

## Oahu Landfill CCE Site Score Sheets

### Criterion 1: Landfill Capacity

#### Criterion Definition

Landfill capacity is the volume required to fill the landfill site at the future projected fill rates.

#### Rationale

A landfill site with a longer capacity is preferred over a site with less capacity. A minimum capacity of 15 years was established by the MACLS with input from ENV. It was decided that 15 years was the minimum life needed to justify the cost of acquiring, permitting, and constructing a new landfill. All of the sites evaluated during this project have estimated capacities greater than 15 years.

#### Measurement

Measurement was carried out in six steps: (1) a temporary site footprint was established at each site; (2) the usable landfill area was calculated as the total area of the footprint minus the area needed for landfill support facilities and other solid-waste related activities; (3) the total volume in cubic yards was estimated from the area of the top and bottom surfaces of the landfill and the distance between the surfaces; (4) the available volume of MSW that can be placed in the site was estimated as total volume minus the volume of soil and other materials needed for the liner, leachate, and gas controls, and for daily, intermediate, and final cover; (5) the available volume was converted to tons of MSW and H-POWER ash using the compacting factors that are being achieved at the WGSL; and (6) the capacity in tons was converted to capacity in years by estimating the amount of ash and MSW to be produced each year until the landfill capacity is reached. Capacity in years for each site (raw data) was then transformed to a ten-point scale with endpoints defined as shown below.

Point Value	Measure Assigned
1	The site with the least capacity needed to fill the landfill site.
10	The site with the greatest capacity needed to fill the landfill site.

#### Data Source

Honolulu Land Information System

#### Data and Measurement Issues

The landfill volume estimate is based on desktop review of the site so the volume should be expected to be refined with more detailed engineering.

Calculation Detail					
Site Num.	Site name	TMK	Landfill Capacity		
			Detail (Census Block)	Raw Score	Scaled Score
1	Site 1	00000001		00000001	#DIV/0!
2	Site 2	00000002		00000002	#DIV/0!
3	Site 3	00000003		00000003	#DIV/0!
4	Site 4	00000004		00000004	#DIV/0!
5	Site 5	00000005		00000005	#DIV/0!
6	Site 6	00000006		00000006	#DIV/0!
7	Site 7	00000007		00000007	#DIV/0!
Raw score data is measured in			Cubic yards	Range	-
Scale direction: 1 = normal scaled score; 0 = inverted scale score			0	Maximum	-

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the highest raw score is set at 1 and the lowest raw score is set at 10.

## Oahu Landfill CCE Site Score Sheets

### Criterion 2: Location Relative to Educational Institutions, Health Care Facilities, or Parks and Recreation Facilities

#### Criterion Definition

Distance measured between subject facilities and landfill. Entities include schools: any school for children up to age 18, public or private, academic or vocational, and public and private colleges and universities but exclude commercial training institutions for adults covered in Criterion 5; health care facilities: any medical or dental health center or office, hospitals (general, specialized, rehab), skilled nursing facilities, clinics (except school clinics), day care or elderly day care, and outpatient surgery centers; public recreational facilities: national, state, and county parks, sports facilities, playgrounds (except school playgrounds), zoos, and community meeting centers.

#### Rationale

The closer a potential site is to the subject facilities the greater the potential impact of a landfill at that location. This criterion assigned lower site values to sites located near these facilities

#### Measurement

Measurement was conducted in three steps. First, identify all facilities defined above near the site. Second, measure the distance from the boundary of each facility to the boundary of the landfill footprint. Third, determine the nearest facility and input its distance to the site footprint as the raw score for the site. The raw distances were then transformed to a ten-point scale defined as shown in the table below.

Point Value	Measure Assigned
1	Shortest distance from the nearest school, health care facility park or recreational facility.
10	Greatest distance from the nearest school, health care facility park or recreational facility.

#### Data Source

Data taken from Google Earth and C&C HoLIS. Any change to the currently assigned footprints may result in minor changes to the findings shown here.

#### Data and Measurement Issues

None

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Educational Institutions, Health Care Facilities, or Parks and Recreation Facilities		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			miles	Range	4.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 3: Location Relative to Residential Concentrations

#### Criterion Definition

Distance measured between residential concentration to landfill site. A residential concentration is defined as one or more residential housing units. This criterion does not include visitor accommodations covered in Criterion 5.

#### Rationale

The closer a potential site is to concentrations of residential development the greater the potential impact of a landfill at that location. This criterion assigned lower values to landfill sites located near residential concentrations.

#### Measurement

All existing residential concentrations near the landfill site were identified. The distance from the landfill to footprint the nearest residential unit in each concentration was calculated from the property line nearest the landfill to the footprint boundary of the site. The shortest distance calculated was entered as the raw score. Raw scores were transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Shortest distance from the nearest residential concentration.
10	Greatest distance to the nearest residential concentration.

#### Data Source

Residences were identified using Tax Map Key (TMK) maps as well as the HoLIS system and TerraMetrics google satellite maps.

#### Data and Measurement Issues

Where the nearest building was a single unit it was sometimes difficult to determine whether that unit was a residence or commercial structure.

