy vehicle of the total traffic was assessed for the existing traffic conditions in the traffic count. The calculation of the expected background traffic , trip generation and derived total traffic for the year 2016 (e.g. the conclusion of the development of the upper portion of the site) follows the same assumptions and procedures as for the total traffic.

The assessment of the increase of heavy vehicle traffic on the quarry road was done at two locations, and for both the AM and the PM peak. The traffic levels on the southbound and northbound traffic were added to give the total, bidirectional traffic volume as the representative traffic volume. The locations “A” and “B” are defined in Figure 4-16, where “A” represents the northern segment of Kapa’a Quarry Road, between the intersections with the quarry access road and Mokapu Blvd and “B” represents the southern road segment between the quarry access and Kalanianaole Hwy. Figure 4-17 shows the increase of heavy vehicle traffic at locations “A” and “B” through 2016, which represents the expected time of completion of the development in the upper portion of the site, for the Am and PM peak traffic.

The results in Figure 4-17 suggest that the traffic volume, expressed in number of heavy vehicles, on the northern segment of the quarry road, represented by “A”, would cause the greatest related traffic volume. In terms of increase of heavy vehicle traffic by 2016, the AM peak at “A” suggests an approximately 70 percent increase in volume: a magnitude of increase that is about the average of increase in heavy vehicle traffic under the four scenarios illustrated in Figure 4-17. It is therefore expected that the northern segment of the quarry road would experience most of the possible impacts of heavy vehicle traffic. A comparison of the project related rates of increase between total traffic and heavy vehicle traffic suggests a 36 percent increase in total traffic volume versus 70 percent increase in heavy vehicle traffic. Therefore the traffic impact assessment suggests that the heavy vehicle traffic generated by the project would result in a twice as large increase in traffic volume than that of the total traffic. It might be beneficial to validate these projections in a new TIAR to be conducted several years into the project, for example at the time a major project milestone is completed, such as the completion of the development in the upper portion of the proposed site, in order to plan mitigation measures with a better understanding of the actually occurring increases in specific traffic volumes.

It is expected that the increase in heavy vehicle traffic may adversely affect the environment and the community, such as through traffic congestion, increase in noise and air pollution, increased highway maintenance costs, increase or wildlife collisions, and other safety issues. Some of the major potential impacts are discussed in the following.

Figure 4-16 Location of point A and B for heavy truck impact evaluation

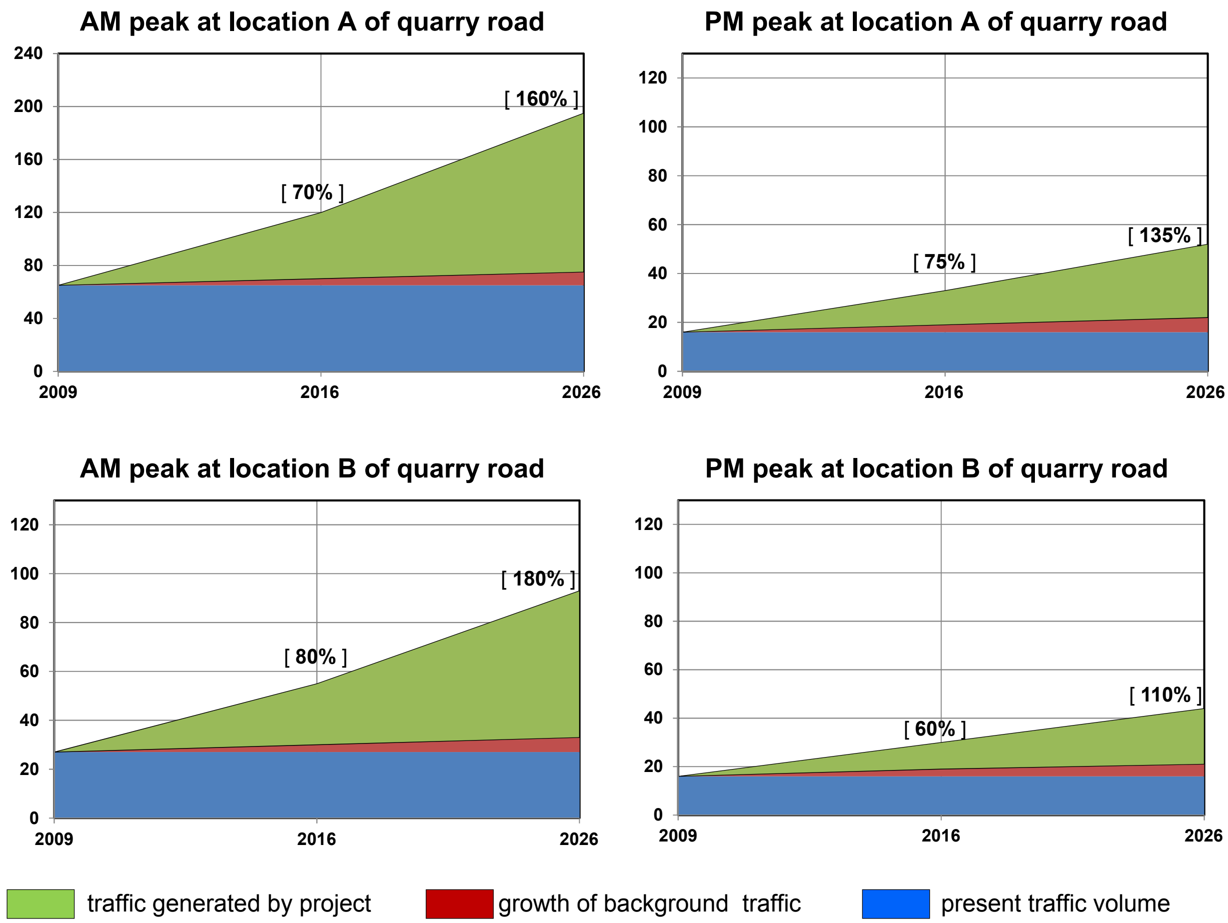


<u>Impacts due to weight:</u> Heavy vehicles contribute more to roadway damage than light vehicles. There is a correlation between weight of trucks and buses and the amount of anticipated damage to bridges and roadway pavement. Hawaii limits the maximum weight and length of heavy vehicles to 65 feet for truck-tractors and semi-trailers and 80,000 pounds for any vehicle that operates or moves on any public road, street, or highway within the state. But the weight of trucks on certain roads could be limited to significant lower allowable weights, especially on roads that were built decades ago and have bridges that cannot accommodate modern day heavy vehicles. While road damages generally increase with heavier vehicles the individual axial weight is also important to consider. Recent trends are towards larger and heavier trucks that would reduce the number of trips and also lower the axial loads since these larger vehicles usually distribute the weigh on more axles, thereby reducing the impacts to roadway pavements.

<u>Impacts due to noise:</u> Noise impacts from heavy vehicles result from two main parameters, the traffic stream and the individual noise from the heavy vehicle.

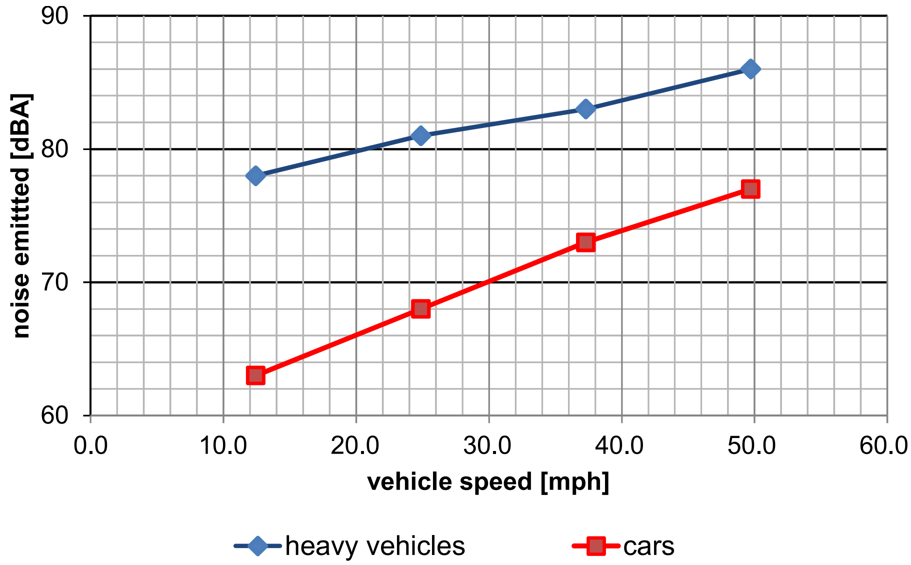
Noise levels resulting from the traffic stream increases with vehicle speed of individual vehicles on the road. The increase of noise with the vehicle speed follows a function that is specific for the type of vehicles. As an approximation, Figure 4-18 shows a comparison between the typical generated noise by a personal car and a heavy vehicle with three of more axles traveling at the same speed (Figure 4-18 represents an average of data given by different publications). As the figure suggests, the noise level emitted by heavy vehicles is significantly higher than for cars. Figure 4-18 suggests that a reduction in speed related noise is more readily accomplished with cars than with heavy vehicles. Reducing actual driving speed can result in significant noise reduction. Enforcing speed limits can be a challenge and typically requires the buy-in of drivers. Enforcing speed limits through simple static signs is most often not effective; but controls as well as dynamic variable signs and those informing drivers of their speed can result in significant speed reduction and noise mitigation. As a rule of thumb, doubling or halving traffic volume results in noise changes of about 3 dBA, which is the level of noise change discernible to the human ear.

Figure 4-17 Projected increase of heavy truck traffic on quarry road for 2016 and 2026



Vertical axis = peak traffic of heavy vehicle (HV) [total number of HV in both direction on quarry road]
[xxx %] % increase of traffic generated by project relative to background traffic in that year; rounded to nearest 5%

Figure 4-18 Comparison between typical speed dependent noise level generated by cars and heavy vehicles



Noise resulting from the operation of an individual heavy vehicle can be strongly attributed to the driving patterns of the operator. The noise emitted from the vehicle is a strong function of the rpm of the engine. Driving the vehicle in low gear can contribute to higher noises. Furthermore frequent deceleration and acceleration can result in higher noises than for vehicles traveling at a constant speed. Avoidable noise is generated from idling large engines unnecessarily and there are recent laws and ordinances forbidding unnecessary engine idling. Another source of noise in the operation of heavy vehicles is pneumatic brakes, which suggests that heavy vehicles driving at a constant speed can reduce noise levels.

<u>Safety issues:</u> Accidents involving heavy vehicles are always risky due to the large kinetic energy coming to an abrupt halt or deflecting on other vehicles. As rule of thumb, human error is the biggest contributor to accidents, not size or weight of the vehicle. For about two thirds of accidents involving heavy vehicles, the drivers of light vehicles are "at fault". Operators of heavy vehicles are professionals who know the capacity and limits of their vehicles often better than operators of private cars. The most common contributors to driver impairment in heavy vehicle are fatigue, drug taking (including drinking) and medical conditions.

The most effective mitigation of accidents involving heavy vehicles is a more effective general road safety deterrence, which includes regulating traffic issues on the roads that are most responsible for unsafe mixing of significant traffic volume of heavy vehicles, cars, light trucks and motorcycles.

Beside human error, ineffective roadways can contribute to a less than desirable safety situation on the roads, such as reduced lane width, sharp curves, insufficient visibility, high speed limits and missing visual indicators, to name a few. Mitigation could include such measures as clearance of roadside hazards or use of barriers to reduce such hazards, improvement and widening of shoulders, audible edge lining, night-time delineation, passing lanes (where appropriate), and replacement of intersections by roundabouts.

Wildlife collisions: An impact of significance for the proposed project is possible wildlife collisions, due to the proximity to the marsh. Avoidance is easier and potentially safer for a car than for a heavy vehicle, given the mass of a truck or bus. Elevated speed is a major contributor to wildlife collisions, since reaction time and avoidance maneuvers are more difficult at higher speeds. The frequency of wildlife collisions is further dependent on the time of day, with night contributing most of the collisions since wildlife is more active at night and can be blinded by headlights of approaching vehicles. Since heavy vehicle traffic resulting from the proposed project would be almost exclusively during the daytime there would be a significant reduction in related impacts. Studies have shown that informative dynamic signs, such as “drive slowly to protect our wildlife” or “# of birds were killed last year on this road; drive with caution” are more effective in promoting better and slower driving than static signs. Considering such dynamic signs for the quarry road and in the vicinity of the marsh might have a positive effect on the reduction of animals killed on the road.

Impacts on air quality: Heavy-duty diesel engines of trucks and buses release unburned hydrocarbons, carbon monoxide (CO), sulfur oxides, nitrogen oxides (NOx), particulate matter, and other toxic compounds. While the emission of hydrocarbon emissions and carbon monoxide from heavy vehicles represent only a small fraction of the overall traffic related emission of these agents, heavy vehicles contribute significant amounts of NOx and particulates. NOx and particulate matter both contribute to public health problems in the United States. NOx emissions from diesel vehicles play a major role in ground-level ozone formation. Ground-level ozone, more commonly known as "smog," is a respiratory irritant that is most problematic in the summer months. It causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. Diesel particulate matter (soot) is a fine particulate matter that is easily inhaled and deposited deep in the lungs and is a probable human carcinogen. Particulate matter can be linked to increased respiratory symptoms and disease. Children and the elderly are most at risk of ozone and particulates. In addition, ozone , NOx, and particulate matter can adversely affect the environment through damage to vegetation, impacts to the aquatic environment and visibility impairment.

Harmful emission levels from heavy vehicles are a function of the weight and size, and therefore of the engine power of the vehicles, and naturally more vehicles with more powerful engines emit more. What seems to be a more important determinant, however, are the ages and the state of operational readiness of the vehicles. Stricter standards for new trucks, originating back some 10 years and having become applicable standards recently, have resulted in significant reductions of emissions, and have lowered the emission of heavy diesel powered vehicles by more than 90% under those of vehicles built only 20 years ago. Therefore, approximately 8 of today's cleaner trucks and buses equal the NOx and particulate matter emissions from one heavy vehicle manufactured about 15 years ago. The reductions are achieved through the use of pollution control devices (e.g. catalytic converters) and low sulfur diesel content, which has reduced the sulfur content of road diesel from 500 ppm to 15 ppm. The overall clean air impacts of these rules have contributed to a significant reduction in emissions from diesel operated heavy vehicles.

The new standards are not applicable to retrofits of the existing fleet of heavy vehicles. Too many vehicles remain in a poor operational state and continue to emit high levels of particulates, visible as smoke. Excess smoke generation indicates diesel engines require maintenance and dark smoke is a sign of insufficient combustion, resulting in wasting fuel and producing excess emissions. From the public's perspective smoking trucks symbolize significant health concerns which need to be mitigated. Suitable mitigation efforts include promoting regular tune-ups and maintenance. Enforcement to reduce excess smoke can use tests to determine the opacity of smoke being emitted from the exhaust pipe. An engine that is not emitting any smoke or emits very little smoke is probably operating efficiently and will pass the opacity test.

Mitigation measures to limit impacts from heavy vehicle traffic which would be considered under the action alternatives include the following:

- Increasing the safety on the quarry road by enforcing or promoting the speed limit, experience has shown that static signs are not as effective as dynamic signs and active enforcing the speed limit.
- Clearance of roadside hazards or installation barriers to reduce such hazards, as an example of a roadside hazard is the present state of the drainage canal directly adjacent to the quarry road and a missing shoulder separating the road from the canal, over sections of the road.
- Improvement and widening of shoulders, possibly also implementing a shared bicycle or sidewalk at sections of the quarry road.

- Audible edge lining and night-time delineation to increase traffic safety during night time. Streetlamps are not installed along the quarry road and therefore nighttime visibility remains difficult. However, streetlights would add to light pollution along the marsh and might not be advisable.
- Passing, acceleration or deceleration lanes (where appropriate) to allow a more effective merging of the heavy vehicles into the quarry road. As have been shown in the TIAR, the AM peak left turn from the quarry access road would require mitigation before planned completion of the proposed industrial park, die to unacceptable level of service (LOS).
- One possible measure to improve the level of service of the intersection of quarry road and quarry access road would be the replacement of the intersection with a roundabout traffic. The roundabout would avoid the potentially problematic merging of heavy vehicles into northbound traffic on the quarry road. A roundabout might also be preferable to other measure, such as signalizing the intersection.
- Noise impacts could be mitigated by avoiding an unsteady traffic flow with frequent decelerations and accelerations. Noise reductions can also be achieved by such measures as lowering the speed on the quarry road, improving the pavement quality and installing noise barriers, e.g. a tree line at the mauka side of the quarry road (this would also help in reducing the visual impact and the probability of wildlife collisions.
- Air impact mitigation is best achieved by promoting the use of newer heavy vehicles in the proposed development and by promoting avoidance of unnecessary idling, strong acceleration and decelerations. The operator of the proposed industrial park could identify inefficient vehicles driving in the development by the amount of excess dark smoke and require maintenance and engine tune-ups as a condition to operate in the industrial development.

With such mitigation measures implemented, the adverse impacts from project related heavy vehicle traffic on the adjacent roadway could be effectively mitigated to such an extent that no significant impacts are expected.

4.9.7. Parking

Under both action alternatives, parking would be exclusively on-site and public roads would not be used for parking by employees and visitors of the proposed industrial park. Therefore there would be no adverse impacts on roadway parking. Both alternatives would provide sufficient parking and loading space in accordance with county land use ordinances.

Under the Preferred Alternative, on-site parking spaces would be less available as under Alternative B, in accordance to the sustainable design approach that encourages alternative modes of transportation. Under the Preferred Alternative parking spaces would be preferably offered to drivers of low emitting vehicles and car- and van-pools. Under the No-action

Alternative there would be no added demand for parking and therefore there would be no adverse effect on roadway parking.

4.9.8 Public Transportation

At present the proposed site is not served by public transportation and no plans have been identified by public transportation authorities to start serving the proposed site in the foreseeable future. The nearest bus stops are at Kalanianaole Highway and Mokapu Boulevard, and employees and visitors who wish to walk to the proposed site would find it hard to walk along the quarry road due to missing or insufficient shoulders and completely missing sidewalks.

Under the low impact development goals of the Preferred Alternative, the applicant envisions implementing a private shuttle that would connect the proposed development with parts of Kailua or Kaneohe or with the nearest public transportation service locations. The implementation of a private shuttle is not committed to in the sustainable design approach and no credit points under the LEED sustainable site credit categories are attempted at this point. The implementation of a shuttle service would be contingent on the identified need for employees and visitors of the propose development. Connecting the proposed site to the public transportation system would be a positive step in promoting the low impacts development goals of the proposed development.

Under Alternative B, no shuttle service is planned and no added demand for public transportation would be expected from the proposed project.

Under the No-action Alternative, there is no known demand for public transportation due to the non-existence of a connection to public transportation.

4.9.9 Alternative Modes of Transportation

As discussed in the previous section, the applicant envisions a private shuttle service if no public transportation service to the proposed site would be implemented before the expected full build-out of the development. With a private shuttle service between, at least, the closest public transportation service points (e.g. bus stops), the occupancy of the affected bus lines on Kalanianaole Highway and Mokapu Boulevard would increase. It is anticipated that the added demand for public transportation would be within the capacity of the existing public transportation system.

