Volume 1 of 3

Final Environmental Impact Statement
Prepared in Accordance with Chapter 343, Hawaii Revised Statutes and
Title 11, Chapter 200, Hawaii Administrative Rules

Waimānalo Gulch Sanitary Landfill Lateral Expansion

Waimānalo Gulch, O'ahu, Hawai'i
TMKs: (1) 9-2-003: 072 and 073

October 2008

City and County of Honolulu
Department of Environmental Services
1000 Uluohia Street, 3rd Floor
Kapolei, Hawai'i 96707

R. M. TOWILL CORPORATION
SINCE 1930
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3494

1-21149-00

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By

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Kapolei, Hawai'i 96707

October 10, 2008
Date

Eric S. Takamura, Ph.D., P.E., Director
Department of Environmental Services
City and County of Honolulu

This document and all ancillary documents were prepared under my direction or supervision. This information, to the best of my knowledge, fully addresses document content requirements as set forth in HAR, Section 11-200-17 and 11-200-18, as applicable.

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technical studies and design documents to maintain the soils and geologic stability of the site. Based on the results, an appropriate design will be prepared and reviewed by the Department of Environmental Services (ENV), the DOH, and other regulatory agencies as required by law.

Surface Water

The proposed project will involve a review of the existing drainage system and its capacity to handle the planned area of expansion. Design, engineering and construction will be reviewed by regulatory agencies. Adverse effects to surface water are not anticipated.

Groundwater and Hydrology

There is potential for leachate entering brackish groundwater from the landfill. Mitigation to address this issue is currently provided through the existing Leachate Collection and Removal System (LCRS) design. As required, the LCRS system design will be modified to ensure against the potential for adverse effects to groundwater and hydrogeological resources of the site.

Natural Hazards

Adverse effects from the proposed project are not anticipated for the following:

Flood Zone - Drainage controls to handle storms have been implemented for the existing site. Future controls will be designed by the City and WMH to be consistent with the requirements for the State and City & County of Honolulu.

Hurricanes - Work procedures practiced within the existing area of landfilling will be practiced within the area of lateral expansion. The measures are designed to reduce the potential for loss of soils, MSW, and ash due to a hurricane or related heavy storm.

Seismic Activity (Earthquakes) - Seismic risk at the project site is minimal. The design of both the current sanitary landfill and the proposed area of lateral expansion will meet

groundwater, and hydrologic resources of the site and the surrounding region, would serve as the principal means of avoiding the occurrence of secondary or cumulative impacts.

Natural Hazards

Potential secondary or cumulative impacts associated with floods, hurricanes, earthquakes, and tsunami have been considered in the design and operating practices applied to the site. Adverse impacts are not anticipated. Safe engineering and design standards have been incorporated in the construction of the existing area of landfilling and will be applied to the proposed area of lateral expansion. The standards applied to the site are designed to maintain a reasonable level of long term safety and reduce or prevent secondary effects due to natural hazards from floods, earthquakes, or tsunami.

Air Quality

The potential for secondary or cumulative effects from landfill gas emissions and operational use of the site involving earthwork and deliveries of refuse exists at the site without the long term use of the mitigative measures provided in this EIS document, and the operational practices that are employed by WMH. Potential long term effects can include the migration of landfill gas, dust, and nuisance odors associated with the landfill and refuse deliveries.

Mitigation to address these concerns will serve to avoid potential secondary and cumulative impacts through on-going monitoring and operational practices that maintain the existing environmental safety of the site, such that it would avoid the opportunity for other larger impacts to occur. In some cases, these measures have already been implemented: a landfill gas collection and control system has been constructed and is operating to reduce uncontrolled releases of landfill associated gases; and a waste digester at the Sand Island Wastewater Treatment Plant has been constructed and in recent months has demonstrated improved performance with fewer deliveries of odor generating sewage solids.

Asbestos disposal records may be incorporated in the records of the hazardous waste exclusion or special waste screening programs.

Emergency Condition Reports

Any emergency incident or condition at WGSLF is required to be documented in an incident report that will be maintained in the operating record. Emergency conditions include fires, hazardous material spills, injury accidents, natural disasters such as floods or violent storms, and any other event that threatens the safety or security of personnel and facilities.

Adequate Storage Procedures

The WGSL is required by permit to maintain records documenting secure storage and handling of any green waste, scrap vehicles, tires or white goods brought to the site. Documentation must show that these materials, which are prohibited from disposal, were stored, managed and removed from the site in accordance with applicable regulations. Records should include documentation of any removal or management of oil, grease, CFCs or other fluids from vehicles and white goods prior to removal from the site to recycling facilities.