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Residential Concentrations		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			miles	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1		Maximum

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 4: Location Relative to Visitor Accommodations

#### Criterion Definition

Distance measured between visitor accommodations and landfill site. Visitor accommodations include hotels, motels, vacation condominium units, time-share units, and hostels. Bed and breakfast and temporary visitor rentals are covered in Criterion 3.

#### Rationale

The closer a potential site is to visitor accommodations the greater the potential impact of a landfill at that location. This criterion assigns lower scores to sites located nearer to visitor accommodations

#### Measurement

All visitor accommodations near the landfill site were identified. The distance between the footprint boundary of the landfill site and the boundary of the visitor accommodations property were measured. The shortest distance from a visitor accommodation and the landfill footprint was entered as the raw score. Distances were transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Shortest distance from the nearest visitor accommodations facility.
10	Farthest distance from the nearest visitor accommodations facility

#### Data Source

The City and County of Honolulu's HoLIS system was used. Where HoLIS did not locate a visitor accommodation near the suite, Google Earth was used to confirm the finding.

#### Data and Measurement Issues

Using just the City and County of Honolulu's HoLIS system is insufficient in determining if there is an existing visitor accommodation. Google Earth is required to determine the presence of visitor accommodations. The "hotels/motels" box was checked in order to detect existing visitor accommodations.

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Visitor Accommodations		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			years	Range	6.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 5: Location Relative to Local or Visitor Commercial Facilities

#### Criterion Definition

The distance measured between commercial facilities and the landfill site. Commercial facilities include stores, shopping centers, and office buildings. Local and visitor commercial facilities include visitor centers, major attractions (public and private), museums, post offices, and fire stations. Medical office buildings are included in Criterion 2.

#### Rationale

The closer a potential site is to visitor and commercial facilities the less desirable that site is because of the greater potential impact of a landfill at that location. This criterion assigns lower value to sites located close to visitor commercial facilities.

#### Measurement

All local or visitor commercial facilities near the landfill site were identified. The distance between the footprint boundary of the landfill site and the boundary of the commercial facilities were measured along roadways identified. The shortest distance from a visitor accommodation and the landfill footprint was entered at the raw score. Distances were transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Shortest distance from the nearest local or visitor commercial facility.
10	Greatest distance from the nearest local or visitor commercial facility.

#### Data Source

State of Hawaii GIS maps (HoLIs), TerraMetrics satellite maps, and City and County of Honolulu map information.

#### Data and Measurement Issues

None.

Calculation Detail					
Site Num.	Site name	TMK	Commercial Facilities		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			years	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 6: Effect on Established Public View Planes

#### Criterion Definition

A view plane is the unobstructed view from an offsite location to the operating area of a landfill site. View planes have been established by the City and County for many areas, and those determinations were used for this criterion.

#### Rationale

Visual impact is one of the common impacts of a landfill if the operating area cannot be hidden by a ridge or vegetation. This criterion will provide a measure of the visual impact.

#### Measurement

Evaluate City-defined scenic viewplanes and applicability to the site. Evaluate "visibility" or level of exposure of the site to public access roads. The nearest public road from the landfill site footprint was used as the basis for measurement. Along the roadway samples of views were taken at 5 points. The first point is nearest to the landfill site on the nearest public road. The 2nd point is 1/4 mi of road in one direction from the 1st point. The 3rd point is 1/4 mi of road in the other direction from the 1st point. The 4th point is 1/2 mi of road in one direction from the 1st point. The 5th point is 1/2 mi of road in the other direction from the first point. However, in some cases it was not appropriate to take sample view points going in certain directions because of obvious obstructions. Sometimes sample view points were taken in one direction that had the most potential for an unobstructed viewplane. This measurement attempted to take the "qualitative" aspect out of the scoring, sites either had a view plane or not.

Point Value	Measure Assigned
1	Any obstruction of established view plans.
10	No obstruction of established public planes.

#### Data Source

Google Earth, C&C Honolulu HOLIS shape file "Public\_Street\_Centerline.shp", and Hawaii State GIS shape file "cr

#### Data and Measurement Issues

Street view images of Google Earth may not be up to date and/or data was not available. Also, a view plane was determined if it was suspected that any portion of the footprint would be visible. Therefore sites that may have raw scores ranked the same in terms of having the same number of sample points having a view plane, sites may be significantly more exposed than others.

Calculation Detail					
Site Num.	Site name	TMK	Effect on Established Public View Planes		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			quarters	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 7: Wind Direction Relative to Landfill Site

#### Criterion Definition

The prevailing wind direction and velocity is measured by data available for a location near each landfill site relative to the location of residential concentrations, visitor accommodation facilities, and commercial land uses.

#### Rationale

Wind can affect areas near landfill by transmitting dust, litter, and odor from a landfill to a receptor. In general, a site with weaker prevailing wind in a direction other than toward populated areas, is preferred over one with strong prevailing winds blowing toward a populated area for a large percentage of the year.

#### Measurement

An index of wind impact was developed by multiplying the maximum annual wind speed by the percentage of time wind blows in the direction of the nearest residential concentration. Wind speed and direction were measured at the nearest meteorological station. The receptors (usually populated areas) are indicated in the calculation details table. The index of wind impact was entered as the raw score for each landfill site. The raw scores were then transferred to a ten point scale with the orientation shown below.