Under the Preferred Alternative's low impact development approach for the lower portion of the site, the use of bicycles would be incentivized by secured bicycle storage and shower facilities, in accordance with LEED requirements. While the proposed project promotes the use of bicycles as an alternative mode of transportation, the quarry road in its existing state does not offer a safe and convenient use of the road for bikers. The proposed marsh perimeter pathway would serve as an attractive and safe means of reaching the proposed site by bicycle from the Kailua and Kaneohe directions. The perimeter path would significantly support the low impact goals of proposed development and it is expected that employees and visitors of the entire industrial development, and not only those of the lower portion of the site, would use the perimeter path. While the perimeter path would be primarily used by pedestrians and bikers for recreation employees and visitor of the park would increase the use of the path. It is expected, however, that project-related additional pedestrians and bikers who would be using the perimeter path between Kalanianaole Highway and the site and between Mokapu Boulevard and the proposed site would not add a significant number of users to surpass the capacity of the perimeter pathway. Therefore it is not expected that the proposed project would have adverse impact on the planned marsh perimeter pathway.

The conceptual design of the proposed route of the marsh perimeter defines the path of the perimeter path to follow along the eastern boundary of the lower portion of the proposed sites. The proposed alignment of the perimeter path along the boundary of the property would coincide with the alignment of the existing drainage canal. The proposed path could only be installed in the area if the existing canal would be filled and the area above the existing canal be used for installing of the perimeter pathway. A separate environmental review might be necessary to ascertain that the adverse impacts of converting the existing canal to make room for the proposed perimeter pathway would not cause significant impacts to the environment.

Under Alternative B, no efforts are planned to promote alternative transportation modes and therefore there would be no adverse effects.

Under the No-action Alternative, no changes would occur in regard to alternative transportation modes.

4.10 Impacts on Existing Views

The proposed project site is located in the Kapa'a Valley, which is located next to the Kawainui Marsh, the largest contiguous wetland area in the state. The project site is located in the lower reaches of the Kapa'a Valley and represents approximately six percent of the land area of the Kapa'a valley. Over the past several decades the Kapa'a Valley has experienced significant changes in its appearance. Significant portions of the valley have been converted from agricultural land use to industrial land use. These industrial operations have contributed to changes in topography in the valley, with vegetation of larger parts of the valley being removed and converted to quarries and landfills. A series of aerial photos, Figures 4-19 through 4-22, portray changes in land use and character of the Kapa'a Valley over the past six decades.

Figure 4-19 shows Kapa'a valley in 1952. The main land use in the lower reaches of Kapa'a valley was agriculture. A raised roadway, being built in the 1940s, separated the Kapa'a Valley from the Kawainui Marsh. Figure 4-20 shows Kapa'a valley in 1965. Significant land area in the valley was converted to quarries and landfills. Agricultural land, stream channel and wetland areas were covered with refuse and/or quarry tailings and overburden. Figure 4-21 shows the valley in the year 1976. The landfill and quarry operations had expanded and occupied more land. Some of the landfill operations were completed. Figure 4-20 shows the work on the H3-Freeway underway. Figure 4-22 shows the valley in the year 1993, when parts of the former quarry and landfill areas in the lower parts of the valley were completed, and vegetation can again be seen covering parts of the former disturbed land areas. Figure 4-23 shows the lower portion of the Kapa'a valley in its present appearance, where the former quarries and landfills have been either vegetated or converted to other land uses. This figure shows the proposed project site, with the existing warehouse development and graded land areas in the upper and lower portions of the site.

As the previous figures show, the Kapa'a Valley has seen major changes in land use and appearance. Efforts during the past decade have improved the appearance of wide stretches in the valley and reintroduced vegetation on the areas where quarries and landfills had created stretches of exposed soil and rock.

Under the two action alternatives, the proposed project would affect existing views in the lower portion of the Kapa'a valley. Warehouse structures would be constructed on land that is presently developed and graded, but not vegetated. A comprehensive visual impact assessment was done to compare existing views with anticipated views of the completed project and is

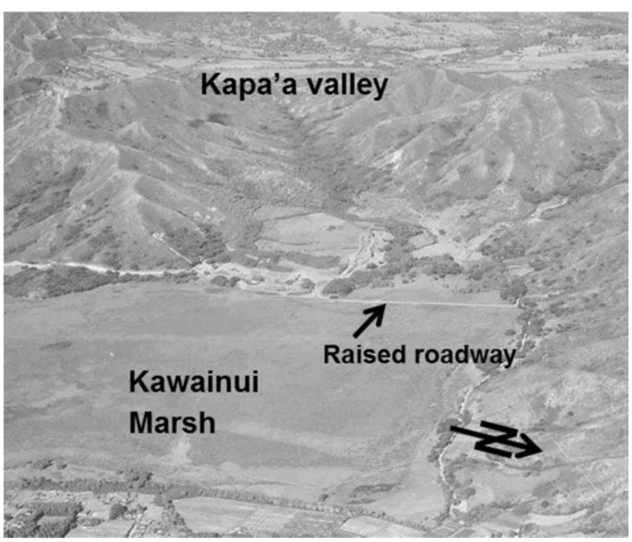


Figure 4-19 Kapa'a valley in 1952

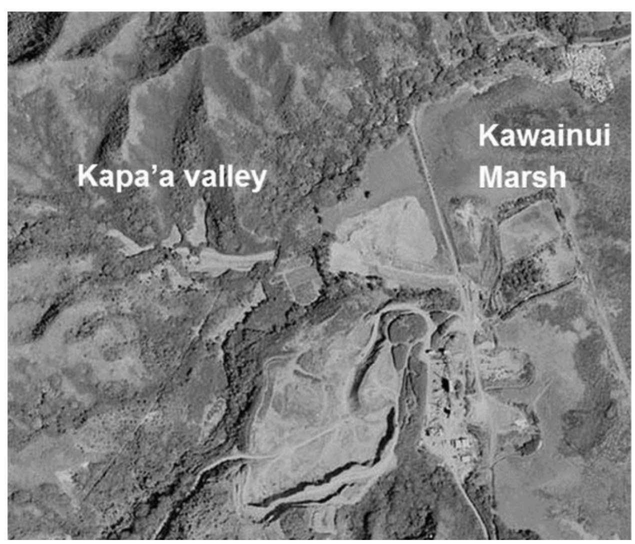
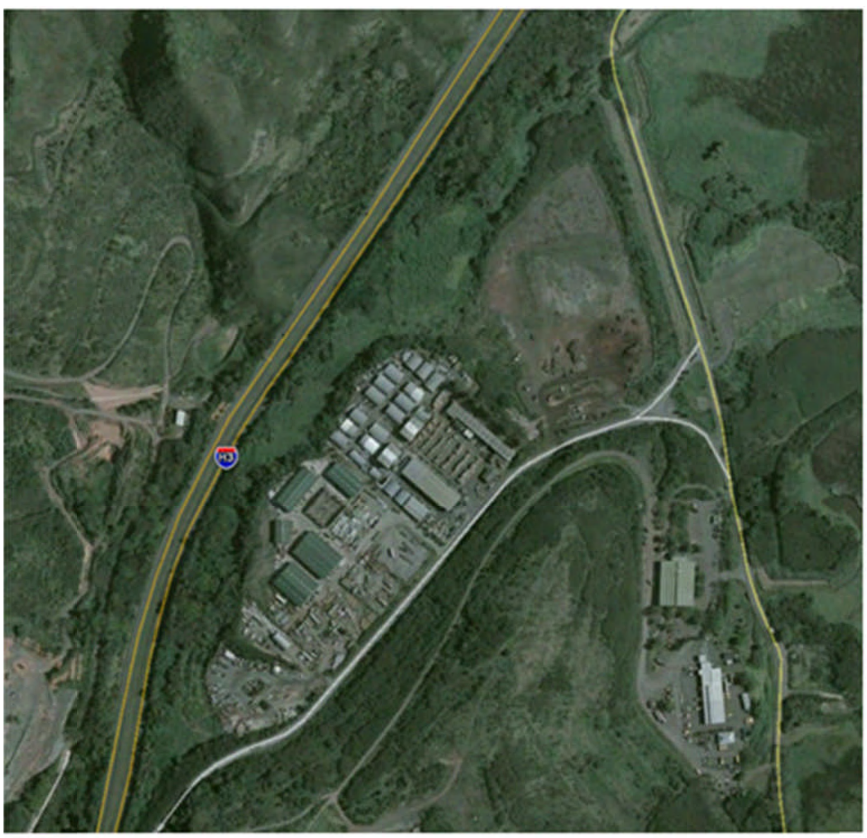


Figure 4-20 Kapa'a valley in 1965

Figure 4-21 Kapa’a valley in 1976

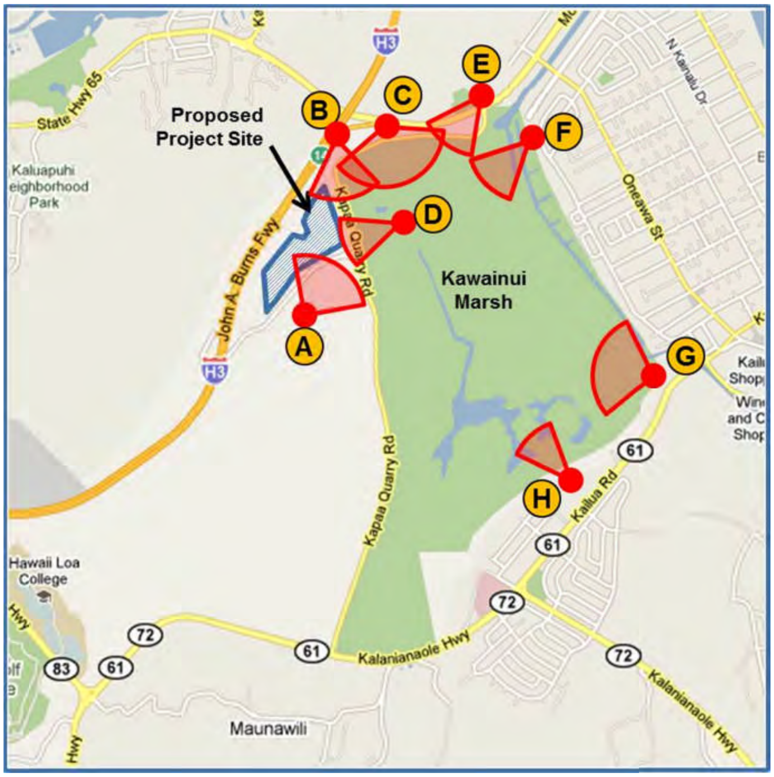
Figure 4-22 Kapa’a valley in 1993

Figure 4-23 Proposed project site in Kapa’a valley at present



presented in Appendix 8 of this DEIS. The view analysis considered a total eight viewplanes at various locations in the vicinity of the proposed project site. To be considered as relevant viewplanes, the locations have to be publicly accessible and represent places of public interest. Figure 4-24 identifies the eight viewplanes used for the visual impact assessment in terms of location and directions of the camera.

Figure 4-24 Definition of eight viewplanes used in the visual impact assessment



The eight viewplanes A through H are defined as follows:

A. Panoramic view from Pahukini Heiau
B. View from the H3-Freeway; at the beginning of the off-ramp
C. Panoramic views from the H3-offramp, at the lane merge with Mokapu Boulevard
D. View from the grounds of the Model Airplane park
E. Views from the grounds of Kalaheo High School
F. View from the Kawainui Neighborhood Park
G. Panoramic view from the southern end of the flood control levee
H. Views from the viewing area of the Ulupo Heiau

Figure 4-25 Existing Viewplane B

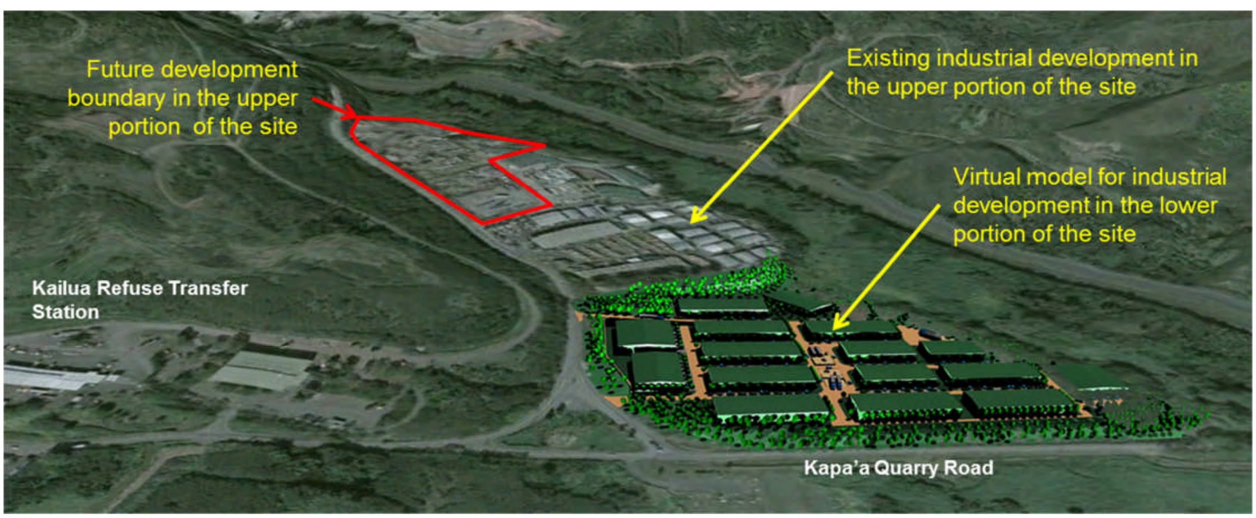
Figure 4-26 Existing Viewplane C

Figure 4-27 Existing Viewplane D

In an initial visit at the locations of the viewplanes, an assessment was made of whether the proposed project site was in direct line of sight. From several viewplanes the proposed project site was either not visible, or the large distance suggested a minor visual impact. Viewplanes B, C and D were identified as having a noticeable visual impact. These three viewplanes are shown in Figure 4-24, 4-25 and 4-26.

For the assessment of how the proposed project development would affect viewplanes under the Preferred Alternative, a virtual model was created and a series of virtual images were generated from the same location and camera settings as the original photos of the viewplanes analyzed. Since it was determined in the initial assessment that the upper portion of the site would not create significant visual impact, the virtual model was only created for the lower portion of the site. Figure 4-28 shows the extent of the virtual model in a superposition with an oblique aerial photo of the proposed site. The virtual model contained the concept layout of the proposed industrial development, with true dimensional representation of warehouses, roadways, site grading, landscaped areas as well as trees, which would serve as visual impact mitigation (as well as for other functions under the low impact development approach). In the virtual images generated for the assessment, objects were rendered with solid surface colors rather than texture maps in order to clearly distinguish the virtual objects from the actual background in the photographic images of existing viewplanes. Using texture maps would create more photorealistic images but mostly for close up views, while the visual impacts assessment typically used views from larger distances (viewplane D is an exception and shows anticipated views of the proposed project from a closer distance).

Figure 4-28 Scope of virtual model of the proposed development used in the visual impact assessment



,

Figure 4-29 Expected view for viewplane B under the Preferred Alternative

Figure 4-30 Expected view for viewplane C under the Preferred Alternative

Figure 4-31 Expected view for viewplane D under the Preferred Alternative

The anticipated views in Viewplanes B, C and D for the Preferred Alternative are presented in Figures 4-29 through 4-31. For a more comprehensive discussion of all viewplanes, refer to Appendix 8 of this DEIS. Under the Preferred Alternative, the development footprint of the lower portion of the site would be surrounded on all four sides by vegetative buffer zones, which would contain larger trees, shrubs and lower vegetation cover to create a dense vegetative screen around the site. In addition to planting trees and shrubs within the buffers at the site perimeter trees would also be planted inside of the development around warehouses. Besides providing effective visual impact mitigation for distant views, the trees will also provide a better appearance inside the development, lower the heat island effect by providing shade for parking areas and building walls, provide sound attenuation, and improve the air quality.

As shown in Figure 4-29 and 4-30, it is expected that with the planned visual impact mitigation measures used under the Preferred Alternative the proposed development would blend into the surrounding landscape and the industrial character of the development would be effectively softened. Figure 4-31 shows the expected visual impression of proposed development in the lower portion of the site from the grounds of the model airplane park. Figure 4-31 used photorealistic representation of trees which would be part of the vegetative buffer zones around the development. In this view, warehouses in the lower portion of the site would only be slightly distinguishable above the trees of the buffer zone.

It is expected that under the Preferred Alternative, visual impact mitigation measures for the proposed development in the lower portion of the site would add no significant adverse visual effects to the appearance of the lower part of the Kapa'a valley. The existing development within the upper portion of the site is already effectively shielded by an existing line of mature trees at the western boundary of the parcel 4-2-15:008.

The low impact development approach under the Preferred Alternative has identified other visual impact measures that might be implemented if the final design recommends its use. One of the technologies considered would be "green walls". A "green wall" is a green building technology that is increasingly used in urban setting to provide attractive cover of living vegetation on otherwise bare looking walls. Green walls use a variety of plants that grow on structurally independent lattice structures which are attached to walls. Green walls are a recent building technology (although many old houses in the US and in Europe have plants growing vertically up on the exterior walls). For industrial buildings, the final design of the proposed project will determine whether green walls would be feasible and recommended. The proposed visual impact mitigation measures under the Preferred Alternative could be augmented by using green walls on eastern and/or northern walls of warehouses at the eastern side of the development in the lower portion of the site that face the marsh.

Under Alternative B, the visual impact would not be mitigated to the same extent as under the Preferred Alternative. No virtual model was created for the planned Alternative B site layout of the lower portion of the site. Under Alternative B, the perimeter buffer zones around the lower portion of the site would not be improved to the same extent as under the Preferred Alternative. No trees would be planted under Alternative B within the site, and therefore visual impact mitigation would be significantly less than under the Preferred Alternative. The appearance of the development in the lower portion of the site would reflect a typical industrial warehouse development, featuring larger structures and paved traffic areas between them.

Under the No-action Alternative, the existing appearance of the project site as depicted in Figures 4-24 through 4-26 would not be altered and there would be no changes in the visual impact.

4.11 Impacts on Land Use and Zoning

This section discusses the expected impacts on land use and zoning for the proposed site and the vicinity. Both action alternatives would change the existing land use and zoning at the proposed site. While the land use under the action alternatives would be different from the existing land use, the proposed land use would not be incompatible. The proposed industrial development would be in an area that is already characterized by larger industrial land uses, and the proposed development, especially under the Preferred Alternative, would effectively mitigate environmental impacts with a low development approach that stresses a development that is responsible towards the environment and the community.

4.11.1 Impacts on Land Ownership

The proposed development would be built on land that is already under the ownership of the applicant and therefore no changes in ownership would be required

4.11.2 Impacts on County Land Use Designation

Both action alternatives would require the rezoning of two of the three land parcels of the property. Parcel TMK 4-2-15:001 (portion of) and 006 are presently within the P-2 (General Preservation) land use zone district and would require a zone change to I-1 (limited industrial). The third parcel TMK 4-2-15:008 is already zoned I-2 (Intensive Industrial) and would not need a zone change.

Under the No-action Alternative no change in land use zoning would be required.

4.11.3 Impacts on State Land Use Districts

The proposed project site is within the Urban state land use district and there would be no changes required under the two action alternative and the No-action Alternative.

4.11.4 Impact on Special Management Area

The lower portion of the site is within the Special Management Area (SMA) . Therefore both action alternatives, the Preferred Alternative and Alternative B, would require a SMA permit for the proposed project.

4.11.5 Impacts on Land Use for the Surrounding Environment

The following land uses would be affected by the action alternatives but would not be affected by the No-action Alternative:

The existing land use in the Kawainui Marsh might be affected; but it is expected that any adverse effect could be mitigated. Impact on the Kawainui Marsh are discussed in more detail in section 4.14

The proposed marsh perimeter trail system would be affected by the proposed project. It is expected that the positive effects of the proposed project would outweigh possible adverse impacts. Adverse impacts on the perimeter path would possibly include increased traffic on the quarry road, associated increases in noise and possibly slightly affected air quality. The expected increases in average traffic related noise from approximately 60 dBA to 63 dBA, at the time of full build out, would still be within a range that is typical for an urban environment. While the perimeter trail would most likely run at a distance from the quarry road for most of the length from the Kalanianaole Highway to Mokapu Boulevard, the planned trail alignment would use an area adjacent to the proposed site for a section of about 1,500 feet. Possible impact would also arise from employees using the trail to commute by bicycle of walking from the bus stops on Mokapu Blvd. or Kalanianaole Highway.

According to the Masterplan of the perimeter path, the area of the mauka drainage canal adjacent to site would be used to construct the perimeter path. This could only be realized when the drainage canal would be modified from its present state; a situation that is not considered under this DEIS but an initiative which the applicant would support.

The industrial operations in the upper part of the valley would be affected by the increased traffic on the quarry road and quarry access road. The traffic impact assessment for this DEIS suggests that the level of service (LOS) on the quarry access road would not be significantly affected by the increase traffic volume generated by the proposed project. The proposed project would increase the water and electricity consumption and thus would impact the associated supply situation of the valley. The capacity of electric supply of the Kapa'a valley would likely have to be increased during the development schedule of the proposed project. If an increase in electric load capacity has to be installed, ample capacity increments would be installed so that possible increases in electric load would not cause any capacity concerns to the established industrial uses in the valley. The water supply is expected to be adequate for the area, even with the added demand created under the two action alternatives. Wastewater systems are not affected since the Kapa'a valley is not connected to the municipal sewer system and onsite wastewater treatment and disposal occurs with septic systems.

The traffic on the federal H3-Freeway will be affected by the proposed project since it has been determined that most of the traffic generated by the proposed project would use the northern segment of the quarry road to go to and leave the proposed development by way of the connection of Mokapu Boulevard. It is expected that a part of the traffic generated by the proposed project would use the H3-Freeway to connect to the island wide and regional traffic network. It is expected that the number of additional trips resulting from the proposed project would not constitute a significant increase of traffic on the H3-Freeway.

The Le-Jardin Academy is located about 1.5 miles from the proposed site. It is expected that students of the Le Jardin Academy and their relatives would be affected by the increased traffic volume generated by the proposed project, but that the impacts would be minor. While it is expected that both action alternatives would affect the traffic volume on the entire length of the quarry road, it is anticipated that the northern segment of the quarry road will have higher increments in traffic volume than the southern segment. The school is located at the southern most segment of the quarry road, and therefore the school is likely less directly affected by traffic conditions. Besides traffic and associated impacts, no other impacts of the proposed project on the school are expected under both action alternatives.

Under the No-action Alternative, there would be no increase in traffic and therefore no adverse impact would be expected.

The Kapa'a Refuse Transfer Station is located in close proximity to the proposed project. It is expected that under both action alternatives, the transfer station would be affected by increases of electricity and water demand by the proposed project, as well as increases in traffic volume. Since the transfer station is located on the southern segment of the quarry road, the traffic impacts are lower than on the northern quarry road segment, where most of the additional traffic would occur as a result of the proposed project. Under the Preferred Alternative, the impacts on the electricity and water supply infrastructure are less than under Alternative B due to the low impact development approach of the Preferred Alternative. No electricity and water supply shortfalls, however, are expected for the transfer facility. The water supply to the transfer facility and other users in the affected area appears to be adequate for the anticipated increase in demand. Electricity supply would be adequate since there would be new power lines installed from the Kalanianaole substation along the quarry road if required.

Under the No-action Alternative, there would be no increase in traffic and also no increases in the water and electricity demand and therefore no adverse impact would be expected.

4.12 Impacts on Population and Community services

This section discusses the impact of the proposed project on the economic development in the Koolaupoko region and associated possible impacts on the community services. The market study, which was conducted for this environmental review, suggests that positive impacts of stimulating economic development in the region would most likely outweigh adverse socioeconomic impact.

The Preferred Alternative and Alternative B would create very similar socioeconomic impacts, and therefore only one assessment of socioeconomic impact is performed in this section. While treating the economic consequences of both action alternatives as equal it is understood, however, that the Preferred Alternative would create somewhat lesser consequences due to the low impact development approach of this alternative. For example, it is assumed that the capital investments of the LEED Silver certifiable development under the Preferred Alternative would involve slightly higher capital investments than developments which would be developed using conventional building technologies. Since the Preferred Alternative would incentivize carpooling, chances are higher under the Preferred Alternative that future employees from outside the greater Kailua and Kaneohe region would opt to commute to work rather than move closer to work, since the expenditures and strains associated with longer commutes would be much more manageable with carpools.

4.12.1 Economic Development Impacts

The main economic development consequence of the proposed project described the market study of this environmental review are summarized in this section. Appendix 2 presents the market study and offers a more in-depth discussion of methodology, results and recommendation. It should be noted that with the advances in the concept design, some assumptions made in the market study have experienced some minor updates. For example, as a result of a 2010 survey of companies at the existing warehouse development (see Appendix 3 for a more detailed discussion of the company survey), it is anticipated that the minimum number of full time equivalent positions created by the proposed project would be about 80 percent of the number assumed in the market study, while the net increase of industrial space would be 90 percent of the added leasable space in the market study. While some of the input and output values of the models used in the market study might be lower following the updates in the concept design of the proposed project, the result and conclusions of the market study are still valid to describe the anticipated trends and general impacts of the project.

In the timeframe of 2030, it is estimated that the Koolaupoko region will readily support about 1,000,000 square feet of additional industrial-type floor area, which includes about 170,000 square feet of demand that will be created via dislocation and conversion of land use. Although an additional one million square feet would represent a doubling of the currently available industrial space in the region, the resulting leasable industrial space would still only supply about 40 percent of the average per capita allowance when compared to other major Oahu and State markets.

It is expected that it will take about 15 to 17 years for the proposed the new industrial space to be reach absorption.

The market study assumed that approximately 60 to 70 percent of current tenants at the existing warehouse development are relocations of newer and exiting small businesses; some upgrading from their home or non-conforming locations, seeking better value by leaving their more expensive locations to industrial developments in the Koolaupoko region, or being encouraged to locate the businesses closer to home in the Koolaupoko region. The findings of the survey of businesses leasing space in the existing warehouse development, which was conducted for this DEIS, supports this assumption and has determined that 85 percent of the companies at the existing warehouse development are smaller companies with 1 to 9 employees, with the average number of employees per company at 6.3. Most of the other tenants are expanding businesses, which would like to serve the expanding windward market without incurring extra cost associated with long distances service operations to the market.

Besides the proposed project, there is very limited land within the Koolaupoko region that could be converted to industrial land use. This emphasizes the importance of creating industrial-type capacity by implementing the proposed project, since alternatives to the proposed site are almost non-existent compared with the size of the planned expansion of the existing warehouse development. The Koolaupoko sustainable communities plan discourages the development of any further industrial subdivisions in the district, but encourages the expansion of industrial uses in the Kapa'a valley "if sufficient demand can be demonstrated". The market study has demonstrated that the region can readily absorb the planned expansion of the existing warehouse area and that the demand for industrial space is high.

The proposed project would generate about $50 million in new capital investment during the length of the proposed project, which is expected to last about 15 to 17 years, from start of site development to full build out. It is expected that total construction wages would be around $12 million.

Taxes that would be generated by the operating industrial park would be in the order of $1.8 and $8 million for the City & County of Honolulu and the State of Hawaii, respectively.

The survey of businesses leasing space at the existing warehouse development concluded that approximately 57 percent of their employees reside in Kailua and Kaneohe. It is expected that in the future under the proposed project, this proportion would remain similar. With an estimate of 600 full time equivalent workers to be employed at the proposed site at full build out, it is therefore expected that 340 employees would come from areas in proximity to the proposed project, and the remaining 260 would commute from locations outside the district.

4.12.2 Impact to Demographics and Public Services

The Koolaupoko region is expected to have a somewhat stable population, with a slight decrease of about three percent from its current 118,000 residents or 3,500 residents anticipated through the year 2030. The estimated new out-of-district 260 employees and their families would be the maximum potential of people moving into the district as a result of the proposed project. The commute from Honolulu or other leeward urban regions could increasingly be a reason to relocate to the windward area when taking a new position in the proposed industrial park; but it is not expected that many of the new employees would indeed relocate to the region. While in-migration of a certain number of new employees and their families to the Koolaupoko region would be assumed, the expected numbers of people moving into the region would most likely be significantly smaller than people who are assumed to move out of the region through the time period of 2030. Therefore it is expected that the net in-migration to the region in the next two decades would be essentially negative, e.g. the proposed project would not generate as many people moving into the region as people who are expected to move out of the region.

Therefore, considering regional-wide consequences of a negative net in-migration on public services, no significant additional burden is expected on schools, hospitals, fire and rescue services, and police services as a result of the proposed project.

Considering site-specific consequences on public services, the following could be expected:

Police department: It is anticipated that the proposed development would not result in significant added demand on the police department. The proposed development would maintain its own security service, and the development would be secured by structural (e.g. perimeter fence, security lighting, security locks) and operational measures (e.g. surveillance cameras, frequent patrols). The strict security maintained within the proposed site would also have beneficial effects on the surrounding area, since the security service would cooperate with the police department to report any unlawful acts and possible security risks in the vicinity of the park (which would also include the adjacent model airplane park and the wetland areas).

Fire department: The new development would be constructed following strict fire codes and using appropriate non-flammable building material. The proposed park would interface with the existing fire water system that features an independent firewater supply that has its own diesel powered fire pumps. The newly developed areas would be equipped with code conformant fire systems. The security and maintenance staff would be trained in basic fire-fighting procedures and potential fires would be reported directly to the fire department in the Kailua area. The response time of fire engines to arrive at the scene would be similar to the present, since the distance between the proposed site and the responding fire stations is unchanged from the existing conditions. Since under both action alternatives, the adjacent roadways would operate at a level of service of C or better, it is expected that fire and rescue vehicles would be able to proceed as swiftly and without delay as they can do so presently.

While the manner of response to potential fires would be the same as under the existing conditions, the probability of fires is always increasing with increasing size of developments. The key to lowering the probability of fires is in mitigation, which includes fire-resistant building materials, code conformant design and layouts, training in basic firefighting and avoidance techniques, and last but not least in the choice of businesses that would be allowed to lease space in the proposed development. The proposed project site seeks a land use zone change from General Preservation (P-2) to Limited Industrial (I-1) for two of the three contiguous land parcels of the property. An I-1 zone excludes businesses using or manufacturing hazardous or fire sensible material or products. This by itself would significantly reduce the risk of fire when comparing the intended land use at the proposed site with intensive industrial land use elsewhere.

In summary, it can be stated that adverse effects on the fire department in the Kailua and Kaneohe areas are not expected.

Medical facilities: Possible consequences of the proposed project on medical facilities could be increased work related accidents or traffic accidents on the adjacent roads as a result in increased project related traffic. The expected type of businesses which would lease space in the proposed project would exclude those involving hazardous materials, products and manufacturing processes. Adding of about 600 new workers in the proposed project would undoubtedly increase the potential of accidents and other incidences that would require medical intervention but it is expected that there would be no significant adverse consequence on medical services. As indicated for the police and fire department the response time to medical emergencies at the proposed site would not be increased.

4.13 Cumulative Impacts

Cumulative impacts are defined as impacts on the environment which results from the incremental impact of the proposed action when added to other past, present, or reasonably foreseeable future action regardless of what agency or person initiates such additional actions. Consequently, cumulative impacts might result from individually minor but collectively significant actions taking place over a period of time.

By definition the No-action Alternative would not involve any actions and therefore would not result in any cumulative environmental impacts. Both action alternatives could potentially result in cumulative impacts if they were adding to impacts generated by other future projects. At the time of this DEIS, however, no additional project of the nature of the proposed project or other development project is known that might be implemented in the vicinity of the proposed project. Therefore cumulative impacts are not expected under both action alternatives. It should be noted that cumulative impacts would only be identified by source and would only be considered in the context of potential incremental impacts for the proposed project.

4.14 Impact on the Kawainui Marsh and Planned Mitigation

Kawainui Marsh is a designated Wetland of International Importance (established 2005) which has a total area of approximately 830 acres of land. The Kawainui Marsh is the largest remaining wetland in the State of Hawaii and represents site of significant environmental and cultural importance.

The marsh is an important habitat for endangered and listed water birds and numerous species of migratory seabirds and waterfowl. The marsh features a number of historic sites site which mirrors its cultural significance dating back to the early days of Hawaiian settlements in the area. The marsh has a significant importance as flood control for the community of Kailua immediately adjacent to the marsh. A flood control levee was build several decades ago along the eastern side of the marsh to improve flood control after several floods in the past had caused significant damages. The marsh, furthermore serves as a natural filter to contain sediments and trap pollutants upstream of the Kaneohe Bay.

After decades of relative neglect, the community and governmental agencies are cooperating in efforts to improve the overall condition of the marsh and mitigate effects caused by invasion of alien species, overgrowth of vegetation and poor water quality. Efforts are underway to restore areas of the marsh, reverse various impacts on its natural environment, and improve habitat conditions for wildlife, so that the marsh can function as an educational and recreational asset for the residents of Oahu, especially the communities closest to the marsh and to visitors alike.

The proposed project is located at the north western perimeter of the marsh and could directly impact on the marsh due to its proximity. This section discusses possible impacts on the marsh which could be caused by the proposed project. This section also lists a range of mitigation measures that would be implemented to reduce unavoidable impacts so that they are no longer representing a significant impact potential. In the following discussion the most effective mitigation measures are introduced and briefly described. The Preferred Alternative features most of the effective and comprehensive impact mitigation measures, since this alternative is committed to a low impact development approach. Under the Preferred Alternative, the lower portion of the site will be developed with the goal of attaining LEED Silver certification under the Core and Shell rating system (Version 3.0) upon project completion.

While most of the considerations hereafter explicitly address impacts on the Kawainui Marsh, such analysis and mitigation measures would also apply to the wetland area in the Kapa’a Stream corridor. Furthermore, the marsh spans approximately 1.3 and 2.0 miles in the east-west and north-south direction, respectively. Due to the considerable dimensions of the marsh, most of the environmental consequences of the proposed project would only affect a small part of the marsh. The impacts and mitigation measures discussed hereafter are therefore only limited to an area of the marsh that is directly adjacent to the proposed site.

4.14.1 Impact on Water Resources

Impacts on water resources, both surface water and groundwater, have immediate consequences and potentially the most significant impacts on the marsh. The marsh is the receiving water for the Kapa’a watershed. The main surface drainage of the watershed is the Kapa’a Stream, which has a total length of about 1.9 miles, approximately 0.7 miles of which are on the property of the applicant. Additional minor surface drainage into the marsh occurs through some drain outlets in the vicinity of the proposed site, all of which have hydrological conditions that are separate from the proposed site. Some drainage of the watershed also flows underground following the original soil horizons. An existing drainage canal, which is located directly mauka of the quarry road, receives seepage and occasionally surface runoff. The drainage canal is connected to the Kapa’a Stream and the confluence of canal and stream is just upstream of a culvert under the quarry road, which represents the end of the Kapa’a Stream and the beginning of the marsh.

Impacts of the surface water runoff into the marsh include sediments, nutrients, suspended solids, organic loads and other water pollutants, such as metals.

Sediments that enter the marsh primarily originate from erosion of the stream bed during high flow events. While the normal flow rates in the Kapa’a Stream are in the range of one to two cubic feet per second, a strong storm event can result in significantly higher flow rates. High flow rates can result in entrainment and transport of sediments to lower elevation. When the hydraulic energy of turbulent flow in the stream are no longer present, e.g. when the flow becomes less turbulent, the entrained sediments settle and result in the accumulation of sediments and in the volume reduction of water basins and flood channels in the marsh. Erosion, which means entrainment and transport of sediments, and subsequent sediments are natural occurrences in stream and receiving water and are not necessarily adverse effects. Problems arise when a watershed stops releasing rainwater at a continuous rate and drainage occurs mainly through high peak flow rates. In case of high peak flows rainwater cannot be percolated into pervious surfaces and be consumed by vegetation covers, so drainage flows from increasingly impervious surfaces. The proposed project converts a significant area from pervious to impervious surface and therefore can add adverse effect from high peak runoff rates. Excess sedimentation in the marsh and associated growth of vegetation on areas that are created by sedimentation can turn wetland into upland, thereby destroying habitat for aquatic fauna and water birds. Sedimentation can furthermore result in death or debilitation of sedentary organisms. In addition to the effect of wildlife sedimentation creating upland in the marsh, sedimentation decreases the flood control function of the marsh, since a wetland area with free surface is no longer available to retain flood water in the marsh.

> Mitigating flood control measures would shave off high flow rates through extended detention of stormwater and controlled release. As a consequence, high runoff rate and associated erosion can be mitigated and the release of the detained water to the stream would occur when the high flow rates in the stream during and after a storm event have abated. Other measures to control high runoff rates from the proposed site would include collection of rainwater from road and roadway sections for subsequent use in irrigation of landscaped and restored habitat areas at the perimeter and within the development footprint. Irrigation promotes the percolation of stormwater and recharging of aquifers. Evapotranspiration from plants furthermore returns the stormwater to its natural environment without contributing to site runoff and associated erosion. The existing wetland area in the lower reaches of the Kapa’a Stream functions as a natural filter that removes sediments from the stream flow and converts the organic components of sediment. The conservation of the wetland area in the stream corridor is therefore an important function that needs to be ensured to mitigate impacts to the marsh.

Nutrients in the surface drainage from the watershed can impair the water quality in several ways. The two primary impacts of excess nutrients in the water are as a potentially toxic substance, and indirectly through a process called eutrophication. Eutrophication is the accelerated growth of algae in the water stimulated by the presence of excess nutrients, nitrogen and phosphorus. The result of runaway eutrophication is the depletion of oxygen and the release of substances that toxic to the aquatic environment. Sources of nutrients can be from entrained natural deposits or organic matter, or from anthropogenic sources, such as from wastewater. Excess nutrients can have a significant adverse consequence on the marsh.

> Mitigation of nutrient release for the proposed project would be to remove nutrient sources from the runoff through treatment units. Another important mitigation is the advanced onsite wastewater treatment, which includes the removal of a significant portion of the nutrient load through combined nitrification and denitrification and absorption to remove nitrogen phosphorus from the wastewater, respectively. Advanced septic system wastewater treatment would be implemented in the lower portion of the site. Advanced treatment is called for because of the proximity to wetland areas and the marsh, and because of the small vertical distance between the saturated soil layer and

point of release of the effluent in the infiltration field. These conditions call for more effective wastewater treatment processes that can be achieved through conventional septic systems. The proposed project would result in effluent concentration in the treated wastewater in the lower portion of the site to such low concentration of organic load, nutrients and suspended solids that the wastewater can be used for irrigation. By implementing the proposed mitigation measures, the impacts of nutrients from the proposed site to the marsh would be effectively mitigated.

Suspended solids are created by dissolving material from solid surfaces and transporting the particles downstream. Suspended solids usually cannot be separated from water through sedimentation since the particles are too small and do not readily settle when the kinetic energy of the water diminishes. The removal of suspended solids relies more on filtering and absorption mechanisms than on settling. Suspended solids contribute to high turbidity and result in degradation of the water quality in the marsh. The concentration of suspended solids in the runoff can be reduced by filtering mechanisms in the soil, biomat or dense aquatic vegetation.

Mitigation measures of suspended solids in surface water include reducing the sources of suspended solids (e.g. reduction in erosion and leaching of particles from materials) and filtering functions in soil and vegetation. Stabilizing exposed soil with vegetation reduces erosion and improves removal of suspended solids through filtering.

Organic load in water can result in adverse effects if the decomposition of organic matter surpasses the ability of the receiving water to effectively break it down. In the presence of sufficient oxygen in the water, organic matter is decomposed by aerobic processes. If the replenishment of oxygen in the water cannot keep up with the rate at which oxygen is used for the aerobic processes, the oxygen concentration can get too low to sustain aquatic life. The decomposition processes would then shift to anaerobic processes which are not as productive as aerobic processes, and which can generate substances that are toxic to aquatic life. Anaerobic processes are a natural component of a wetland in which vegetation and soil naturally exist in partly anaerobic environments. Problems arise when aerobic and anaerobic processes are out of balance and anoxic environments prevail. The marsh is negatively affected by an oxygen concentration which is too low.

Mitigation measures planned for the proposed project would include the advanced wastewater treatment to substantially lower the organic load in the effluent where the point of release of treated wastewater is close to surface water, e.g. in the lower portion of the project site.

Additional impacts on water resources of the marsh could originate from the release of harmful agents to the water, either directly or indirectly. For example, runoff could be polluted by leaking equipment if such equipment is operated or installed in a non-conformant fashion. Another example is the use of unsuitable herbicides or fertilizer products near or in water that could introduce toxic discharge in the water.

Mitigation under the proposed project would include the avoidance of leaking equipment or the runoff of contaminated stormwater from such equipment. Furthermore only certified and environmentally friendly herbicides and fertilizers would be used near or in water. The choice of vegetation used in landscaping, could have a significant indirect effect since native and adaptive plants have a significantly lower demand for fertilizer and herbicides than typical plants used in landscaping.

Impacts to water resources during construction and site development require comprehensive and thorough mitigation, since significant impacts typically occur during construction when larger areas of the project site are not soil stabilized and exposed to erosion and runoff. Mitigation measures have to be in accordance with local codes and state and federal laws, such as the requirements to conform to provisions of the Clean Water Act (such as the National Pollutant Discharge Elimination System (NPDES)). In accordance to the more strict mitigation requirements under the low impact development approach of the project, a comprehensive erosion and sedimentation control plan would be created and implemented for all phases of the project that would conform to the requirements of the 2003 EPA Construction General permit. Site specific Best management Practices (BMPs) would be implemented to significantly reduce impacts during construction. Applicable site specific structural and non-structural BMPs could include the following:

- Utilize silt fences to remove sediments with filter media as stormwater flows through the fence.
- Utilize sedimentation basins, to allow for settling of sediments from stormwater volumes.
- Build perimeter dikes to contain runoff on the site and promote infiltration.
- Plant fast growing grasses for temporary soil stabilization if there are breaks or delays in construction of the final stabilized grade.
- Place hay, grass, woodchips, straw or gravel on the soil surface to cover and hold soils.
- For entry/exist use stabilization gravel to avoid soil and dirt to be carried onto public roadways.
- Prevent spills of hazardous agents.
- Avoid building material being washed into the receiving stream or other drainage areas.

4.14.2 Impact on Vegetation

Wetland vegetation is specifically adapted to the living conditions within wetland areas, and can exist and thrive in saturated soil for extended periods of time. Wetlands are characterized by applying three criteria: type of soil, periods of inundation and specific vegetation. Changes in wetland can cause changes in vegetation. For example wetland vegetation could make way for woody or wood-forming plants, which then would promote the conversion of wetland to upland.

The growth of undesirable plants in wetlands areas might require intervention, especially when undesirable plants encroach to the wetland.

> Mitigation to undesired changes of vegetation in the marsh would include controlling the encroachment of unsuitable plants to the marsh. Mitigation measures would further involve avoidance of the conversion of wetland to upland area and the restoration of wetland where needed. Avoidance of excess sedimentation would not only improve the hydrological condition of the marsh but would also help to conserve the unique wetland vegetation.

4.14.3 Impact on Wildlife

In the absence of suitable mitigation measures, the proposed project could contribute to adverse impacts on wildlife living in the Kawainui Marsh. Some important potential consequences are briefly discussed:

The marsh is a habitat for a number of endangered and listed water birds and a population of migratory seabirds and waterfowl. Since the proposed project would construct detention basins for flood control and treatment of runoff, water ponds with constant or intermittent water surfaces could develop inside these detention ponds, especially around the discharge wells. Endangered water birds could be attracted to these water ponds, subjecting them to increased predator threat.

> Mitigation measures would be implemented in accordance with recommendations and requirements of the U.S. Fish and Wildlife Service (USFWS). The objective of such mitigation measures would include keeping endangered water birds away from the water ponds and related threats from non-native predators.

The proposed project might attract non-native predators such as feral cats, rats or mongooses. These predators could be attracted by human activities and by trash stored in open containers or carelessly spread. These non-predators are a threat to ground breeding birds and other wildlife.

> Mitigation measures would involve continuous predator removal and control, e.g. through trapping methods. Other mitigation would further be to remove all sources of food for these predators from the development and instruct occupants and visitors of the warehouse development not to feed these animals.

The potential of wildlife collisions typically increases with higher traffic volume and with higher vehicle speed, when effective avoidance maneuvers could become dangerous for motorists and are therefore not executed by the motorists. The proposed project would increase the traffic volume on the quarry road, directly causing adverse effects on wildlife collisions.

Mitigation measures would include the development and implementation of site specific avoidance measures for federally listed endangered species and migratory birds in cooperation with the USFWS. The reduction of the average speed of vehicles on the quarry road would reduce wildlife collision potential. (Lowering the speed on the quarry road would also decrease impact from air pollution and noise, and increase traffic safety). Dynamic traffic signs that inform motorists about the frequency of wildlife collisions and solicit cooperation are more effective than static signs; active speed limit enforcement also is more effective than static signs.

Light pollution can have a significant impact on wildlife, since excess light can impair navigation and can reduce the food source by attracting insects and thus causing an undersupply of food for birds in areas close to bright night sky.

Mitigation of light pollution is part of the low impact development approach of the proposed project. The sustainable design approach (Refer to Appendix 4 of the DEIS) gives a detailed description of the proposed measures to mitigate light pollution, such as reducing exterior lights and avoiding interior lights to penetrate the building envelope. Excessive outdoor lighting would be avoided, to ensure that light does not directly shine into the Kawainui Marsh or contribute significantly to a strong glare that could be seen from the interior marsh. The lighting scheme of the industrial development within the lower portion of the proposed site would be developed in accordance to Lighting Zone LZ1 – “Dark” of the Illuminating Engineering Society of North America. The lighting requirements would call for low emitting lamps, full cut-off or shielded lamps to avoid light trespass into the adjacent areas, avoidance of light intensities that exceed the objective of lighting, timed and event controls of lighting, directing of lights on tasks to avoid glare, and controlling interior lighting power with a direct line of sight to any opening in the envelope by a significant degree during certain times of the night. External lighting would only be directed on areas where light is needed and all excessive lights will be avoided or effectively shaded.

4.14.4 Air and Noise Impact

The primary source of air and noise pollution would be from increased traffic on Kapa’a Quarry Road.

Air impacts, the most immediate and quantitatively largest impact potential on the marsh would come from increased vehicle exhaust, with exhaust originating from diesel powered vehicles possibly being the largest impact. Direction of the prevailing trade winds is from the east, which would primarily send the exhaust away from the marsh and would thus naturally mitigate related impacts. Other impacts on wildlife and vegetation would be the discharge of agents that could be directly harmful to living organisms, or those which could cause indirect adverse effect through the stimulation adverse environmental and habitat conditions as a result of accumulation and of changing chemical composition in water and soil.

> Mitigation to air impacts from increased traffic would be through reduction of vehicle speed and driving habits of motorists on the quarry road. While speed is the main determinant for increased traffic related air pollution, the types of vehicles and their operational conditions are also important mitigation measures. Newer heavy vehicles emit considerably less volume of harmful agents than older trucks and buses; vehicles with well-maintained engines likewise emit significantly less than engines that are inefficiently operated. Active mitigation measures would be the implementation of lower speed limits and better driving habits through appropriate signaling, enforcement and information about the merits to protect our nature through good driving, respectively. Other mitigation measures could be improvements of the quarry road to make the traffic flow more effective, by lowering the instances of frequent accelerations and deceleration and making the traffic flow more smoothly, thereby lowering fuel consumption and reducing the exhaust of harmful agents.

Noise impacts, the most immediate and quantitatively largest noise potential on the marsh would likewise originate from increase traffic volume on the quarry road. Noise can affect the marsh primarily through affecting wildlife and the resulting reduction in habitat, as wildlife retreats from areas in the vicinity to the roads. While it is generally true that noise causes loss of habitat and avoidance, habituation occurs when wildlife gets used to the noise level of the environment and newer generations of animals grow up accustomed to the elevated noise level. With increased traffic, there is also an increased chance of wildlife collisions and deaths of animals from the traffic. Noise has the somewhat beneficial side effect of causing wildlife to leave the area next to the roads and thereby decrease the number of deaths or injuries of animals when they collide or are otherwise adversely affected by vehicles. Habituation bears the risk that wildlife re-approaches the roads and thereby gets endangered by increased risk of colliding with more vehicles in the road. With the direction of the dominant trade winds coming from the east, noise propagates more efficiently downwind, which means away from the marsh, thereby mitigating the noise impacts via natural conditions. In addition to adverse impact on wildlife, noise is an annoyance and sometimes harmful to human beings. The expected noise levels on the quarry road at the time of full build-out would be in the order of about 60 to 63 dBA, which are noise levels common to urban settings. The traffic noise level on weekends, when the marsh is more used for recreation, is expected to be lower than during weekdays.

> Mitigation measures of noise impacts from traffic address similar mechanisms as air impacts. Noise is a strong function of the speed of vehicles and decreases measurably with lower speed. Noise at lower speeds is generated primarily from accelerations and decelerations. Heavy vehicles produce significantly more noise than cars at lower speeds, as a result of less wind generated sound energy and more audible engine noise.

Noise levels are higher on streets with rough and damaged pavement than on roads with smooth asphalt. Noise is attenuated in the presence of sound absorbing surfaces, such as vegetation close to the road, which reduces multiplying sounds caused by reflection on hard surfaces. Besides lowering the speed on the quarry road and allowing for a smooth traffic flow, effective noise mitigation measures could include repaving the road and planting vegetation along the makai (direction to the ocean) side of the road.

4.14.5 Impacts through Litter and Non-conforming Waste Disposal

There are ample examples around the perimeter of the marsh where litter and unsuitable and unlawful waste disposal adversely affect the appearance of the environment and cause harm to fauna and flora. For example, while disposed rusting refrigerators are an eyesore and can affect wildlife, leaking refrigerators that are dumped can cause spills of harmful agents that also affect water, soil and air. As a general rule increasing human activity in an area increases the potential of littering and unlawful waste disposal, especially when law enforcement is difficult and the area is remote.

Mitigation of littering and unlawful waste disposal can be achieved through two types of measures; avoidance of littering and unlawful disposal, and swift removal. Avoidance of littering can be achieved through better education, combined with encouragement to report on cases of exceptional unlawful disposal activities. Much of the littering is due more to carelessness than malice, and educational signs and campaigns telling people that litter and disposed objects can kill animals and harm the environment can be an effective mitigation measure. Unlawful disposal of larger and possibly harmful objects is almost always perpetrated with intent and could only be mitigated by strict enforcement and significant fines and penalties. Community organized removal of litter is a great way to rectify related impacts and many community groups are engaged to help keep the environment safe and beautiful. Removal of larger objects that were disposed of at the perimeter of the marsh requires more organized effort, including use of lifts and trucks to collect and transport the debris away from the marsh and to proper disposal. Over many years, the applicant has removed substantial amounts of debris and litter from the perimeter of the proposed site and from the banks of the drainage canal, and even from canal itself. The proposed project would continue the strict management of litter and debris from the area that surrounds the proposed site, which most likely would also include the marsh perimeter on the mauka side of the quarry road facing the proposed site.

4.14.6 Cultural Impacts

Within and around the Kawainui Marsh there are several archeological and cultural sites of importance which are listed in the Hawaii State Register for Historic Places. Almost all of the sites are located at the southern side of the marsh with a distance between the proposed project and these sites between one and two miles. Given the distances, there are no direct impacts of the proposed project to these sites. One site that is located adjacent to the proposed site is the Pahukini Heiau, which is located about 2,000 feet west of the closest wetland area.

> <u>Mitigation</u> measures are not expected to be required due to the lack of adverse impacts of the proposed project on archeological and cultural sites in and around the Kawainui Marsh. The applicant, however, sees the importance of preserving the cultural heritage of the region and has cooperated in the past with local community groups to preserve important sites and improve their appearance, when those showed signs of deterioration. One mitigation measure is the responsible handling of cultural artifacts if found during construction. The construction would be stopped until a cultural resources manager has determined the required course of action. Communication with State agencies has indicated that no cultural and archeological sites and assets are expected at the proposed site.

4.14.7 Visual Impacts on the Marsh

Visual impacts can affect long-distance and near distance viewplanes in and around the marsh. A comprehensive visual impact assessment was created for this environmental review and can be found in Appendix 8 of this DEIS. The study concluded that the project would not significantly affect most long distance and panoramic views of the marsh. The proposed project is located within an area that has existing industrial uses and visible structures. The upper portion of the project site is effectively shielded from direct line of sight from almost all view planes within and around the marsh. The lower portion of the site is visible from view planes at a higher elevation in the north western area around the marsh, for example form the adjacent H3-Freeway, but is not visible from locations around and within the marsh that are at equal elevations as the project site.

> <u>Mitigation</u> measures for visual impacts are the construction of vegetative buffer zones around the lower portion of the site. The upper portion of the site does not adversely affect the view planes around the marsh that were investigated in the visual impact assessment of this DEIS. In addition to planting trees and shrubs around the perimeter of the site, trees would also be planted around buildings within the development. Trees would therefore create a vegetative buffer next to the building, which, besides visual impact mitigation, would also improve the thermal performance of the building, lower the heat island effect and reduce air and noise pollution. The applicant contemplates the use

of so-called “green walls” around the sides of buildings that face the marsh. Green walls can be very effective to shield buildings and help them blend into a green background. The visual impact assessment suggests that with the planned mitigation measures, the proposed development in the lower portion of the project site would not create a significant visual impact for the marsh. More details can be obtained from the visual impact assessment in Appendix 8.

4.14.8 Impacts on Recreational and Educational Uses of the Marsh

Conservation efforts of the Kawainui Marsh have recently gained increased support by community groups and governmental agencies to protect and enjoy the marsh as a valuable asset to the community and nature. There are recent initiatives which endeavor to make the marsh more accessible for recreation and education. One of these initiatives is the planned marsh perimeter pathway, which would create a path that stretches around the entire marsh and provides pedestrians and bikers with an opportunity to enjoy the marsh from close distance and on a secure pathway. The planned marsh perimeter route would use a stretch of about 1,500 feet, which is on the property of the applicant next to the quarry road. The existing model airplane park is next to the proposed project site on the makai side of the quarry road. This park could be affected by the proposed project primarily through increased traffic on the quarry road and possible visual impacts from newly constructed buildings only a couple of hundred feet away.

<u>Mitigation</u> measures would include actions already described for lowering traffic induced noise and air impacts on the marsh. The primary activity of the Airplane park is the operation of small planes with miniature high-pitched engines for recreational enjoyment. The related activities do inherently create sound and people engaged in model airplane activities as well as spectators are expected to be less susceptible to sound in their related recreational activities than people who engage in quite recreational activities. However, the activities in the model airplane park are mostly going on over the weekend, when the traffic on the quarry road is lower than during weekday rush hours and those times when the increased traffic due to the proposed project is at its peak. For these reasons it is expected that traffic mitigation measures to be implemented for air and noise mitigation would be sufficient for the recreational activities adjacent to the proposed project site. Visual impact mitigation could be accomplished by installing the planned vegetative buffer zone around the eastern perimeter of the proposed site. In regard to the planned perimeter path, the planned route adjacent to the proposed site would coincide with the existing drainage canal along the mauka side of the quarry road. Proposed changes to the canal could open this area up for the construction of the perimeter pathway as a paved path located at a safe distance beside the quarry road.

4.14.9 Impact to Infrastructure

The perimeter of the marsh that borders the proposed project site features electric power lines and telecommunication cables installed at utility poles along the quarry road. Project related consequences to the marsh would mainly be through short term impacts to add cables to the existing utility poles and install new poles, if required, or through visual impact. Besides these impacts no other impacts are anticipated since no requirements are anticipated by the project to install new infrastructure close to or within the marsh.

> Mitigation measures would address only short-term effects, such as possible replacement of utility poles along the quarry road.

4.14.10 Miscellaneous Impacts

One possible impact to the marsh would be the danger of fire in the marsh. Historically, the marsh has been subjected to a number of fires in the past decades, some more serious than others. A wide spread fire could significantly damage marsh vegetation. A project related risk related to increase the fire hazard could not been identified, since the proposed development itself would implement strict fire standards to prevent and to combat fires. In addition, the predominant wind direction is from the east, thus fires in the marsh could more likely endanger the proposed development than vice versa. An indirect elevated fire risk could arise through increased traffic on the quarry road. Since the proposed project would greatly increase the presence of security and protective surveillance in the area it is expected that fire risks from arsons and self ignition from unlawfully disposed waste would actually be reduced.

> Mitigation measures to fire risks in the marsh in the area of the proposed project would be surveillance and the removal of unauthorized or abandoned objects that could pose a fire hazard.

4.15 Irreversible and Irretrievable Commitment of Resources

The development of the proposed Kapa’a Light Industrial Park would result in direct and indirect commitments of resources. Some resources committed could be recovered in a relatively short period of time, while in other cases, resources would be irreversibly or irretrievably committed by virtue of being consumed or by the long time period that resources would be committed to the proposed action.

Resources expended for the development of the proposed project would be offset by the creation of needed facilities and the resulting operational benefits. Construction of the proposed Kapa’a Light Industrial Park would augment the economic and social viability of the Koolaupoko region and would provide a centralized location with urgently needed industrial space for light industrial and commercial activities.

The conversion of approximately 22 acres of pervious to impervious land (under the Preferred Alternative) could be considered irretrievably committed. On the other hand about two acres would be converted from developed land to open land thereby offsetting part of the losses. Under the Preferred Alternative measures would be implemented to reverse some of the adverse impacts by implementing rainwater harvesting and use of collected rainwater to recharge of aquifers of irrigation.

Biological resources lost during the development are expected to be minimal, and the restoration of currently sparsely vegetated land at the perimeter of the site to quality habitat would augment biological resources and diversity at the site. The area converted from pervious to impervious land would not be previously undeveloped land or agricultural land but would be area that was created by landfill. The proposed industrial park would be developed in accordance to LEED standards for sustainable project development. The project team would implement building approaches that would be consistent with the intent and objectives of sustainable site development.

The development of the proposed project would require commitment of various construction materials, such as aggregate, concrete, steel, wood and other building materials. As part of the low impact development approach and LEED certification goals, a significant portion of construction material would be reused or recycled material. In addition, much of the material committed to the new construction may be recycled in the future or be used for upgrades at the proposed site sometime in the future.

The proposed industrial development would require the use of an amount of fossil fuel, electrical energy and water during construction. These should be considered irretrievably committed to the development effort.

This page is left blank intentionally

CHAPTER FIVE RELATIONSHIP TO LAND USE PLANS POLICIES AND CONTROLS

The development of the proposed Kapa'a Light Industrial Park needs to be consistent with the main principles of existing land use visions, policies and guidelines for Oahu and the Koolaupoko region. This section discusses compliance of the proposed industrial development with the City and County of Honolulu General Plan and the Koolaupoko Sustainable Communities Plan.

5.1 State Land Use Districts

The proposed Land Use Zone Change would not require a change of State Land Use Districts. All land that would be used for the proposed industrial development is presently located within the state's Urban district.

5.2 Compliance with General Plan

The five following sub-sections of the General Plan apply to commercial and industrial developments, such as the proposed Kapa'a Light Industrial Park. These sections discuss how the proposed Kapa'a Light Industrial Park would be consistent with such policies, visions and guidelines of the General Plan.

5.2.1 Consistency with Views and Policies of Economic Activity

Objective A *To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.*

Policy 1: *Encourage the growth and diversification of Oahu's economic base.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide important infrastructure prerequisites for the growth and diversification of Oahu's economic base. The Koolaupoko region is significantly under supplied with industrial space. Employees and customers of businesses, which serve the windward region from other location on the island, have to travel considerable distances to commute or visit these businesses. Increased time and costs to travel and commute costs businesses, employees and customers valuable resources that could be saved if more leasable industrial space were available in the Koolaupoko area. The proposed Kapa'a Light industrial Park would alleviate the shortage of industrial space and would help to encourage growth and diversification.

Policy 2: *Encourage the development of small businesses and larger industries, which will contribute to the economic and social well-being of Oahu residents.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide ample opportunity specifically to small businesses and some larger businesses in the Koolaupoko area to develop and diversify. Industrial space in the Koolaupoko region is scarce and small and larger companies are hampered in their development by such shortages. Growing small companies from Koolaupoko region can lack the resources required to incur logistical costs caused by the need to find industrial space outside of the region that they want to serve. A survey conducted for the DEIS reveals that 85 percent of the businesses leasing space in the existing warehouse development are smaller companies with less than ten employees. Seventy percent of the employees of such companies reside in the greater Kailua and Kaneohe region. Large companies could save on costs if they could locate service centers and base yards close to the customers in the Koolaupoko region, instead of incurring costs and time to drive from service centers and base yards outside of the region.

Policy 3: *Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide an appropriate location for businesses and light industries developed on the premises of sustainable site and socially responsible development. The requested zone change to Limited Industrial (I-1) land use would disqualify highly polluting industrial or industries that store or handle harmful material. The proposed Kapa'a Light Industrial Park would be built utilizing sustainable design, construction and operational methods, thereby decreasing emissions that typically accompany such industrial activities. While the sustainable core and shell development approach would be administered by the developer, tenants would be encouraged to streamline their businesses along the low impact development approach of the development. In certain cases tenants would be contractually obligated to adopt low impact development strategies where required to mitigate impact that extends past the leased area. For example tenants would need to abide by light pollution reduction and energy and water saving strategies as part of their lease agreements. The fact that the Kapa'a Light Industrial Park would be developed in accordance to LEED and would, upon completion, apply to be LEED certified, would help to attract businesses who are environmentally aware and would also help businesses offer more environmentally friendly products and services.

Policy 4: *Encourage the development of local, national, and world markets for the products of Oahu-based industries.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide sufficient infrastructure and warehouse space for innovative businesses that can compete with products on the local, national and world market. The innovative nature of the development, using sustainable technologies and alternative energies promises to attract innovative thinking organizations.

Objective G: *To bring about orderly economic growth on Oahu.*

Policy 2: *Permit the moderate growth of business centers in the urban-fringe areas:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide the means for existing and new businesses to grow or to provide a better long-term basis for their businesses. The capacity of the proposed Kapa'a Light Industrial Park would be able to accommodate moderate growth. More important yet, the Kapa'a Light Industrial Park would be geared to provide the framework for a sustainable infrastructure to engage in entrepreneurial activities.

Policy 3: *Maintain sufficient land in appropriately located commercial and industrial areas to help ensure a favorable business climate on Oahu:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide space for commercial and light industrial activities to help ensure a favorable business climate on Oahu. There is an urgent and significant need for quality industrial space in the Koolaupoko region. Industrial space, including industrial warehouse space, will be lost in the Koolaupoko region due to changing land uses and rezoning efforts. In addition, older industrial developments now in use in the region could be replaced by modern and environmentally friendly facilities. Relocation of businesses and establishing new businesses in the new Kapa'a Light Industrial Park would help to create opportunities for businesses and the local community.

5.2.2 Consistency with Views and Policies of Natural Environment

Objective A: *To protect and preserve the natural environment.*

Policy 1: *Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide important light industrial infrastructure, which would be developed in a manner that is responsible to the environment and the community. The low impact development approach of the proposed warehouse development with sustainable technologies would minimize impacts on the environment and community of the proposed warehouse park.

Policy 2: *Seek the restoration of environmentally damaged areas and natural resources:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would be built on land that has been significantly impacted by industrial activities over the past decades. Developing this area would improve land that was impaired by landfill many years ago. The proposed project would decrease harmful runoff and would actively engage in restoring natural resources. As part of the low impact development approach about eight acres of land that is presently either not vegetated or only sparsely vegetated would be restored to habitat condition using native and adaptive plants.

Policy 3: *Retain the Island's streams as scenic, aquatic, and recreation resources:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement mitigation that would effectively protect the water resources from polluted runoff conditions and would actually improve existing water quality in the Kapa'a Stream.

Policy 4: *Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would give due considerations to important natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation. The development of the Kapa'a Light Industrial park would follow low impact development standards of environmentally friendly and energy efficient buildings and the development would be designed and constructed in such a manner to qualify for LEED Silver certification upon completion of the project

The proposed project would give due consideration for the features mentioned above:

- Slope, flood and erosion hazards: All slopes in within the development area would be stabilized with appropriate means to avoid erosion. Flood exposure would be avoided since the development would be built outside areas with defined flood hazards.
- Water-recharge areas: The proposed development would endeavor to increase perviousness within the proposed site. All open space within the development would be pervious and vegetated. Rainwater would be collected from a significant portion of the warehouse roof and some segments of roadways. After storage in underground taverns, the collected rainwater would be used for irrigation (e.g. potable water would no longer be used for irrigation) and allow water recharging through infiltration.
- Distinctive landforms would be retained within the proposed site. The existing site is a landfill area that was formed about 30 – 40 years ago. The landfill area would be graded to create an attractive landscaped surface, where currently there is exposed soil with signs of surface erosion at the present time.
- Existing vegetation would not only be conserved but vegetation on the site would be significantly improved by using native and adaptive plants for landscaping and open space restoration and eradicating the existing thick vegetation of invasive plant species.

Policy 6: *Design surface drainage and flood-control systems in a manner, which will help, preserve their natural settings.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would use an array of Best Management Practices (BMP) to create an environmentally friendly drainage and flood-control systems. The stormwater management system would include the following components:

- Pervious areas would be maximized within the development footprint by use of open-grid pavement and landscaped areas around the warehouse structure that would be planted with trees.
- All land outside the development footprint would be pervious area, stabilized with native of adaptive plants or other suitable final soil stabilization measures.

- All parking spaces within the lower portion would be pervious to increase the amount of rainwater infiltration.
- All or a large portion of the impervious warehouse roofs and some roadway sections would collect rainwater. Harvested rainwater would then be stored in underground cisterns for subsequent use of irrigation; therefore converting impervious roof area to “semi-pervious area”.
- All stormwater would be collected and conveyed to detention basins. No stormwater would be released directly to the receiving water without first flowing through detention ponds.
- Upstream of the detention basins the stormwater would flow through pre-treatment units where all floatable debris and a high portion of sediments, nutrients, and oil-grease contained in the stormwater would be removed from the stormwater.
- The stormwater would remain in the detention basins for flood control. The detained stormwater would be released after the storm event to the receiving water in order to shave off high peak runoff flow rates which could result in streambed erosion and subsequent sedimentation in the marsh.
- The type of detention pond for the lower portion of the project site would be an “extended” extension pond. These types of detention ponds can remove a significant portion of suspended solids and nutrients.
- The banks of the normally dry detention ponds would be planted with plants that can either live in a dry or wet environment.
- The detention ponds would be equipped with suitable avoidance measures to discourage endangered water birds from accessing the pools since they would be subject to higher predator threats.

Policy 7: *Protect the natural environment from damaging levels of air, water, and noise pollution:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would incorporate active and passive measures to limit air, water, and noise pollution. In particular, some examples of effective measures would include:

- Landscaping with native or adaptive plants within and at the perimeter of the development footprint.

- Using vegetative buffer zones around the development to limit air and noise pollution.
- Using other means to lower air pollution such as avoid unnecessary idling of engines, promoting low-emitting vehicles, promoting alternative transportation, and other measures.
- Using other means to lower noise pollution, both mitigating noise at the source and attenuating noise propagation.
- Implementing an advanced and highly effective stormwater management and treatment system for flood control, and effective removal of pollutants in stormwater.
- Implementing effective onsite wastewater treatment in the form of up to 18 new septic systems for the entire new development; the onsite alternative septic systems in the lower portion of the site would be able to increase the treatment effectiveness and reduce a much higher percentage of organic loads, nutrient and suspended solids than can be removed with conventional septic systems.
- Implementing an effective waste management plan to avoid disposal of wastewater that is not compatible with the onsite wastewater treatment systems (septic systems).

<u>Policy 8:</u> *Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy. The low impact development approach of the proposed project would create habitat and vegetative buffers zones between the development and surrounding wetland areas. The existing site is not considered a habitat for endangered species. The existing site rather features a population of urbanized birds and small mammals. This population would find an expanded habitat in the perimeter areas of the project.

<u>Policy 9:</u> *Protect mature trees on public and private lands and encourage their integration into new developments:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since efforts would be made to preserve all mature trees on the proposed site. Mature trees are mainly located in stream corridor and in the eastern side of the property, but not within the area of the proposed development footprint. The area containing mature trees would not be negatively impacted by the new development, thus most of the mature trees would be preserved. In addition to conserving existing trees the proposed project would plant a significant number of trees in vegetative buffer zones around the proposed development and within the development in landscaped areas around buildings. The vegetative buffer zones would feature native or adaptive plants and would have densely planted wind-breaks to provide effective mitigation against noise pollution, air pollution and visual impact (including light pollution).

Policy 10: Increase public awareness and appreciation of Oahu's land, air, and water resources.

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since the proposed development would be designed and built based on sustainability concepts. Part of the LEED Silver certification plan is to offer educational outreach to promote awareness about the Kawainui Marsh.

Objective B: To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 1: Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would be developed using a wide range of mitigation measures to protect adjacent forests and watershed areas; marshes, rivers, and streams. The Kawainui Marsh, which is located adjacent to the proposed development would benefit from the new development through an improved upstream watershed and water quality of the Kapa'a Stream, achieved by the comprehensive stormwater management system, which would improve the present water quality impacts of the present site configuration. Erosion control measures used in the proposed project would decrease the amount of erosion. Detention ponds of the proposed development would regulate the storm-water discharge by retaining water in the soil and in the ponds. The wildlife habitat on restored land upstream of the marsh would add to the biodiversity of the area.

Policy 2: Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas:

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would utilize visual impact mitigation measures to protect scenic views. The new warehouses would be built in an attractive style that blends into the surrounding area. Trees would be planted around the buildings within development to provide “green cover” for large warehouse walls. Trees planted in the vegetative buffers around the perimeter of the lower portion of the site would provide effective visual impact mitigation. External lighting design would avoid light pollution. The proposed project would be planned in an area where previous industrial activities have changed the appearance of the Kapa’a Valley. In contrast to the existing industrial uses in or adjacent to the Kapa’a Valley, the proposed industrial development would implement visual impact mitigation.

Policy 3: *Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would not impede important views of the mountains and the sea.

Policy 4: *Provide opportunities for recreational and educational use and physical contact with Oahu's natural environmental.*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would provide educational opportunities about environmentally friendly commercial and industrial developments as part of the LEED Silver certification approach.

5.2.3 Consistency with Views and Policies of Transportation & Utilities

Objective A: *To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.*

Policy 9: *Promote programs to reduce dependence on the use of automobiles:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since the sustainable development approach would promote the use of alternative transport modes. Alternative transport would include public transportation, private shuttles, bicycles, car pools, and other measures. Preferred parking would be offered for car pools and low-emitting vehicles. There would be secured bicycle racks and a locker-shower opportunity for bicycle users. At the present there are no plans to extend TheBus service to the proposed site. The use of bicycles on the Kapa’a Quarry Road is far from safe and secure and a dedicated combined pedestrian and bikeway would be beneficial to create good traffic conditions for bicyclists and pedestrians. The applicant would support plans to build a 1,500 feet section of the proposed perimeter pathway on his property. Portions of this proposed marsh perimeter pathway could be used to safely and comfortably reach the project site from Mokapu Boulevard and Kalanianaole Highway.

Objective B: *To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.*

Policy 3: *Encourage the development of new technology, which will reduce the cost of providing water and the cost of waste disposal:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since the proposed development would actively engage in incorporating new technology that reduces costs of water usage, as well as lowering the cost of waste disposal through recycling measures. The proposed industrial development would make extensive use of harvested rainwater for irrigation and other applicable non-potable applications. Rainwater harvesting in concert with use of high efficiency toilets, urinals and fixtures offer a significant technology solution to reduce water consumption. Part of the LEED Silver certification program is a comprehensive construction waste management plan under which significant part of material from the site would be reused or recycled. Operational plans of the proposed industrial development will have a comprehensive recycling program.

Policy 4: *Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would actively incorporate measures to lower the water consumption and would lower water consumption by recycling water and harvesting rainwater that can be used for irrigation or other grey water applications. A part of onsite treated wastewater would be reused for irrigation and infiltrated on the site. As part of the low impact development approach occupants of the park would be encouraged to recycle and to responsibly use resource, and facilities would be provided to make these efforts easy and convenient.

Policy 5: *Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would incorporate safe, efficient, and environmentally sensitive waste-collection and waste-disposal services. The proposed industrial park would implement a comprehensive waste management plans that would include construction waste management, material reuse, recycled content of both pre- and post-consumer content, preferred use of regional material, rapid renewable material and certified woods. These measures would be promoted under the LEED project approach of sustainable design, construction and operation.

Policy 6: *Support programs to recover resources from solid-waste and recycle wastewater.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement and maintain comprehensive waste management and recycling content programs. Wastewater would be treated and infiltrated on site. Wastewater disposal in areas that are close to sensitive areas would include advanced treatment capabilities to significantly lower the concentration of organic loading, nutrients and suspended solids in ten effluent. The effluent of the onsite wastewater treatment would be such a good quality to allow us to use it for irrigation.

Policy 7: *Require the safe disposal of hazardous waste.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would safely collect and dispose of any hazardous waste. The type of land use in the proposed industrial development would exclude industries using or manufacturing hazardous materials.

Objective C: To maintain a high level of service for all utilities.

Policy 1: *Maintain existing utility systems in order to avoid major breakdowns:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement and maintain, in good working order, all utilities in the proposed development. Implementation of energy savings and on-site photovoltaic electricity generation would reduce the baseline energy demand and in particular peak demand, thus mitigating system breakdown. Implementation of water saving products and management measures would significantly lower water consumption and preserve the existing infrastructure. Onsite wastewater treatment would provide effective treatment of sewage and avoid discharge of wastewater from the proposed development to municipally wastewater treatment plants in Kailua or Kaneohe.

Policy 4: *Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would incorporate load management technology to decrease peak electricity demand or to flatten out the peak demand curve over the day. In addition, the proposed development would incorporate renewable heat recovery or electricity generation by photovoltaic in order to lower peak demand.

<u>Objective D</u>: *To maintain transportation and utility systems, which will help Oahu, continue to be a desirable place to live and visit.*

<u>Policy 5:</u> *Require the installation of underground utility lines wherever feasible:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would place all improved utilities underground within the proposed site.

5.2.4 Consistency with Views and Policies of Energy

<u>Objective A:</u> *To maintain an adequate, dependable, and economical supply of energy for Oahu residents.*

<u>Policy 1:</u> *Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on Oahu:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would support active and passive energy conservation. The proposed development would utilize state-of-the-art energy conservation technology and measures to lower baseline and peak demand in the proposed development. A portion of the electricity demand would be generated using on-site renewable energy systems. The project development of the lower portion of the site would apply for LEED Silver certification upon completion, which requires the implementation of a wide range of for sustainable technologies, including energy savings of at least 30 percent under the baseline of conventional developments.

<u>Policy 2:</u> *Establish economic incentives and regulatory measures, which will reduce Oahu's dependence on petroleum as its primary source of energy:*

The proposed Kapa’a Light Industrial Park development would be consistent with this policy, since it would promote the use of renewable energies and therefore help to reduce energy demand that is primarily based on petroleum fuel. The proposed development would promote energy efficiency that would consume electricity at levels that is far below design baseline performance prescribed in conventional building codes. At present about 80 percent of Hawaii’s electricity is made from petroleum.

Effective energy savings therefore directly helps reducing Hawaii's dependency on petroleum. The proposed development would install photovoltaic panels on rooftops to generate electricity that is either used by the warehouses on site or is net-metered.

Policy 3: *Support programs and projects, which contribute to the attainment of energy self-sufficiency on Oahu.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate energy generation technology to provide electrify, heat and cooling from renewable or indigenous resources. The low impact development approach of the proposed project uses a wide range of active and passive building technologies to reduce energy consumption and promote renewable energies. As part of the LEED Silver certification plan an amount of renewable energy certificates (REC) will be purchased to promote the use of indigenous energy.

Policy 5: *Give adequate consideration to environmental, public health, and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it makes capital investments in energy efficiency and renewable energy sources. The integrated LEED project development approach stresses a triple bottom-line to promote the economy, social responsibility and environmental stewardship. .

Objective B: *To conserve energy through the more efficient management of its use.*

Policy 1: *Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would follow the LEED project development approach and would make energy efficiency and renewable energy important design and development goals. Since LEED project certification involves a third party review process the public can be assured that energy efficiency and savings would be part of proposed industrial warehouse development. Energy efficient performance of buildings is a prerequisite to obtain LEED Silver certification.

Policy 2: *Provide incentives and, where appropriate, mandatory controls to achieve energy efficient siting and design of new developments:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate energy efficiency in the proposed development as per

LEED project development approach. The sustainable building and site development standards of LEED entail the completion all or many of the following credits:

- Commissioning of building energy systems to increase energy efficiency
- Minimum energy performance
- Refrigeration management by avoiding or phasing out CFCs (Chlorofluorocarbons) and using environmentally friendly refrigerants
- Optimize energy performance
- Onsite renewable energy
- Measurement and verification of building and tenants
- Promoting green power applications

Policy 3: *Carry out public, and promote private, programs to more efficiently use energy in existing buildings and outdoor facilities:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would not only equip new warehouses with energy efficient technology, but would also convert existing buildings to be more energy efficient.

Policy 4: *Promote the development of an energy-efficient transportation system:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would encourage car-pooling and other means of alternative transportation for the users and employees of the proposed warehouse development. The proposed development would provide bicycle friendly infrastructure with bike racks and locker & shower facilities. Preferred parking would be offered for carpools, low-emitting cars and alternative fuels cars. The applicant promotes the extension of public transportation to the proposed site; although at the moment such extension is not planned by the City & County traffic authorities. In the event that no public transportation would be offered to serve the proposed site with public transportation, the applicant may possibly offer private shuttle service at a point in the development, when enough demand is being developed by businesses in the light industrial park.

Objective C: *To fully utilize proven alternative sources of energy.*

Policy 1: *Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively promote and install commercially available solar energy systems. In addition to photovoltaic energy generation selected warehouses would be equipped with solar water heater for potable water needs.

Policy 2: *Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement a comprehensive waste management plan, which would include recycling of glass, metal, paper, cardboard and plastic as well as composting of some organic waste. The recycled combustible content (e.g. plastic, paper, cardboard) could be converted to energy in waste incendiary facilities. The organic biomass could be composted onsite and reused, thereby reducing the energy footprint of the proposed development.

Objective D: *To develop and apply new, locally available energy resources.*

Policy 1: *Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:*

a. Solar insulation;
b. Biomass energy conversion;
c. Wind energy conversion;
d. Geothermal energy; and
e. Ocean thermal energy conversion.

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would seek to attract companies that develop, build and sell innovative energy technology. In addition, the proposed development would make efforts to attract pilot installation of innovative energy conversion technology. Onsite renewable energy is part of the LEED Silver certification plan.

Objective E: *To establish a continuing energy information program.*

Policy 1: *Supply citizens with the information they need to fully understand the potential supply, cost, and other problems associated with Oahu's dependence on imported petroleum:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would make efforts to engage the users of the park to increase the portion of renewable energy resources and save energy (thus avoiding the use of petroleum derived energy)

Policy 2: *Foster the development of an energy conservation ethic among Oahu residents:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively engage the users of the park to use energy efficiently. The proposed warehouse development would be a "living proof" that energy conservation and enhanced business activities are not exclusive propositions. The proposed industrial development could publicly promote responsible energy use and would therefore offer valuable "real life" application knowledge of energy efficiency, energy saving strategies and renewable energy applications. Sharing of energy and water consumption data is a prerequisite of the LEED Silver certification plan. The planned web site of the proposed project could promulgate energy and water consumption data.

Policy 3: *Keep consumers informed about available alternative energy sources and their costs and benefits:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would engage users of the park about implementing energy conservation and using renewable energy.

Policy 4: *Provide information concerning the impact of public and private decisions on future energy use:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would encourage participation in energy issues of users of the propose warehouse park, which are not only relevant to the warehouses but also of broader public interest.

5.2.5 Consistency with Views and Policies of Public Safety

Objective A: *To prevent and control crime and maintain public order.*

Policy 1: *Provide a safe environment for residents and visitors on Oahu:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide a safe environment for the users and visitors of the proposed warehouse development. It is anticipated that the constant presence of security measures and private security patrols would decrease any possible criminal activities in the areas adjacent to the proposed site.

Policy 5: *Establish and maintain programs to encourage public cooperation in the prevention and solution of crimes:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively work with users of the park in the prevention of crime. It is anticipated that the development of the proposed warehouse park would lower the incidence of crime in the area since improved security on the proposed site would also positively impact adjacent areas.

<u>Objective B:</u> *To protect the people of Oahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.*

<u>Policy 1:</u> *Keep up-to-date and enforce all City and County safety regulations:*

The proposed Kapa'a Light Industrial Park development would consistent with this policy, since it would enforce all City and County safety regulations as well as additional safety regulations implemented by the users.

<u>Policy 2:</u> *Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since all buildings would be located outside high-risk flood zones and the buildings would be constructed in such a manner to not create any health or safety hazards.

<u>Policy 6:</u> *Reduce hazardous traffic conditions:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since all private roads and intersections with public would be constructed and maintained in such a manner to reduce hazardous traffic conditions.

<u>Policy 7:</u> *Provide adequate fire protection and effective fire prevention programs:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since effective fire prevention and protection would be implemented, such as adequate fire water supply, fire water booster pumps, preference to fire resistant construction materials, dedicated fire accesses to the buildings and comprehensive fire prevention instructions.

5.3 Consistency with Koolaupoko Sustainable Communities Plan

This section discusses how the proposed Kapa'a Light Industrial Park would support the visions, guidelines and planning principles set forth in the Koolaupoko Sustainable Communities Plan.

5.3.1 Consistency with the Role of Koolaupoko on Oahu

The Koolaupoko Sustainable Community Plan calls for sustaining quality of life in the region by balancing and integrating environmental, economic, social and cultural objectives. The proposed Kapa'a Light Industrial Park would positively affect economic and social aspects of the region, while providing an attractive place of operation for commercial and light industrial businesses that would be environmentally friendly and respectful to cultural concerns and the natural surroundings.

Goals for the future land use the Koolaupoko region are shaped by the region's role to provide only minor population growth, while future significant residential growth is directed instead to Oahu's Primary Urban Center and Ewa Development Plan Areas in accordance with the General Plan. The future role of the Kapa'a Light Industrial Park would be to attract beneficial new employment opportunities for residents of the Koolaupoko regions, while providing modern and environmentally friendly warehouse space for light industrial and commercial uses in the region, in order to mitigate a growing shortfall for warehouse space.

It would not be the goal of the proposed Kapa'a Light Industrial Park to attract significant growth of economic activity and employment from other part of the islands, or such businesses that would serve an island-wide market. Rather, the primary business goal of the proposed Kapa'a Light Industrial Park would be to contribute to the revitalization of the commercial base of the Koolaupoko region by providing much needed modern warehouse space that is built, equipped and operated in an environmentally friendly and energy efficient manner.

As was identified in the market study of this environmental review, the Koolaupoko region is presently significantly undersupplied with industrial space. Compared to the average per capita allowance of industrial space on Oahu, the Koolaupoko region only provides about 20 percent of the average per capita allowance at the present time. Adding the planned approximately 600,000 square feet of gross leasable space of the proposed development to the industrial space supply in the Koolaupoko region would result in approximately 40 percent of comparable per capita allowance of industrial space in other markets on Oahu. The Koolaupoko region could absorb the planned industrial space within a development time frame of 15 to 17 years.

The proposed Kapa'a Light Industrial Park would be the expansion of an already existing industrial warehouse complex. The proposed expansion of the development is not a brainchild of "foreign" developers, who have identified the land adjacent to the Kawainui Marsh for a significant industrial project. The proposed development is a "local" initiative, initiated by long-term "local" developers, who are rooted in the community and the proposed development is directed to benefit the local community rather than an island-wide market.

5.3.2 Consistency with the Visions of the Sustainable Community Plan

The vision of the Koolaupoko Sustainable Community Plan is the long-term protection of community resources and its residential character as well as the adoption of improvement and developments that reflect a stable population. The two cornerstones of the plan are protecting community resources and providing improved infrastructure to serve changing needs of the population.

The first cornerstone of the plan requires the preservation, conservation, and enhancement of the region's resources, which are:

1. Natural and scenic resources
2. Cultural and historical resources
3. Agricultural resources
4. Residential environmental of neighborhoods

The proposed Kapa'a Light Industrial Park would affect the first two resource categories of the above list, namely natural and scenic resources and cultural and historical resources. The area in the Kapa'a Valley is not of agricultural use and is not adjacent to residential neighborhoods. Appropriate measures for the design, construction, outfitting and operation of the industrial development would be applied to effectively protect important community resources.

The second cornerstone of the plan calls for improved infrastructure to serve the changing needs of the population in the region. The proposed Kapa'a Light Industrial Park would provide urgently needed industrial space which is modern, environmentally friendly and energy efficient. Both environmental protection and an efficient and responsible use of energy are increasingly important and fundamental challenges for Hawaii.

Key elements of the vision, policies and guidelines for Koolaupoko futures, which are applicable to the proposed Kapa'a Light Industrial Plan, are as follows:

<u>The concept of “ahupua‘a” in land use and natural resource management</u>: Ahupua’a refers to the historic Hawaiian principle that the land provides abundantly only when revered as a unique entity stretching from the mountains to the ocean. All elements in the stream of natural abundance must contribute to the health of ahupua’a. Therefore any development in the ahupua’a will affect its viability. The proposed Kapa’a Light Industrial Park would therefore contribute by being developed in manner that is respectful to the land, limits its emissions to a minimum and consumes as little resources and in the most responsible manner as possible. Being located adjacent and upstream from the important Kawainui Marsh, the proposed industrial warehouse development would contribute to the health of the Kapa’a Stream by discharging only stormwater that has passed through a comprehensive stormwater management system that removes a significant portion of pollutants and provides flood control.

<u>Preserve and promote open space throughout the region:</u> The proposed Kapa’a Light Industrial Park would be developed while leaving large areas within the property as open spaces. As part of the LEED Silver certification plan about eight acres of land would be converted from either graded and not vegetated and sparsely vegetated to restored habitat, featuring native and adaptive plants. The proposed site would be surrounded by vegetative buffer zones comprised of dense planted shrubs and trees, establishing dense wind-breaks that could effectively mitigate noise, air pollution and visual impacts. The vegetative buffer zones would be open spaces service as habitat for the native population of urbanizes birds and small mammals.

<u>Enhance existing commercial and civic districts;</u> The proposed Kapa’a Light Industrial Park would be an expansion of an already existing warehouse development. While the present warehouse development represents individually designed and erected buildings, the future industrial warehouse development would be a consistently planned development and would contain modern environmentally friendly and energy efficient warehouses.

5.3.3 Consistency with Land Use Policies, Principles and Guidelines

The relevant commercial and industrial activities that define the land use of the proposed warehouse park would include service companies, light industrial activities and storage facilities. According to the Sustainable Communities Plan, it is encouraged to satisfy evolving infrastructure needs for certain commercial and light industrial uses in the regions. The plan contends that the anticipated demand for industrial space in the region should be accommodated by existing industrial zones in the Kailua, Kaneohe and in the Kapa’a area, with the latter being a portion of the proposed Kapa’a Light Industrial Park that is already in operation at the present time.

The market study of this environmental review has determined that the demand for industrial space cannot be satisfied by existing industrial zoned land within the Koolaupoko region. At present the Koolaupoko region is significantly undersupplied with industrial space when compared to the average Oahu supply of industrial space. The per capita industrial space allowance in the Koolaupoko region is presently only about 20 percent of the average Oahu allowance. Another factor to be considered is that over the next years it can be anticipated that more and more industrial zoned land within the region is being lost due to re-zoning and new developments on this land that is not industrial in nature. The proposed Kapa'a Light Industrial Park would therefore be consistent with land use policies and guidelines of the Koolaupoko Sustainable Communities Plan.

<u>General Policies</u> indicate that light and extractive industry activities in the Kapa'a Valley are accepted land uses. Therefore the proposed Kapa'a Light Industrial Park would be consistent with future land use plans in the region.

<u>Applicable Planning Principles</u> of the Sustainable Community Plan would be consistent with the proposed Kapa'a Light Industrial Park, such as:

- The proposed park would promote alternative modes of transportation, such as bicycles uses and car-pooling. Though at the moment the site is not served by public transportation, the developer of the proposed industrial park would promote public transportation or private shuttles to serve the expanded industrial development in the futures.
- The buildings in the proposed industrial development would be built in such a manner to respect the natural surroundings.
- Landscaping features would use open spaces between the buildings and would use native and adaptive plants, which offer many advantages over other plants, such as less irrigation requirements, less fertilizer, and less maintenance, to name a few.
- The development approach of the proposed industrial development would be consistent with the demand for energy efficiency and resource conservation by promoting the use of alternative energy as well as implementing comprehensive energy efficiency measures. Water conservation would be promoted by use of appropriate water efficient fixtures (e.g. fixtures certified under the EPA WaterSense program) use of harvested rainwater for irrigation and more water efficient landscaping (e.g. plants that need less irrigation water, water efficient irrigation technology). The proposed development would establish comprehensive waste management programs during construction and normal operation that would include recycling and other sustainable waste reduction, use and reuse measures.

- The site of the proposed Kapa'a Light Industrial Park is composed of presently large areas of fill material from former quarry operations. Plans for restoring these areas of the site are consistent with the planning principles of the Sustainable Communities Plan, which call for suitable depth of topsoil to establish plant material similar to that in the surrounding area.

The following planned measures of the proposed Kapa'a Light Industrial Park would be consistent with the Implementation Guidelines for light and extractive industry, set forth in the Koolaupoko Sustainable Community Plan, such as:

Visual Screening, Lighting and Signage:

- Noise and other adverse impacts from parking, loading and service areas would be buffered from adjacent wildlife preserves and public roads by an appropriate combination of vegetative buffer zones, landscaped setbacks other mitigation measures (e.g. sound barriers).
- Visual impact from large buildings and solid walls would be mitigated by landscaping to soften the appearance of buildings, by planting trees and by the possible installation of "green walls" around selected buildings.

Drainage and Waste Material:

- A comprehensive stormwater management plan would mitigate impacts from qualitative and quality impacts of runoff from the site. The stormwater management plan would contain a range of Best Management Practices (BMPs), such promoting infiltration of rainwater, collecting all stormwater in detention ponds for release into receiving waters after the storm event and removing at least 80 percent of main pollutants from the stormwater before discharge to the receiving waters. With the implementation of the proposed comprehensive stormwater management system the proposed development would result in no direct discharge of stormwater runoff into receiving water.
- Leachate from underground storage tanks, if any, would be avoided by appropriate measures. Leachate from fill material, as currently happens, would be avoided by collecting the stormwater runoff into suitable detention basins and treating it efficiently before discharging it into the receiving waters;
- Litter and other waste material would be prevented from encroaching into adjacent sites through the use of landscaping as well as proper maintenance of the site.

5.3.4 Consistency with Infrastructure Policies and Principles

The proposed Kapa'a Light Industrial Park would be consistent with the following policies and principles in regard to public infrastructure.

Water system development: The general policies on conserving precious water resources would be adopted through planned design and operational measures:

- The sustainable development plan of the proposed industrial park calls for significant water savings of 40 percent savings compared to conventional industrial developments excluding irrigation needs.
- The proposed development would install only water efficient fixtures such as certified under the EPA (including low-flush toilets, waterless urinals, flow constrictors and other water conserving devices).
- Native and adaptive plants would be used for landscaped areas; drip irrigation would be used, where applicable; no potable water would be used for irrigation, instead collected rainwater and recycled wastewater (after receiving advanced treatment) would be used for irrigation.

Wastewater treatment systems: The proposed Kapa'a Light Industrial Park would endeavor to minimize wastewater discharge in order to conserve natural resources and to alleviate current capacity problems of public wastewater systems.

The proposed development would be consistent with the following General Policies:

- Within the newly developed area, wastewater effluent would be treated and recycled, where feasible, as a water conservation measure. The extent of wastewater recycling would be contingent on technology and other regulatory aspects.
- The proposed on-site treatment of wastewater would be consistent with the requested delay of further sewer connections in Kailua.
- The reduced water use in toilets, urinals and other blackwater sources would result in less wastewater generated on the site and a reduced volume of wastewater to be treated.

The proposed development is consistent with the following Planning Principles and Guidelines:

- The proposed development would use recycled wastewater for the purpose of irrigation, provided these uses conform with State's rules and guidelines for the treatment and use of recycled water;

- Berms or other suitable landscape elements would be used, where applicable and necessary from the design, as a buffer between on-site wastewater treatment system and adjacent buildings on the property.

Electrical and communication systems: The proposed development of the Kapa’a Light Industrial Park would be consistent with the applicable guidelines:

- Electrical and communication cables in the proposed development would be placed underground within the proposed development footprint.
- The proposed development would encourage and implement significant energy conservation and saving measures as well as on-site electricity generation (by renewable means); therefore, additional electrical grid capacity required by the proposed industrial development would be reduced from a normal baseline amount.
- With innovations in the communication technology, no major additions of communication assets would be anticipated for the proposed development.

Solid Waste handling and Disposal: The anticipated waste management of the proposed Kapa’a Light Industrial Park would be consistent with the demanded general policies of the Koolaupoko Sustainable Communities Plan, regarding to waste reduction, re-use and recycling as well as the efficient disposal of waste.

- The design, construction and operational approach of the proposed development would follow the LEED Silver certification plan. Since the proposed industrial development will be developed in accordance with the LEED rating system for Core and Shell, implementation of energy efficient site development and technology is a requirement.
- The proposed industrial development would actively engage in significant efforts to reduce and reuse solid waste. All or some of the following waste mitigation measures would be implemented by the proposed development, construction waste management, materials reuse, recycled content, regional material, rapidly renewable materials, and certified wood.

Drainage systems: The sustainable development approach of the proposed Kapa’a Light Industrial Park would be consistent with drainage related policies of the Koolaupoko Sustainable Communities Plan. Due to the proximity and upstream location to important wetland area (e.g. Kawainui Marsh), the proposed development would implement and operate a comprehensive stormwater management system to mitigate all possible adverse drainage effects.

The planned stormwater management and drainage system for the proposed Kapa’a Light Industrial Park is consistent with the following general policies and planning principles:

- The planned drainage system design would promote control and minimization of non-point source pollution and the retention of storm water on-site and in wetlands; the proposed system would collect all stormwater runoff from impervious surfaces and convey it to detention ponds where they are temporarily retained and then released after the storm event..
- The entire development footprint would be outside the Kapa’a Stream set-back. This ensures that the natural drainage capacity of the Kapa’a Stream would not be negatively affected by the development.
- Stormwater is recognized as an important source of non-potable water that should be retained for recharge of the aquifer rather than quickly moved to coastal waters. The planned drainage strategy would collect stormwater in detention ponds and release it in a controlled way. Stormwater would also be harvested from roof areas of warehouses and selected roadway section, stored in underground cistern and subsequently used for irrigation and, if possible, other graywater applications in the buildings.
- The proposed development would promote infiltration of rainwater through natural and developed vegetated open space as the preferred solution to drainage problems wherever these measures can be applied. The proposed development would implement structural and operation measures to control non-point source pollutants.
- The proposed development would utilize several stormwater detention basins of different sizes for gradual release of retained stormwater into the receiving waters.

Urban Design features:

It is recognized that the physical appearance or "design" of appurtenances comprising the infrastructure, individually and collectively, impact and influence the physical appearance of the community where they are located. The development approach of the proposed industrial development would use such types of design features, building materials, layouts and operational measures that would positively affect the appearance of the proposed development. Examples of mitigation of visual impact are the vegetative buffer zones, significant planting of trees within the industrial development, green walls around selected buildings and the avoidance of light pollution emanating from the proposed site. The proposed Kapa’a Light Industrial Park would therefore be consistent with the planning principles and guidelines for urban design of the Koolaupoko Sustainable Community Plan.

5.4 County Special Management Area

A portion the land parcel designated as TMK 4-2-015:006, which is part of the proposed site, is within the County Special Management Area. A Special Management Area permit must be obtained from the City and County of Honolulu in order to allow the development of the Kapa'a Light Industrial Park on that portion of the parcel TMK 4-2-015:006.

CHAPTER SIX - FINDINGS AND EXPECTED DETERMINATION

This section discusses how the proposed project satisfies significance criteria defined for the environmental review. Furthermore, this section states the anticipated determination by the Accepting Authority.

6.1 Significance Criteria

The proposed Kapa'a Light Industrial Park project would increase the number of warehouses at the proposed project site from presently 30 to a total planned capacity of 61 warehouse structures. The planned increase of industrial space would increase the existing 283,000 square feet by 606,000 square feet, resulting in a total industrial space of approximately 890,000 square feet. The number of employees is expected to increase from approximately 280 exiting to 880 at full build-out. Thus the planned expansion would result in an approximate doubling of the number industrial warehouse structures at the proposed project site, and a tripling of industrial space and employees.

The proposed development would provide about 606,000 square feet of additional industrial warehouse space to the Koolaupoko region. The market analysis of this has concluded that the Koolaupoko region is presently significantly undersupplied with industrial space and especially the greater Kailua and Kaneohe regions would benefit from industrial space close to this market. By adding an approximately 606,000 square feet of industrial space, the proposed development would increase the per capita allowance of industrial space in the Koolaupoko region from presently about 20 percent to an estimated 37 percent of the average per capita industrial space allowance on Oahu. The Koolaupoko region would therefore acquire about one third of Oahu's average per capita allowance after full build is reached, most likely in 2026. Therefore, even with the addition of 606,000 square feet of new industrial space, the Koolaupoko region would still lag behind other regions in terms of per capita allowance of industrial space.

While providing much needed industrial space for the Koolaupoko region, the proposed development would be developed using low impact development approaches, specifically environmentally friendly and energy efficient building approaches, in order to effectively lower impacts to the environment and the community., The development would be designed and constructed to qualify for LEED (Leadership in Energy and Environmental Design) Silver certification upon completion of the project. The applicable LEED standard is the LEED 2009 for New construction, Core and Shell rating system.

The proposed project would not simply mitigate additional impacts of a growing industrial development but would effectively lower certain impacts to the environment. Examples are improving water quality in the Kapa'a Stream relative to the present situation. At the present the project site contributes to a high concentration of total suspended solids in the Kapa'a Stream. The proposed stormwater treatment system is expected to lower TSS concentration, since after completion of the project all stormwater runoff from the site would be treated. Other measures to effectively mitigate the existing impact and improve the environmental situation at the site would be to restore about eight acres around the proposed development footprint in the lower portion of the site with native and adaptive plants.

By implementing a comprehensive system of impact mitigation under the Preferred Alternative, especially using low impact development approach for the development in the lower portion of the site of the proposed Kapa'a Light Industrial Park, it is expected that no significant adverse impacts to the environment and the community would occur. Therefore this Environmental Impact Statement should be accepted by the Accepting Authority, the City & County of Honolulu, Department of Planning & Permitting. Based on the "Significant Criteria" listed in Section 12 of the Hawaii Administrative Rules Title 11, Chapter 200, an agency must determine whether an action may have a significant impact on the environment, including all phases of the project in its short-term and long-term impacts. The "Significant Criteria" are discussed for the proposed project to establish the fact that the proposed project, especially under the Preferred Alternative, does not have significant adverse impacts on the environment:

Based on the analysis of this Environmental Impact Statement, the following Significant Criteria are satisfied by the Preferred Alternative of the proposed project, as follows:

1. <u>*The proposed Kapa'a Light Industrial park would not involve an irrevocable commitment to loss or destruction of any natural or cultural resource.*</u>

   The development footprint of the proposed development would be located entirely on previously disturbed land that was created as landfill area from quarry deposits and municipal waste. All land that would be used for the proposed building footprint is presently graded but has no permanent vegetation, other than introduced grasses. No part of the proposed development would be built on land that is presently open space, agricultural land or wetland. Based on recent studies (DoH 2007) and the existing soil and runoff conditions at the proposed site might result in considerable impact on the water quality in the adjacent stream and wetlands. The proposed low impact development approach would treat all runoff from the site and would stabilize all presently exposed soil areas, thereby improving the existing runoff conditions.

The proposed development would convert a total land area of about 22 acres from pervious to impervious area by constructing buildings and installing an impervious traffic area. The conversion to impervious land is typically associated with an irrevocable commitment of resources but in the proposed project the conversion of previous land to impervious landfill area it is expected that the environmental conditions would be improved and not adversely affected. Water leaching through landfill can dissolve, entrain and transport material from the landfill body that could be harmful to the environment. Modern landfills feature liners under the landfill body to avoid leachate from reaching the groundwater; the landfill area of the proposed site does not have such a seal. Therefore by avoiding percolation of a part of the water into the landfill, impact to the water resources would be mitigated. A significant portion of rainwater would be collected from roof areas and roadway sections and used for irrigation on approximately eight acres of newly restored habitat and landscaped area within and at the project site perimeter. Therefore a significant part of areas that were converted to impervious surfaces would retain a “quasi” pervious character, with rainwater collected on these areas and infiltrated at other areas.

Rather than deteriorating natural resources at the site, the proposed development would result in improvements to the environment and would rectify some of the impacted environmental conditions at the site. The proposed project would utilize low impact development approaches using a range of sustainable building technologies and would therefore protect natural and cultural resources. The lower portion of the project site, which is closest to environmentally sensitive land would be designed and constructed in such a way to be awarded Leadership in Environmental and Energy Design (LEED) Silver certification upon completion of the project. The LEED Silver certification goal for the lower portion of the project site demonstrates the applicant's commitment to develop the proposed project by avoidance of loss or destruction of any natural resource.

The proposed project would not have any detrimental effects on cultural resources. The proposed site is a landfill area that was created several decades ago. Communications with state agencies have concluded that no cultural or archeological resources are expected at the proposed site. The only existing site of cultural significance is a Heiau that is located several hundred feet away from the proposed site. The Heiau would not be adversely affected by the proposed project.

2. *The proposed project would not curtail the range of beneficial uses of the environment.*

The existing environment at the proposed project site is not a major habitat for endangered species or other migratory birds. At the present site there is a population of urbanized birds and small mammals which would not be adversely affected. The proposed project would implement approximately eight acres of restored habitat at the perimeter of the lower portion of the site with native and adapted plants. The restored habitat would convert areas that are presently not vegetated, sparsely vegetated or vegetated with invasive species. Therefore the project would improve biodiversity and restore native environment at the site. This would broaden rather curtail beneficial uses of the environment at these portions of the project site.

The proposed site does not have any recreational value, therefore recreational uses of the environment would not be curtailed. Furthermore the development footprint of the proposed project does not convert agricultural land, wetland, streams, previously natural vegetated space containing mature trees, or other vegetated open space to developed land.

The low impact development approach of the proposed project promotes the conservation of natural resources and the avoidance of significant adverse impacts on the environment.

3. *The proposed project would not conflict with the state's long term environmental policies and goals.*

The proposed Kapa'a Light Industrial Park is consistent with applicable goals, visions and guidelines of the General Plan and the Koolaupoko Sustainable Communities Plan. By adopting an environmentally friendly design based on sustainable technologies for the proposed industrial warehouse development, the short and long-term needs for additional warehouse space in the Koolaupoko region can be satisfied in a manner that causes a small ecological footprint. The proposed project will implement building and site development approaches that are in accordance with the latest developments of sustainable and green buildings. The LEED Silver certification goal of the lower portion of the proposed project is in accordance to goals of the state to develop buildings "green" and energy friendly. The LEED strategy of the project will implement sustainable site development, water and energy conservation, renewable energy, reuse of materials and a regional focus of building material. All of these development goals of the proposed project are in accordance with the State's strategies to become more energy independent, increase the use of indigenous energy resources and conserve the natural resources of the state.

4. *The economic and social welfare of the community or state would not be affected.*

The proposed Kapa’a Light Industrial Park would not negatively affect the economic welfare, social welfare, or cultural practices of the community or State. On the contrary, the proposed project would provide much needed industrial space to the region and thereby would help to strengthen the economic infrastructure of the Koolaupoko region, as well as to strengthen the employment situation within the region. The Koolaupoko region is significantly undersupplied with industrial space to accommodate industrial service and light manufacturing companies. At present, the region offers only one fifth of the state’s per capita allowance for industrial zoned land. Even with the addition of approximately 600,000 square feet of industrial space by the proposed project the per capita would still only approach approximately 40 percent of Oahu’s average per capita allowance. The character of the added industrial space would be to provide space to businesses that server the local and sub-regional market, which is reflected in the requested zone change to Limited Industrial (I-1). Land use under the I-1 zone designation allows light industrial use but excludes intensive industrial use by companies that would serve an island wide market. Approximately 85 percent of tenants in the existing warehouse development are small local companies with employees who are primarily residing in the Koolaupoko region. The proposed project would cater to the needs of a local market and would allow more residents to avoid the long and expensive commute to leeward area. A survey of existing tenants indicates that approximately 60 percent of all employees of businesses that lease space in the existing warehouse development are residents of Kailua and Kaneohe. It is expected that future employment in the proposed industrial development would be similar; therefore suggesting that only about 260 of the future employees would be from outside the region. A small number of these new employees and their families might opt to relocate to the Koolaupoko region, thereby increasing the population and creating new demand on public service. However, the expected out-migration from the Koolaupoko region through 2030 is approximately 3,500 residents. Thus the project related in-migration would not result in a net increase of the population. Since it is expected that the project would reach full absorption in approximately 2026, it can be expected that the project related increase in residents to the region would not adversely affect the region and the community.

5. *The proposed project would not substantially affect public health.*

There would be no significant emissions from the proposed site. The land use that is permitted under the sought Limited Industrial (I-1) zone change excludes operations that handle, manufacture or transport hazardous waste. Domestic type wastewater from the proposed development would be treated on-site using reliable and effective treatment options by septic systems. Wastewater generated next to environmentally sensitive areas would be treated with alternative rather than conventional septic systems, which produce an effluent that has concentrations of organics, nutrients and suspended solids that are below typical effluent from municipal wastewater treatment facilities. The effluent of the onsite septic systems would be injected at a safe distance from water resources to exclude any contamination of adjacent aquatic resources by bacteria or other harmful agents found in normal domestic wastewater. Discharge of industrial wastewater would not be allowed onsite, and wastewater which contained material that is incompatible with the septic systems (i.e. chemicals, oil, refrigerants, etc.), would be collected and be discharged offsite in accordance with applicable laws and ordinances. It is not expected that construction material would contain material which would be harmful to human beings and wildlife.

Stormwater would be treated using Best Management Practices (BMP) that would remove potentially harmful substances and would release the runoff to the receiving waters in a controlled and environmentally friendly way. There are no intended uses that would cause significant air and noise pollution. The sustainable design of the warehouses would avoid harmful agents and would provide better indoor environmental climate conditions than could be found in typical conventional warehouses.

6. *No substantial secondary impacts, such as population change, or effects, on public facilities are anticipated.*

The proposed project would not precipitate substantial population increases and associated adverse effects on public facilities are not expected. A survey of companies at the existing warehouse indicates that approximately 60 percent of all employees of businesses that lease space in the existing warehouse development are residents of Kailua and Kaneohe. It is expected that future employment in the proposed industrial development would be similar to the existing and that the majority of future work force would come from the Koolaupoko region, especially from the Greater Kailua and Kaneohe region. Of the anticipated 600 new jobs created by the proposed project at full build out, likely around the year 2030, only about 260 of the future employees would be from outside the region. A number of these new employees and their families might opt to relocate to the Koolaupoko region thereby increasing the population and creating new demand on public service. However, the expected out-migration from the region Koolaupoko region through 2030 is approximately 3,500 residents. Therefore the project related in-migration would not result in a net increase of the population, since it is expected that the project would add industrial space, and therefore jobs, at a steady pace until full absorption by around 2026. With the expected out-migration of 3,5000 in the period to 2030 it can be expected that the project related increase in residents to the region would not adversely affect the region and the community. Therefore, any increase in demand on public service through project related in-migration to the region would be offset by the expected out-migration from the region in the same period.

An increase in demand for medical services, schools, pre-school, police, etc. based on a per capita allowance is not expected at a region-wide scale, due to the expected negative net in-migration. The demand on municipal water and electricity supply might increase due to the fact that more businesses are added in the region. The market study for this environmental review concludes that up to 70 percent of the business that lease space in the existing warehouse development are relocation from within the region. Anticipating the same trend for the added industrial warehouse space under the proposed project would suggest that most likely older industrial space would be exchanged for new space provided in the proposed project. New space would be more energy and water efficient warehouses than the space it replaces. Therefore it cannot be inferred that the entire added warehouses would add demand on public electricity and water supply. An increase in water and electricity demand at the site would not automatically result in the overall island wide demand increase, because the new warehouse space would replace space with less effective water and electricity conservation measures on an island wide level.

With respect to site-specific increases in water and electricity demand, there would be an increased demand and a need for transmission to the proposed site. The water supply system serving the proposed site has enough capacity. The electric supply to the site might require some additional capacity. The increased electricity demand would be partially mitigated by the low impact development proposed in the proposed warehouse park that would lower demand for electricity by about 30 percent and water by about 40 percent under baseline consumption rates for conventional industrial warehouses. Electricity would be generated by photovoltaic generation on-site, thereby supplying a part of the energy and peak power demand of the proposed project with renewable and environmentally friendly technologies.

The public wastewater facilities would only be indirectly affected by in-migration of future employees moving into the region. The public wastewater system would not be affected by the new businesses at the proposed site, because the proposed site would have on-site wastewater treatment. With an anticipated net decrease of residents in the region, there would be an overall reduction of demand on wastewater services.

7. *No substantial degradation of environmental quality is anticipated.*

The proposed warehouse development would not result in substantial degradation of environmental quality. The development approach of the proposed industrial warehouse park is based on a low impact development approach that results in efficient and environmentally friendly design, construction and operational methods. The proposed development would improve the environmental quality of the existing site by improving stormwater runoff quality, and by establishing and restoring native habitat with native and adaptive plants on approximately eight acres of land, which presently has no or insufficient vegetation or primarily invasive species. The proposed project would furthermore effectively mitigate several potential environmental impacts to such an extent that they would no longer cause substantial adverse environmental consequences. The proposed industrial development would be surrounded by extensive vegetative buffer zones to mitigate visual, noise and air pollution impacts. These buffer zones would also create new habitat for the population of urbanized birds and small mammals that are presently populating the project site. The interior of the proposed development would use measures to lower the heat island effect and thus improve the micro-climate within the proposed development. Another important impact mitigation measure in the proposed project would be to implement a comprehensive plan to reduce light pollution impacts.

8. *The proposed action does not involve a commitment to larger actions, nor would its cumulative impacts result in considerable effect on the environment.*

The proposed warehouse development, especially if seen in comparison to the other industrial activities in the Kapa'a Valley, would not significantly add incremental impacts to cumulative effects on the environment. No other future projects were identified in the area affected by the proposed site that would result in a cumulative effect. The project does not commit the community to larger actions since the proposed project would not add significant demand on public facilities, infrastructure or service. Electricity and water supply infrastructure would need only incremental expansion in the vicinity of the project but not on a regional or island-wide level. The project would furthermore not require additional infrastructure for wastewater or solid waste disposal. The traffic on adjacent roads would increase due to the project, but the resulting traffic impacts would not require significant commitments to upgrade the regional roadway systems. Decreasing level of service at intersections affected by the project could be rectified by smaller mitigation measures such as adding acceleration or deceleration lanes. Affected roadways would generally not require mitigation for level-of-service impacts. The impact on traffic would be continuously monitored and mitigated measures would identified, if required, at key project milestones.

The proposed development would employ means to improve the water quality and peak flow conditions in the Kapa'a Stream, and would provide measures for a better groundwater situation resulting from implementation of Best Management Practices (BMP). The proposed site is made of landfill area that was formed by deposits of quarry tailings and overburden; with significant landfill operations starting several decades ago. The proposed development would rectify some of the presently encountered environmental impacts at this brownfield site, such as large areas of exposed soil and resulting runoff problems, air-borne dust pollution and invasive species, to name a few.

9. *No rare, threatened or endangered species or their habitats would be affected.*

The proposed warehouse development would not substantially and adversely affect rare, threatened, or endangered species or their habitats. The warehouses would be exclusively built on previously disturbed land that represents no major habitat for rare, threatened or endangered species at the present time. No previously undisturbed land, including wetland areas, would be used for the proposed project and no mature forested areas would be affected that serve endangered species. The proposed project would be located adjacent to the Kawainui Marsh, the largest contiguous wetland in the state, which is habitat to several federally listed species and a population of migratory seabirds. The proposed project would not result in degradation of aquatic resources that would threaten endangered species, due to the comprehensive mitigation measures which would greatly reduce impacts from runoff and wastewater discharges. The proposed project would implement measures to discourage rare and endangered water birds from visiting created water pools, such as detention ponds, in order to reduce an elevated predator risk from non-native predators. The proposed project would implement control and trapping measures to avoid population build-up of non-native predators such as feral cats, rats or mongooses being attracted to buildings, thus increasing the risk to birds nesting in the vicinity of the project.

10. *Air quality, water quality and ambient noise would not be detrimentally affected.*

The proposed warehouse development would not directly impact air quality, water quality or ambient noise levels. Adverse effects by the proposed project on the water quality in the adjacent surface water resources such as the Kapa'a Stream, wetland areas and drainage canals would be avoided by comprehensive stormwater management systems and no discharge of any untreated waste to the receiving waters. Onsite septic systems would treat all wasterwater before injection into the ground. Points of injection pf treated wastewater would occur at a safe horizontal and vertical distance from the receiving water and saturated soil layers. In areas close to environmentally sensitive areas or in areas where the distance to receiving waters or the groundwater table would be too small to inject effluent from conventional septic systems, alternative septic systems would be installed that have a lower concentration of organic loading, nutrients and suspended solids than is required for municipal wastewater treatment facilities.

Direct adverse air quality impacts from the proposed project are not expected because of the light industrial nature of the businesses at the proposed site, and the lack of large combustion equipment at the site. Possible air quality consequences by other sources would be mitigated by appropriate measures. Indirect effects on the air quality would be through increased traffic volume on the adjacent roadways. The developer would promote measures to lower exhaust from vehicles by encouraging avoidance of unnecessary idling of trucks and vehicles within the park and discouraging older diesel powered vehicles or vehicles with insufficiently maintained engines to use the proposed industrial park. Newer reduced emissions diesel engines and less polluting diesel fuel, which are now required by law, can significantly reduce the amount of air pollution associated with traffic. Possible air quality impacts from wind borne pollution would be reduced by vegetative buffer zones around the site. The park would maintain a clean appearance by ensuring that litter and debris are always disposed off in accordance to environmentally responsible resource management. The roadways would be frequently cleaned so that little or no dust would be carried away from the site

Noise impacts would be lowered by controlling noise generation at the source and by attenuating noise propagation. Source noise control would be executed by avoiding unnecessary idling of engines, encapsulating significant noise sources and avoiding loud noise outside normal operation hours of the park. Effective noise propagation mitigation would be accomplished by buffer zones, orienting building openings away from noise sensitive areas, utilizing noise control walls at selected locations and other measures. Noise impacts due to increased traffic on adjacent roads could be mitigated by controlling the traffic flow on the roads, specifically by measures to reduce the speed limit and by affecting driving habits that can produce the highest noise impacts, such as frequent acceleration and deceleration. The existing noise level on roads adjacent to the proposed site is typical to urban settings; the proposed site is within the urban land zone district. The increase of noise due to increase in traffic volume would be at or below the threshold which could be discernible to the human ear.

11. *The proposed project would not affect environmentally sensitive areas, such as flood plains, tsunami inundation zones, erosion prone areas, geologically hazardous lands, fresh waters and coastal waters.*

The proposed warehouse development would not affect flood plains. The proposed development footprint would remain entirely outside areas designated with heightened flood hazards. The proposed project is outside any tsunami inundation zone. The proposed site would improve erosion conditions of the existing land that is was created by former landfill and that has, to a large extent, areas without vegetation and with exposed soils or gravel surface. The proposed project would improve rather deteriorate the water quality of the receiving Kapa'a Stream since the proposed project would implement a comprehensive stormwater management system. The planned stormwater treatment approach would remove at least 80 percent of pollutants contained in stormwater runoff before the stormwater is released to the Kapa'a Stream and would use detention ponds for flood control and the avoidance of high runoff rates from the site, which could result in stream bed erosion and subsequent sedimentation in wetlands. The proposed erosion control would stabilize all surfaces within the development footprint and would increase the vegetative cover in areas that would be converted from presently bare soil to restored habitat.

12. *The proposed project would not substantially affect scenic vistas and view planes identified in country and state plans and studies.*

The proposed warehouse development would not substantially affect scenic vistas and view planes in the Kapa'a Valley. The Kapa'a Valley has an industrial appearance due to its extensive quarry and landfill operations that started decades ago. The proposed industrial development would not provide a substantial impairment of the existing vistas in the valley. The proposed site is divided between an upper and lower portion of the site. The upper portion of the site has an existing warehouse development which is surrounded by a screen of trees and larger bushes on most of its perimeter. The visual impact of the upper portion of the site is limited to very few locations along the H3-Freeway that passes the property at its northern boundary. The upper portion of the site can barely be seen from view planes that are publically accessible and that are located around the Kawainui Marsh. By adding trees to the existing tree line around the upper portion virtually all visual impact can be mitigated.

The lower portion of the proposed site would have a more noticeable visual impact than the upper portion. The lower portion would, however, not impair scenic vistas, but could be marginally visible from several points around the marsh and would be clearly visible from a limited number of viewplanes. This environmental review presents a comprehensive visual impact analysis which compares the existing views with anticipated future views of the project with the help of virtual reality rendering of the development in the lower portion of the site.

The proposed project would implement extensive measures to mitigate visual impact. Vegetated buffer zones which would contain larger trees and shrubs would be built around the site perimeter. In addition, trees would also be planted within the development footprint to decrease the visual impact of the buildings and create effective visual impact mitigation. Mitigation by the vegetative buffer zones around the proposed project would mitigate far and near distant views. The completed visual impact assessment reveals that the proposed warehouses could be effectively shielded from near distance views around the proposed site.

The proposed mitigation would conceal and screen the warehouse buildings to the extent possible. Selected warehouses in the lower portion of the proposed site would be surrounded by a line of trees and possibly also so-called “green walls”, a green building technology that provides metal trellises around outer warehouses walls where plants can grow to create vertical vegetative covers. Green walls create visual mitigation with attractive “green” appearances, reduce energy consumption, reduce noise propagation and look more natural. The external and interior lighting design of the warehouses would mitigate light pollution by selecting appropriate lamps, lighting controls and full cut-off or fully shielded fixtures. Light pollution mitigation would also include avoidance of internal lighting to contribute to external light pollution. Therefore proposed warehouse design would help to retain the night sky conditions in the region.

13. *The proposed project would not require substantial energy consumption*.

The proposed warehouse development would utilize sustainable measures to significantly lower energy consumption. A significant portion of the proposed project would be developed according to design and construction requirements by the U.S. Green Building Council Leadership for Energy and Environmental Design (LEED) rating systems. The proposed project would apply for LEED Silver certification upon completion of the project. The proposed project would seek advanced credit recognition under LEED by lowering the energy demand by at least 30 percent under the applicable baseline for industrial warehouses. The building design would implement active and passive measures to lower the energy consumption. Energy saving measures would include appropriate orientation and shells of warehouses, sufficient insulation, high energy-efficient windows, using a significant degree of day-lighting and natural lighting, avoidance of unnecessary internal heat sources, using integrated building controls, lowering water demand and wastewater generation plus other measures. Apart from efficient energy consumption, the design approach would include the generation of a significant amount of electricity onsite with photovoltaic energy systems on the warehouse roofs. The onsite energy generation would lower peak electricity demand of the proposed industrial development. At times when excess electricity would be generated, the project would perform net-metering, if applicable. Since the proposed warehouse development would replace older warehouses with newer, more energy efficient warehouses, the proposed project would result in somewhat of an island wide-net reduction of energy consumption for such space.

6.2 Anticipated Determination

On the basis of the forgoing discussion of significance criteria, the proposed Kapa’a Light Industrial Park is not expected to have significant impacts on the environment. Therefore, the Accepting Authority accepts this Environmental Impact Statement

This page is left blank intentionally

CHAPTER SEVEN - AGENCIES, ORGANIZATIONS AND BOARDS CONTACTED

The following agencies, organizations and boards were contacted in course of this environmental view.

City and County of Honolulu
Department of Transportation Services
Transportation Planning Division
650 S. King Street 3rd Floor
Honolulu, Hawaii 96813

City and County of Honolulu
Kailua Neighborhood Board No. 31
Planning & Zoning Committee
P.O. Box 487
Kailua, Hawaii 96734

City and County of Honolulu
Department of Facility Management
Transportation Planning Division
650 S. King Street 3rd Floor
Honolulu, Hawaii 96813

Honolulu Board of Water Supply
630 South Beretania Street
Honolulu, HI 96813-2404

Honolulu Fire Department
Aikahi Fire Station
45 Kaneohe Bay Dr
Kailua, Hawaii 96734

Honolulu Police Department
Kailua City Police Station
219 Kuulei Road, Kailua, Hawaii 96734

Oahu Transit Services Inc.
811 Middle Street
Honolulu, Hawaii 96819

State of Hawaii
Department of Business, Economic Development & Tourism
Office of Planning
235 S. Beretania Street, Suite 600
Honolulu, Hawaii 96813

State of Hawaii
Department of Health
Clean Water Branch
919 Ala Moana Blvd., Room 301
Honolulu, Hawaii 96814

State of Hawaii
Department of Health
Wastewater Branch
919 Ala Moana Blvd., Room 301
Honolulu, Hawaii 96814

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

State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, HI 96813

State of Hawaii
Department of Health
Indoor and Radiological Health Branch
919 Ala Moana Blvd., Room 301
Honolulu, Hawaii 96814

Natural Resources Conservation Service
United State Department of Agriculture
Hawaii Field Office
99-193 Aiea Heights Drive, Suite 109
Aiea, Hawaii 96701

Department of the Army
U.S Army Corps of Engineers
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

U.S Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Hawaiian Electric Company (HECO)
820 Ward Avenue
Honolulu, Hawaii 96814

Kailua Chamber of Commerce
600 Kailua Road, Suite 107
Post Office Box 1496
Kailua, Hawaii 96734

Harold K.L. Castle Foundation
1197 Auloa Road
Kailua, HI 96734

This page is left blank intentionally

CHAPTER EIGHT - LIST OF PERMITS AND APPROVALS

Permits and approvals that are either required or might be required, pending a decision by the permitting agency, are as follows:

Permit description	Permitting agency	Description
Permits related to water resources management: 1. Stream Channel Alteration Permit 2. Well abandonment permit	State Department of Land and Natural Resources Commission on Water Resource Management	1. Permit required if any stream bed or stream bank is altered in any way. The need for this permit will be determined after the design is completed 2. Permit required prior to sealing a well
National Pollutant Discharge Elimination System (NPDES): 1. Storm Water Runoff 2. Hydrotesting 3. Dewatering Permit	State Department of Health Clean Water Branch	1. Permit is required for storm water discharges from construction activities including clearing, grading and excavation activities 2. Discharge of non-polluted hydrotesting water 3. Discharge of dewatering effluent from construction activities.
Construction related permits 1. Building Permit 2. Grading Permit 3. City Trenching Permit	Department of Planning and Permitting City and County of Honolulu	1. Permits are required for the construction of any building or structure 2. Permit required for grading which changes drainage patterns with respect to properties abutting the construction site 3. Permit required for trenching any public facility
Road construction related permits: 1. Road construction related permits 2. Right-of-Way Permit 3. Street Usage Permit	Department of Transportation Services City and County of Honolulu	1. Permit is required for any construction activities within the City and County of Honolulu right-of-way; 2. Permit needed for work within City and County roadways 3. Permit needed for work within City and County roadways

Permit description	Permitting agency	Description
Noise Variance Permit	State Department of Health	Permit may be required for unusually loud construction activities or night work.
Underground Injection Control (UIC) permit	State Department of Health Safe Drinking Water Branch	Permit for injection well for sewage, industrial/commercial, or aquaculture-related wastewaters
Individual Wastewater System (IWS)	State Department of Health Wastewater Branch	Permit required for septic tank system
Permits for work in navigable waters of the US 1. Section 10 Rivers and Harbors Act 2. Section 404 of Clean Water Act	U.S. Department of the Army Corps of Engineers	1. Permit needed prior for any construction in, over or under navigable water of the U.S. 2. Permit needed for discharge of dredge and/r fill material into waters of the U.S, including wetlands
Section 401 of Clean Water Act (Water Quality (401) Certification)	State Department of Health Clean Water Branch	Certification is required if seeking a Federal license or permit for activities involving the possibility of discharge into navigable waters (certification required for Section 10 and Section 404 permits)
Special Management Area (SMA) permit	Department of Planning and Permitting City and County of Honolulu	Major Special Management Area (SMA) permit is required for the development of the lower portion of the proposed site
Section 10 Endangered Species Act	United States Department of the Interior Fish and Wildlife Services	Incidental take permit may be required if aspects of the project endanger listed species

CHAPTER NINE DISTRIBUTION LIST

The Draft Environmental Impact Statement (DEIS) was distributed in electronic format on data-CD to the following identified stakeholders:

Ahahui Malama I Ka Lokahi
P.O. Box 751
Honolulu, Hawaii 96808
Attn.: Office of the President

Mr. John Harrison, President
Hawaii Audubon Society
850 Richards Street, Suite 505
Honolulu, Hawaii 96813

Kawai Nui Heritage Foundation
c/o Ms. Susan Miller
1030 Aoloa Place, Apt. 102 B
Kailua, Hawaii 96734

Ms. Joan Fleming, President
Lani-Kailua Outdoor Circle
653 Milokai Street
Kailua, HI 96734

Ms. Donna Wong, Executive Director
Hawaii's Thousand Friends
25 Maluniu Avenue, Suite 102 #282
Kailua, Hawaii 96734

Kailua Bay Advisory Council
629-A Kailua Road, Suite #3
Kailua, Hawaii 96734

Mr. Puna Nam, President
Kailua Chamber of Commerce
Post Office Box 1496
Kailua, Hawaii 96734

Mr. Bill Lane, Account Manager
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840

Mr. Henry Curtis, Executive Director
Life of the Land
76 North King Street, Suite 203
Honolulu, Hawaii 96817

Mr. Robert D. Harris, Director
Sierra Club of Hawaii Chapter
P.O. Box 2577
Honolulu, Hawaii 96803

Mr. Randy Ching, County President
The League of Women Voters of Honolulu
49 South Hotel Street, Room 314
Honolulu, Hawaii 96813

Mr. Chuck Prentiss, Chair
Kailua Neighborhood Board No. 31
Neighborhood Commission Office
530 South King Street, Room 406
Honolulu, Hawaii 96813

Kailua Satellite City Hall
1090 Keolu Drive, # 110
Kailua, Hawaii 96734

Dr. Pua Aiu, Administrator
State Historic Preservation Div., DLNR
Kakuhihewa Building
601 Kamokila Blvd., Suite 555
Kapolei, Hawaii 96707

Dr. Neal Palafox, Director
Department of Health State of Hawaii
Kinau Hale
1250 Punchbowl Street
Honolulu, Hawaii 96813

Mr. Orlando Dan Davidson, Executive Officer
Land Use Commission, State of Hawaii
DBEDT
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Mr. Richard C. Lim, Interim Director
DBEDT
No. 1 Capitol District Building
250 South Hotel Street - 5th Floor
Honolulu, Hawaii 96813

Mr. Brian Gibson, Executive Director
Oahu Metropolitan Planning Organization
Ocean View Center
707 Richards Street, Suite 200
Honolulu, Hawaii 96813

Mr. Glenn Okimoto, Interim Director
Department of Transportation, State of Hawaii
Aliiaimoku Building
869 Punchbowl Street
Honolulu, Hawaii 96813

Mr. Clyde Namu'o, Chief Executive Officer
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Ms. Mary Lou Kobayashi, Administrator
Office of Planning, State of Hawaii, DBEDT
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Mr. William J. Aila Jr., Interim Chairperson
Department of Land and Natural Resources,
State of Hawaii
1151 Punchbowl Street, Room 130
Honolulu, Hawaii 96813

Mr. Lawrence T. Yamamoto, State Conservationist
USDA NRCS, Pacific Islands Area State Office
P.O. Box 50004
Honolulu, Hawaii 96850

Lt. Col. Douglas Guttormsen, District Commander
US Army Corps of Engineers
Honolulu District, Bldg. 230, CEPOH-EC-R
Fort Shafter, Hawaii 96858-5440

Dr. Loyal Mehrhoff, Field Supervisor
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Room 3-122, Box 50088
Honolulu, Hawaii 96850

Mr. Guilherme R. Costa, Conservation Specialist
Oahu Soil & Water Conservation District
99-193 Aiea Heights Drive, Suite 109
Aiea, Hawaii 96701

Kailua Public Library
239 Kuulei Road
Kailua, HI 96734
Attn.: Mr. Tom Coleman

Kaneohe Public Library
45-829 Kamehameha Highway
Kaneohe, HI 96744
Attn.: Ms. Cindy Chow, Branch Manager

LIST OF PREPARERS

Manfred Zapka, PhD, PE, Principal
LEED-AP, CEM, CBE
Sustainable Design & Consulting LLC
P.O. Box 283267
Honolulu, Hawaii 96828, USA
Tel: 808-265-6321
sustainabledc@gmail.com

Phyllis C. Horner, PhD, LEED GA, Senior Consultant
Sustainable Design & Consulting LLC
P.O. Box 283267
Honolulu, Hawaii 96828, USA

REFERENCES

ASHRAE (2008) "Advanced Energy Design Guide for Small Warehouses and Self-Storage Buildings"

American Water Work Association (1999) Water Quality & Treatment, Fifth Edition, McGraw-Hill, New York

Barnstable County Department of Health and the Environment (2000) "A Compendium of Information on Alternative Onsite Septic System Technology in Massachusetts", Barnstable County Department of Health and the Environment, Barnstable, Massachusetts 02630

City and County of Honolulu (1988) Final Environmental Impact Statement for the Kapaa Refuse Transfer Station, Department of Public Work, City and County of Honolulu, Honolulu, Hawaii

City and County of Honolulu (2006) Final Environmental Assessment, Kawai Nui Model Airplane Park Comfort Station, Honolulu, Hawaii

City and County of Honolulu (1977) General Plan of the City and County of Honolulu, Amendment 2002, Honolulu, Hawaii

City and County of Honolulu (2000) Koolaupoko Sustainable Communities Plan, DEPARTMENT OF PLANNING AND PERMITTING, Honolulu, Honolulu, Hawaii

City and County of Honolulu (1999) Revised Ordinances of Honolulu, City and County of Honolulu, Chapter 21. Land Use Ordinance, Department of Planning and Permitting, Ordinance No. 99-12, Honolulu, Hawaii

Cultural Survey Hawaii (2000) Archaeological Assessment and Background Literature Search for the Proposed Circle-Kawai Nui Marsh Trai Project, Kailua Ahupua'a, District of Ko'olaupoko, Island of Oahu, Honolulu, Hawaii

EPA (2002) "Onsite Wastewater Treatment Systems Manual", Office of Water, Office of Research and Development, U.S. Environmental Protection Agency

EPA (2006) "Onsite Wastewater Treatment Systems, Technology Fact Sheet 9 Enhanced Nutrient Removal— Nitrogen", Office of Water, Office of Research and Development, U.S. Environmental Protection Agency

Gibby, A. R., Ryuichi Kitamura, Huichun Zhao (1990) Evaluation of Truck Impacts on Pavement Maintenance Costs. Transportation Research Record (1262), 48 - 56

Hawaii State Department of Health (DOH) (2004) "List of Impaired Waters in Hawaii, Prepared under Clean Water Act 303", Hawaii State Department of Health, Environmental Planning Office

Hawaii State Department of Health (DOH) (2007) Total Maximum Daily Loads (TMDLs) for Total Suspended Solids, Nitrogen and Phosphorus in Kapa’a Stream Kailua, Hawaii, State of Hawaii Department of Health, Environmental Health Administration Environmental Planning Office, May 2007

Hawaii State Department of Health (DOH) (2007) “Koolaupoko watershed restoration action strategies”, Kailua Bay Advisory Council, Hawaii Department of Health

Hawaii State Department of Health (DOH) (2009) "Guidelines for the Reuse of Gray Water", Hawaii State Department of Health, Wastewater Branch

Hawaii State Department of Health (DOH) (2007) "The Hawaii Onsite Wastewater System Program", Hawaii State Department of Health, Wastewater Branch, Hawaii Water Environment Association, 29th Annual Conference, Honolulu, Hawaii

Hawaii State Office of State Planning (1996) "Hawaii's Coastal Nonpoint Pollution Control Program", Hawaii Coastal Zone Management Program

Hawaii State Department of Land and Natural Resources (1997), “Ulupo Heiau,State Monument, Preserve Hawaii’s Past for the future”, Division of State Parks

Hawaii State Department of Land and Natural Resources (2007) Sustainability Hotspot – Kawainui Marsh

Helber Hasters and Fee, Planners (2003) Kawaii Nui Marsh Pathway, Final Environmental Assessment, Prepared for City & County, Honolulu, Hawaii

Honolulu Board of Water Supply (2002) Water System Standards, Honolulu, Hawaii

Institute for Transportation Engineers (2003) Trip Generation, 7th Edition, Institute of Transportation Engineers, Washington, DC

Kailua Bay Advisory Council (2002) Koʻolaupoko Water Quality Action Plan, Kailua Bay Advisory Council, Kailua, Hawaii

Lee, Fred G. (2000) "Appropriate Use of MSW Leachate Recycling in Municipal Solid Waste Landfilling" Proceedings Air and Waste Management Association

Luskin, David M. (2001) "Effects of Truck Size and Weights on Highway Infrastructure and Operations", University of Texas at Austin, Center for Transportation Research

MacDonald, Gordon (1983) Volcanoes in the Sea, The Geology of Hawaii, University of Hawaii Press, Honolulu of Honolulu, Department of Transportation Services, prepared by Helber Hasters and Fee, Honolulu, Hawaii

Mays, Larry W. (1999) Water Distribution Systems Handbook, McGraw-Hill, New York

Repa, Edward W. (2003) "Bioreactor Landfills A Viable Technology", NSWMA Research Bulletin 03-02

U.S. Fish & Wildlife Service (2005) Draft Revised Recovery Plan for Hawaiian Waterbirds, U.S. Fish and Wildlife Service, Portland, Oregon

U.S. Green Building Council (2009) Green Building Design and Construction, LEED Reference Guide, 2009 Edition