4.6. Stormwater Management

4.6.1. Drainage Control System

Stormwater is managed by controlled grading on the surface of the WGSL and a maintained engineered system of drainage ditches, channels, pipes, and basins. The stormwater drainage control system is managed to:

- Prevent run-on of surface water to the active disposal face or uncovered refuse
- Minimize erosion in all sections of the WGSL to address run-off/run-on
- Maintain roads and other ancillary facilities in useable condition under all weather conditions

- Prevent excessive runoff or sedimentation impacts to neighboring properties

The WGSL in areas being used for active disposal of refuse is graded at a slope of 2 to 5 percent away from the disposal area. Earthen berms are constructed upgradient of the active disposal areas if needed to prevent runoff from mixing with the leachate control system and to divert drainage around areas susceptible to erosion. Earthen berms are also constructed downgradient of locations that may be susceptible to erosion.

The landfill stormwater management system is designed and constructed to manage runoff from a 25-year, 24-hour storm. Runoff is collected in a system of surface ditches, channels, pipes and ponds.

Design Criteria

According to GeoSyntec, RCRA Subtitle D requires that the surface water control features at landfills be designed to control both run-on and runoff from the 24-hour, 25-year storm. The 24-hour, 25-year storm at WGSL is 9.2 inches based on information presented by the State of Hawaii (1984) and is used as the basis to evaluate the performance of the sedimentation/detention pond and estimate runoff for the landfill grading plan. (GeoSyntec and WMH, 2008).

Proposed Improvements

There are two surface water control systems are proposed for WGSL (GeoSyntec, 2008):

- Western Bypass Channel. GEI Consultants (GEI) prepared the Western Bypass Channel (off-site stormwater conveyance) for the upper canyon and western areas flows adjacent to the Landfill. The system will capture the upper watershed's flows and route them around the landfill so that they do not mix with the surface water runoff from the landfill. The water

will flow via large diameter pipes and/or concrete-lined channel(s) and discharge at a point south of WGSL's existing sedimentation basin.

- Onsite Stormwater Management System. This system has two components that capture: (i) flows from the western side of the landfill (primarily landfill runoff with minor amounts of run on); and (ii) flows from the eastern side (both landfill runoff and run on). Both flows will discharge stormwater to the existing sedimentation basin.

Figure 4-8 shows the alignment for the landfill's eastern and western systems and general details for the pipe and collection channels for the preferred expansion. Pipes and channels will be sized when construction drawings for the expansion are prepared. (GeoSyntec, 2008).

GeoSyntec evaluated the existing sedimentation basin configuration (i.e., emergency spillway, etc.) for flood control and for water quality requirements in the County of Honolulu Drainage Standards (City and County of Honolulu, 2000). GeoSyntec also used information presented by Shimabukuro et al. (1986) and EarthTech (2006) (e.g., dimensions, riser elevations, infiltration trenches, spillway, etc.). GeoSyntec's evaluation concludes that the existing basin meets the requirements for flood control and for water quality provided upstream run-on is diverted around the basin. (GeoSyntec, 2008).

Surface Water During Operations

During operations, surface water will be controlled by temporary pipes and ditches that will be moved as necessary to address stockpiles, active fill areas, the extent of each cell, and fill sequencing. Since the size of each cell may vary depending on the waste stream at the time, surface water details will be designed as part of preparing the construction drawing package for each cell. (GeoSyntec, 2008).

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Section 5
Environmental Setting
Potential Impacts and Mitigation Measures

5.1. Climate and Rainfall

5.1.1. Climate and Rainfall

WGSL is located in a region of O'ahu that is relatively arid when compared to the rest of the island due to the "rain-shadow" effect of the Wai'anae Mountain Range. Average annual rainfall in the lowland area is approximately 20 inches, while stations in nearby mountains experience significantly higher rainfall averages (Hokuloa gauge, elevation 2,200 feet mean sea level [msl], average annual rainfall is 42 inches).

The Waimānalo Gulch area receives approximately 20 to 30 inches of rainfall annually. The Wai'anae weather station, located near the WGSL offices, sits at an elevation of 10 feet above msl and receives an average of 20 inches of rain per year, with extreme temperature records of 45° Fahrenheit (F) and 96°F. Rainfall increases substantially with elevation, reaching an average of 75 inches at the top of Mt. Ka'ala, 4,003 feet above MSL. According to an on-site rain gauge, located at the weather station, the average rainfall at the WGSL is approximately 15 inches per year.

Winds at the WGSL are predominantly the prevailing Hawaiian tradewinds. These tradewinds are channeled along the Nānākuli coastline by the Wai'anae and Ko'olau Mountains in a southeast to northwest direction at an average speed of approximately 10 knots. Between October and April, the WGSL experiences southerly winds associated with Kona storms or approaching storm fronts.