Point Value	Measure Assigned
1	The site with the least appropriate wind pattern (wind impact index)
10	The site with the most appropriate wind pattern (wind impact index)

#### Data Source

Meteorological stations located nearest to the landfill site was used for the data for that site. The source of the data was DOH weather stations, a study of wind resources done by HECO, and a study of wind resources done for the MCAS Kanehoe Bay.

#### Data and Measurement Issues

A higher wind speed will reduce the odor impact on closer receptors and increase the impact of litter on receptors further away. Meteorological stations are located in areas that may not represent the conditions at the landfill sites.

Calculation Detail					
Site Num.	Site name	TMK	Wind Direction Relative to Landfill Site		
			Location of Wind Data	Raw Score	Scaled Score
1	Site 1	00000001	000000000000008	1	1
2	Site 2	00000002	000000000000009	2	1
3	Site 3	00000003	000000000000010	3	1
4	Site 4	00000004	000000000000011	4	1
5	Site 5	00000005	000000000000012	5	1
6	Site 6	00000006	000000000000013	6	1
7	Site 7	00000007	000000000000014	7	1
Raw score data is measured in Scale direction: 1 = normal scaled score; 0 = inverted scale score			Index Score	Range	5.00
			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 8: Effect on Local Roads and Traffic in Residential Neighborhoods

#### Criterion Definition

The criterion describes the effect of landfill-induced traffic on residential neighborhoods through which MSW trucks must travel to reach the site. The definition of traffic impact is the distance between the residential housing units and the landfill site. This distance measured is between the roadway used by the MSW trucks which travels along existing State highway on a local roadways.

#### Rationale

A potential landfill site that causes less traffic through residential neighborhoods is preferred over sites that generate larger amounts of traffic longer trips through residential homes (house passed.) This criterion measures the impact of additional traffic in a residential area. The cost of upgrading the roadway (a form of mitigation) is measured by Criterion 9. Road access to the potential landfill site is based on whether there is an access road available regardless of its condition (i.e. improvement needed). Estimated distance of the access road was measured from the entry/exit of the site to the nearest residential concentration.

#### Measurement

The subject roadway was selected as the shortest route between the point at which MSW trucks would likely leave the highway and the likely entry to the landfill footprint. Maps were used to identify residential housing units along the identified path. Both occupied and vacant units were included and multi family units were counted as one unit. The distance between the roadway and the residential concentrations was entered as the raw score. Those distance counts were then transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Greatest distance between the local roadways in the residential neighborhood and LS.
10	Smallest distance between the local roadways in the residential neighborhood and LS.

#### Data Source

State of Hawaii GIS maps, City and County of Honolulu HoLis System, Google Earth database.

#### Data and Measurement Issues

The route selected for MSW trucks may change. Distance measured may change if additional residential units are constructed between now and the date of the new landfill opening. The distance between any new housing units in each multi family residential building can be obtained to improve the measurements shown here. The method of observation may have included some commercial establishments which may overestimate the nearest units passed.

Calculation Detail					
Site Num.	Site name	TMK	Effect on Local Roads and Traffic in Residential Neighborhoods		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			Miles	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.



## Oahu Landfill CCE Site Score Sheets

### Criterion 9: Wear and Tear on Highways and Roadways Caused by Landfill Related Traffic

#### Criterion Definition

This criterion considers the extent to which developing siting a landfill at a specific site results in deterioration of existing roadways. The deterioration is measured as the cost of upgrading the subject roadways(s) to a level consistent with MSW track traffic.

#### Rationale

A potential site that produces less roadway deterioration, and thus less cost for roadway upgrading, is preferred over a site that will cause greater deterioration and require greater roadway upgrade expenditures.

#### Measurement

Roadways between the State highway and the landfill site were identified and roadway type was established. Distance along the path from the highway to the site were measured and determination was made as to the extent of upgrade required to carry heavy truck traffic. The cost of the required upgrades calculated in current dollars. Calculation included construction and maintenance costs for 15 years. Average construction costs per mile were multiplied by the miles of roadway improvement required, and those dollars were entered as raw scores. The raw scores were then transformed to a ten-point scale with orientation as shown below.

Point Value	Measure Assigned
1	Highest upgrading cost which includes construction and maintenance cost for 15 years.
10	Lowest upgrading cost which includes construction and maintenance cost for 15 years.

#### Data Source

Sources used: Need maps, construction costs sources, roadway type sources.

#### Data and Measurement Issues

None

Calculation Detail					
Site Num.	Site name	TMK	Wear and Tear on Highways and Roadways Caused by Landfill Related Traffic		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	000000000000008	1	1
2	Site 2	00000002	000000000000009	2	1
3	Site 3	00000003	000000000000010	3	1
4	Site 4	00000004	000000000000011	4	1
5	Site 5	00000005	000000000000012	5	1
6	Site 6	00000006	000000000000013	6	1
7	Site 7	00000007	000000000000014	7	1
Raw score data is measured in			Dollars	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 10: Location Relative to Identified Community Disamenities

#### Criterion Definition

This criterion considers the relative number of "disamenities" currently exist in the larger community in which the potential landfill exists. Community disamenities include wastewater treatment plants, slaughterhouses, other landfill sites, public housing, correctional facilities, operating quarry sites, and power plants. The community was defined as the ahupua`a in which the landfill site is located.

#### Rationale

The MACLS wanted to avoid locating a landfill in an area that already has many community disamenities. Locating a landfill in an area with few existing disamenities was considered to be more just than locating it in a community that already has several disamenities.

#### Measurement

Maps were used to identify the ahupua`a in which each landfill site was located. Then the number of disamenities within the Ahupua`a for that site were counted. That number of disamenities was entered as the raw score. The raw scores were then transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Highest number of disamenities existing in an LS area.
10	Lowest number of disamenities existing within any LS area.

#### Data Source

The Ahupua`a maps available from Bishop Museum (circa 1850) were used to describe the communities in which the landfill sites were located. Disamenities were identified using real property data, Google earth map, C&C HoLIS and lists of public projects, including Hawaiian Electric Company website, Oahu correctional facility list, and the C&C mayor's advisory committee on landfill site selection notes (2011).

#### Data and Measurement Issues

As the ahupua'a map is only available in print, it is sometimes difficult to identify a ahupua'a in which footprint is located. The ahupua'a noted in the table below is the best estimate of the location of the footprint.

Calculation Detail						
Site Num.	Site name	TMK	Ahupua'a	Location Relative to Identified Community Disamenities		
				Detail	Raw Score	Scaled Score
1	Site 1	00000001	Site 1.1	0000000000000008	1	1
2	Site 2	00000002	Site 2.2	0000000000000009	2	1
3	Site 3	00000003	Site 3.3	0000000000000010	3	1
4	Site 4	00000004	Site 4.4	0000000000000011	4	1
5	Site 5	00000005	Site 5.5	0000000000000012	5	1
6	Site 6	00000006	Site 6.6	0000000000000013	6	1
7	Site 7	00000007	Site 7.7	0000000000000014	7	1
Raw score data is measured in				number	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score				1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

**Oahu Landfill CCE Site Score Sheets**  
**Criterion 11: Location Relative to H-Power**

**Criterion Definition**

Distance measured between the H-Power facility and the landfill site. The measurement includes the distance along suitable truck accessible roadways from the H-POWER facility to the landfill site. This criterion measures the additional cost of a site that is more than 12 miles from H-POWER.

**Rationale**

A landfill site with lower transportation costs was preferred. The H-POWER contract provides cost adjustments for distances greater than 12 miles.

**Measurement**

The distance was measured in miles along suitable truck-accessible roadways from the H-Power facility to each landfill site. The excess distance was calculated by subtracting 12 miles from the total distance. The excess distances were transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Greatest distance along suitable truck-accessible roadways from H-POWER facility to each LS.
10	Shortest distance along suitable truck-accessible roadways from H-POWER facility to each LS.

**Data Source**

The distance was measured using Google Earth from the point at which the landfill access road intersected the public road.

**Data Issues and Measurement Discussion**

None.

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Power House		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			miles	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 12: Effect of Precipitation on Landfill Operations

#### Criterion Definition

Precipitation is the predicted amount of rainfall at a landfill site. The 24-hour duration and the 100-year average recurrence interval (also referred to as peak events) are used to select the rainfall data to be used. The duration and recurrence intervals in the State landfill regulations are 24-hour duration and the 25-year average recurrence interval, so this criterion exceeds state requirements.

#### Rationale

Precipitation affects landfill operations by reducing the efficiency of earthmoving machinery, generating leachate, and making it more difficult to manage discharge from the site. The MACLS was particularly concerned with problems that might result from unusually severe storms. Peak event rainfall describes the worst-case potential for negative impact of those storms. A landfill site with lower peak event rainfall is preferred over a site with heavier peak event rainfall.

#### Measurement

For each landfill site, the watershed area above the site was identified on maps. Several points along the ridgeline within the watershed, whether inside or outside the site boundaries, were identified for inspection. The latitude and longitude of each of those points was identified on maps, and the 100-year peak rainfall was identified for that point in NWS records. The greatest 100-year peak rainfall was recorded in inches of precipitation identified per hour and entered as the raw score for the landfill site. The raw peak even rainfall was then transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Greatest rainfall in inches per hour.
10	Least rainfall in inches per hour.

#### Data Source

Google Earth maps were used to identify watershed areas and identify the latitude and longitude of precipitation measurement locations. The National Weather Service records were used to identify precipitation intensity and duration for those locations.

#### Data Issues and Measurement Discussion

Peak event precipitation is dependent on past rainfall measurements. It is possible that greater rainfall may occur in the future. The extent of uncertainty is equal for all sites, therefore the relative scores assigned to each site will serve as a reasonable measure of peak event problems at each site.

Calculation Detail					
Site Num.	Site name	TMK	Effect of Precipitation on Landfill Operations		
			Location of Max Rainfall	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			inches/hour	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 13: Landfill Development, Operation and Closure Cost

#### Criterion Definition

This criterion is an estimate the cost of landfill operations in 2021 (the first year of operation). The net present value of the cost of acquisition, development, and closure over the number of years the landfill will be in operation is added to get a total estimated annual cost. In addition the cost of purchasing the land, costs include storm water control and treatment, drainage facilities to handle peak rain events, soil suitability for daily cover; and cost to purchase the land.

#### Rationale

The cost of a new landfill is an important consideration. Site-specific factors can make the cost of one site significantly different than another. This criterion measures that difference.

#### Measurement

The cost of acquisition, development, operation, and closure divided into the cubic yards of capacity is calculated. The ratio for all the sites are transformed into deciles where 1 is the highest estimated cost/cubic yard of capacity and 10 is the lowest estimated cost.

Point Value	Measure Assigned
1	The highest estimated annual cost per cubic yard of landfill life in 2021 for all sites.
10	The lowest estimated annual cost per cubic yard of landfill life in 2021 for all sites.

#### Data Source

Comparative cost for Waimanalo Gulch Solid Waste Landfill, property tax records, and current road costs.

#### Data Issues and Measurement Discussion

None.

Calculation Detail					
Site Num.	Site name	TMK	Landfill Development, Operation and Closure Cost		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			dollars	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 14: Displacement Cost

#### Criterion Definition

This criterion considers the cost of displacing an existing commercial operation on or near a potential landfill site. The cost is considered to be the reduction in economic value to the county due to the loss of business at the site. The loss of revenue and cost of relocation accruing to the owner of the commercial operation are covered in Criterion 13.

#### Rationale

The MACLS wanted to avoid use of landfill sites that would displace important elements of industry in the City & County of Honolulu. Use of a site that would displace commercial operations in the visitor or agricultural industry, for example, would be contrary to the General Plan. This criterion attempts to measure the economic value of displaced commercial activity.

#### Measurement

Commercial operations for each site were identified. The economic value of production (gross revenues), total payments to local employees (gross payroll), and number of jobs (FTE employees) were estimated annually for each of the last five years. The direct value of the business was the sum of revenues and payroll. Indirect and induce costs were estimated using IO Model multipliers and the total induced value sales and payroll were entered as the raw score for displacement cost. The raw scores were transformed to a ten-point scale with the orientation shown below.

Point Value	Measure Assigned
1	The site with the highest estimated displacement cost.
10	The site with the lowest estimated displacement cost.

#### Data Source

HoLIS maps were used to identify existing commercial operations within the TMK boundaries of each landfill site. The value of operations were taken from public financial records. Payroll records for quarry workers were referenced from Hawaiian Cement VP's verbatim reported on 2004 StarBulletin newspaper. Tax base data and multipliers for indirect and induced economic value were taken from the DBEDT READ I-O Model.

#### Data Issues and Measurement Discussion

Estimating displacement cost is a complex process and one subject to many subjective decisions.

Calculation Detail					
Site Num.	Site name	TMK	Displacement Cost		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			dollars	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1		Maximum

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 15: Potential for Solid Waste- Related Land Uses

#### Criterion Definition

This criterion measures acres of land within the site to accommodate businesses that would benefit from operating close to the landfill (e.g., metal and other material recyclers).

#### Rationale

If a site has adequate space for solid waste related activities it can be more cost effective for such activities to co-locate with the landfill. This criterion identifies whether a site has space that could be used for other activities and is not needed for landfill-related activities.

#### Measurement

Estimated the acres of developable land not suited for landfill. Transform the range of acres into deciles where 1 is the least acreage available for solid waste related uses and 10 is the greatest acreage available.

Point Value	Measure Assigned
1	Least acreage available for solid waste related uses.
10	Greatest acreage available for solid waste related uses.

#### Data Source

The topographic map of the site and the preliminary landfill layout.

#### Data Issues and Measurement Discussion

Areas that were designated Impaired Waterways or CWRM well offset were considered acceptable for the recycling area (but not for use as landfill space).

Calculation Detail					
Site Num.	Site name	TMK	Potential for Solid Waste-Related Land Uses		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			Acres	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criteria 16: Location Relative to Wetlands and Natural Area Reserve Systems (NARS)

#### Criterion Definition

This criterion measures the distance between the landfill boundary and the nearest boundary of a parcel that contains a wetland or is part of a reserves natural reserve area classified by the Natural Area Reserve Systems (NARS).

#### Rationale

A landfill site at greater distance from wetlands is preferred over a site that occupies or is near wetland areas.

#### Measurement

All wetlands and NARS sites near each landfill site were identified. Distances were measured in miles along a point-to-point aerial path from the nearest boundary of the wetlands or NARS site to the nearest point on the footprint of the potential landfill site. The shortest distance for each site was entered as the raw data for each site. The raw data were then transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	The site with the shortest distance between the LS boundary and a parcel classified as containing wetlands or a NARS area.
10	The site with the greatest distance between the LS boundary and a parcel classified as containing wetlands or a NARS area.

#### Data Source

Hawaii State GIS shape files "NaturalAreaReserve.shp", " wetlnds\_In\_n83.shp", "wetlnds\_py\_n83"

#### Data Issues and Measurement Discussion

All distances will be rounded to the nearest tenth of a mile. Raw score will be a distance value.

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Wetlands and Natural Area Reserve Systems Land (NARS)		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	-17
2	Site 2	00000002	0000000000000009	2	-13
3	Site 3	00000003	0000000000000010	3	-8
4	Site 4	00000004	0000000000000011	4	-4
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	6
7	Site 7	00000007	0000000000000014	7	10
Raw score data is measured in			miles	Range	2.00
Scale direction: 1 = normal scaled score; 0 = inverted scale			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

\*Wetland code



Oahu Landfill CCE Site Score Sheets

Criterion 17: Location Relative to Listed Threatened and Endangered Species

Criterion Definition

This criterion considers the distance from the landfill footprint to parcels classified as a habitat for listed threatened or endangered plants or animals.

Rationale

A landfill site at a greater distance from a habitat for listed threatened or endangered plants or animals is preferred over a site at a lesser distance from these habitats.

Measurement

All habitats for threatened or endangered species of plants and animals near each landfill site were identified. Distances were measured in miles along a point-to-point aerial path from the nearest boundary of the habitat to the nearest point on the footprint of the potential landfill site. The shortest distance for each site was entered as the raw data for each site. The raw data were then transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	The site with the shortest distance between the LS boundary and a parcel classified as containing a habitat for endangered species.
10	The site with the greatest distance between the LS boundary and a parcel classified as containing habitat for endangered species.

Data Source

Plant habitats were identified in DLNR documents and animal habitats were identified in the U. S. Fish & Wildlife Service

Data Issues and Measurement Discussion

None.

Calculation Detail					
Site Num.	Site name	TMK	Location Relative to Listed Threatened and Endangered Species		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			miles	Range	5.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 18: Surface Water Resources

#### Criterion Definition

This criterion measures the potential at each landfill site to discharge untreated storm water from the landfill to identified perennial or intermittent streams classified as important streams or into class AA marine waters.

#### Rationale

In general, a site with none or only a small chance of discharging untreated storm water into streams or the ocean is preferred over one with a greater potential for untreated water discharge. The MACLSS combined stream and ocean criteria to indicate equal concern for discharge into any surface water.

#### Measurement

All Class 1 perennial or intermittent streams and class AA marine waters (critical surface waters) within or near each potential landfill site were identified. Critical surface waters determined to be up-gradient of a landfill footprint were eliminated from further consideration. Sites that contained critical surface waters within the landfill footprint were assigned a raw score of zero. Then the distance between other critical surface waters and the nearest point on the landfill footprint was measured along a point-to-point aerial path. The shortest distance from each site was entered as the raw data for this criterion. The raw data were then transformed to a ten-point scale with the orientation shown below.

Point Value	Measure Assigned
1	The site with the shortest distance to the nearest Class 1 perennial or intermittent stream of Class AA marine waters.
10	The site with the greatest distance to the nearest Class 1 perennial or intermittent stream of Class AA marine waters.

#### Data Source

State of Hawai'i, Department of Health, Water Quality Standards Maps; Hawai'i Administrative Rules, Chapter 11-54, Water Quality Standards Map (digitized polygons) and Hawaii State GIS shape file "Class Water"

#### Data Issues and Measurement Discussion

All distances will be measured to the nearest hundredth of a mile.

Calculation Detail					
Site Num.	Site name	TMK	Surface Water Resources		
			Critical Surface Water Type	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in Scale direction: 1 = normal scaled score; 0 = inverted scale score			Binary measure  1	Range  Maximum	1.00  7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Criterion 19: Archeological and Culturally Significant Resources

#### Criterion Definition

Archaeological and cultural resources include all sites listed or eligible for listing on the State Register of Historic Places or are identified as a culturally significant site by the DLNR, State Historic Preservation Division (SHPD).

#### Rationale

A better landfill site will not be located close to archaeological and cultural resources.

#### Measurement

This criterion measures the number of miles along a point-to-point aerial path from the archaeological and cultural resources to the site. The range of measurements is transformed into deciles as shown in the table below.

Point Value	Measure Assigned
1	Known area(s) of significant archaeological and/or historical importance have been listed in areas within 0.25 miles of the site.
5	Known area(s) of significant archaeological and/or historical importance have been listed in areas within 0.25 and 0.5 miles of the site.
10	Known area(s) of significant archaeological and/or historical importance have been listed in areas greater than 0.5 miles of the site.

#### Data Source

A lengthy list of archaeological studies was used to develop data for this Criterion; see Appendix.

#### Data Issues and Measurement Discussion

Two problems are suggested. First, the scoring system may not be the most effective one; it does not distinguish between sites with resources in the footprint and those with resources within 0.25 miles of the footprint, and it makes an unused distinction between distances from 0.25 and 0.5 mile away, and those 0.5 or more miles from the footprint. Second, it may not be appropriate to assign a point value of zero to a site that has not been studied.

Calculation Detail					
Site Num.	Site name	TMK	Archeological and Culturally Significant Resources		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			miles	Range	4.00
Scale direction: 1 = normal scaled score; 0 = inverted scale score			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

Oahu Landfill CCE Site Score Sheets

**Oahu Landfill CCE Site Score Sheets**  
**Criterion 20: Quality of Agricultural Lands**

**Criterion Definition**

This criterion considers the suitability of the soils for agricultural uses at each landfill site. Note that all qualified sites were previously qualified for consideration as landfill site because there was sufficient non-prime agricultural land on the site in which to locate a landfill footprint. This criterion deals with prime agricultural land nearby the site.

**Rationale**

The MACLS wanted to avoid using prime agricultural lands or ALISH prime lands as the landfill site. This criterion evaluates the quality of agricultural lands, if any, near the landfill site.

**Measurement**

Any ALISH land classified as prime, unique, or other important agricultural land located near the proposed landfill site, was identified. The distance between the nearest boundary of the identified parcel and the landfill footprint boundary was measured in miles along a point-to-point aerial path. The smallest distance for each site was entered as the raw score. Raw scores were transformed to a ten-point scale with the orientation noted below.

Point Value	Measure Assigned
1	Prime agricultural land.
5	Unique agricultural land.
10	All other land.

**Data Source**

The State of Hawaii Agricultural Land Use of Hawaii maps serve as a basis for evaluation, as located in the Hawaii State GIS shape file "alish\_n83.shp"

**Data Issues and Measurement Discussion**

All distances will be rounded to the nearest 10th of a mile.

Calculation Detail					
Site Num.	Site name	TMK	Quality of Agricultural Lands		
			Detail	Raw Score	Scaled Score
1	Site 1	00000001	0000000000000008	1	1
2	Site 2	00000002	0000000000000009	2	1
3	Site 3	00000003	0000000000000010	3	1
4	Site 4	00000004	0000000000000011	4	1
5	Site 5	00000005	0000000000000012	5	1
6	Site 6	00000006	0000000000000013	6	1
7	Site 7	00000007	0000000000000014	7	1
Raw score data is measured in			Miles	Range	3.00
Scale direction: 1 = normal scaled score; 0 = inverted scale			1	Maximum	7.00

Note: Normal scaled score is used when the raw data and the scaled score have the same direction, low to high. The higher score is preferred and thus the highest score is set at 10 and lowest score is set at 1. In cases where the lower score is preferred, the scale is inverted, i.e., the lowest raw score is set at 10 and the highest score is set at one.

## Oahu Landfill CCE Site Score Sheets

### Appendix A

#### Wetland Code Description From USFWS

##### Description for code PEM1C :

Description for code PEM1C :

P System PALUSTRINE: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics: 1. are less than 8 hectares ( 20 acres ); 2. do not have an active wave-formed or bedrock shoreline feature; 3. have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; 4. have a salinity due to ocean-derived salts of less than 0.5 ppt.

Subsystem :

EM Class EMERGENT: Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

1 Subclass Persistent: Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems.

Modifier(s):

C WATER REGIME Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Description for code PSS3C :

P System PALUSTRINE: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics: 1. are less than 8 hectares ( 20 acres ); 2. do not have an active wave-formed or bedrock shoreline feature; 3. have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; 4. have a salinity due to ocean-derived salts of less than 0.5 ppt.

Subsystem :

SS Class SCRUB-SHRUB: Includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.

3 Subclass Broad-Leaved Evergreen: Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that generally remain green and are usually persistent for a year or more; e.g. red mangrove (*Rhizophora mangle*).

Modifier(s):

C WATER REGIME Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Description for code R4SBC :

R System RIVERINE: The Riverine System includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.

4 Subsystem INTERMITTENT: This Subsystem includes channels that contain flowing water only part of the year, but may contain isolated pools when the flow stops.

SB Class STREAMBED: Includes all wetlands contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide.

Subclass :

Modifier(s):

C WATER REGIME Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Oahu Landfill CCE Site Score Sheets

**Appendix B**  
**Oahu Landfill Road Study**  
**0% Cost Estimate**

<b>AMERON QUARRY</b>				
<b>TMK: 4-2-015-001</b>				
<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
<u>Proposed driveway connection to Kapaa Quarry Place</u>				
A.C. Pavement 2 1/2" thick, in place complete.	34	TON	\$200.00	\$6,800.00
Base Course 6" thick, in place complete.	38	CY	\$300.00	\$11,400.00
Subbase Course, 12" thick, in place complete.	75	CY	\$65.00	\$4,875.00
			<b>TOTAL</b>	\$23,075.00
NOTE: Quantities are based on an approximation of paving ~2000 sf of roadway to add a 24' wide driveway connecting to the main road with a minimum turning radius of 45'.				
<b>LAIE UPLANDS</b>				
<b>TMK: 5-5-007-001</b>				
<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
<u>Aakahi Gulch Road</u>				
Demolition and removal of existing A.C. pavement, including base course.	35490	SF	\$5.00	\$177,450.00
P.C.C. Pavement 9" thick, in place complete.	430	CY	\$375.00	\$161,250.00
Base Course 6" thick, in place complete.	287	CY	\$300.00	\$86,100.00
A.C. Pavement 2 1/2" thick, in place complete.	337	TON	\$200.00	\$67,400.00
Base Course 6" thick, in place complete.	371	CY	\$300.00	\$111,300.00
			<b>SUBTOTAL</b>	\$603,500.00
<u>Undeveloped Road</u>				
P.C.C. Pavement 9" thick, in place complete.	360	CY	\$375.00	\$135,000.00
Base Course 6" thick, in place complete.	240	CY	\$300.00	\$72,000.00
Subbase Course 12" thick, in place complete.	480	CY	\$65.00	\$31,200.00
			<b>SUBTOTAL</b>	\$238,200.00
			<b>TOTAL</b>	\$841,700.00
<b>WAIMEA UKA 1</b>				
<b>TMK: 6-1-006-001</b>				
<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
<u>Ashley Road</u>				
Demolition and removal of existing A.C. pavement, including base course.	176150	SF	\$5.00	\$880,750.00
A.C. Pavement 2 1/2" thick, in place complete.	2963	TON	\$200.00	\$592,603.40
Base Course 6" thick, in place complete.	2180	CY	\$300.00	\$654,000.00
			<b>TOTAL</b>	\$2,127,353.40
<b>WAIMEA UKA 2</b>				
<b>TMK: 6-1-007-001</b>				
<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL</b>
<u>Kawailoa Road &amp; Kawailoa Drive</u>				
Demolition and removal of existing A.C. pavement, including base course.	560110	SF	\$5.00	\$2,800,550.00
A.C. Pavement 2 1/2" thick, in place complete.	9422	TON	\$200.00	\$1,884,400.00
Base Course 6" thick, in place complete.	10372	CY	\$300.00	\$3,111,600.00
			<b>TOTAL</b>	\$7,796,550.00

Oahu Landfill CCE Site Score Sheets

<b>KEAAU ROAD/OHIKILOLO</b>				
<b>TMK: 8-3-001-013</b>				
DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
<u>Proposed driveway connection to Farrington Highway</u>				
A.C. Pavement 2 1/2" thick, in place complete.	34	TON	\$200.00	\$6,800.00
Base Course 6" thick, in place complete.	38	CY	\$300.00	\$11,400.00
Subbase Course, 12" thick, in place complete.	75	CY	\$65.00	\$4,875.00
			<b>TOTAL</b>	\$23,075.00
NOTE: Quantities are based on an approximation of paving ~2000 sf of roadway to add a 24' wide driveway connecting to the main road with a minimum turning radius of 45'.				
<b>NANAKULI UKA</b>				
<b>TMK: 8-5-006-004</b>				
Waianae Valley Road				
DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
Demolition and removal of existing A.C. pavement, including b	19650	SF	\$5.00	\$98,250.00
A.C. Pavement 2 1/2" thick, in place complete.	331	TON	\$200.00	\$66,200.00
Base Course 6" thick, in place complete.	364	CY	\$300.00	\$109,200.00
Subbase Course 12" thick, in place complete.	728	CY	\$75.00	\$54,600.00
			<b>TOTAL</b>	\$328,250.00
NOTE: Existing Waianae Valley Road is assumed to be 12' wide A.C. pavement from Haleahi Road intersection to proposed point of access. Assuming widening of road by 12 feet for two way traffic.				
<b>KULIA I KA</b>				
<b>TMK: 3-9-010-047</b>				
Proposed driveway to				
connect to exist.				
Kalaniana'ole Hwy				
DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
A.C. Pavement 2 1/2" thick, in place complete.	34	TON	\$200.00	\$6,800.00
Base Course 6" thick, in place complete.	38	CY	\$300.00	\$11,400.00
Subbase Course for undeveloped roadway, 12" thick, in place	75	CY	\$65.00	\$4,875.00
			<b>TOTAL</b>	\$23,075.00
NOTE: Quantities are based on an approximation of paving ~2000 sf of roadway to add a 24' wide driveway connecting to the main road with a minimum turning radius of 45'.				

NOTES:

- Existing roads are assumed to be A.C. pavement and 24' wide unless otherwise specified.
- Cost estimate does not include any earthwork required to access and develop the site.



## GLOSSARY

ahupua`a	
DBEDT	The Hawaii Department of Business, Economic Development and Tourism
DLNR	The Hawaii Department of Land and Natural Resources
DOH	The Hawaii Department of Health
ENV	
HoLIS	Honolulu Land Information System
H-Power	
IO Model	The Input-Output Model maintained by DBEDT
LS	Landfill Site
MACLSS	The Mayor's Advisory Council on Landfill Site Selection
NARS	Natural Area Resource System
NWS	National Weather Service
READ	Research and Economic Analysis Division, DBEDT
WGSL	Waimanalo Gulch Solid Waste Landfill

## Notes

This document has been prepared to inform the MACLSS about minor changes to the landfill site selection criteria prior to the weighting exercise. The changes have occurred in the process of implementing and refining the definitions and measurement criteria based on the realities of available data on the sites.

The version shown here does not contain the actual data being collected. Any data shown is facsimile or place-holder data. Raw data and scores will be inserted after weights have been decided. The document is a work in progress.

Following your lead we have attempted to eliminate correlated criteria where ever we could.