Typically, daily temperatures range from the low 60's to upper 70's during the winter season and from the lower 70's to upper 80's during the summer season.

Adverse impacts to topography, geology, or soils are not anticipated based on the use of the mitigation measures as described above.

Secondary or cumulative impacts are not anticipated or expected. The site has been in operation for approximately 18 to 19 years and has been subject to ongoing technical studies and evaluations by independent technical consultants for the topographic, geologic and soils resources of the site to ascertain the performance and environmental safety of the facility. During this period the technical studies that have been completed have been used to improve the capacity, capability, and safe use of the site for a landfill.

The evaluation of WGSL through the preparation of technical studies and reports will continue to be used for further improvements and modifications, as required, through the mitigative measures provided in this EIS document.

5.4. Surface Water

Surface water at the site is limited by the existing dry and arid conditions of the site. There are no natural perennial streams located within the project site. After heavy rainfall events, overland surface water flows occur in Waimānalo Gulch and are directed to surface water drainage systems constructed at the landfill.

5.4.1 Drainage Control System

In 2003, GeoSyntec Consultants, Inc., prepared the report, Revised 14.9 Acre Landfill Expansion Master Plan, Waimānalo Gulch Landfill, for WMH. The purpose of the report was to fulfill the permitting requirements for the landfill involving the prior expansion area which included composite lined disposal cells E-1 through E-4 that were added to the original footprint of the landfill along the eastern and northern sides of the existing landfill footprint. The development of cells E-1 through E-4 included the construction of a stability berm along a portion of the western side of the landfill to provide stability for the cells.

5.6.4. Tsunami Hazard

A tsunami involves the generation of a series of destructive ocean waves that can affect all shorelines. These waves can occur at any time with limited or no warning. Persons in low lying shoreline or beach areas are advised to immediately go to higher ground.

According to the O'ahu Civil Defense Agency, the evacuation boundary for the project area runs along Farrington Highway. The location of the project site mauka of the highway is considered to be safe from wave action and is not identified as a location subject to inundation by a tsunami.

5.6.5. Potential Impacts and Mitigation Measures

Flood Zone

Drainage controls to handle storm events have been implemented for the portions of the site used for landfilling. The drainage controls were designed to accept peak flows from ~~a 100-year design storm from~~ a tributary area of 622 acres. Future control of storm and flood flows will be designed by the City and WMH to be consistent with the requirements for control of storm water runoff by the State and City & County of Honolulu. With the mitigation measures proposed, the potential for adverse impacts associated with flooding are not anticipated.

Hurricanes

Work procedures that are practiced within the existing area of landfilling will be practiced within the area of lateral expansion. The measures identified above are designed to reduce the potential for loss of soils, MSW, and ash due to a hurricane related storm. With the mitigation measures proposed, the potential for adverse impacts associated with hurricanes are not anticipated.

Seismic Activity (Earthquakes)

Seismic risk at the project site is minimal. The design of both the current sanitary landfill and the proposed area of lateral expansion will meet the EPA Subtitle D (40 CFR Part 258) standard for stability. <u>The design of the expansion will also be subject to review by</u>

Discussion:
Although the proposed project is not a coastal dependent facility, the location of the project site was based on selection criteria and governmental regulations that establish the suitability of the site for use as a municipal sanitary landfill.

The proposed project property is owned by the City & County of Honolulu and is designated for a landfill. The use of the site for this purpose is not expected to affect the location or expansion of future coastal dependent developments.

6. Coastal hazards
Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.
Policies:
(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
(D) Prevent coastal flooding from inland projects.

Discussion:
The potential for hazards from storm wave, tsunami, hurricane, wind, flood erosion, subsidence, and point and nonpoint source pollution will be addressed by the proposed project through adherence to the landfill site operating manual and through adherence to all required regulatory permit authorizations and controls.

The development of the project will also be in compliance with the requirements of the Federal Flood Insurance Program, the City & County of Honolulu Drainage, Grading and Development standards for Flood Hazard Districts, and the LUO, Section 21-9.10, Flood Hazard Districts.

Coastal flooding is not anticipated based on the location of the project inland and upgradient of the Farrington Highway.

7. Managing development
Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.
Policies:
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion:
The project site is within the State Agricultural Land Use District. Land uses within this designation are subject to regulation by the State and City & County of Honolulu. The county's zoning designation is AG-2, Agricultural.

All improvement activities will be conducted in compliance with State and County environmental rules and regulations. This subject document is prepared to identify and, where necessary, propose mitigation measures to address the potential for impacts anticipated from the construction and operation of the project. This document will be published for public review in compliance with procedures set forth in HRS, Chapter 343.

8. Public participation;
Objective: Stimulate public awareness, education, and participation in coastal management.
Policies: