REMOVAL ACTION WORK PLAN

Former Kohala Sugar Company
Pesticide Mixing Site
North Kohala, Hawaii

Prepared for
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ACRONYMS AND ABBREVIATIONS

ACSI	Advanced Compliance Solutions, Inc.
amsl	above mean sea level
AST	aboveground storage tank
bgs	below ground surface
CRM	concrete rubble masonry
DU	decision unit
EAL	environmental action level
EPA	U.S. Environmental Protection Agency
HDOH	Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response
HICDC	Hawaii Island Community Development Corporation
Integral	Integral Consulting Inc.
O&M	operation and maintenance
OCP	organochlorine pesticide
PAH	polycyclic aromatic hydrocarbon
PPE	personal protective equipment
RAL	removal action level
RAO	removal action objective
RAR	removal action report
RAWP	removal action work plan
RCRA	Resource Conservation and Recovery Act
SVOC	semivolatile organic compound
TCLP	toxicity characteristic leaching procedure
TEQ	toxic equivalency
Weston	Weston Solutions, Inc.
XRF	X-ray fluorescence

1 INTRODUCTION AND PURPOSE

This removal action work plan (RAWP) describes the remedial activities that will be performed by the Hawaii Island Community Development Corporation (HICDC) to address impacted soil at the former Kohala Sugar Company pesticide mixing site, North Kohala, Island of Hawaii (the site). Work is being conducted pursuant to a voluntary agreement for remedial action between HICDC and the Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response (HEER) Office, dated November 5, 2014. The selected remedy consists of removal of soil impacted primarily with arsenic and dioxins at concentrations above unrestricted land use environmental action levels (EALs), as described in the final removal action report (RAR) (Integral and ACSI 2014). This work plan, for implementation of the RAR, has been commissioned by HICDC, the property owner, who is performing residential development on the subject property and surrounding properties.

1.1 PROJECT SUMMARY

As a result of historical site use, soils containing arsenic and dioxin (as well as lead, mercury, and semivolatile organic compounds [SVOCs]) at the site present a potential direct exposure risk to humans and may present terrestrial ecotoxicity hazards (as discussed in Section 3). Based on these findings, a removal action was recommended by HDOH. In order to determine the most appropriate approach, an evaluation of removal action alternatives was performed as part of the RAR (Integral and ACSI 2014). The RAR screened and evaluated options that would be effective, technically and administratively feasible, and cost effective for addressing the soil arsenic and dioxin issues at the subject property. The goals of the removal action are as follows:

1. Remediate portions of the property anticipated for future unrestricted (residential) land use to appropriate bioaccessible arsenic and toxic equivalency (TEQ) dioxin soil concentrations, herein defined as removal action levels (RALs).
2. Prevent migration of contaminants to surface or groundwater.
3. Minimize potential risk to human health or ecological receptors from exposure to arsenic- and dioxin-impacted soil, during and after the removal action.

Based on a comparison of the remedial alternatives, on-island landfill disposal was selected, and as described in the RAR, it provides the best balance of effectiveness, implementability, and cost. In addition, this remedy results in a clean site, with no loss of land use, no need to manage long-term operation and maintenance (O&M), and no potential community stigma of having a closed, contaminated site in the neighborhood. The RAR was approved by HDOH, and HICDC and HDOH entered into a voluntary agreement to perform the work. Implementation of the removal action is outlined in this RAWP.

2 BACKGROUND

2.1 SITE DESCRIPTION

The site consists of approximately 0.5 acres of land that formerly housed pesticide mixing operations for the Kohala Sugar Company (Figures 1, 2, and 3), which operated between 1863 and 1971. The property was owned by the Kohala Company from 1971 to 1980, when it was purchased by the Hawaii Conference Foundation. HICDC acquired the property in 2006 for residential redevelopment. The site is a portion of the 18.3-acre parcel (tax map key 03-5-5-019: 025) owned by HICDC, located 1.5 miles mauka of the Pacific Ocean coastline in the vicinity of the town of Hawi, North Kohala District, Hawaii. The site is surrounded by fallow, highly vegetated former plantation land and pasture land. Residential housing on HICDC land is located within 500 ft of the site to the southwest, and the Kohala High School and Kohala Elementary School complex is located to the east within several hundred feet. A fence has been installed around the former pesticide mixing site to prevent trespasser direct contact with site soils. Former facilities remaining on the site include two (upper and lower) concrete rubble masonry (CRM) retaining walls and four steel aboveground storage tanks (ASTs) (Figure 4). A very large banyan tree is present at the center of the site, with roots grown into the CRM walls. Further description of the site and its surroundings can be found in Weston Solutions, Inc.'s (Weston's) combined Phase I/II targeted brownfields assessment (Weston 2011).

2.1.1 Climate

The North Kohala District of the Island of Hawaii has a mild, semitropical climate characterized by abundant sunshine, persistent northeast trade winds, relatively constant temperatures, and moderate humidity. Severe storms are infrequent in this region.

Average monthly temperatures range from the high 70s (°F) in the summer months to the low 60s (°F) during the winter (WRCC 2015). Based on the Hawi rain gauge, average annual rainfall near the site is approximately 146 cm (57 inches) with most of the rainfall occurring in November through January and in March and April (Giambelluca et al. 2013).

2.1.2 Topography

The regional topography slopes to the northwest toward the Pacific Ocean, approximately 1.3 miles north of the site. Site elevations range from approximately 496 ft above mean sea level (amsl) at the western boundary and drops sharply to approximately 476 ft amsl at the eastern boundary (Figure 4).

2.1.3 Soils/Geology

The following discussion was provided by Weston (2011). The dominant surficial soils in the vicinity of the site are of the Kohala series, which is typified by well-drained silt-clay loams formed from the *in situ* degradation of basaltic rocks (NRCS 2015). These soils are further described as inceptisols, which are soils with weakly developed horizons that occur on young land surfaces. These soils lie atop the Hawi and Pololu Volcanics, which are separated by a red, lateritic soil up to 3 ft thick. The younger Hawi Volcanics represent late-stage volcanism, with the last eruptions occurring approximately 120,000 years before present. The older Pololu Volcanics represent the uppermost shield-building stage of the Kohala volcano and date to approximately 700,000 to 250,000 years before present (USGS 2002).

2.1.4 Surface Water

The nearest surface water body to the site is the Pacific Ocean (Figure 1). Several ephemeral streams are located in the vicinity, including one immediately east of the site, fed from Kumakua Gulch.

2.1.5 Groundwater

The following discussion was provided by Weston (2011). Groundwater recharge occurs mainly through local rainfall. Average rainfall in the area of the site is approximately 57 inches per year; rainfall rates increase to approximately 80 inches per year directly upgradient, potentially recharging the groundwater flowing under the site. Fresh groundwater occurs primarily in the freshwater lens that occurs in the Pololu Volcanics; a perched aquifer is also common near the base of the Hawi Volcanics (USGS 2002). Groundwater in the Hawi area is not limited to the unconsolidated soils, mainly due to the high permeability of the lava units, which is increased by high porosity, fractures, breccia zones, and lava tubes. Groundwater permeability in the volcanic units is significantly lowered by the presence of weathering/soil horizons and crosscutting dikes. Dike-impounded water is more common near the summit of the Kohala range, where volcanic centers are more common (USGS 2002).

Groundwater depth beneath the site can be interpolated from drinking water wells drilled near the town of Hawi. The freshwater lens is approximately 480 ft below ground surface (bgs), and the perched aquifer does not appear to be present under the site. The freshwater lens is approximately 100 ft thick in well no. 7449—the closest well for which data are presented. Groundwater transitions to brackish, then saline, with depth.

A total of nine water wells were identified within a one-mile radius of the site: one well was found within an eighth-mile radius, four wells were found within a quarter- to half-mile radius, and four wells were found within a half- to one-mile radius. A list of the wells identified and a map of the well locations can be found in Weston (2011, Appendix G).

Based on data presented in *Aquifer Identification and Classification for the Island of Hawaii: Groundwater Protection Strategy for Hawaii* (Mink and Lau 1993), the site is part of the Kohala aquifer sector and is in the Hawi System. This aquifer system consists of an unconfined basal aquifer in flanking lavas. Groundwater in the site vicinity is classified as a currently used drinking water source (<250 mg/L Cl^-), and as irreplaceable with a high vulnerability to contamination.

Because of the limited leaching potential of site chemicals of concern, the depth to groundwater of nearly 500 ft, and the high transmissivity of the underlying aquifer, no groundwater hazard was present at the site due to site conditions (Integral and ACSI 2014).

2.2 CURRENT AND FUTURE LAND USE

The current land use of the site is idle. Once remediation has been completed, the property may be developed for residential use.

3 DESCRIPTION OF RELEASE

The North Kohala pesticide mixing site was identified by the HDOH HEER Office and evaluated for soil contamination in a series of studies conducted from 2009 through 2011. In summary, site soils were determined to contain arsenic and dioxins (and several other compounds) at concentrations exceeding Tier 1 and Tier 2 EALs.

3.1 PREVIOUS STUDIES

Several investigations have been performed at the site, which was listed on the Comprehensive Environmental Response, Compensation, and Liability Information System in 2009 (U.S. Environmental Protection Agency [EPA] identification number HIN000908796). The HDOH HEER Office conducted initial soil sampling at the site in August 2009, collecting multi-increment samples from four decision units. HDOH identified dioxins/furans (dioxin), metals (arsenic, lead, and mercury) and SVOCs at concentrations at or above HDOH EALs for unrestricted (i.e., residential) land use (HDOH 2011). In December 2010, Weston (acting as an EPA contractor) collected 10 additional multi-increment samples (plus two replicate samples) from surface and subsurface soils (up to 48 inches deep) at the site to further delineate the extent of soil impacts (Weston 2011). At the same time, the HDOH HEER Office collected multi-increment samples from two decision units on private property adjacent to the HICDC property and two decision units to the north of the site. The HDOH sampling decision units were contiguous with Weston's, designed to support site characterization. HDOH conducted an additional soil sampling program in October 2011 to further delineate the lateral extent of soil impacts.

The following section summarizes those previous investigations. A layout map of investigation decision units is shown in Figure 5, and a summary of soil sample analytical results (including all compounds for which one or more samples exceeded the residential Tier 1 EAL) is provided in Table 1. TEQ dioxin calculations are based on individual dioxin/furan congener concentrations and the World Health Organization 2005 toxic equivalency factors.

HDOH, August 2009

The HDOH HEER Office conducted initial soil sampling at the site in August 2009. Four decision units were sampled across the former pesticide mixing site. Multi-increment surface soil samples were collected from the four decision units (DU-1 through DU-4), and one of the decision units was multi-increment sampled in triplicate for quality assurance purposes. The layout of the four initial decision units is shown on Figure 5.

The samples were analyzed for a broad suite of chemical compounds, including SVOCs, organochlorine pesticides (OCPs), chlorinated herbicides, carbamate pesticides, metals (arsenic, lead, and mercury), and dioxins/furans (dioxin).

The multi-increment sample from DU-1 showed the highest levels of arsenic and dioxin. Total arsenic was 820 mg/kg in the <2 mm particle size soil and 1,300 mg/kg in the <0.25 mm particle size soil; bioaccessible arsenic was 230 mg/kg (measured in <0.25 mm particle size soil). TEQ dioxin was reported at 11,000 ng/kg. HDOH recommends the use of bioaccessible arsenic in assessment of human health direct contact hazards; the HDOH EAL for bioaccessible arsenic for unrestricted (residential) land use is 23 mg/kg. Other compounds identified at concentrations above unrestricted land use EALs include lead, mercury, polycyclic aromatic hydrocarbons (PAHs; a subset of SVOC compounds), and pentachlorophenol. All four decision units sampled by HDOH showed one or more compounds present at concentrations exceeding a residential EAL.

Weston and HDOH, December 2010

Weston and HDOH conducted additional soil sampling at the site in December 2010. They laid out five additional perimeter decision units on the HICDC property (DU-7, DU-8, DU-10, DU-11, and DU-20), adjacent to the four 2009 HDOH decision units, and surface soil (0 to 6 inches bgs) multi-increment samples were collected from those five decision units. Subsurface multi-increment soil samples were collected beneath DU-1, DU-2, and DU-8 (the areas previously shown [DU-1 and DU-2] or anticipated [DU-8] to have the highest contaminant impacts). Subsurface soil multi-increment samples were collected from 6 to 24 inches bgs in all three decision units, and subsurface soil multi-increment samples from 24 to 48 inches bgs were collected from DU-1 and DU-2. At the same time that Weston was collecting soil samples on the HICDC property, HDOH collected surface multi-increment samples from two decision units (DU-14 and DU-15) contiguous to the Weston decision units but on an adjacent property not owned by HICDC (the Harbottle property). In addition to soil sampling, Weston collected a rinsate sample from the old, rusted ASTs on the site. Visual observations indicated that there were no residual solids in the tanks.

Samples collected during the December 2010 mobilization by Weston and HDOH were submitted to Test America laboratory for analysis of a broad suite of compounds. Analytical results were compared to the unrestricted land use EALs (Table 1). EALs are based on the following scenario: 1) land use will be unrestricted, 2) groundwater utility is drinking water, and 3) the distance to the nearest surface water body is greater than 150 m. Surface soil samples (0 to 6 inches bgs) from DU-7, DU-8, DU-10, and DU-15 exceeded unrestricted land use EALs for one or more compounds. All three subsurface samples from the 6- to 24-inch depth interval exceeded an EAL for one or more compounds. These samples were collected in DU-1, DU-2, and DU-8. The deeper (24- to 48-inch depth interval) subsurface sample collected in DU-2 (sample identification number DU-12-4) exceeded EALs for dioxin. The 24- to 48-inch depth interval sample from DU-1 did not show an EAL exceedance. Based on this limited subsurface data set, it is likely that soil contamination exceeding EALs extends beyond 24 inches in depth in the contiguous area comprised of DU-1, DU-2, and DU-8.

HDOH, October 2011

The HDOH HEER Office collected multi-increment surface soil samples from three additional decision units in October 2011 to help further bound the lateral extent of EAL exceedances at the site. The samples were collected in DU-16 and DU-17 (north of DU-10) and in DU-18 (south of DU-15). Analytical results indicated no EAL exceedances in the DU-16 and DU-17 surface soil samples collected from the northern perimeter of the site. TEQ dioxin levels exceeded the EAL in DU-18 to the south of prior sampling areas, on the adjacent Harbottle property. Sampling results are summarized in Table 1.

Integral and ACSI, July and August 2013

Review of prior HDOH and Weston soil sampling results for the site revealed no concentrations of compounds on the Resource Conservation and Recovery Act (RCRA) toxicity characteristic list (40 compounds) greater than 20 times the toxicity characteristic leaching procedure (TCLP) regulatory level,[1] with the exception of arsenic, lead, and mercury. A summary of laboratory results is provided in the final RAR (Integral and ACSI 2014). To evaluate hazardous waste potential for arsenic, lead, and mercury, Integral Consulting Inc. (Integral) and Advanced Compliance Solutions, Inc. (ACSI) collected soil samples in July and August 2013 from areas expected to represent worst case conditions (highest total arsenic levels). Two multi-increment waste characterization samples (WC-01 and WC-03) were collected from decision units as shown on Figure 6. Multi-increment samples, consisting of 30 sample increments, were collected from the 0- to 6-inch depth interval from each decision unit.

The waste characterization samples were analyzed for TCLP metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); analytical results are shown on Table 2. No TCLP results were above regulatory levels for determination of hazardous waste. Arsenic was reported in WC-01 and WC-03 at 2.6 and 0.89 mg/kg, respectively, as compared to a regulatory level of 5 mg/kg. In order to ensure that waste characterization samples reflected worst case conditions, total arsenic was also tested. WC-01 and WC-03 were determined to contain 3,000 and 930 mg/kg, respectively. Total arsenic in WC-01 was higher than reported for any previously evaluated soil sample at the site, and therefore is believed to be representative of worst case conditions. In summary, waste characterization sampling and analysis confirms that site soils, if excavated, would not be considered a hazardous waste and would be suitable for landfill disposal at the West Hawaii Sanitary Landfill.

Integral and ACSI collected a multi-increment sample of surface soils (0- to 6-inch depth) from an open field area (former agricultural and ranch land) on HICDC property, approximately a quarter mile from the former pesticide mixing site (Figure 2; sampling area CF-01), for evaluation as clean fill soil suitable for use in a site remedy. Sample CF-01 (CF for "clean fill") was collected on July 25, 2013, and analyzed for total metals, OCPs, and dioxins/furans. These

[1] As a general rule, samples with total concentrations of compounds <20 times the TCLP regulatory limit will not fail TCLP (exceed the regulatory limit) due to insufficient chemical mass.

compounds are the most likely contaminants to be found in former agricultural fields. Results of the sampling and analysis of clean fill material are shown on Table 3, and indicate that potential fill soils are clean, as there were no exceedances of HDOH Tier 1 EALs. Therefore, these soils would be suitable for use as excavation backfill soil at the former pesticide mixing site.

3.2 CONCEPTUAL SITE MODEL

Former sugar plantation facilities and operational areas at the site, related to agricultural cultivation and processing of sugar, are believed to have been the source of release of chemical contaminants. Sampling was performed at and around those facilities/operations to identify soil impacts. Releases of pesticide and herbicide chemicals are believed to have occurred at the site as chemicals were mixed and transferred to field vehicles for application. Releases of chemicals would have entered site soils from the surface and migrated downward through the soil column. Contaminated surface soils could also have been transported downslope by surface erosion. The source of PAHs in site soils is not known. However, based on observed concentrations of individual PAH compounds less than 10 mg/kg and an understanding of site history, PAH residues in site soils may be the result of decayed asphalt pavement, used oil application to roadways, or vehicle exhaust.

3.3 ENVIRONMENTAL HAZARD EVALUATION

Chemicals detected in soil were evaluated using the HDOH EAL Surfer tool (HDOH 2012a). Chemical concentrations in site soils observed in decision unit sampling and laboratory analyses from the 2009 HDOH study, the 2010 Weston and HDOH studies, and the 2011 HDOH study were compared to HDOH EALs. Table 1 presents a summary of chemical concentrations in soil samples, showing only those compounds with one or more exceedances of a Tier 1 EAL. Chemicals of concern (exceeding an EAL) include TEQ dioxins, arsenic, lead, mercury, PAHs (i.e., benzo[*a*]pyrene, benzo[*a*]anthracene, benzo[*b*]fluoranthene, and dibenzo[*a,h*]anthracene), and pentachlorophenol.

HDOH guidance recommends evaluating soil environmental hazards to include human direct contact (ingestion, dermal absorption and inhalation), vapor emissions to indoor air, terrestrial ecotoxicity, gross contamination, and leaching (potential impact to groundwater). The dominant hazard for chemicals in soil at the subject site is direct contact. Screening with the EAL Surfer also indicated that pentachlorophenol exhibited a potential leaching hazard in DU-1 and DU-2. None of the chemicals of concern is volatile; therefore, vapor emissions to indoor air are not a concern. None of the gross contamination EALs was exceeded for site conditions. HDOH has not established terrestrial ecotoxicity screening levels, and no ecological risk screening was performed by Integral for the project. Other regulatory agencies have developed ecological soil screening levels for some of the site chemicals of concern including arsenic, PAHs

and pentachlorophenol (for example see USEPA [2005]). The ecological soil screening levels are designed to evaluate the need for further ecological risk assessment, and are not cleanup levels. However, it is generally recognized that cleanup to human health risk-based cleanup levels is protective of most ecological receptors.

3.4 CHEMICALS OF CONCERN

Arsenic and dioxin were determined to be the most significant chemicals of concern in terms of direct human contact hazards. Table 1 highlights the concentrations of chemicals in site soils.

3.4.1 Arsenic

Arsenic is a common soil contaminant in Hawaii, often related to its former use as an herbicide in sugarcane production. At the subject site, arsenical herbicides are believed to have been managed prior to 1950. HDOH recommends the management of arsenic by evaluation of total and bioaccessible arsenic. In recent guidance (HDOH 2012b), HDOH describes arsenic soil categories based on the magnitude of bioaccessible arsenic levels. Bioaccessible arsenic is the fraction of total arsenic that is extracted from soil using an *in vitro* laboratory test designed to simulate conditions within the human gastrointestinal tract (Drexler and Brattin 2007; Brattin et al. 2013). HDOH has developed four soil categories based on bioaccessible arsenic levels: Category A (natural background levels), Category B (minimally impacted), Category C (moderately impacted), and Category D (heavily impacted). The bioaccessible levels for each soil category are shown in the legend of Figure 7. Remediation is typically recommended for Category C and D soils.

Figure 7 shows the bioaccessible arsenic levels observed in surface soils (0 to 6 inches bgs) at the site, color coded by soil arsenic categories. DU-1, DU-2, DU-8, and DU-10 contain bioaccessible arsenic in surface soils at Category D levels. Arsenic Category C soils were not identified in surface soils, and the balance of soils were in Category A and B levels. Subsurface soils (6- to 24-inch depth) in DU-1 and DU-2 had bioaccessible arsenic at Category C levels, and subsurface soils in DU-8 had Category D arsenic soils (see Table 1; subsurface soils are not depicted on Figure 7).

3.4.2 Dioxin

Dioxin is a highly toxic chlorinated organic compound, commonly observed in soils formerly used for agriculture in Hawaii, where pesticides/herbicides such as pentachlorophenol were applied. Similarly to arsenic management, HDOH has published specific guidance for the management of dioxin,with associated soil categories based on dioxin concentrations

(HDOH 2010). As with arsenic, HDOH has developed four soil categories based on TEQ[2] dioxin levels: Category A (natural background levels), Category B (minimally impacted), Category C (moderately impacted), and Category D (heavily impacted). The TEQ dioxin levels for each soil category are shown in the legend of Figure 8. Remediation is typically recommended for Category C and D soils.

Figure 8 shows a similar but more extensive pattern of surface soil contamination, as compared with arsenic. Surface soils (0 to 6 inches bgs) in DU-1, DU-2, DU-7, DU-8, and DU-10 show dioxin Category D soils. DU-3 and DU-4, on the HICDC property, and DU-15 and DU-18 on the adjacent Harbottle property, contain dioxin Category C soils. Subsurface soils (6 to 24 inches bgs) in DU-1 and DU-2 contain dioxin Category C soils, and DU-8 contains dioxin Category D soils. Deeper subsurface soils (24 to 48 inches bgs) in DU-2 contain dioxin Category C soils.

3.4.3 Other Chemicals of Concern

In addition to arsenic and dioxin, lead, mercury, and PAHs were observed at concentrations above unrestricted land use EALs. Lead was reported in surface soils of DU-1 at 230 mg/kg, slightly above the EAL of 200 mg/kg. Mercury was reported in surface soils of DU-11 and DU-2 at 14 and 8 mg/kg, respectively, above the EAL of 4.7 mg/kg. SVOCs were reported in DU-1, DU-2, DU-3, and DU-4 at concentrations above EALs. Benzo[*a*]pyrene was reported in surface soils of DU-10 and DU-14 (on the Harbottle property) above EALs.

3.5 SUMMARY OF ENVIRONMENTAL HAZARDS

Arsenic, lead, mercury, dioxin, PAHs, and pentachlorophenol were observed on the site, above the direct contact EAL for unrestricted land use. Pentachlorophenol was observed above the EAL for leaching (potential for groundwater contamination). Mercury was reported in surface soils (0 to 6 inches bgs) of DU-1, DU-2, and DU-8 at 14, 8, and 6.9 mg/kg, respectively, above the EAL of 4.7 mg/kg. Four individual PAHs (benzo[*a*]pyrene, benzo[*a*]anthracene, benzo[*b*]fluoranthene, and dibenzo[*a,h*]anthracene) exceeded EALs in surface soils (0 to 6 inches bgs) of DU-4. One PAH (benzo[*a*]pyrene) was at or above the EAL in surface soils (0 to 6 inches bgs) in DU-3 and DU-10 on the HICDC property and in DU-14 on the Harbottle property. The EAL for pentachlorophenol was exceeded in surface soils (0 to 6 inches bgs) of DU-1, DU-2, and DU-4. Of the chemicals of concern, arsenic and dioxin are the most extensive (greatest lateral and vertical extent at concentrations above EALs) and can be considered the chemicals driving the remediation process. If arsenic and dioxin are addressed, the other chemicals will be addressed simultaneously.

[2] TEQ is a method of summing the toxic effects of the various dioxin and furan congeners (related compounds), and generating a single TEQ value for comparison against risk-based levels.

The leaching hazard from pentachlorophenol is not considered to be a significant environmental hazard, since the area of impact above the leaching EAL is small (DU-1, DU-2, and DU-4), and the concentrations are no more than four times the leaching EAL. In addition, depth to groundwater is several hundred feet, and the aquifer is thick and transmissive (large groundwater flux).

Based on a comprehensive review of chemical concentrations in site soils, we believe that the principal hazards are arsenic and dioxin by direct contact, and that these should be the basis of the removal action levels.

4 REMOVAL ACTION SCOPE OF WORK

Soils containing arsenic and dioxin (as well as lead, mercury, and SVOCs) at the former Kohala Sugar Company property present a potential direct exposure risk to humans and may present terrestrial ecotoxicity hazards. Based on these findings, a removal action is recommended. The most appropriate approach was determined by evaluating the removal action alternatives, to screen and assess options that would be effective, technically and administratively feasible, and cost-effective for addressing the soil arsenic and dioxin issues at the subject property.

4.1 REMOVAL ACTION OBJECTIVES

The primary focus of the removal action is to address elevated arsenic and dioxin (and several other chemicals) in the soils at the site, to provide protection of human and ecological health by preventing direct contact exposures to contaminated soils. The removal action objectives (RAOs) are as follows:

1. Remediate portions of the property anticipated for future unrestricted (residential) land use to appropriate bioaccessible arsenic and TEQ dioxin soil concentrations, herein defined as RALs.
2. Prevent migration of contaminants to surface or groundwater.
3. Minimize potential risk to human health or ecological receptors from exposure to arsenic- and dioxin-impacted soil, during and after the removal action.

4.1.1 Removal Action Levels

The RALs are the target concentrations of bioaccessible arsenic and TEQ dioxins that will be achieved by the removal action, to allow appropriate site land use. A bioaccessible arsenic RAL of less than or equal to 23 mg/kg and a TEQ dioxin RAL of 240 ng/kg are recommended for the site. Soils exceeding these RALs (Category C and D) require remediation. Considering the planned unrestricted (residential) land use at the subject property, all Category C and D soils will be addressed.

4.2 REMOVAL ACTION ALTERNATIVES CONSIDERED

Based on the above-stated RAOs and RALs, Integral presented the removal alternatives listed below. Since leaching of site contaminants and impact to groundwater do not represent a significant site risk, the alternatives considered consist of proven methods for eliminating human direct contact risk and terrestrial ecological risk.

1. No action (does not meet RAOs; included for comparative baseline only)

2a. On-island landfill disposal

2b. Mainland landfill disposal

3a. Soil cap

3b. Concrete cap.

Each alternative was evaluated against the following three performance criteria: effectiveness, implementability, and cost. Based on thoughtful comparison of the remedial alternatives, Alternative 2a (on-island landfill disposal), which provides the best balance of the three criteria, was selected by HDOH as the approved removal action alternative (Integral and ACSI 2014). This remedy results in a clean site, with no loss of land use, no need to manage long-term O&M, and no potential community stigma of having a closed contaminated site in the neighborhood.

4.3 REMOVAL ACTION TASKS

4.3.1 Site Preparation

Preparatory work to facilitate remedy implementation will include the following activities: 1) clearing of vegetation and fencing; 2) installation of a construction access road; 3) removal of one large banyan tree, and 4) disassembly and removal of four steel ASTs. Vegetation within the impacted area consists of dense shrubs and trees. To facilitate survey work and the delineation of cap extent, grubbing work will bring vegetation to ground level. Existing fencing surrounding the impacted area and ranch fencing along the northern perimeter of the site will be removed to provide vehicle access from Kumakua Street. Silt fencing will be installed along property boundaries to prevent cross-property migration of contaminated soil.

No road exists to enable heavy-duty vehicles, necessary for remedy construction and trucking of soil to the landfill, to access the site. A planned (temporary) gravel access road is shown on engineering drawings in the County of Hawaii grading permit package (Appendix D). Integrated within the western (upper) CRM wall, as depicted in Figure 4, is a large banyan tree. Aboveground vegetation and root systems of the banyan tree must be removed prior to implementing the recommended remedy. West of the CRM wall are four ASTs. The two vertical tanks are approximately 10 ft in height and 8 ft in diameter, and the two horizontal tanks are approximately 20 ft long and 6 ft in diameter. All of the ASTs are empty and rinsate testing (Weston 2011) indicated that residual contents are nonhazardous. Prior to implementing the recommended remedy, each tank will be disassembled and either recycled or disposed of in accordance with state and federal requirements.

During the preconstruction site survey, conducted to support the County grading permit package (Appendix D), the planned excavation limits were staked to facilitate soil excavation.

Upon initial contractor mobilization, the site will be cleared of heavy vegetation, an 8 ft dust fence will be installed around the site perimeter, and silt fencing will be constructed along downslope perimeters to control storm water and sediment runoff.

4.3.2 Soil Excavation and Disposal

Soil within the decision units containing arsenic and TEQ dioxins exceeding RALs will be excavated and loaded into dump trucks for transport and disposal at the West Hawaii Landfill. The depth of initial soil excavation will be based on prior sampling and analysis (see estimated soil contamination depths on Figure 9 and Table 4). A portable X-ray fluorescence (XRF) instrument, capable of measuring total arsenic levels, will be used to confirm that soil excavation depths are adequate. Since arsenic and dioxin are generally collocated, removal of arsenic will be a proxy for removal of both arsenic and dioxin (subject to confirmation sampling and analysis as described below).

During soil excavation and truck loading, water spray will be used as necessary to prevent the generation of dust, consistent with the dust control program (Appendix B). A health and safety manager will be on-site during all soil handling periods to ensure compliance with the project-specific health and safety plan (Appendix A) and to monitor the effectiveness of dust control measures. Soils will be transported from the site to the landfill by a licensed trucking firm in dump trucks with tarp covers to prevent soil release during transport. After loading a truck with soil, the tires will be spray-washed with water on a gravel pad, to remove any contaminated soils prior to the truck departing the site. Soil will be dumped at the landfill under the direction of Waste Management Inc. personnel, and truck beds will be washed and/or tarped prior to returning to the site for reloading.

Rock and cement from the existing retaining walls, and roots associated with the banyan tree and other vegetation, are anticipated to be encountered during excavation work. This larger debris material will either be managed as waste material and landfill disposed, or will be water washed to visibly clean and left on site.

4.3.3 Site Restoration

Upon attainment of the RALs, as demonstrated by post-excavation sampling and analysis, the excavation will be backfilled with clean soil and graded to conform with the surrounding topography. Two options are available for procuring clean backfill soils. The first is a borrow area on the HICDC property east of the project site (sampling area shown on Figure 2). Alternatively, clean soils immediately west of the soil excavation area (including soils within DU-11) may be used for fill or final grading. Prior to using soils from DU-11 for fill or grading, a multi-increment sample from below 6 in. depth will be collected to ensure soils are clean. Once placed and compacted, soils will be re-vegetated with grasses to prevent soil erosion and allow for future use.

5 QUALITY ASSURANCE PROCEDURES

This section provides further details on the post-excavation sampling and analysis program, designed to demonstrate the attainment of soil RALs.

5.1 POST-EXCAVATION CONFIRMATORY SOIL SAMPLING ACTIVITIES

After the initial soil excavation has been conducted in accordance with the excavation plan (Figure 9),) and as further required by real-time XRF analysis for arsenic, a comprehensive post-excavation soil sampling and analysis program will be conducted. This will consist of multi-increment sampling of soils on the excavation bottom, in accordance with the sampling design. As previously discussed, the initial excavation depths were defined by sampling and analysis of investigation decision units. Excavation depths of 1, 2, and 3 ft are assigned to various decision unit areas. A post-excavation sampling program will respect the areas of various sampling depths; however, to improve sampling efficiency, a new layout of decision units is recommended. These post-excavation sampling decision units are shown on Figure 10, labeled PE-1 through PE-5 (PE for "post-excavation"). PE-5 is designed to sample the western area, where excavation will extend to 1 ft in depth. PE-1 and PE-4 are designed to sample soil where excavation will extend to 2 ft in depth. PE-2 and PE-3 are designed to sample the area where excavation will extend to 3 ft in depth.

Within each decision unit, a multi-increment sample consisting of at least 30 sample increments will be collected in a stratified random manner from the upper 6 inches of exposed soil. One of the five decision units will be multi-increment sampled in triplicate to provide information on sampling and analysis variance. Samples will be collected with a coring device or collected in a core shape. Multi-increment sampling will be performed in accordance with Section 3, 4 and 5 of the HDOH Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan (HDOH 2009).

Upon receipt of laboratory results, each decision unit will be evaluated for attainment of RALs. If the concentrations are below the RALs, the decision unit will be deemed clean. If the decision unit has concentrations above the RALs, then an additional 1 ft of soil will be excavated and the decision unit will be resampled for another evaluation of RAL attainment. Once the RALs have been attained for all decision units, backfilling and grading with clean soil fill and revegetation will be conducted.

5.2 LABORATORY ANALYTICAL PROCEDURES

Samples will be analyzed for the primary chemicals of concern (arsenic and dioxins/furans) as well as other compounds reported during the investigation phase at concentrations above Tier 1 EALs. The following list shows the compounds to be tested and associated laboratory methods.

- Total arsenic and lead (EPA methods 3050B/6010 or 6020)
- Total mercury (EPA method 7471B)
- Bioaccessible arsenic (Solubility Bioaccessibility Research Consortium [SBRC] gastric *in vitro* test)
- Dioxins/furans (EPA method 8290)
- Pentachlorophenol and PAHs (EPA method 8270).

All sample data received from the commercial analytical laboratory will be validated using Stage 2A (USEPA 2009) data validation methods, including a review of sample quality control, detection limit data, and sample documentation. The review does not include calibration or performance-check data.

5.3 RECORD KEEPING

5.3.1 Field Notes

A dedicated field notebook will be used during sampling. At a minimum, the following information will be recorded during the collection of each sample:

- Sampling location and description
- Name(s) of sampling personnel
- Date and time of collection
- Designation of samples as composite, incremental, or grab
- Type of equipment used
- Field instrument readings and calibration
- Field observations and details related to the analysis or integrity of the sample
- Preliminary sample description
- Sample preservation method
- Sample identification number and any other explanatory codes used
- Shipping arrangements

- Name of the recipient laboratory.

In addition to sampling information, the following will be recorded in the field notebook:

- Team members
- Time of arrival and entry
- Other personnel on-site
- A summary of meetings or discussions with contractors or agency personnel
- Deviations from the sampling plan
- Changes in personnel
- Dust monitoring observations and mitigation actions taken to control dust.

5.3.2 Photographs

Photographs will be taken at representative sampling locations and other areas of interest at the site or sampling area, which will serve to verify information entered in the field notebook. Photographs will be date-stamped and a brief description of each one will be recorded in a dedicated field notebook, along with the name of the person taking the photograph.

5.4 CHAIN OF CUSTODY AND TRANSPORTATION

A chain-of-custody form will be used to document sample collection and shipment to the laboratory for analysis. The chain of custody will identify the contents of each shipment and maintain the custodial integrity of the samples. Until the samples are shipped, the custody of the samples will be the responsibility of Integral. Identification of all equipment rinsate, environmental samples, field blanks, and duplicates will be documented on this form.

5.5 SAMPLE IDENTIFICATION

All samples will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Each sample will have a preassigned, descriptive, unique identification number. Each sample container will be labeled to include the sample identification, date and time of collection, sampler(s), analytical parameters, preservation method, and sample matrix.

Samples will be identified with the appropriate decision unit name, with a letter indicating initial and subsequent sampling from that decision unit. For example, initial samples from a decision unit might be PE-1A. If that decision unit requires additional excavation and another confirmation sample, the second sample would be PE-1B, and so forth until the RALs are

attained. For the decision unit selected for triplicate sampling, the sample identification numbers will contain extra numbers (1, 2, and 3); for example, in DU PE-1 during the first post-excavation sampling round, the sample identification numbers would be PE-1A1, PE-1A2, and PE-1A3.

5.6 FIELD EQUIPMENT

Hand tools will be utilized to collect soil samples. The following equipment and supplies are applicable to all sample collection efforts:

- Personal protective equipment (PPE)
- Auger
- Hand trowels
- Stainless steel bowl
- Stainless steel spoons
- Digging bar/pick/shovel
- Brush (for decontamination)
- Basin (for decontamination)
- Spray bottles (for decontamination)
- Nonphosphate detergent
- Distilled water
- Resealable plastic bags
- Equipment bags and plastic sheeting
- Pin flags.

5.7 DECONTAMINATION PROCEDURES

Decontamination of sampling equipment will be conducted consistently to assure the quality of the samples collected. All reusable field tools and equipment will be cleaned and decontaminated with a nonphosphate detergent (such as Alconox) and triple-rinsed with distilled water between sample collection efforts at each decision unit. Tools and equipment will not be cleaned between multi-increment sampling increments, but will be cleaned before proceeding to the next multi-increment sample. Cleaned small equipment will be stored in plastic bags, whereas large equipment will be stored on plastic sheeting. Materials to be stored

more than a few hours will also be covered. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal.

5.8 DISPOSAL OF RESIDUAL MATERIAL

In the process of collecting environmental samples, the sampling team will generate potentially contaminated solid waste, including used PPE and disposable sampling equipment. Such waste will be bagged and thrown away with regular trash, as it is not considered hazardous and can be sent to the municipal landfill.

Decontamination fluids that will be generated in the sampling event will consist of deionized water, residual contaminants, and water with nonphosphate detergent. The volume and concentration of the decontamination fluid will be sufficiently low to allow for disposal at the site or sampling area. The water (and water with detergent) will be poured onto the ground.

6 SCHEDULE

An approximate schedule is provided below.

Activity	Duration
Site preparation activities	1 week
Soil excavation and disposal	2 weeks
Confirmation sampling and analysis	3 weeks
Site restoration	1 week

7 REFERENCES

Brattin, W., J. Drexler, Y. Lowney, S. Griffin, G. Diamond, and L. Woodbury. 2013. An *in vitro* method for estimation of arsenic relative bioavailability in soil. *J. Toxicol. Environ. Health*. 76(7):458–478.

Drexler, J.W., and W.J. Brattin. 2007. An *in vitro* procedure for estimation of lead bioavailability: With validation. *Hum. Ecol. Risk Assess.* 13:383–401.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online rainfall atlas of Hawai'i. *Bull. Amer. Meteor. Soc.* 94:313-316, doi: 10.1175/BAMS-D-11-00228.1.

HDOH. 2009. Technical guidance manual for the implementation of the Hawaii state contingency plan, interim final. Hawaii Department of Health, Office of Hazard Evaluation and Emergency Response. November 12, 2009, and as updated online. http://www.hawaiidoh.org/tgm.aspx.

HDOH. 2010. Update to soil action levels for TEQ dioxins and recommended soil management practices. EHA/HEER Office memo 2010-389-RB. June. Hawaii Department of Health.

HDOH. 2011. Screening for environmental hazards at sites with contaminated soil and groundwater, fall 2011 updates. Revised January 2012. Hawaii Department of Health, Environmental Management Division.

HDOH. 2012a. Tier 1 environmental action levels Surfer. Hawaii Department of Health, Environmental Management Division. January. http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/environmental-hazard-evaluation-and-environmental-action-levels.

HDOH. 2012b. Update to soil action levels for inorganic arsenic and recommended soil management practices. EHA/HEER Office memo 2011-690-RB. September. Hawaii Department of Health.

Integral and ACSI. 2014. Final removal action report, former Kohala Sugar Company pesticide mixing site. April. Integral Consulting Inc., Louisville, CO, and Advanced Compliance Solutions, Inc., Honolulu, HI.

Mink, J.F., and L.S. Lau. 1993. Aquifer identification and classification for the island of Hawaii: Groundwater protection strategy for Hawaii. Technical report no. 191. May. University of Hawaii Water Resources Research Center, Honolulu, HI.

NRCS. 2015. Soil survey. U.S. Department of Agriculture, Natural Resources Conservation Services. http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/

USEPA. 2005. Ecological soil screening levels for arsenic, interim final. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-62, March 2005.

USEPA. 2009. Guidance for labeling externally validated laboratory analytical data for superfund use. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

USGS. 2002. Reassessment of groundwater recharge and simulated groundwater availability for the Hawi area of North Kohala, Hawaii. Water Resources Investigations report no. 02-4006, D.S. Oki. U.S. Geological Survey, Honolulu, HI.

Weston. 2011. Phase I/II investigation targeted brownfields assessment, Kohala Sugar Plantation, pesticide mixing site, Kohala, Hawaii. Prepared for U.S. Environmental Protection Agency, Region 9. April. Weston Solutions, Inc., Honolulu, HI.

WRCC. 2015. Western Regional Climate Center, Desert Research Center. Online at: www.wrcc.dri.edu

FIGURES

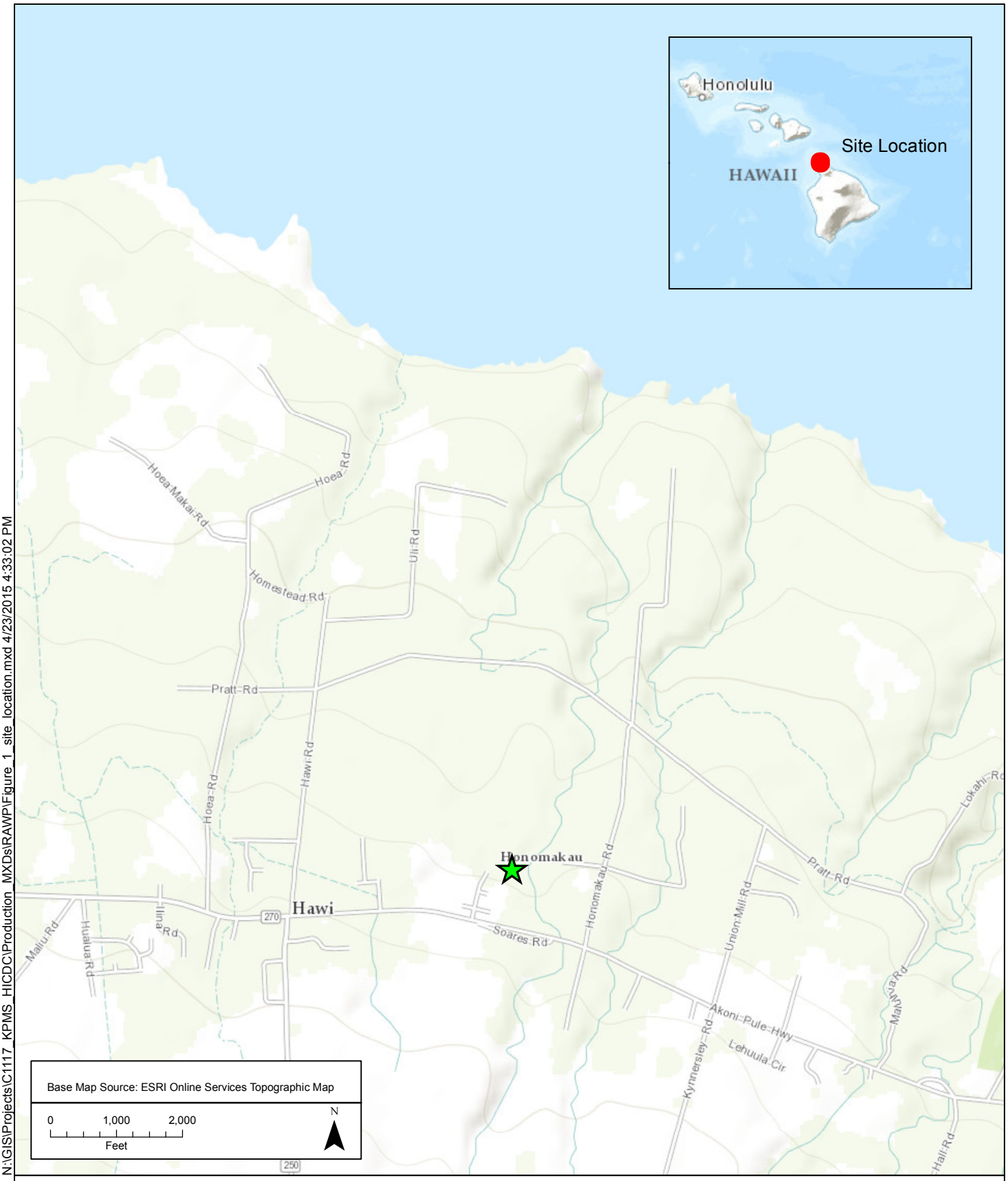

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Figure 1.
Site Location
Former Kohala Sugar Company Pesticide Mixing Site

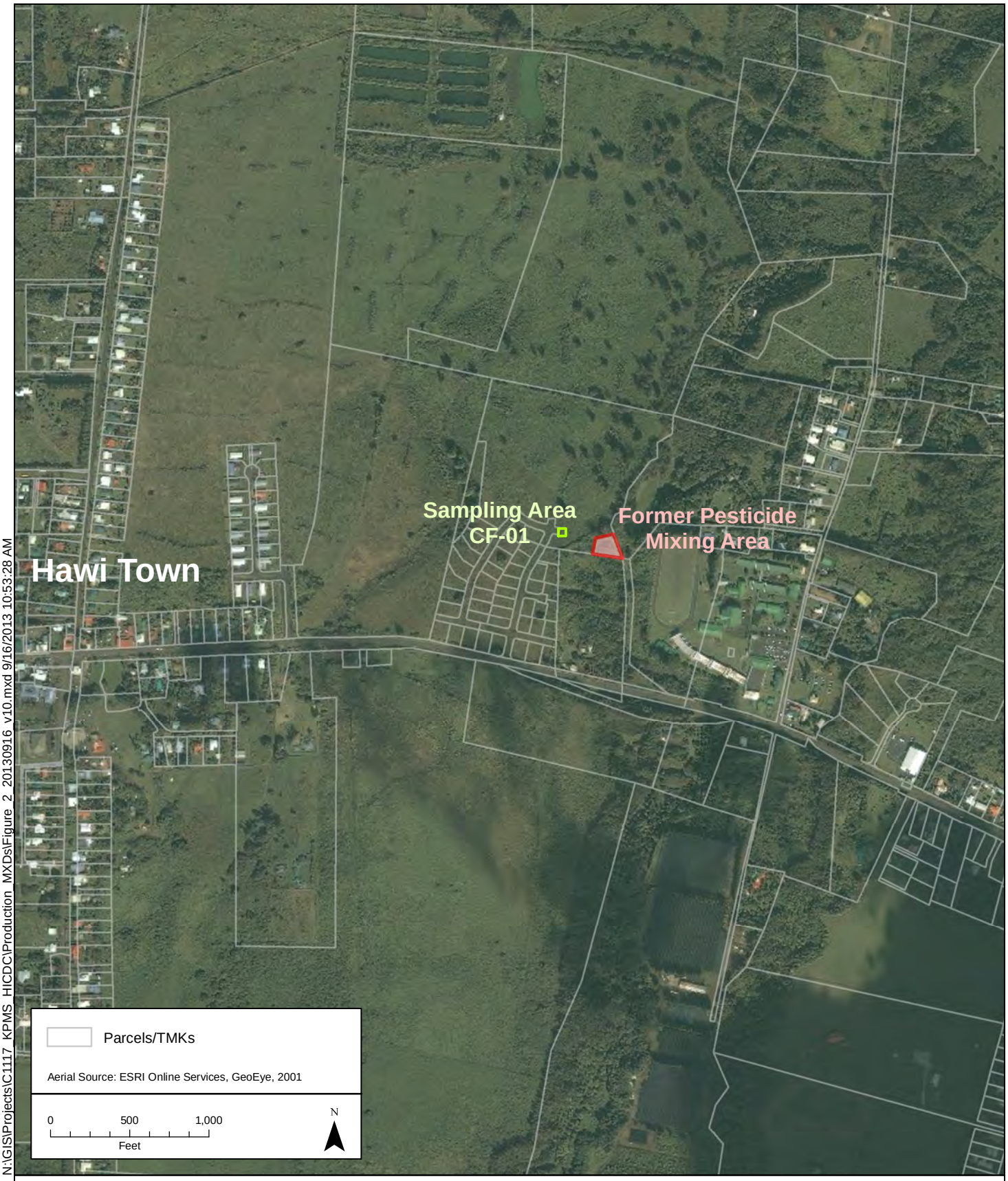

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Figure 2.
Site Vicinity and Property Boundaries
Former Kohala Sugar Company Pesticide Mixing Site

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Figure 3.
Site and Neighboring Properties
Former Kohala Sugar Company Pesticide Mixing Site

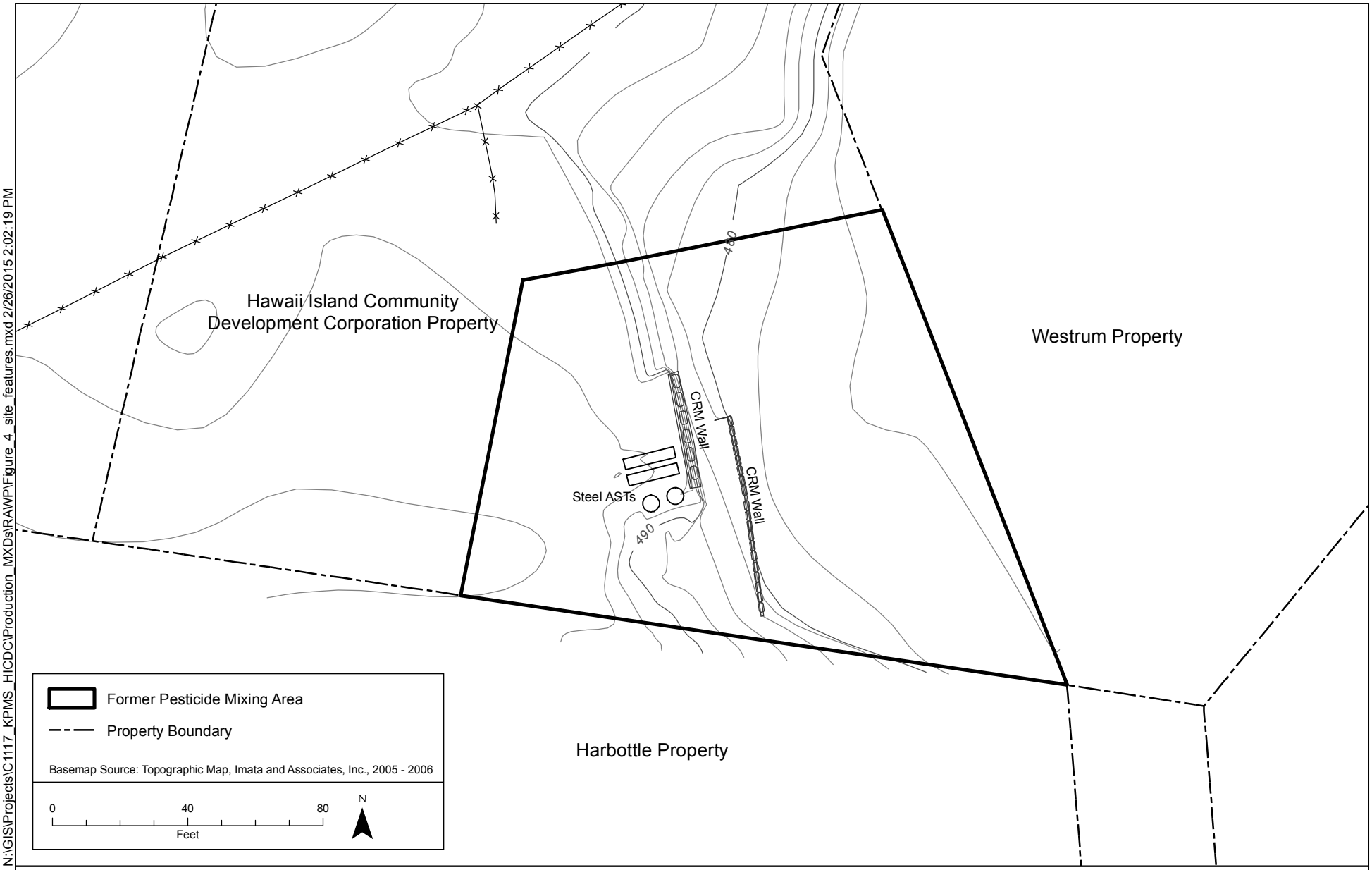

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Figure 4.
Site Features
Former Kohala Sugar Company Pesticide Mixing Site

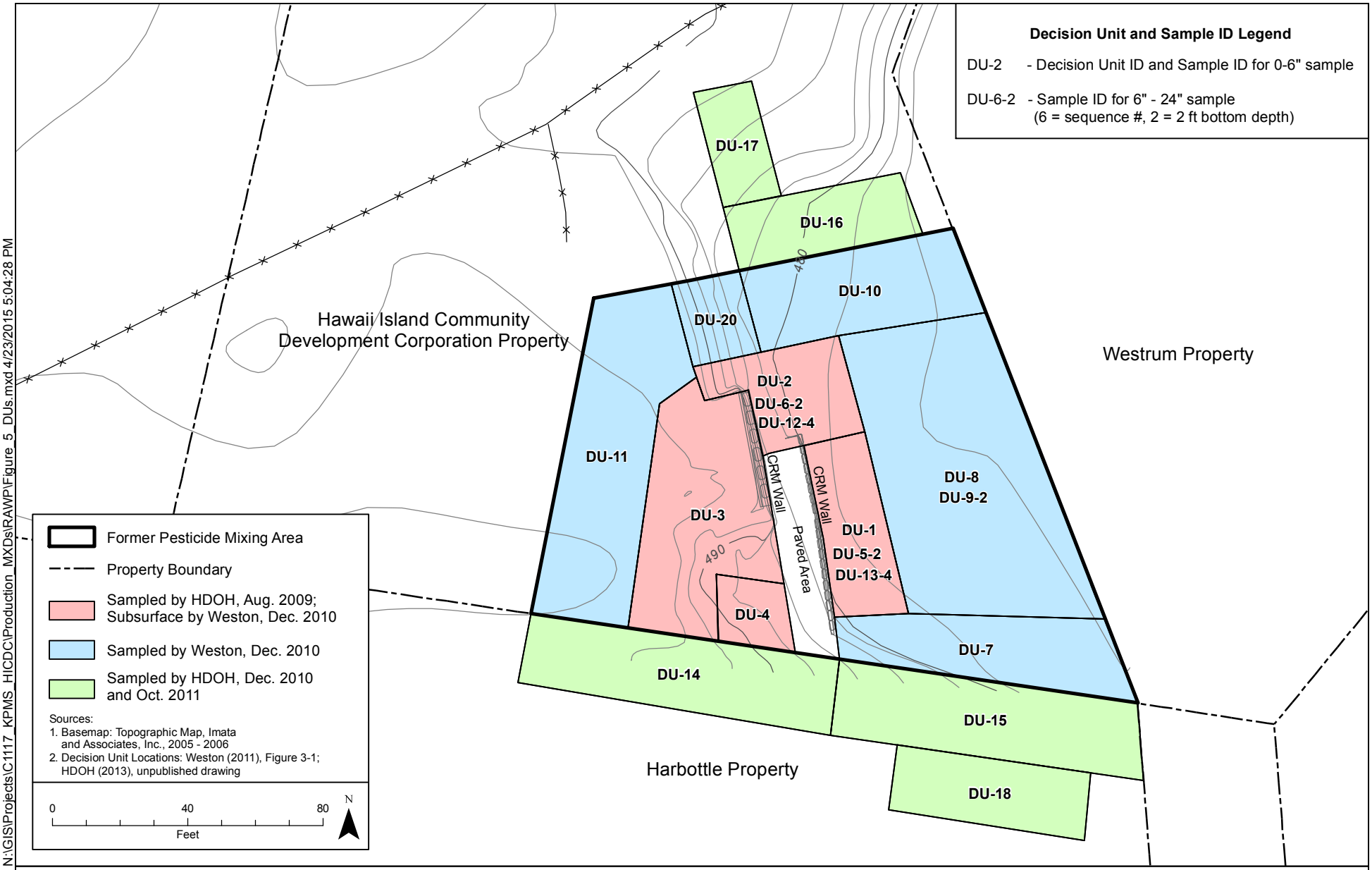

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Figure 5.
Investigation Decision Units and Sample Identification
Former Kohala Sugar Company Pesticide Mixing Plant

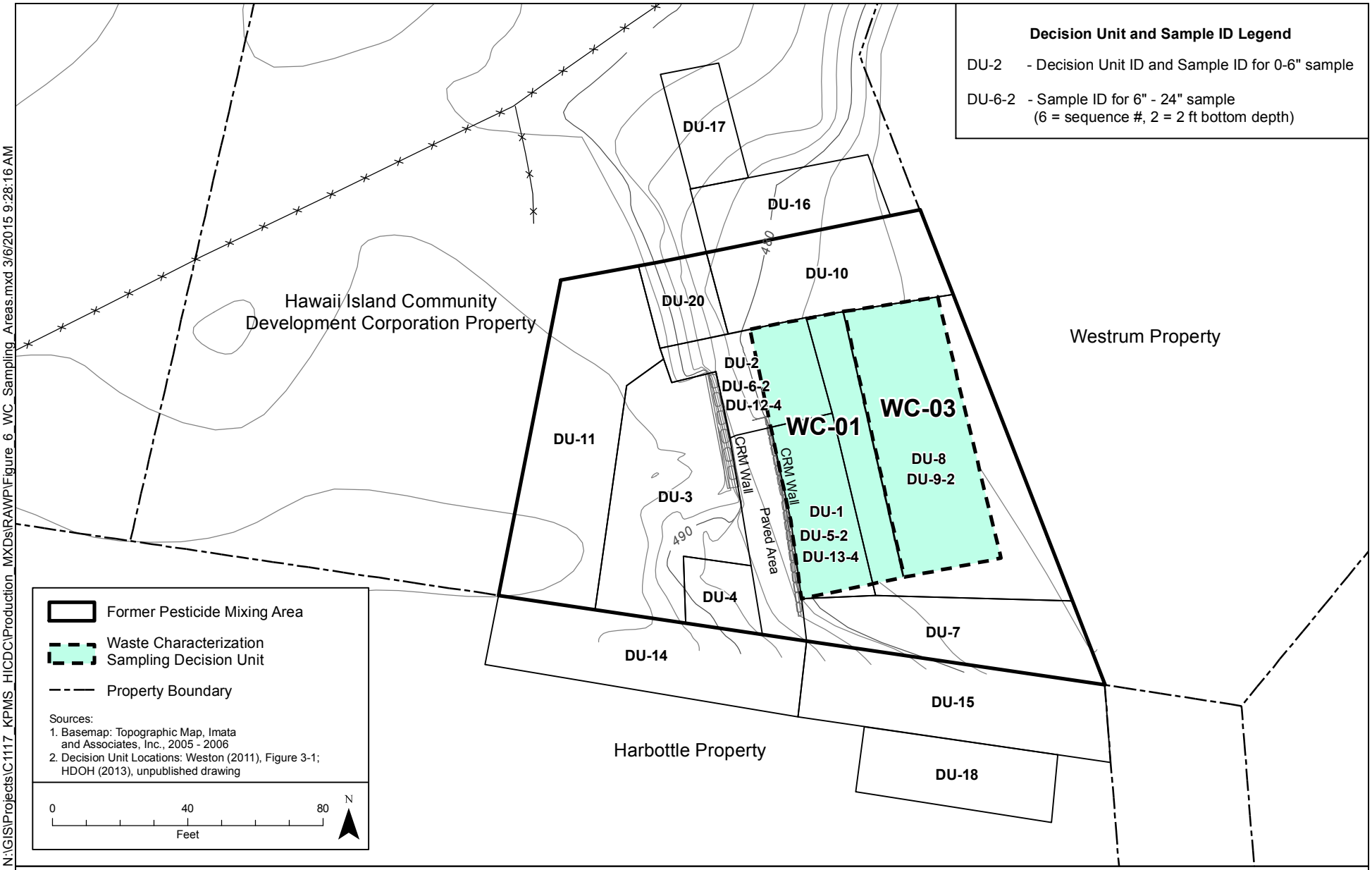

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Figure 6.
Waste Characterization Sampling Areas
Former Kohala Sugar Company Pesticide Mixing Plant

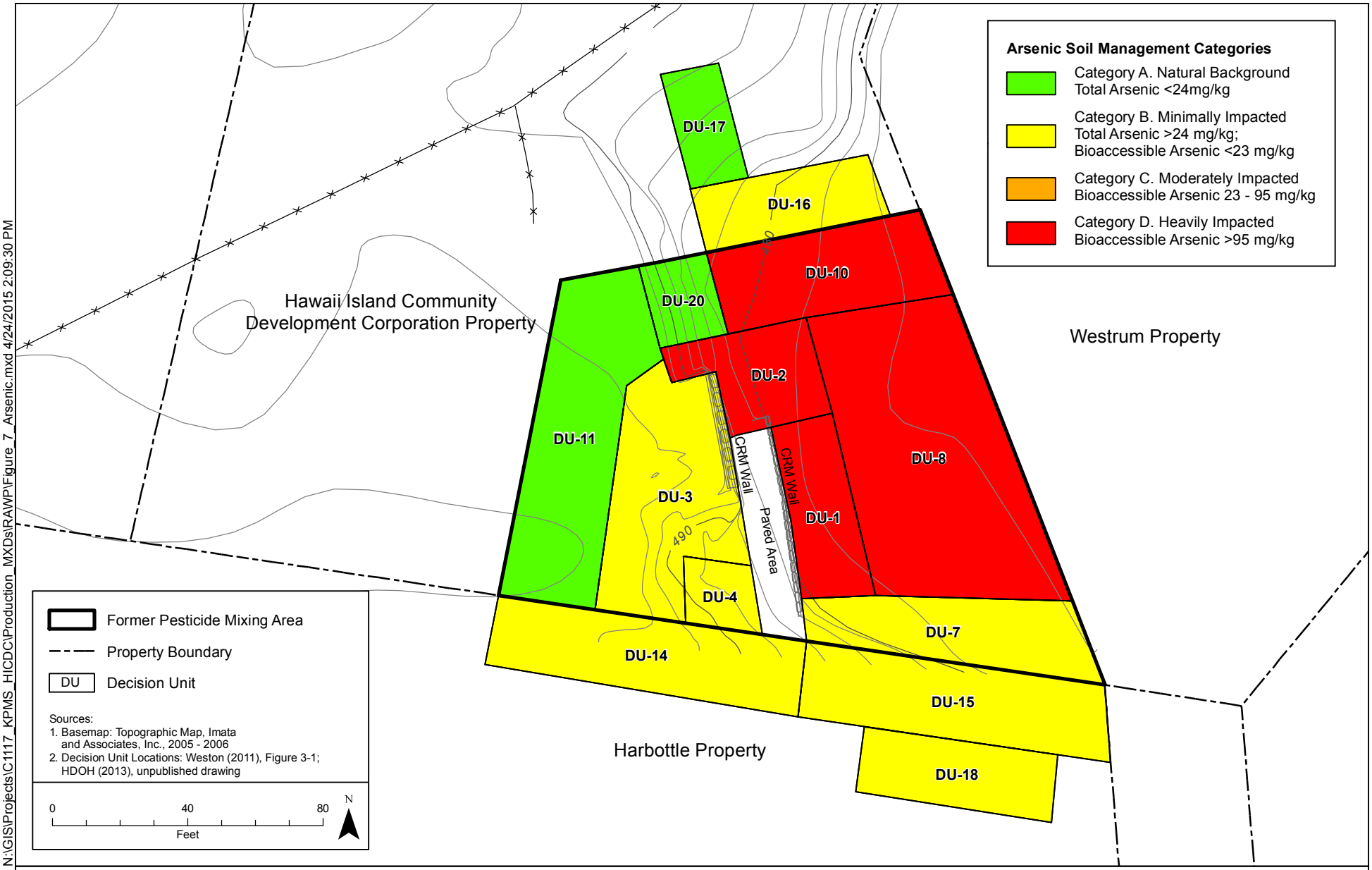

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Figure 7.
Environmental Hazard Map
Arsenic in Surface Soils (0-6 in. bgs)
Former Kohala Sugar Company Pesticide Mixing Plant

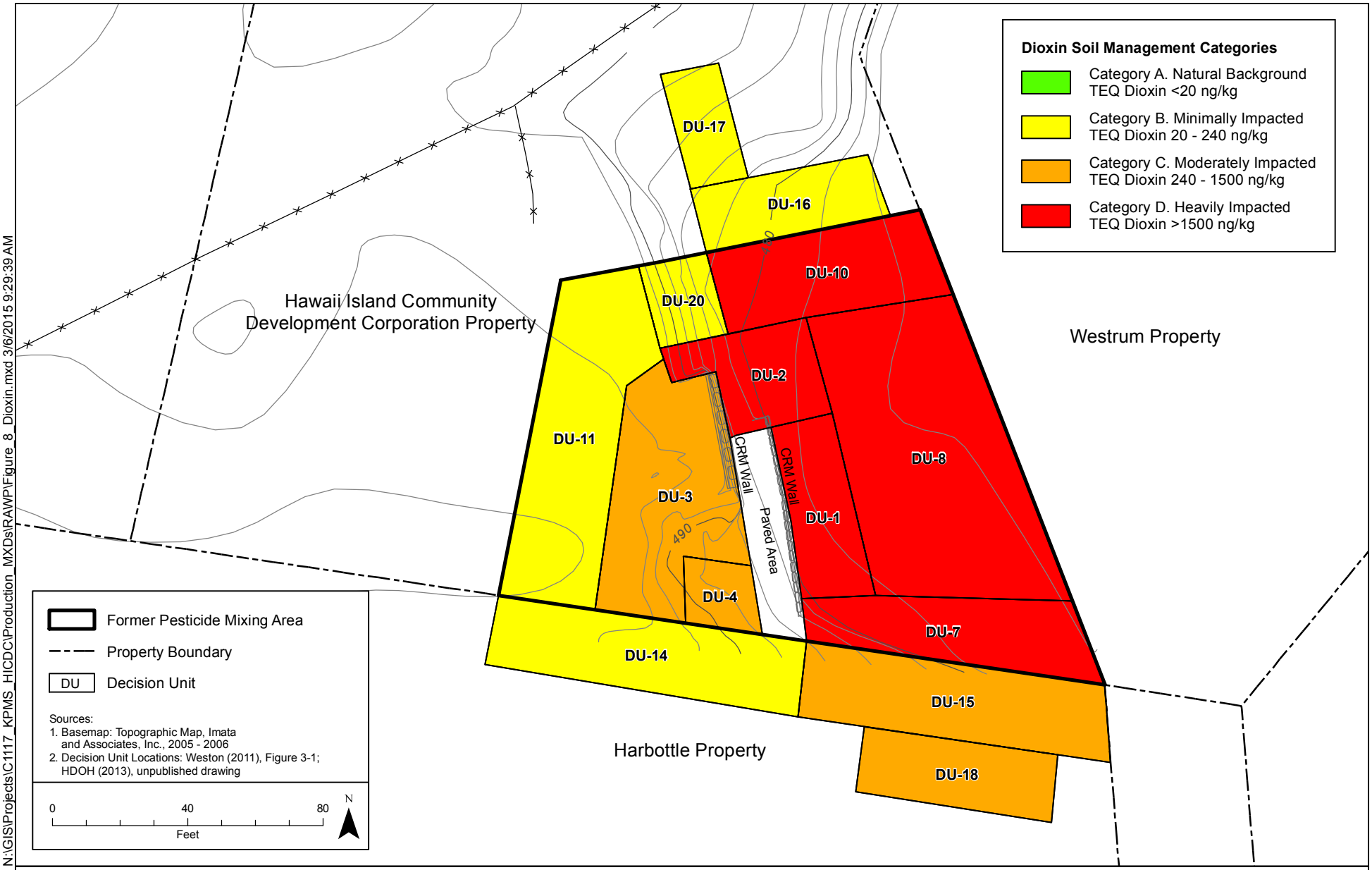

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Figure 8.
Environmental Hazard Map
Dioxin in Surface Soils (0-6 in. bgs)
Former Kohala Sugar Company Pesticide Mixing Plant

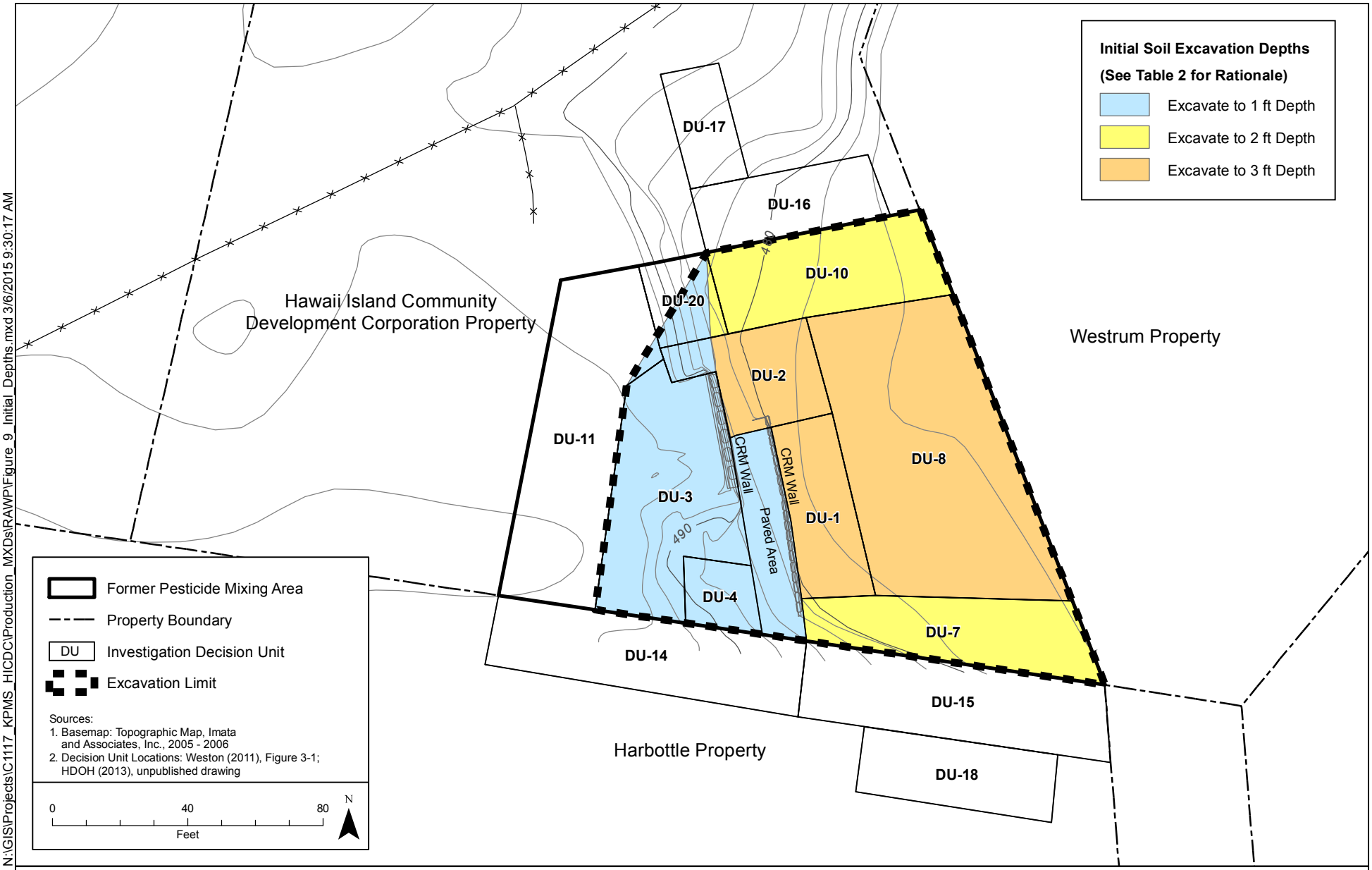

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Figure 9.
Initial Soil Excavation Depths
Former Kohala Sugar Company Pesticide Mixing Plant

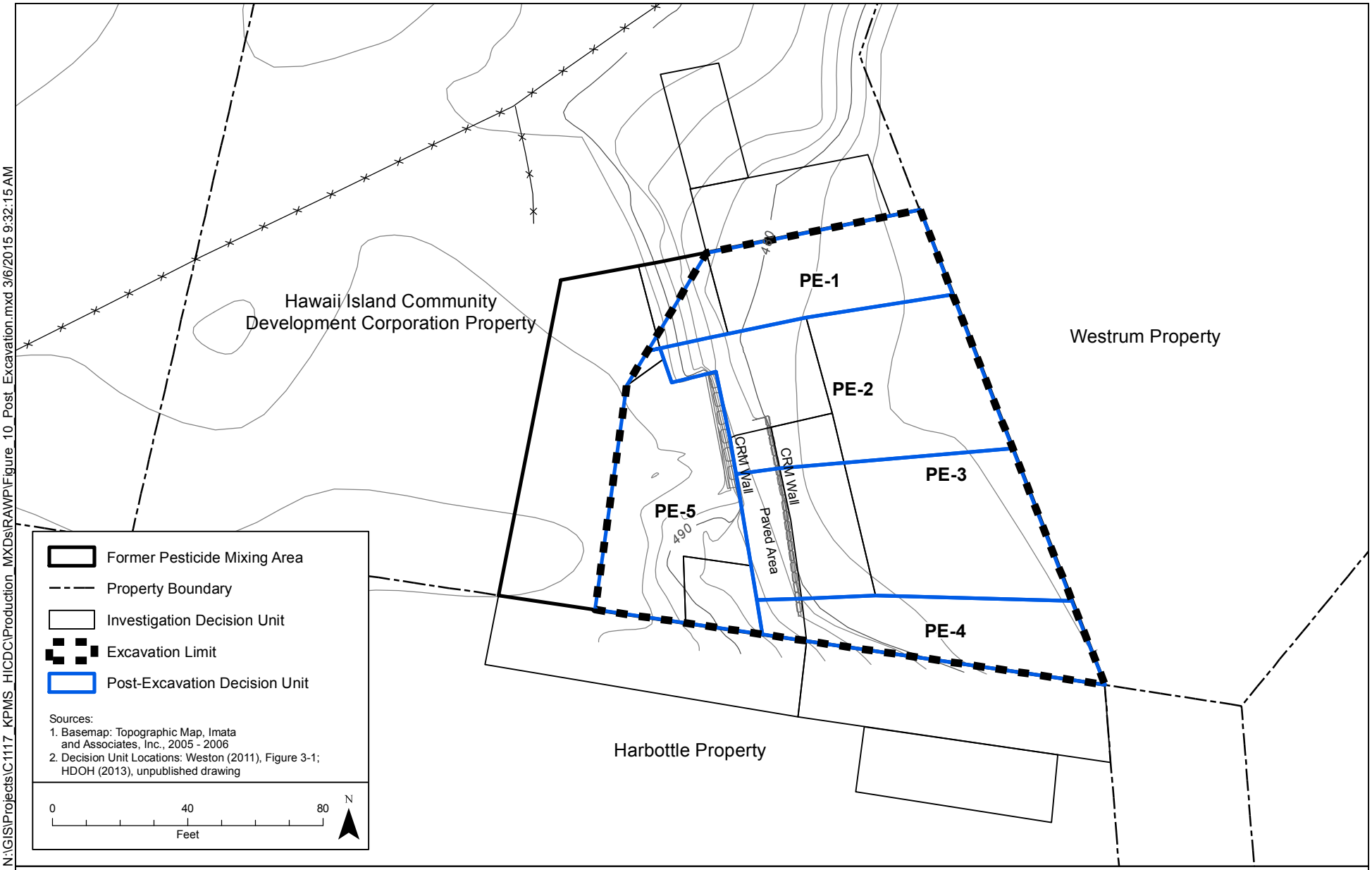

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Figure 10.
Preliminary Post-Excavation Sampling
Decision Unit Layout
Former Kohala Sugar Company Pesticide Mixing Plant

TABLES

Table 1. Surface and Subsurface Soil Sampling Results and Environmental Hazard Screening

	Environmental Action Levels [a]																			
	Soil Environmental Hazards																			
Sample ID:							KPMA-DU-1	KPMA-DU-2	KPMA-DU-3	KPMA-DU-4 [b]	KPMA-DU-5 [b]	KPMA-DU-6 [b]	DU-5-2	DU-6-2	DU-07	DU-8 [c]	DU-9-2	DU-10	DU-11	DU-12-4
Decision Unit ID:							DU-1	DU-2	DU-3	DU-4	DU-4	DU-4	DU-1	DU-2	DU-7	DU-8	DU-8	DU-10	DU-11	DU-2
Sample Depth:							0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	6"-24"	6"-24"	0"-6"	0"-6"	6"-24"	0"-6"	0"-6"	24"-48"
Sampled By:							HDOH	HDOH	HDOH	HDOH	HDOH	HDOH	WESTON	WESTON	WESTON	WESTON	WESTON	WESTON	WESTON	WESTON
Compounds	Direct Exposure	Vapor Emissions To Indoor Air	Terrestrial Ecotoxicity	Gross Contamination	Leaching	Background	Sample Date: 8/17/09	8/17/09	8/17/09	8/17/09	8/17/09	8/17/09	12/14/10	12/14/10	12/13/10	12/13/10	12/14/10	12/14/10	12/15/10	12/15/10
Dioxins-Furans (ng/kg)																				
TEQ dioxins-furans [f]	240	nonvolatile	site-specific	1E+09	180,000	240	**11,000**	**7,100**	**250**	**660**	**610**	**900**	**420**	**1,000**	**4,700**	**4,700**	**1,400**	**1,800**	63	230
Metals (mg/kg)																				
Arsenic, total (<2 mm fraction)	23	nonvolatile	site-specific	1,000	use batch test	24	821	788	24	28	34	25	306	368	66.9	2,030	489	714	15.2	35.6
Arsenic, bioaccessible[g] (<0.25 mm fraction)	23	NA	NA	NA	NA	NA	**234**	**197**	NA	NA	ND	NA	**54.7**	**59.9**	8.6	**519**	**98.9**	**176**	NA	3.6
Lead	200	nonvolatile	site-specific	1,000	use batch test	73	**210**	64	25	109	135	120	20.1	66	14	89.8	12.4	43.9	18.4	11.5
Mercury	4.7	use soil gas	site-specific	500	use batch test	0.72	**14.2**	**8.0**	0.31	0.44	0.47	0.42	0.56	1.21	0.57	**6.92**	0.53	1.6	0.42	0.78
Semivolatile organic compounds (µg/kg)																				
Benzo[*a*]pyrene	150	nonvolatile	site-specific	500,000	5,700	NA	ND	ND	**295**	**998**	**3,220**	**1,810**	4.6 J	ND	36 J	41 J	3.1 J	**150**	15 J	ND
Benzo[*a*]anthracene	1,500	nonvolatile	site-specific	500,000	10,000	NA	202	ND	199	1,050	**3,240**	**1,890**	3.5 J	ND	23 J	41 J	ND	150	13 J	ND
Benzo[*b*]fluoranthene	1,500	nonvolatile	site-specific	500,000	9,200	NA	366	202	558	**1,960**	**5,780**	**3,350**	8.3 J	23 J	63	95	7.3 J	260	27 J	7.6 J
Dibenzo[*a,h*]anthracene	150	nonvolatile	site-specific	500,000	12,000	NA	91	ND	89	**172**	**548**	**293**	ND	ND	7.7 J	13 J	ND	27 J	ND	ND
Indeno[*1,2,3-cd*]pyrene	1,500	nonvolatile	site-specific	500,000	30,000	NA	161	109	193	546	**1,750**	966	3.6 J	ND	34 J	39 J	4 J	93	10 J	739 J
Pentachlorophenol	890	nonvolatile	site-specific	500,000	820	NA	**3,470**	**3,520**	250	725	554	**1,760**	0.5	1.37	0.31 J	3.02	4.48	0.57	0.22 J	0.30 J

Table 1. Surface and Subsurface Soil Sampling Results and Environmental Hazard Screening

	Environmental Action Levels [a]																	
	Soil Environmental Hazards						Sample ID:	DU-13-4	DU-14	DU-15 [d]	DU-16 [d]	DU-17 [d]	DU-18 [c]	DU-19 [c]	DU-20	KSPMA2-DU-1 [e]	KSPMA2-DU-2 [e]	KSPMA2-DU-3 [e]
							Decision Unit ID:	DU-1	DU-14	DU-15	DU-15	DU-15	DU-8	DU-8	DU-20	DU-16	DU-17	DU-18
							Sample Depth:	24"-48"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"	0"-6"
							Sampled By:	WESTON	HDOH	HDOH	HDOH	HDOH	WESTON	WESTON	WESTON	HDOH	HDOH	HDOH
Compounds	Direct Exposure	Vapor Emissions To Indoor Air	Terrestrial Ecotoxicity	Gross Contamination	Leaching	Background	Sample Date:	12/15/10	12/13/10	12/13/10	12/13/10	12/13/10	12/13/10	12/13/10	12/15/10	10/12/11	10/12/11	10/12/11
Dioxins-Furans (ng/kg)																		
TEQ dioxins-furans [f]	240	nonvolatile	site-specific	1E+09	180,000	240		150	80	220	**470**	280	**4,200**	**4,200**	55	130	50	**350**
Metals (mg/kg)																		
Arsenic, total (<2 mm fraction)	23	nonvolatile	site-specific	1,000	use batch test	24		80.5	24.6	73.5	151	115	1440	2440	8.6	32	11	35
Arsenic, bioaccessible[g] (<0.25 mm fraction)	23	NA	NA	NA	NA	NA		10.8	NA	NA	NA	NA	NA	**660**	NA	NA	NA	NA
Lead	200	nonvolatile	site-specific	1,000	use batch test	73		9.69	23.4	22	29	27.6	83.4	62.8	12.9	9.6	9.1	17
Mercury	4.7	use soil gas	site-specific	500	use batch test	0.72		0.85	0.63	0.73	1.06	1.08	2.96	3.03	0.43	0.27	0.39	0.62
Semivolatile organic compounds (µg/kg)																		
Benzo[*a*]pyrene	150	nonvolatile	site-specific	500,000	5,700	NA		6.6 J	**169**	16.9	72.5	23.5	52 J	130	10	ND	ND	ND
Benzo[*a*]anthracene	1,500	nonvolatile	site-specific	500,000	10,000	NA		6.5 J	94.8	13.7	49.4	17.9	44 J	110	9.2 J	ND	ND	ND
Benzo[*b*]fluoranthene	1,500	nonvolatile	site-specific	500,000	9,200	NA		13 J	272	29.4	112	45	120	250	25 J	ND	ND	ND
Dibenzo[*a,h*]anthracene	150	nonvolatile	site-specific	500,000	12,000	NA		ND	19.9	ND	10.8	ND	16 J	37 J	ND	ND	ND	ND
Indeno[*1,2,3-cd*]pyrene	1,500	nonvolatile	site-specific	500,000	30,000	NA		539 J	65.5	9.58	39.2	11.6	46 J	94	8.6 J	ND	ND	ND
Pentachlorophenol	890	nonvolatile	site-specific	500,000	820	NA		NA	NA	NA	NA	NA	4.81	1.87	0.21 J	ND	ND	130

Notes:

Table includes only compounds with one or more sample result exceeding HDOH Tier 1 EAL.

Screening color coding:

Exceeds direct contact EAL (bioaccessible arsenic screening in lieu of total arsenic)

Exceeds direct contact and leaching EALs

EAL = environmental action level

HDOH = Hawaii Department of Health

NA = not analyzed

ND = not detected at lab detection limit

J = estimated value; analyte detected but a concentration less than the quantitation limit.

[a] HDOH Environmental Action Levels for:
Land use: Unrestricted
Groundwater utility: Drinking water
Distance to nearest surface water body >150m

[b] Samples DU-4, DU-5 and DU-6 are triplicate multi-increment (MI) samples of surface soils (0"-6") from Decision Unit 4

[c] Samples DU-8, DU-18 and DU-19 are triplicate MI samples of surface soils (0"-6") from Decision Unit 8

[d] Samples DU-15, DU-16 and DU-17 are triplicate MI samples of surface soils (0"-6") from Decision Unit 16

[e] Sample IDs DU-16, DU-17 and DU-18 were used by Weston in December 2010, and again by HDOH in October 2011. The reader is cautioned to refer to sample ID, decision unit ID, and sample depth to avoid confusion.

[f] Dioxin and furan congeners are converted to toxic equivalency (TEQ) value of most toxic congener (2,3,7,8-TCDD); 1/2 detection limit value used for nondetect values.

[g] Bioaccessible arsenic measured using SBRC-gastric in vitro method.

Table 2. Waste Characterization Soil Sampling Results

Compound	Regulatory Limit	WC-01	WC-03
TCLP (mg/L)			
Arsenic	5.0	2.6	0.89
Barium	100	ND (0.01)	0.24
Cadmium	1.0	0.023	0.004
Chromium	5.0	0.035	0.0096
Lead	5.0	ND (0.03)	0.0049
Selenium	1.0	ND (0.10)	ND (0.05)
Silver	5.0	ND (0.05)	ND (0.02)
Mercury	0.2	ND (0.002)	ND (0.002)
Totals (mg/kg)			
Arsenic		3000	930

Notes:
ND (0.01) = compound not detected at reporting limit of 0.01 mg/L
TCLP = toxicity characteristic leaching procedure

Table 3. Clean Fill Soil Sampling Results

Compound	EAL [a]	Sample CF-01
Metals (mg/kg)		
Arsenic	24	20
Barium	1,000	60
Chromium	1,100	92
Lead	200	15
Mercury	4.7	0.55
Organochlorine Pesticides (µg/kg)		
gamma-BHC	37	1.6
Chlordane (technical)	16,000	5.9
Dioxins/Furans (ng/kg)		
TEQ dioxins	240	30 [b]

Notes:

Only detected compounds are shown.
EAL = environmental action level

[a] Tier 1 environmental action level (EAL) for soil where land use is unrestricted, groundwater is drinking water resource

[b] TEQ calculated assuming 1/2 detection limit for nondetect samples (see Table 2 for TEQ calculation)

Table 4. Soil Volumes Exceeding Environmental Action Levels

DU	Area (ft^2)	Depth (ft) [a]	Volume (ft^3)	Volume (CY)	Tons [b]
DU-01	1,050	3.0	3,150	117	187
DU-02	1,042	3.0	3,126	116	185
DU-03	2,363	1.0	2,363	88	140
DU-04	421	1.0	421	16	25
DU-07	1,573	2.0	3,146	117	186
DU-08	4,427	3.0	13,281	492	787
DU-10	1,654	2.0	3,308	123	196
Total	12,530	-	28,795	1,066	1,706
Total with 20% contingency (rounded) [c]			**35,000**	**1,300**	**2,000**

Notes:

CY = cubic yard

[a] Basis of interpreted depth of contamination

DU-01 Sample DU-5-2 (6-24") failed for dioxin and arsenic; sample DU-13-4 (24-48") passed

DU-02 Sample DU-6-2 (6-24") failed for dioxin and arsenic; sample DU-12-4 (24-48") passed

DU-03 Only a surface soil sample, but dioxin levels moderate, likely extend below 6"

DU-04 Only a surface soil sample, arsenic low but semivolatile organic compounds fairly high, likely extend below 6"

DU-07 Only a surface soil sample, dioxins high, expect deeper contamination

DU-08 Sample DU-9-2 (6-24") failed, no deeper sample but 6-24" sample levels heavily impacted; contamination expected to extend below 24"

DU-10 Only a surface soil sample, but dioxins and arsenic high, expect deeper contamination

[b] Calculation of tonnage assumes 1.6 tons per in-place CY

[c] Excavation depth may increase based on confirmation sampling and analysis

APPENDICES

APPENDIX A

SITE HEALTH AND SAFETY PLAN

[IN PREPARATION]

SITE HEALTH AND SAFETY PLAN

Former Kohala Sugar Company
Pesticide Mixing Site
North Kohala, Hawaii

Prepared for
Hawaii Island Community Development Corporation

Prepared by

integral consulting inc.
285 Century Place
Suite 190
Louisville, CO 80027

June 2015

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Attachment 2. Regulatory Notices
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State Right to Know Posters

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Heat Stress

Attachment 4. Material Safety Data Sheets
Alconox®

Attachment 5. Employee Exposure/Injury Incident Report

Attachment 6. Near-Miss Incident Report

ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
AST	above ground storage tank
CFR	Code of Federal Regulations
CHSM	Corporate Health and Safety Manager
CIH	certified industrial hygienist
CPR	cardiopulmonary resuscitation
CRM	concrete rubble masonry
CRZ	contamination reduction zone
EZ	exclusion zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDOH	Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response Office
HEPA	high-efficiency particulate air
HICDC	Hawaii Island Community Development Corporation
HIOSH	Hawaii Occupational Safety and Health Act
IDLH	immediately dangerous to life and health
Integral	Integral Consulting Inc.
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PID	photoionization detector
PPE	personal protective equipment
RALs	remedial action levels
RAR	removal action report
RAWP	removal action work plan
SHSP	site health and safety plan
SSO	site safety officer
STEL	short-term exposure limit

SVOCs	semivolatile organic compounds
SZ	support zone
TEQ	toxicity equivalence

SITE HEALTH AND SAFETY PLAN APPROVAL

This site health and safety plan has been reviewed and approved for operations to sample and oversee the removal of impacted soils at the former pesticide mixing site at the Former Kohala Sugar Company Pesticide Mixing Site, North Kohala, Hawaii.

_____ _____

Integral Project Manager Date

_____ _____

Integral Corporate Health and Safety Manager Date

SITE HEALTH AND SAFETY PLAN

This site health and safety plan (SHSP) has been prepared to cover activities related to the remediation of contaminated soil at the former North Kohala Sugar Company pesticide mixing site (site). The Hawaii Island Community Development Corporation (HICDC) is the site owner and is contracting Integral Consulting Inc. (Integral) to prepare project planning documents and to provide oversight during the remediation work. HICDC will contract with a construction firm (Contractor) to implement the work, in accordance with plans prepared by Integral.

The remedial construction Contractor will develop their own site-specific health and safety plan that is at least as stringent as this plan. This Integral SHSP does not address heavy equipment use and safety, traffic mitigation, tree and debris removal, or items related to construction and excavation activities. The remedial construction Contractor is responsible for developing their own plan that includes these and all other sections that are necessary to safely conduct all Contractor activities. The Integral SHSP is a minimum standard for the site and will be strictly enforced for all Integral personnel its subcontractors.

SITE HEALTH AND SAFETY PLAN ACKNOWLEDGMENT

All Integral employees, its subcontractors or consultants, are required to review and be familiar with the provisions of this SHSP, to ask any questions to ensure safe work, and to acknowledge same by signature below.

I have reviewed the SHSP prepared by Integral, dated May 1, 2015 for the Former Kohala Sugar Company fieldwork. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and guidelines while an employee of Integral, or its subcontractors or consultants. I have had an opportunity to ask questions regarding this plan, which have been answered satisfactorily by Integral.

Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date

SAFETY OBJECTIVES

1. The first and foremost priority during this project is to maintain a safe and healthy work environment.
2. Work will not be performed until every necessary safety precaution has been taken.
3. No project objectives will knowingly be allowed to put at risk human health and/or the environment.
4. All employees have both the right and responsibility to stop work if unsafe conditions are observed.

Integral and the HICDC's remedial construction Contractor and their respective subcontractors shall at all times conduct their activities with appropriate precautions to avoid bodily harm to persons or the risk of damage to any property or the environment.

1 INTRODUCTION

Remediation activities will be performed by the HICDC to address impacted soil at the former Kohala Sugar Company pesticide mixing site, North Kohala, Island of Hawaii. Work is being conducted pursuant to a voluntary agreement for remedial action between HICDC and the Hawaii Department of Health (HDOH) and the Hazard Evaluation and Emergency Response (HEER) Office, dated November 5, 2014. To complete remediation, it is necessary to remove soil that is impacted primarily with arsenic and dioxins/furans, as well as other chemical compounds.

This site health and safety plan (SHSP) provides general health and safety provisions to protect workers from potential hazards during field activities at the site. This SHSP has been prepared in accordance with applicable regulations of Hawaii Occupational Safety and Health (HIOSH) and the federal Occupational Safety and Health Administration (OSHA) safety regulations (29 CFR 1910 and 29 CFR 1926). HIOSH is the state equivalent of the federal government's Occupational Safety and Health Act, which is administered by OSHA.

Attachments to the SHSP provide an emergency route map from the site to the nearest hospital (Attachment 1), regulatory notices (Attachment 2), safety procedures (Attachment 3), material safety data sheets (Attachment 4), an employee exposure/injury incident report (Attachment 5), and a near-miss incident report (Attachment 6).

This SHSP has been prepared to identify potential site hazards to the extent possible based on information available to Integral. Integral cannot guarantee the health or safety of any person entering this site. Because of the potentially hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness at this site. The health and safety guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior evaluation by trained health and safety personnel.

A copy of this SHSP must be in the custody of the field crew during field activities. All individuals performing fieldwork must read, understand, and comply with this plan before undertaking field activities. Once the information has been read and understood, the individual must sign the Site Health and Safety Plan Acknowledgment form provided as part of this plan. The signed form will become part of the project file.

This plan may be modified at any time based on the judgment of the Integral site safety officer (SSO) in consultation with the project manager and Integral corporate health and safety manager (CHSM) or designee. Any modification will be presented to the onsite team during a safety briefing and will be recorded in the field logbook.

1.1 OBJECTIVES AND METHODS

The primary objective of remediation (also called a removal action) at the site is to remove contaminated soil so that the property is suitable for unrestricted land use, including residential development. The goals of the removal action are as follows:

1. Remediate soil at the site to allow for future unrestricted (residential) land use, by achieving bioaccessible arsenic and toxic equivalency (TEQ) dioxin soil concentrations, herein defined as removal action levels (RALs).
2. Prevent migration of contaminants to the air, surface or groundwater.
3. Minimize potential risk to human health or ecological receptors from exposure to arsenic- and dioxin-impacted soil, during and after the removal action.

To meet these objectives, field activities will include the following preparatory activities, to be performed by the Contractor or Subcontractor with oversight from Integral personnel:

- Clearing of vegetation and fencing.
- Installation of a construction access gravel road.
- Removal of one large banyan tree.
- Disassembly and removal of four steel above ground storage tanks (ASTs).
- Grubbing work to bring vegetation to ground level.
- Existing fencing surrounding the impacted area, and ranch fencing along the northern perimeter of the site, will be removed to provide vehicle access from Kumakua Street.
- Silt fencing will be installed along property boundaries to prevent cross-property migration of contaminated soil.
- Site work perimeters will be established, and soil loading and equipment decontamination areas will be constructed.

Once the preparatory activities are completed, soil will be excavated within established decision units (DUs) and loaded into dump trucks for transport and disposal at the West Hawaii Landfill.

After soils have been removed, a comprehensive post-excavation confirmation sampling and analysis program will be implemented by Integral staff. The sampling and analysis will consist of multi-increment sampling of soils on the excavation bottom, in accordance with the RAWP (Integral and ACSI 2015). If samples are determined to meet the RALs, then the excavation work will be deemed complete, and site restoration work will commence. If soils within certain confirmation decision units do not meet RALs, then further excavation and additional confirmation sampling will be undertaken – until RALs are achieved across the project site.

Additional details on the objectives and methods are presented in Section 5 of the RAWP (Integral and ACSI 2015).

1.2 ORGANIZATION

This SHSP covers two main field activities: oversight of preparatory activities, construction, and excavation; and post-excavation soil sampling. Chemical and physical hazard evaluations are presented in Sections 2 and 3, respectively. Specific health and safety guidelines associated with each task, including a brief description of the work, are discussed in Section 11 (Task-Specific Safety Procedures).

1.3 ROLES AND RESPONSIBILITIES

All Integral personnel, subcontractors, or consultants and visitors on this site must comply with the requirements of this SHSP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs.

1.3.1 Site Safety Officer

The SSO has full responsibility and authority to implement this SHSP and to verify compliance. The SSO reports to the project manager and is onsite or readily accessible to the site during all work operations. The SSO is responsible for assessing site conditions and directing and controlling emergency response activities. The specific responsibilities of the SSO include:

- Managing the safety and health functions on this site
- Serving as the onsite point of contact for safety and health concerns
- Assessing site conditions for unsafe acts and conditions and ensuring corrective action
- Ensuring that all Integral employees and subcontractors understand and follow the SHSP
- Ensuring that daily work schedules and tasks are reasonable for the required levels of effort and weather conditions
- Confirming local emergency response phone numbers and locations
- Conducting and documenting the initial and daily or periodic health and safety briefings
- Evaluating and modifying the level of protective apparel and safety equipment, based on site conditions
- Ensuring that the field team observes all necessary decontamination procedures.

If the SSO determines that site conditions are unsafe, he or she has the authority to suspend field operations until the problem is corrected. The SSO can modify SHSP procedures in the field. Any changes must be documented in the field logbook, and field staff must be immediately informed of the change. The project manager and Integral's CHSM must be notified by phone or email within 24 hours of any major changes to the SHSP.

1.3.2 Project Manager

The project manager has overall responsibility to ensure that personnel working onsite are safe. The specific responsibilities of the project manager include:

- Ensuring that the SHSP is developed prior to the field work or site visit
- Reviewing and approving the SHSP prior to the field work or site visit
- Ensuring employee understanding of and compliance with the SHSP.

1.3.3 Corporate Health and Safety Manager

The CHSM provides guidance to the project manager and SSO on SHSP preparation and reviews and approves the SHSP. The CHSM also serves as an arbitrator if there is a conflict between the project manager, SSO, and field personnel. In addition, the CHSM[1] conducts periodic unannounced audits of Integral field operations to ensure compliance with the SHSP.

1.3.4 Field Personnel

All Integral personnel and subcontractors on this site are responsible for reading and complying with this SHSP, using the proper personal protective equipment (PPE), reporting unsafe acts and conditions, and following the work and safety and health instructions of the project manager and SSO. All Integral personnel, subcontractors, or consultants can and are encouraged to suspend field operations if they feel conditions have become unsafe.

1.4 SITE DESCRIPTION

The site consists of approximately 0.5 acres of land that formerly housed pesticide mixing operations for the Kohala Sugar Company. The property was owned by the Kohala Company from 1971 to 1980, when it was purchased by the Hawaii Conference Foundation. The site is a portion of the 2-acre parcel (tax map key 03-5-5-019: 025) owned by HICDC, located 1.5 miles mauka of the Pacific Ocean coastline in the vicinity of the town of Hawi, North Kohala District, Hawaii. The site is surrounded by fallow, highly vegetated former plantation land and pasture land. Residential housing on HICDC land is located within 500 ft of the site to the southwest,

[1] The audit task may be delegated to an office health and safety representative by the CHSM.

and the Kohala Mission School is located to the east within several hundred feet. A chain-link fence has been installed around the former pesticide mixing area to prevent trespasser direct contact with site soils. Former facilities remaining on the site include two (upper and lower) concrete rubble masonry (CRM) retaining walls and four steel ASTs. A very large banyan tree is present at the center of the site, with roots grown into the CRM walls.

- **Owners/tenants:** HICDC acquired the property in 2006
- **Site history:** The site formerly housed pesticide mixing operations for the Kohala Sugar Company, which operated between 1863 and 1971.
- **Current site use:** Idle; once remediation is complete the property may be used for residential use.
- **Hazardous waste site:** No. Contaminated soils do not meet the definition of "hazardous waste" as defined by the Resource Conservation and Recovery Act (RCRA).
- **Industrial waste site:** Yes. Soil contamination is present above Hawaii Department of Health environmental action levels for unrestricted land use.
- **Topography (if applicable):** The regional topography slopes to the northwest toward the Pacific Ocean, approximately 1.3 miles north of the site. Site elevations range from approximately 496 ft above mean sea level (amsl) at the western boundary and drops sharply to approximately 476 ft amsl at the eastern boundary.
- **Site access:** A construction access road will be developed as part of the preparatory work.
- **Nearest drinking water/sanitary facilities:** None. Contractor shall supply temporary sanitation facilities (porta-potty and hand wash station).
- **Nearest telephone:** Field crew cell phones
- **Size of site:** Approximately 0.5 acre
- **Pathways for hazardous substance dispersion:** Skin contact with soil and dust inhalation.

1.5 PROJECT MANAGER AND OTHER KEY CONTACTS

	Name (Affiliation)	Work Telephone	Cell Phone
Project manager	William Cutler (Integral)	(720) 465-3342	(808) 381-9121
Site safety officer	Dennis Poma (Integral)	(808) 369-7116	(808) 349-9076
Corporate health and safety manager	Eron Dodak (Integral)	(503) 943-3614	(503) 407-2933

Facility contact	Brian Nishimura (Consultant to HICDC)	(808) 935-7692	(808) 896-0593
Client contact	Keith Kato (HICDC)	(808) 969-1158 x205	(xxx) xxx-xxxx

2 CHEMICAL HAZARD EVALUATION

Potentially hazardous chemicals known to exist at the site are primarily arsenic and dioxins. Other chemicals of concern include lead, mercury, pentachlorophenol and polycyclic aromatic hydrocarbons (PAHs). The chemicals of concern, applicable chemical properties, and potential exposure routes are presented in the following sections.

The following table lists the historical site maximum constituent concentrations for constituents at the Former Kohala Sugar Company. In addition, the table lists the properties of sample decontamination chemicals that may be used at the site (i.e., Alconox®). The table also lists the chemical properties and OSHA permissible exposure limit (PEL), short-term exposure limit (STEL), and immediately dangerous to life and health (IDLH) level. Some chemicals used during equipment decontamination or sample preservation may volatilize and enter the field crew's breathing zone and be inhaled. Breathing zone air can be monitored to ensure that the chemicals do not exceed the PEL. If any of the chemicals exceed the PEL, immediate action is required (e.g., don respirators, leave site) as designated in the "Air Monitoring" section (Section 5) of this SHSP.

Chemical Properties

Chemical of Concern	Soil concentration (site maximum)	Medium	OSHA PEL (ppm)	NIOSH REL (ppm)	OSHA IDLH (ppm)	IP(eV)	Carcinogen or Other Hazard
2,3,7,8-TCDD	11 µg/kg (Dioxin TEQ)	Soil	--	--	--	--	Ca
Arsenic	2,440 mg/kg	Soil	0.010 mg/m^3	0.002 mg/m^3	5 mg/m^3	--	Ca
Lead	210 mg/kg	Soil	0.050 mg/m^3	0.050 mg/m^3	100 mg/m^3	--	P
Mercury	14.2 mg/kg	Soil	0.1 mg/m^3	0.05 mg/m^3 (vapor)	10 mg/m^3	--	P
Coal tar pitch volatiles (PAHs)	(see individual PAH concentrations below)	Soil	0.2 mg/m^3	0.1 mg/m^3	80 mg/m^3	--	Ca
Benzo(a)pyrene	3,220 µg/kg	Soil	--	--	--	--	Ca
Benzo(a)anthracene	3,240 µg/kg	Soil	--	--	--	--	Ca
Benzo(b)fluoranthene	5,780 µg/kg	Soil	--	--	--	--	Ca
Dibenzo(a,h)anthracene	548 µg/kg	Soil	--	--	--	--	Ca
Indeno(1,2,3-cd)pyrene	1,750 µg/kg	Soil	--	--	--	--	Ca
Pentachlorophenol	3,520 µg/kg	Soil	0.5 mg/m^3	0.5 mg/m^3	2.5 mg/m^3	NA	--
Alconox®	NA	NA	--	--	--	--	--

Notes:
-- = none established
Ca = carcinogen
IDLH = immediately dangerous to life and health
IP(eV) = ionization potential (electron volts)
NA = not available
P = poison
PEL = permissible exposure limit
ppm = parts per million
REL = recommended exposure limit
STEL = short-term exposure limit

The table below summarizes the chemical characteristics and potential chemical exposure routes at the site.

	Likely	Possible	Unlikely
Potential Chemical Exposure Routes at the Site:			
Inhalation		X	
Ingestion			X
Skin absorption		X	
Skin contact		X	
Eye contact		X	
Chemical Characteristics:			
Corrosive			X
Flammable			X
Ignitable			X
Reactive			X
Volatile			X
Radioactive			X
Explosive			X
Biological agent			X
Particulates		X	
If likely, describe:			

Notes:

3 PHYSICAL HAZARD EVALUATION AND GUIDELINES

The following sections present general physical hazards guidelines.

3.1 GENERAL PHYSICAL HAZARDS

The following table presents possible physical hazards that are expected to be present during field activities.

Possible Hazard	Yes	No	Proposed Safety Procedure
Heavy equipment	X		Stay back from operating equipment; wear safety vests and hard hats; coordinate and maintain eye contact with equipment operator.
Material handling	X		Lift properly; seek assistance if necessary; do not overfill coolers or boxes. Seek assistance if drums must be moved.
Adverse weather	X		Seek shelter during electrical storms; work in adverse weather conditions only with proper training and equipment.
Plant/animal hazards	X		Know local hazards and take appropriate precautions. Use insect repellent if mosquitoes are persistent.
Uneven terrain/tripping	X		Use caution, wear properly fitting shoes or boots, and keep work area orderly.
Noise	X		Wear ear protection when working around heavy equipment and other noise sources.
Excavations	X		Do not enter excavations greater than 3 ft in depth without evaluation by a qualified person and implementation of applicable trenching and excavation safeguards as required by law.
Heat stress	X		Follow heat stress information (Attachment 3). *Note:* potential for heat stress will depend on season and location of the site.
Falling objects	X		Wear hard hats near overhead hazards (i.e., winch).

Summary of potential physical hazards posed by proposed site activities:

Activity	Potential Hazard
Oversight of preparatory activities, construction, and excavation	Heavy equipment, adverse weather, plant/animal hazards, uneven terrain/tripping, noise, excavations, heat stress, falling objects
Soil sampling	Adverse weather, plant/animal hazards, uneven terrain/tripping, excavations, heat stress
Sample handling/mobilization	Material handling

4 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

The following sections address PPE and safety equipment required for completing the field activities.

4.1 PERSONAL PROTECTIVE EQUIPMENT

Based on the hazards identified above in Sections 2 and 3, the following table identifies the PPE required for site activities.

Site Activity	Level of Protection	
	Initial[a]	Contingency[b]
Oversight of preparatory activities, construction, and excavation	D/MD	Suspend work
Soil sampling	D/MD	Suspend work
Sample handling	D/MD	Suspend work
Decontamination	D/MD	Suspend work

Notes:
[a] Operational efficiencies may result in PPE upgrades or downgrades.
[b] Based on unexpected change in site conditions, such as visually observed dust levels.

Each level of protection will incorporate the following PPE:

Level D	Long pants and work coveralls, hard hat, latex or nitrile gloves under work gloves, eye protection, and steel-toe boots, and traffic safety vest are required. Hearing protection is required as needed.
Level MD	Same as Level D with addition of rain gear.

Respirator and Respirator Cartridge Information

Is there potential for a respirator to be donned during fieldwork? Yes _____ No X

4.2 SAFETY EQUIPMENT

The following safety equipment will be onsite during the proposed field activities.

Air Monitoring (check the items required for this project)

- [ ] OVM
- [ ] LEL/O_2 meter
- [ ] H_2S meter
- [ ] Detector pump and tubes (e.g., benzene)
- [ ] Air sampling pumps
- [ ] Miniram (particle monitors)
- [ ] Radiation meter
- [ ] Other:

First Aid Kit Mandatory, including absorbent compress, adhesive bandages, adhesive tape, antiseptic, burn treatment, medical exam gloves, sterile pad, cardiopulmonary resuscitation (CPR) shield, triangle bandage, scissors—for cutting off the PPE from an injured person (check additional items required for the site)

- [ ] Emergency blanket
- [X] Insect repellent
- [X] Sunscreen
- [ ] Other: _____

Other (check the items required for this project)

- [X] Eyewash
- [X] Drinking water
- [X] Stopwatch for monitoring heart rate for heat stress monitoring[2]
- [X] Thermoscan® thermometer for heat stress monitoring
- [ ] Survival kit[3]
- [ ] Personal flotation device
- [X] Cool vests or neck collars
- [ ] Fit test supplies
- [X] Fire extinguisher (drill rigs and onboard larger sampling vessels)
- [X] Windsock, wind speed meter
- [X] Cellular phone
- [ ] Radio sets
- [ ] Global positioning system
- [X] Other: Ear plugs for working within 50 ft of heavy equipment.

[2] Heart rate monitoring requires special training.
[3] Consult the CHSM for guidance for site-specific survival kits.

5 DUST CONTROL

In order to address the specific concerns of community members about the potential for dust exposures during soil removal work, a Dust Control Plan has been prepared, and is included as Appendix B of the RAWP. Visual dust monitoring will be conducted, as acute hazards are not possible if dust is not visible.

Dust control methods include:

- Wet the soil during excavation, with a hose from an on-site water truck or tank.
- Wet the soil once loaded in trucks and effectively cover the soil prior to departure from the site. Utilize trucks with the most effective covers for dust control.
- Construct a gravel pad for washing truck tires to prevent soil "trackout" from the site. Wash and visually inspect truck tires before leaving the site.
- Wash out the truck bed after leaving soil at a landfill, or require effective covering of the truck bed prior to departure from the landfill.
- Cover open excavations with plastic/tarps at the end of each work day.
- Erect and maintain an 8 ft high dust screen around the perimeter of the work site.
- Continuously monitor for fugitive dust (visible dust) at the site perimeter to document that dust controls are effective. Conduct visual dust monitoring by trained site personnel to maintain compliance and safety.

Administrative dust controls include:

- Ensure that the written dust control plan has been reviewed and approved by the Hawaii Department of Health Hazard Evaluation and Emergency Response Office before implementation.
- Assign supervision to ensure that the dust control plan elements are implemented, followed, and revised as necessary to achieve control objectives.
- Prohibit excavation work when wind speeds are in excess of 20 mph to prevent dust migration from the work site, unless continuous visual monitoring and application of water is shown to prevent dust generation.
- Limit truck speeds through adjacent neighborhood to 15 mph or lower.
- Select truck routes and hauling times to minimize impacts on adjacent neighborhoods.
- Notify the community before the excavation/hauling work begins and identify the anticipated duration of the project.

- Provide supervision, notices to the neighborhood, and/or security measures to discourage children from playing at the site or on equipment during off-work times or days.
- Conduct site work primarily when school is in session to minimize the potential for children to be attracted to the work site when not in school.
- Provide an opportunity for community members to review the written dust control plan and/or observe dust control measures that are implemented (from a safe distance).

For further details on the Dust Control Plan see Appendix B of the RAWP.

6 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

The following sections present requirements for health and safety training and medical monitoring.

6.1 HEALTH AND SAFETY TRAINING AND MEDICAL MONITORING

State and federal laws establish training requirements for workers at uncontrolled hazardous waste sites (including areas where accumulations of hazardous waste create a threat to the health and safety of an individual, the environment, or both). Integral and subcontractor personnel are required to complete the following training requirements prior to working at the site.

6.1.1 Training Requirements

Task	No Training	24-hour	40-hour[a]	Supervisor[b]	First Aid/CPR[c]	Medical Monitoring
Integral Field Personnel						
Dennis Poma			X	X	X	X
Silvia Barber			X		X	X
[Name]						
Other Integral Subcontractors[d]			X		X	X

Notes:

[a] Must have current OSHA 8-hour refresher if it has been more than a year since the OSHA 40-hour training.
[b] At least one person onsite must be OSHA HAZWOPER supervisor trained if this is a hazardous waste site.
[c] At least one member of each team of two or more people onsite must be first aid/CPR trained.
[d] Integral subcontractors and consultants may have requirements that are more stringent than those listed above. These are minimum training and monitoring requirements required to work on this site during periods of soil disturbance (i.e. excludes land surveyors working at site when undisturbed or after contaminated soil has been removed).

6.1.2 Site Safety Meetings

Site safety meetings must be held before beginning new tasks or when new staff enters the site. Site safety meetings should be held at a minimum of once a week and should be held daily on complex or high hazard projects. Tailgate safety meetings must occur every morning during

review of the day's work plan, covering specific hazards that may be encountered. Additional meetings will be held at any time health and safety concerns are raised by any of the personnel. Attendance and topics covered are to be documented in the field logbook.

6.2 MEDICAL MONITORING

OSHA requires medical monitoring for personnel potentially exposed to chemical hazards in concentrations in excess of the PEL for more than 30 days per year and for personnel who must use respiratory protection for more than 30 days per year. Integral requires medical monitoring for all employees potentially exposed to chemical hazards.

Will personnel working at this site be enrolled in a medical monitoring program?	Yes	X	No	_____

7 EMERGENCY RESPONSE PLAN

The following sections discuss emergency recognition and prevention, emergency response and notification, emergency decontamination, site communications, and use of the buddy system.

7.1 EMERGENCY RECOGNITION AND PREVENTION

It is the responsibility of all personnel to monitor work at the site for potential safety hazards. All personnel are required to immediately report any unsafe conditions to the SSO. The SSO is responsible to immediately take steps to remedy any unsafe conditions observed at the work site.

The following are examples of some emergency situations that could occur during the field activities:

- Slips, trips, and falls (on sloped areas, excavations, debris, etc.).
- Lacerations (from scrap metal, debris, trees, etc.) .
- Dust is visually observed and not controlled.
- Entrainment of clothes or objects in moving equipment or parts.
- Serious injury or illness (e.g., heat stroke, physical injury, heart attack).
- Severe thunderstorm with lightning.

Immediate actions will be taken by the field team under the leadership of the SSO in response to these emergencies.

7.2 EMERGENCY RESPONSE AND NOTIFICATION

If an emergency at the site warrants it, all personnel must immediately evacuate the affected work area and report to the SSO at the predetermined emergency assembly location:

Field vehicle

In case of injury, field personnel should take precautions to protect the victim from further harm and notify local or facility emergency services. In remote areas, it will be necessary to have first aid-trained personnel on the field team. The victim may require decontamination prior to treatment if practicable—requirements will vary based on site conditions.

Emergency medical care will be provided by:

- [X] Local emergency medical provider (i.e., fire department)
- [ ] Facility emergency medical provider
- [ ] First aid-trained field staff (for remote areas only)

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
Fire	Hawaii County Fire Department	911	No
Police	Waimea Police Department	911	No
Ambulance	--	911	No
Hospital	Kohala Hospital	808-889-6211	No
Site phone	Field Crew Cell Phones	--	No
Directions to the hospital:	Consult attached map.		

The SSO must confirm that the hospital listed is still in operation and that it has an emergency room. **It is required that the SSO drive to the hospital so that the directions are practiced and understood prior to initiating fieldwork.**

Corporate Resource	Name	Work Telephone	Cell Phone
Integral CHSM [a]	Eron Dodak	Office: (503) 943-3614	(503) 407-2933
Integral President	William Locke	Office: (720) 465-3315	(303) 548-1111
Integral Human Resources Manager	Amy Logan	Office: (720) 465-3312	NA
Medical consultant	Dr. Peter Greaney (WorkCare)	Office: (800) 455-2219 x2114	NA
Incident Intervention	--	(888) 449-7787	

Notes:

[a] If the CHSM cannot be reached, call Ian Stupakoff [Office: (360)705-3534, ext. 20; Cell: (360)259-2518]. If Ian Stupakoff cannot be reached, call David Livermore [Office: (503)943-3613; Cell: (503)806-4665]. If David Livermore cannot be reached, call Barbara Trenary [Office: (206) 248-9645; Cell: (206) 849-0882].

In case of serious injuries, death, or other emergency, the Integral CHSM must be notified immediately at the phone numbers listed above. The Integral CHSM will notify the project manager and Integral's President. The project manager will notify the client.

7.3 EMERGENCY DECONTAMINATION PROCEDURES

In case of an emergency, if possible, gross decontamination procedures will be promptly implemented. If a life-threatening injury occurs and the injured person cannot undergo

decontamination procedures onsite, then the medical facility will be informed that the injured person has not been decontaminated and given information regarding the most probable chemicals of concern.

Decontamination procedures will only be used if practical and if they will not further injure the person or delay treatment. Decontamination procedures should not be implemented if there is not a reasonable possibility that the injured party requires such intervention. The SSO will make the determination whether or not to decontaminate the injured person. The following steps will be followed for decontaminating injured personnel while onsite:

- If it will not injure the person further, cut off PPE using scissors or scrub the gross contamination from the injured person's PPE (e.g., Tyvek® coveralls, work boots) with a Alconox® solution followed by a rinse with tap or deionized/distilled water
- Remove PPE if feasible without further injuring the person.

7.4 SITE COMMUNICATIONS

Each field team will carry a cell phone or satellite phone that is in good working order. If there is any type of emergency that requires the site to be evacuated (e.g., severe thunderstorm with lightening, chemical release), the field team leader will blow the air horn three times. When the horn sounds, all personnel will meet at the predetermined emergency assembly location, provided the muster point is in safe territory (field vehicle). All other emergency notifications that do not require evacuation (e.g., injury) will be conducted using a cell or satellite phone. Emergency phone numbers are listed above in Section 7.2.

7.5 BUDDY SYSTEM

The buddy system will be used at the site at all times. The buddy system is a system of organizing employees into field teams in such a manner that each employee of the field team is designated to be observed by at least one other employee in the field team. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

8 WORK ZONES

Work zones are defined as follows:

Exclusion zone (EZ)	Any area of the site where hazardous substances are present, or are reasonably suspected to be present, and pose an exposure hazard to personnel. For the subject site, the EZ is the area within the boundaries of the site perimeter 8-ft dust fence (see Appendix D of RAWP, County of Hawaii Grading Permit engineering drawings).
Contamination reduction zone (CRZ)	Area between the exclusion and support zones that provides a transition between contaminated and clean zones. The CRZ is the temporary roadway immediately outside the perimeter dust fence.
Support zone (SZ)	Any area of the site, so designated, that is outside the exclusion and contamination reduction zones.

Site control measures in work zones are described below for each type of field activities. The Contractor is responsible for defining and adapting the work zones at the site.

8.1 OVERSIGHT OF PREPARATORY ACTIVITIES

Exclusion zone: An approximate 12 ft radius will be established around the exaction area and will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained personnel (i.e., wearing level D protective clothing) will be allowed in this area. During tree removal, Integral personnel will remain at least twice the height of the tree away from the tree and removal equipment in any direction.

Contamination reduction zone: After preparatory activities are completed at a station, the EZ will become the CRZ.

Support zone: All areas outside the EZ and CRZ.

8.2 OVERSIGHT OF CONSTRUCTION

Exclusion zone: An approximate 12 ft radius will be established around the excavation area and will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained personnel (i.e., wearing level D protective clothing) will be allowed in this area.

Contamination reduction zone: After construction activities are completed at a station, the EZ will become the CRZ.

Support zone: All areas outside the EZ and CRZ.

8.3 OVERSIGHT OF EXCAVATION

Exclusion zone: An approximate 12 ft radius will be established around the excavation area and will be marked with orange traffic safety cones or caution tape. Only properly equipped and trained personnel (i.e., wearing level D protective clothing) will be allowed in this area.

Contamination reduction zone: After excavation activities are completed at a station, the EZ will become the CRZ.

Support zone: All areas outside the EZ and CRZ.

8.4 SOIL SAMPLING

Exclusion zone: The area inside the excavation will be considered the EZ. Sample collection and processing will occur in this area. Only properly equipped and trained personnel (i.e., wearing level D protective clothing) will be allowed in this area. Decontamination will occur away from other personnel in a downwind portion of the EZ.

Contamination reduction zone: After sampling activities are completed at a station, the EZ will become the CRZ.

Support zone: All areas outside the EZ and CRZ.

Controls to be used to prevent entry by unauthorized persons: No unauthorized personnel will be allowed into the exclusion/contaminant reduction zones.

9 EQUIPMENT DECONTAMINATION AND PERSONAL HYGIENE

9.1 EQUIPMENT DECONTAMINATION PROCEDURES

After sampling is completed, the exclusion zone will be used as the contaminant reduction zone for decontamination activities, provided there is no contamination remaining after the sampling is completed. To minimize or prevent personal exposure to hazardous materials, all personnel working in the exclusion zone and contaminant reduction zone will comply with the following decontamination procedures:

- All personnel will wash soil and chemicals from their raingear or Tyvek® coveralls before leaving the exclusion zone.
- All gloves, Tyvek®, rain gear, and rubber boots will be removed prior to entering the field vehicle.

Decontamination equipment required at the site includes the following:

- Buckets or tubs
- Laboratory grade distilled/deionized water
- Site water
- Scrub brushes (long-handled)
- Alconox® detergent
- Plastic bags
- Plastic sheeting
- Paper towels
- Garbage bags
- Clean garden sprayer

All non-disposable components of the sampling equipment (e.g., stainless steel spoons and bowls used for sample compositing) that contact the soil will be decontaminated using the following steps:

4. Rinse with site water/tap water
5. Wash with Alconox® detergent
6. Triple rinse with distilled water using a garden sprayer (compositing equipment only).

Cleaned small equipment will be stored in plastic bags and large equipment will be stored on plastic sheeting. Materials to be stored for more than a few hours will be covered.

Disposable equipment and PPE intended for one-time use will not be decontaminated, but will be bagged for appropriate disposal in the municipal landfill, as it is not considered hazardous waste.

Decontamination fluids will be disposed on at the site or sampling area. The wash water will be poured on the ground.

9.2 PERSONAL HYGIENE

The following personal hygiene practices will be used at the site to reduce exposure to chemicals.

- Long hair will be secured away from the face so it does not interfere with any activities.
- All personnel leaving potentially contaminated areas will wash their hands, forearms, and faces in the contaminant reduction zone prior to entering any clean areas or eating areas.
- Personnel leaving potentially contaminated areas will shower (including washing hair) and change to clean clothing as soon as possible after leaving the site.
- No person will eat, drink, or chew gum or tobacco in potentially contaminated areas. Single portion drink containers and drinking of replacement fluids for heat stress control will be permitted only in support areas.
- Smoking is prohibited by Integral personnel and subcontractors in all areas of the site because of the potential for contaminating samples and for the health of the field team.

10 VEHICLE SAFETY, SPILL CONTAINMENT, AND SHIPPING INSTRUCTIONS

10.1 VEHICLE SAFETY

Integral's vehicle safety program requires the following:

- Cell phone usage while driving is not allowed, including the use of hands-free devices. If it not feasible to wait to use the cell phone until arriving at the destination, pull off the road and park in a safe location to use the cell phone. Do not pull to the side of the road to use a cell phone because this significantly increases the risk of a rear-end collision.
- All vehicles are to be operated in a safe manner and in compliance with local traffic regulations and ordinances.
- Drivers are to practice defensive driving and drive in a courteous manner.
- Drivers are required to have a valid driver's license and liability insurance (per local state laws).
- Seat belts are to be worn by the driver and all passengers.
- No persons are allowed to ride in the back of any trucks or vans, unless equipped with seatbelts.
- Vehicles are to be driven in conformance with local speed limits.
- Personnel who are impaired by fatigue, illness, alcohol, illegal or prescription drugs, or who are otherwise physically unfit, are not allowed to drive or work on Integral field sites.
- Personnel are to avoid engaging in other distractions such as changing radio stations while driving.
- Motor vehicle accidents are to be reported to the responsible law enforcement agency, the Integral human resources manager, and the Integral CHSM on the same day of occurrence. Documentation of damage should be photographed.
- Personnel who have experienced work-related vehicle accidents or citations may be required to complete a defensive driving program.

10.2 SPILL CONTAINMENT

Bulk chemicals will not be used at the site.

10.3 SHIPPING INFORMATION

Federal laws and international guidelines place restrictions on what materials may be shipped by passenger and cargo aircraft. In addition, 49 CFR regulates labeling, manifesting, and shipment of all packages containing potentially hazardous materials. In the course of this field investigation, the following items will be shipped to and from the site as shown below:

Item	Hazardous Constituent	Quantity	Packaging	How Shipped
Soil samples	arsenic, dioxins	20 solid matrix samples	Coolers	Field vehicle to airport
Other	None			

A 24-hour emergency response number (on any shipping documents such as a Uniform Hazardous Waste Manifest, Shipper's Declaration of Dangerous Goods, etc.) is required for shipments of all dangerous or hazardous goods. Integral does not have a 24-hour emergency contact number for dangerous or hazardous goods shipment. No dangerous or hazardous goods may be shipped by Integral until an account is set up with a 24-hour emergency response service such as CHEM-TEL (1-813-248-0573). If any hazardous or dangerous goods need to be shipped for a project, they must be shipped directly to the site by the supplier. Any hazardous or dangerous goods that are not used in the course of the field effort must remain at the site.

The samples will be prepared and labeled for shipment in accordance with the sampling and analysis plan developed for the site.

Air shipment of equipment with lithium batteries is required to note the presence of these batteries. Warning labels are available from the equipment rental agency and can be copied.

11 TASK-SPECIFIC SAFETY PROCEDURE SUMMARY

The following sections briefly describe safety procedures for each task.

11.1 OVERSIGHT OF PREPARATORY ACTIVITIES

A hard hat, safety glasses, traffic safety vest, and steel-toe boots are required at all times without exception. Use gloves and hearing protection as needed.

The exclusion zone around the excavation will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. A fence around the perimeter of the site will keep unauthorized personnel from entering and will indicate that this is an active work site.

Always stay clear of heavy equipment and be aware of its location. Keep in eye contact with the equipment operator(s). Stay away from pinch points. During tree removal, stay at least twice the distance of the height of the tree in all directions. Be aware during debris removal and breakdown, as pieces could become airborne during demolition.

11.2 OVERSIGHT OF CONSTRUCTION ACTIVITIES

Notify the utility public locating service 48 hours prior to initiating field work and obtain a utility locating ticket. Confirm the absence of underground and overhead utilities before starting excavation activities. Be sure that all utilities are marked or have a designation that they are not present in the area. Take a few minutes to examine the locations of fire hydrants, gas meters, etc. to make sure that the utility locating marks make sense. If there is any doubt as to the location of underground utilities, call the public or a private utility locator. Finally, check for overhead utilities and obstructions such as trees.

A hard hat, safety glasses, traffic safety vest, and steel-toe boots are required at all times without exception. Use gloves and hearing protection as needed.

The exclusion zone around the excavation will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. A fence around the perimeter of the site will keep unauthorized personnel from entering and indicate that this is an active work site.

Always stay clear of heavy equipment and be aware of its location. Keep in eye contact with the equipment operator(s). Stay away from pinch points.

11.3 OVERSIGHT OF EXCAVATION ACTIVITIES

Notify the utility public locating service 48 hours prior to initiating field work and obtain a utility locating ticket. Confirm the absence of underground and overhead utilities before starting excavation activities. Be sure that all utilities are marked or have a designation that they are not present in the area. Take a few minutes to examine the locations of fire hydrants, gas meters, etc. to make sure that the utility locating marks make sense. If there is any doubt as to the location of underground utilities, call the public or a private utility locator. Finally, check for overhead utilities and obstructions such as trees.

A hard hat, safety glasses, traffic safety vest, and steel-toe boots are required at all times without exception. Use gloves and hearing protection as needed.

The exclusion zone around the excavation will be marked with orange traffic cones or caution tape and personnel will police the area to make sure no unauthorized personnel enter the exclusion zone. A fence around the perimeter of the site will keep unauthorized personnel from entering and indicate that this is an active work site.

Always stay clear of heavy equipment and be aware of its location. Keep in eye contact with the equipment operator(s). Stay away from pinch points. Be aware of open excavations and mindful of where you step to avoid slips, trips, and falls.

11.4 SOIL SAMPLING

A hard hat, safety glasses, traffic safety vest, steel-toe boots, and nitrile gloves are required at all times; a hard hat is optional when all heavy equipment is idle (shut off) and there are no overhead hazards.. Avoid getting soil on clothes or skin. Exercise care when lifting, assembling, and decontaminating equipment. Keep equipment organized. Do not enter any excavation greater than 3 feet deep.

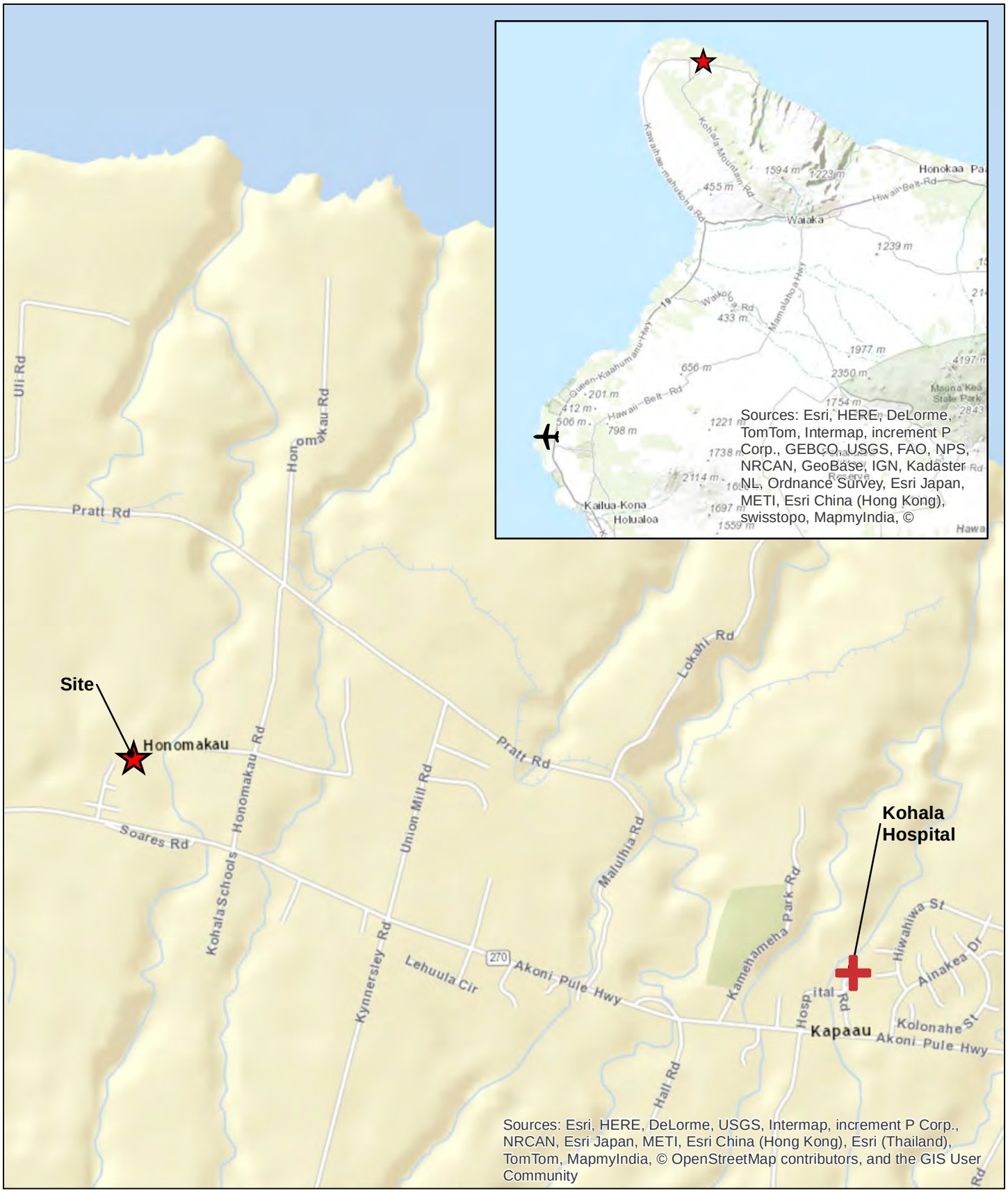
During hot temperatures be sure to keep hydrated and take frequent breaks in the shade to keep body temperature down. Wear sunscreen and use bug spray as needed.

12 REFERENCES

Integral and ACSI. 2015. Removal Action Work Plan, Former Kohala Sugar Company, Pesticide Mixing Site, North Kohala, Hawaii. Draft, May 1, 2015.

ATTACHMENT 1

SITE MAP AND HOSPITAL ROUTE



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Attachment 1.
Emergency Route Map
Former Kohala Sugar Company Pesticide Mixing Site

ATTACHMENT 2

REGULATORY NOTICES

Workers' Compensation - You have the right to receive workers' compensation benefits and medical care if you suffer a work- related injury. You must report the date, time and circumstance of your injury immediately to your employer or supervisor. Give the name of the insurer to your doctor so that your doctor will know where to send the physician's report. If your employer does not file a report of the injury, you may file a written claim with the Disability Compensation Division. You do not pay for the premium cost; your employer pays the entire amount.

You are entitled to all required medical, surgical and hospital services and supplies including medication; weekly benefits from the fourth day of disability to replace wage loss, representing 66 2/3% of your average weekly wage but not more than the maximum weekly benefit amount annually set by the Department; additional benefits if the injury results in permanent disability or disfigurement; vocational rehabilitation, if appropriate; funeral and burial expenses if the work injury results in death; and additional weekly benefits to the surviving spouse and other dependents.

Temporary Disability Insurance - You have the right to file a claim for temporary disability insurance benefits within 90 days from the date of disability if you suffer a disabling non work-related injury/illness, or inability to work because of your pregnancy. Your employer or insurance carrier should furnish you with a TDI-45 claim form or some other authorized claim form. You may receive TDI benefits if your inability to work is properly certified by a physician. Generally, you must have worked for an employer in Hawaii at least two weeks prior to your disability. During the last 52 weeks, you must have: worked for at least 14 weeks; been paid for at least 20 hours per week; and earned at least $400.

After a 7 consecutive day waiting period, you will be paid 58% of your average weekly wage, not to exceed the maximum in the TDI law. Your employer may have an "equivalent" plan approved by the Department, which may provide different benefits. You should ask your employer for details if they have an "equivalent" plan.

You may be required by your employer to share in the premium cost. Your share cannot be more than one-half of the cost and should not exceed .5% of your weekly wages. Your employer pays the remaining portion exceeding the prescribed limitation. If you are not eligible for benefits (see second paragraph above), your employer cannot deduct any contributions from you to share in the premium cost.

Prepaid Health Care - You have the right to enroll in your employer's prepaid health care insurance plan after 4 consecutive weeks of employment where you have worked at least 20 hours each week. The health care plan must be approved by the Department and include insurance coverage for hospital, surgical, medical, diagnostic and maternity medical care.
You should claim benefits under this program if a non work-related injury or illness requires medical care. Give your doctor or hospital the name of your employer's health care contractor and the plan name.

If you are required to share in the premium cost for your coverage, your share cannot be more than 1.5% of your monthly wages or one-half the premium cost (whichever is less). Your employer pays the balance.

Disability Compensation Division:

Oahu	586-9161 (Workers' Compensation)
	586-9188 (Temporary Disability Insurance and Prepaid Health Care)
Hilo	974-6464
Kona	322-4808
Maui	243-5322
Kauai	274-3351

This notice provides general background information on labor laws administered and enforced by DLIR's Disability Compensation Division and is not intended to serve as a substitute for legal counsel. For specific legal advice on individual situations, please consult an attorney.

Dwight Takamine, Director
Department of Labor and Industrial Relations

***You may satisfy Hawaii Labor Laws' posting requirements by posting our official labor law poster. For more information:**
http://hawaii.gov/labor/official-labor-law-poster

You have the right to be free from unlawful discrimination in your employment. All applicants and employees of private and public employers (except the federal government), union members, and job seekers in employment agencies are protected by Hawaii law against employment discrimination.

You cannot be denied a job, fired, or subjected to unequal terms and conditions of employment because of your race, sex, including gender identity or expression, sexual orientation, age, religion, color, ancestry/national origin, disability, marital status, civil union status, credit history, credit report, arrest and court record (except in limited circumstances), or domestic or sexual violence victim status. Sexual harassment by a supervisor or coworker is a form of sex discrimination.

Examples of Unlawful Employment Discrimination:

- If you are a pregnant employee and are denied leave recommended by a doctor, or are denied reinstatement to the same or comparable position after giving birth.
- If you are subjected to unwanted sexual advances or demands, offered benefits in exchange for sexual favors, threatened with demotion, firing, or loss of benefits for refusing sexual advances, or subjected to unwelcome sexual conduct.
- If you are denied a job or a promotion because of your race, sex, including gender identity or expression, sexual orientation, age, religion, color, ancestry, disability, marital status, civil union status, credit history, credit report, arrest and court record (except in limited circumstances), or domestic or sexual violence victim status.

Filing a Complaint:

You have the right to file a complaint if you have been subjected to discrimination because of your race, sex, including gender identity or expression, sexual orientation, age, religion, color, ancestry, disability, marital status, credit history, credit report, arrest and court record, or domestic or sexual violence victim status.

You can file a complaint by calling the Hawaii Civil Rights Commission. Under state law, you must file your complaint within 180 days of the act of discrimination.

You have the right to be free from discriminatory or retaliatory action from your employer for filing a complaint, participating in an investigation, or opposing a discriminatory practice.

Hawaii Civil Rights Commission:
Oahu: 586-8636
Hawaii: 974-4000, ext.68636
Maui: 984-2400, ext.68636
Kauai: 274 -3141, ext.68636
Molokai/Lanai: 1-800-468-4644, ext.68636 TDD/TTY: 586-8692

This notice provides general background information on Hawaii laws prohibiting discrimination in employment, which are administered and enforced by the Hawaii Civil Rights Commission. This is not intended to serve as a substitute for legal counsel. For specific legal advice on individual situations, please consult an attorney.

Dwight Takamine, Director
Department of Labor and Industrial Relations

***You may satisfy Hawaii labor Laws' posting requirements by posting our official labor law poster. For more information: http://hawaii.gov/labor/official-labor-law-poster**

Updated 1-11-12

You have the right to be notified in writing at least 60 days in advance of possible layoffs or terminations due to certain business transactions taken by your employer. Your employer must also notify the Department of Labor and Industrial Relations in the same manner according to the Dislocated Workers Act (DWA). The DWA applies to businesses which have at least 50 persons employed in the state at any time during the 12 months preceding the event, and are a party to a sale, transfer, merger, business takeover, bankruptcy, or business transaction, which will result in the relocation outside the state or the shutting down of all or a portion of operations.

You have the right to payment of a dislocated worker allowance if you are laid off or terminated due to these transactions and are eligible for unemployment compensation benefits. These payments supplement unemployment benefits for a maximum 4 week period.

For general information about the Dislocated Workers Act or the Dislocated Workers Allowance, please call the Workforce Development Division at 586-8877. For information about assistance to employers and employees facing a business closure, please contact the following Workforce Development Division offices:

Workforce Development Division:

Oahu:	Honolulu:	586-8700
	Waipahu:	675-0010
	Kapolei:	692-7630
	Kaneohe:	233-3700
Hawaii:	Kona:	327-4770
	Hilo:	981-2860
Maui:		984-2091
Kauai:		274-3056
Molokai:		553-1755

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Dwight Takamine, Director
Department of Labor and Industrial Relations

***You may satisfy Hawaii labor Laws' posting requirements by posting our official labor law poster. For more information: http://hawaii.gov/labor/official-labor-law-poster**

You have the right to be free from discrimination and retaliation if you leave your job to perform military service, when seeking initial employment, reemployment, and retention in employment, promotionor any benefit of employment.

You have the right, if you leave your job to perform military service, to elect to continue your existing employer-based health plan coverage for you and your dependents for up to 24 months while in the military.

You have the right, even if you don't elect to continue coverage during your military service, to be reinstated in your employer's health plan when you are reemployed, generally without any waiting periods or exclusions (e.g., preexisting condition exclusions) except for service connected illnesses or injuries.

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You have the right to a safe and healthful workplace. The State of Hawaii has developed a federally approved Occupational Safety and Health Administration (OSHA) program and the State is solely responsible for enforcing its own occupational safety and health regulations, which are applicable to most employers in the State of Hawaii, except those hired for domestic service in or about a private home, maritime or shipbuilding employees, employees covered by a federal agency, and employees working on military installations.

You have the right to notify your employer or the Hawaii Occupational Safety and Health Division (HIOSH) about workplace hazards. HIOSH will keep your name and identity confidential.

You have the right to request a HIOSH inspection if you believe that there are unsafe and/or unhealthful conditions at your workplace. You or your representative may participate in the inspection.

You have the right to see HIOSH citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation. Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.

You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.

You have the right to file a safety and health complaint. Your employer may not discriminate against you for making a complaint or for exercising your rights under the law, some of which are detailed above. You can file a discrimination complaint with HIOSH within 60 days of the discriminatory act.

Violations of the HIOSH Law may result in penalties of up to $77,000 per item. Serious violations carry a mandatory penalty of up to $7,700; willful or repeated violations up to $77,000; and failure to correct a violation within the prescribed time can result in assessed penalties of up to $7,700 per day.

Hawaii Occupational Safety & Health Division:

Oahu:	586-9100
Hawaii:	974-4000, ext. 6-9100
Maui:	984-2400, ext. 6-9100
Kauai:	274-3141, ext. 6-9100
Molokai/Lanai:	1-800-468-4644, ext. 6-9100

This notice provides general background information on Hawaii Occupational Safety and Health laws and is not intended to serve as a substitute for legal counsel. For specific legal advice on individual situations, please consult an attorney.

Dwight Takamine, Director
Department of Labor and Industrial Relations

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For more information: http://hawaii.gov/labor/official-labor-law-poster

Updated 3-28-12

You have the right to unemployment benefits if you lose your job or your work hours are substantially reduced through no fault of your own. You may file your claim for unemployment insurance benefits online or in-person at a local claims office.

Go to **uiclaims.hawaii.gov** between 6:30 am to 11:00 pm, Monday through Friday and between 9:00 am to 11:00 pm on weekends & holidays (Hawaii Standard Time). You will need a valid email address in order to create an online account.

Important Information:

- When you file, you must provide your social security number.
- If you are not a U.S. citizen, you should have your alien registration number available.
- You will need to provide information for all of your employers in the past 18 months, such as the employer's name, address, zip code, phone number, dates of employment, and reason for separation. Ex-military servicepersons should have their DD214 (member 4) available. Former federal employees should have their Standard Form 8, Standard Form 50, or pay stubs available.
- File your claim promptly. Your claim will begin only from the week that you file with the Unemployment Insurance Office.
- If benefits are payable, you must receive your payments by direct deposit. You must provide your account type (savings or checking), financial institution routing number, and your account number.

Unemployment Insurance Offices:

Honolulu Claims Office ..... 586-8970 or 586-8971..... dlir.ui.honolulu@hawaii.gov
Waipahu Claims Office ..... 675-0030 ..... dlir.ui.waipahu@hawaii.gov
Hilo Claims Office..... 974-4086 ..... dlir.ui.hilo@hawaii.gov
Kona Claims Office ..... 322-4822 ..... dlir.ui.kona@hawaii.gov
Maui Claims Office..... 984-8400 ..... dlir.ui.maui@hawaii.gov
Molokai Claims Office ..... 553-1750 ..... dlir.ui.maui@hawaii.gov
Kauai Claims Office..... 274-3043 ..... dlir.ui.kauai@hawaii.gov
Liable Interstate Unit ..... (808) 586-8960..... dlir.ui.honolulu@hawaii.gov

This notice provides general background information on Hawaii Unemployment Insurance laws and is not intended to serve as a substitute for legal counsel. For specific legal advice on individual situations, please consult an attorney.

Dwight Takamine, Director
Department of Labor and Industrial Relations

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Updated 9-26-14

Minimum Wage - You have the right to receive a minimum wage of at least $7.25 per hour through December 31, 2014; at least $7.75 per hour beginning January 1, 2015; at least $8.50 per hour beginning January 1, 2016, at least $9.25 per hour beginning January 1, 2017; and at least $10.10 per hour beginning January 1, 2018. Under certain conditions, "tipped employees" may be paid less per hour.

Overtime - You have the right to be paid overtime at least one and one-half times your regular rate for all hours worked in excess of 40 in a workweek. The law also requires employers to maintain payroll records for at least 6 years.

- The Hawaii Wage and Hour Law exempts certain types of employment from minimum wage and overtime, such as outside salespersons and employees in an executive, administrative, supervisory, or professional capacity.

Payment of Wages - You have the right to be paid at least twice monthly on regular paydays designated in advance in cash, by checks convertible into cash, or within certain requirements, by direct deposit into the employee's account at a federally insured depository institution or pay card; within 7 days after the end of each pay period; paid wages in full at the time of discharge or no later than the next working day; or paid no later than the next regular payday if you quit or resign. However, if you give your employer one pay period's notice of your intention to quit, you must be paid on your last day of employment.

Notification Requirements - You have the right to be notified in writing at the time of hire of your rate of pay and the paydays. Any changes in pay arrangements prior to the time of such changes, and of any policies with regard to vacation, sick, or holiday pay must be made in writing or through a posted notice. You must also be furnished with a pay statement on payday showing gross wages, amount and purpose of each deduction, net pay, date of payment, and pay period covered. If your employer requires that you give advance notice of quitting and you are terminated after giving that notice, your employer is liable for the wages you would have earned up to the last day you intended to work unless you were terminated for cause.

Withholding of Wages - You have the right to ensure that there are no wrongful withholdings of your wages. Your employer may not collect, deduct or obtain authorization to deduct for:

- Fines (For example - an amount you must pay to your employer for being tardy.)
- Cash shortages in a common cash register or cash box used by two or more people, or in a cash register or cash box under your sole control unless given an opportunity to account for all moneys received at the start of a shift and all monies turned in at the end of a shift.
- Penalties or replacement costs for breakage.
- Losses due to your acceptance of checks which are later dishonored if the employer has authorized you to accept checks.
- Losses due to faulty workmanship, lost or stolen property, damage to property, or default of customer credit or nonpayment for goods or services received by customers, as long as those losses are not due to your willful or intentional disregard of the employer's interest.

Your employer or prospective employer cannot require you to pay a job application processing fee. Your employer may deduct state and federal withholding taxes, amounts specified by court orders and amounts you authorized in writing.

Collection of Unpaid Wages - You have the right to file a complaint for unpaid wages with the Wage Standards Division within one year from the time the wages became due. Certain executives, administrators, professionals and outside salespersons may need to file a claim in a court of competent jurisdiction.

Hawaii Family Leave Law - You have the right to receive up to 4 weeks of unpaid, job-protected leave for the birth or adoption of your child, or to care for your child, parent, spouse or reciprocal beneficiary with a serious health condition. You are eligible only if you have at least 6 consecutive months of service, and your employer has 100 or more employees. Accrued paid leaves may be substituted for any part of the 4- week period. If your employer provides for paid sick leave, you may use 10 days of your accrued and available sick leave per year unless a collective bargaining agreement provides for more than 10 days.

Prevailing Wages and Overtime on State and County Government Construction Projects - You have the right to be paid the prevailing wages on government construction projects.

Lie Detector Tests - You have the right to refuse a lie detector test.

Work Injury - You have the right to file a complaint if you feel that you have been suspended, discharged, or discriminated against solely because of a work injury that is compensable under the Workers' Compensation Laws, except under certain circumstances.

Wage Standards Division:

Oahu: 586-8777 Hilo: 974-6464 Maui: 243-5322 Kona: 322-4808 Kauai: 274-3351

This notice provides general background information on Hawaii Wage and Hour laws and is not intended to serve as a substitute for legal counsel. For specific legal advice on individual situations, please consult an attorney.

Dwight Takamine, Director
Department of Labor and Industrial Relations

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You have the right to not suffer from any adverse employment action, such as termination or discrimination, regarding your employment conditions because you reported or were about to report to a government agency or your employer, verbally or in writing, a violation or a suspected violation of a law or a contract executed by the government.

You have the right to not suffer from any adverse employment action because you participated in an investigation, hearing or inquiry conducted by a government agency or court of law.

If you believe your employer has violated this law, you may file a lawsuit in state court within 2 years after the occurrence of the alleged violation.

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Department of Labor and Industrial Relations

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http://labor.gov/labor-law-poster/

ATTACHMENT 3

SAFETY PROCEDURES

HEAT EXHAUSTION

What happens to the body:

Headaches, dizziness, or light-headedness, weakness, mood changes, irritability or confusion, feeling sick to your stomach, vomiting, fainting, decreased and dark-colored urine, and pale, clammy skin.

What should be done:

- Move the person to a cool shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or call 911.)

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

HEAT STROKE - A Medical Emergency

What happens to the body:

Dry, pale skin (no sweating); hot red skin (looks like a sunburn); mood changes; irritability, confusion, and not making any sense; seizures or fits, and collapse (will not respond).

What should be done:

- Call for emergency help (i.e., ambulance or 911.)
- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures, remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train workers about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks.)
- Use the buddy system (work in pairs.)
- Drink plenty of cool water (one small cup every 15-20 minutes.)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool, shaded areas (allow your body to cool down.)
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk of heat illnesses.)

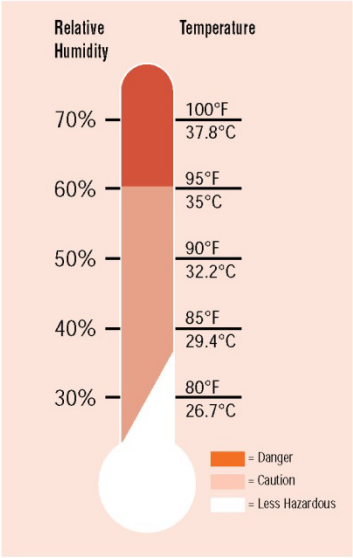
Workers are at increased risk when...

- They take certain medications. Check with your doctor, nurse, or pharmacy to see if medicines you take affect you when working in hot environments.
- They have had a heat-induced illness in the past.
- They wear personal protective equipment.

THE HEAT EQUATION

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and **death**.



Oregon Occupational Safety & Health Division
440-3333E-S(9/03)

ATTACHMENT 4

MATERIAL SAFETY DATA SHEETS

ALCONOX MSDS

Section 1 : MANUFACTURER INFORMATION

Product name: Alconox

Supplier: Same as manufacturer.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Supplier MSDS date: 2005/03/09

D.O.T. Classification: Not regulated.

Section 2 : HAZARDOUS INGREDIENTS

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE
497-19-8	7-13	SODIUM CARBONATE	NOT AVAILABLE	4090 MG/KG RAT ORAL 6600 MG/KG MOUSE ORAL	2300 MG/M3/2H RAT INHALATION 1200 MG/M3/2H MOUSE INHALATION
7722-88-5	10-30	TETRASODIUM PYROPHOSPHATE	5 MG/M3	4000 MG/KG RAT ORAL 2980 MG/KG MOUSE ORAL	NOT AVAILABLE
7758-29-4	10-30	SODIUM PHOSPHATE	NOT AVAILABLE	3120 MG/KG RAT ORAL 3100 MG/KG MOUSE ORAL >4640 MG/KG RABBIT DERMAL	NOT AVAILABLE

Section 2A : ADDITIONAL INGREDIENT INFORMATION

Note: (supplier).
CAS# 497-19-8: LD50 4020 mg/kg - rat oral.
CAS# 7758-29-4: LD50 3100 mg/kg - rat oral.

Section 3 : PHYSICAL / CHEMICAL CHARACTERISTICS

Physical state: Solid

Appearance & odor: Almost odourless.
White granular powder.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): Not applicable.

Vapour density (air=1): Not applicable.

By weight: Not available.

Evaporation rate (butyl acetate = 1): Not applicable.

Boiling point (°C): Not applicable.

Freezing point (°C): Not applicable.

pH: (1% aqueous solution).
9.5

Specific gravity @ 20 °C: (water = 1).
0.85 - 1.10

Solubility in water (%): 100 - > 10% w/w

Coefficient of water\oil dist.: Not available.

VOC: None

Section 4 : FIRE AND EXPLOSION HAZARD DATA

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Not available.

Sensitivity to mechanical impact: Not applicable.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: None

Section 5 : REACTIVITY DATA

Chemical stability: Stable under normal conditions.

Conditions of instability: None known.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizers.

Hazardous decomposition products: See hazardous combustion products.

Section 6 : HEALTH HAZARD DATA

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of Acute Exposure

Eye contact: May cause irritation.

Skin contact: Prolonged contact may cause irritation.

Inhalation: Airborne particles may cause irritation.

Ingestion: May cause vomiting and diarrhea.
May cause abdominal pain.
May cause gastric distress.

Effects of chronic exposure: Contains an ingredient which may be corrosive.

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available for mixture, see the ingredients section.

Exposure limit of material: Not available for mixture, see the ingredients section.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Medical conditions aggravated by exposure: Not available.

First Aid

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
Seek medical attention if symptoms persist.

Ingestion: Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.
Do not induce vomiting, seek immediate medical attention.

Section 7 : PRECAUTIONS FOR SAFE HANDLING AND USE

Leak/Spill: Contain the spill.
Recover uncontaminated material for re-use.
Wear appropriate protective equipment.
Contaminated material should be swept or shoveled into appropriate waste container for disposal.

Waste disposal: In accordance with municipal, provincial and federal regulations.

Handling procedures and equipment: Protect against physical damage.
Avoid breathing dust.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Launder contaminated clothing prior to reuse.

Storage requirements: Keep containers closed when not in use.
Store away from strong acids or oxidizers.
Store in a cool, dry and well ventilated area.

Section 8 : CONTROL MEASURES

Precautionary Measures

Gloves/Type:

Neoprene or rubber gloves.

Respiratory/Type:

If exposure limit is exceeded, wear a NIOSH approved respirator.

Eye/Type:

Safety glasses with side-shields.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

ATTACHMENT 5

EMPLOYEE EXPOSURE/INJURY INCIDENT REPORT

Employee Exposure/Injury Incident Report

(completed by the CHSM or designee)

Employee:	
Office or field location:	
Incident:	
Potential or known exposure (describe):	
Physical injury or illness (describe):	

Location (city and state):		Project and Contract No.	
Date of incident:		Time of incident:	
Date incident reported:		Person to whom incident was reported:	

Weather condition during incident:	Temperature:		Precipitation:	
Wind speed and direction:		Cloud cover:		

Name of materials potentially encountered (chemical exposure):

Chemical and phase (i.e., liquid, solid, gas, vapor, fume, mist), radiological, etc.:	

Describe the exposure/injury in detail and the parts of the body affected (attach extra sheets if necessary):

Describe exact onsite or offsite location where the incident occurred:

What was the employee doing when the exposure/injury occurred? (Describe briefly as site reconnaissance, soil sampling, etc.):

How did the incident occur? Describe fully the factors that led to or contributed to the incident:

Was medical treatment given? ☐ Yes ☐ No If yes, when?			
By whom?		Name of paramedic:	
		Name of physician:	
		Other:	

Where?	Onsite		Offsite	

If offsite, name of hospital or clinic:	
Length of inpatient stay (dates):	
Was Integral Consulting management notified? ☐ Yes ☐ No If yes, when?	
Name and title of manager(s) notified:	
Did the exposure/injury result in permanent disability or death? ☐ Yes ☐ No	
If yes, explain:	

Number of days away from work		Number of days of restricted work activity:	

Has the employee returned to work? (Yes / No) If yes, date:	

Names of other persons affected during the incident:		

Names of persons who witnessed the incident:		

Name and title of field team leader or immediate supervisor at the site:
Was the operation being conducted under an established safety plan? ☐ Yes ☐ No

If yes, attach a copy. If no, explain:	
Was personal protective equipment (PPE) used by the employee? ☐ Yes ☐ No	
If yes, list items:	
Did any limitations in safety equipment or PPE affect or contribute to exposure? ☐ Yes ☐ No	
If yes, explain:	

Attachments to this report:		Medical report(s) (if not confidential)		Site safety plan
		Other relevant information		

Employee's signature		Date
Site safety officer's signature		Date
Project manager's signature		Date

Corporate health and safety manager review and comments

Corrective action/procedure changes carried out on the project:		
Corrective actions to be taken to prevent similar incidents at other sites:		
Corporate Health and Safety Manager's signature		Date

ATTACHMENT 6

NEAR-MISS INCIDENT REPORT

Near-Miss Incident Report

(completed by field staff)

Employee:	
Office or site location:	

Near-Miss Incident (check one or more): Exposure ☐ Physical injury ☐ Property damage ☐

Location (city and state):		Project and Contract No.	
Date of incident:		Time of incident:	

Fully describe the incident, including how it happened, persons involved, if chemicals were involved in the incident, etc.:

Was the operation being conducted under an established safety plan? ☐ Yes ☐ No

If yes, attach a copy. If no, explain:	

Employee's signature		Date
Project Manager's signature		Date
Site safety officer's signature		Date

Corporate health and safety manager review and comments

Corrective action/procedure changes carried out at the site:		
Corrective actions to be taken to prevent similar incidents at other sites:		
Corporate Health and Safety Manager's signature		Date

APPENDIX B

DUST CONTROL PLAN

APPENDIX B. DUST CONTROL PLAN

Implementation plans for the remediation of soil at the former Kohala Sugar Company pesticide mixing area will be required to specifically address concerns of community members about the potential for dust exposures during soil removal work at the contaminated site, or from contaminated soil transportation to the landfill. Major elements to be addressed in this dust control program include: 1) specific methods to eliminate or limit dust exposures to the extent feasible, and 2) administrative controls. Storm water controls are described in the NPDES storm water permit package. Dust control program elements to be considered and implemented as technically feasible are as follows.

Dust Control Methods

- Wet the soil during excavation, with a hose from an on-site water truck or tank.
- Wet the soil once loaded in trucks and effectively cover the soil prior to departure from the site. Utilize trucks with the most effective covers for dust control.
- Construct a gravel pad for washing truck tires to prevent soil "trackout" from the site. Wash and visually inspect truck tires before leaving the site.
- Wash out the truck bed after leaving soil at a landfill, or require effective covering of the truck bed prior to departure from the landfill.
- Cover open excavations with plastic/tarps at the end of each work day.
- Erect and maintain an 8-foot-high dust screen around the perimeter of the work site.
- Continuously monitor for fugitive dust (visible dust) at the site perimeter to document that dust controls are effective. Conduct visual dust monitoring by trained site personnel to maintain compliance and safety.

Administrative Controls

- Ensure that the written dust control plan has been reviewed and approved by the Hawaii Department of Health Hazard Evaluation and Emergency Response Office before implementation.
- Assign supervision to ensure that the dust control plan elements are implemented, followed, and revised as necessary to achieve control objectives.
- Prohibit excavation work when wind speeds are in excess of 20 mph to prevent dust migration from the work site, unless continuous visual monitoring and application of water is shown to prevent dust generation.
- Limit truck speeds through adjacent neighborhood to 15 mph or lower.
- Select truck routes and hauling times to minimize impacts on adjacent neighborhoods.

- Notify the community before the excavation/hauling work begins and identify the anticipated duration of the project.
- Provide supervision, notices to the neighborhood, and/or security measures to discourage children from playing at the site or on equipment during off-work times or days.
- Conduct site work primarily when school is in session to minimize the potential for children to be attracted to the work site when not in school.
- Provide an opportunity for community members to review the written dust control plan and/or observe dust control measures that are implemented (from a safe distance).

APPENDIX C

NPDES GENERAL STORM WATER PERMIT

[IF REQUIRED]

APPENDIX D

COUNTY OF HAWAII GRADING PERMIT

[IN PREPARATION]

County of Hawai‘i

DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION

GRADING PERMIT NO. _____

Fee: $ _____
Check only – payable to:
County Director of Finance

Owner: Hawaii Island Community Development Authority
Address: 100 Pauahi St, #204
Hilo, HI 96720
Phone: 808-935-7692

Civil Eng. / Surveyor: Dennis Poma
License No.: 10776-C
Address: 94-515 Ukee St, #301
Waipahu, HI 96797
Phone: 808-369-7116

Contractor: _____
License No.: _____
Address: _____
Phone: _____

Location: Kumakua St, Hawi, Hawaii
Tax Map Key: (3) 5-5-019:25
Cut (CY): 4,034

Parcel Area (acre): 18.3
Area to be Graded (acre): 0.48
Disposal Site: West Hawaii Landfill

Start Date: August 2015
(minimum 2 working days after issuance date)
Completion Date: October 2015
Fill (CY): 2,700
Borrow Site: On site soil

Remarks: _____

933-7653 (Hawai‘i Island) 40 Pookela Street, Hilo, HI 96720

1. STATE DLNR – HISTORIC PRESERVATION DIVISION

Approved:

Received By: _____ Date: _____ _____ Date: _____

2. PLANNING DEPARTMENT

Approved:

Received By: _____ Date: _____ _____ Date: _____

3. DEPARTMENT OF PUBLIC WORKS

Approved for Permit Issuance:

Received By: _____ Date: _____ _____ Date: _____

I hereby certify that all work as requested above will conform to Chapter 10 of the Hawai‘i County Code.

Owner: _____ Date: _____

Return to the Department of Public Works, Engineering Division, upon completion of work.

Certification
Accepted by: _____ Date: _____
(DPW inspector / engineer)

Grading Permit
INSTRUCTIONS TO THE APPLICANT

1. The Owner/Applicant is responsible for obtaining all approvals. Approvals shall be obtained in numerical order. The Historic Preservation Division will issue a letter addressing the specific request. No work can begin until the grading permit is issued by the Department of Public Works.

2. All work shall be in accordance with Chapter 10 – Erosion and Sedimentation Control, of the Hawai‘i County Code, and as shown on the approved plan.

3. The Owner/Applicant shall provide three (3) sets of grading plans to the Department of Public Works. The plans shall include existing and proposed contours, erosion and sediment control measures, limits of grading providing proper setbacks from the property lines, location of any structures or easements, and any drainage patterns or devices.

4. The Applicant may call the Historic Preservation Division (933-7653) and the Planning Department (961-8288) for their requirements.

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD / CWB

03047PJS.03a

March 21, 2003

To: All Persons with Construction Activities Disturbing One (1) or More Acres of Total Land Area

From: Denis R. Lau, P.E., Chief
Clean Water Branch

Subject: National Pollutant Discharge Elimination System (NPDES) Permit Requirements for Your Construction Activity

You need to obtain coverage under an NPDES permit from the Department of Health (DOH), Clean Water Branch (CWB) for your construction activities, including clearing, grading, and excavation, that result in the disturbance of one (1) or more acres of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit authorizing discharges of storm water associated with your construction activity to State waters is required before the commencement of the construction activities.**

The CWB requires that a Notice of Intent (NOI) to be covered by the NPDES general permit for your construction activities be submitted at least 30 days before the commencement of your construction activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

You may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater (i.e., concrete truck wash water, etc.) is discharged from your project into State waters and/or coverage under the NPDES general permit(s) is not permissible. An application for the NPDES permit is to be submitted at least 180 days before the commencement of your construction activities. The NPDES application forms may also be picked up at our office or downloaded from our website at
http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

Hawaii Administrative Rules, Section 11-55-38, also requires you to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. Please submit a copy of your request for review by SHPD or SHPD's determination letter for your project.

If you have any questions, please contact the Engineering Section of the CWB at (808) 586-4309.
or toll free 974-4000 + 864309#

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

Information for Review Submission of Hawai`i County Grading, Grubbing & Stockpiling Permits

To improve and expedite the State Historic Preservation Division's review of Department of Public Works grubbing, grading and stockpiling permits, we request that the following information be submitted with your permit application:

1. A site map showing the area of proposed land-altering within the affected TMK parcel(s)
2. Location map showing known historic sites and approved buffer zones in relation to the proposed project area
3. Description of current vegetation cover and condition of the project area; description of any structures, roads or other features within the project area (photographs are very helpful)
4. Copies of previously approved permits and/or and prior SHPD review and comment letters that pertain to the property
5. Summary of land use history if known (i.e., former cane cultivation)
6. Construction dates of buildings within the project area, if known
7. Mailing address and phone number of the contact person to whom we will send our review letter

Copies of completed permit application forms and the above information may be faxed to the Hilo SHPD office at (808) 933-7655, or dropped off or mailed to 40 Po`okela Street, Hilo (96720). If you have questions, call 933-7653 or 933-7650. If you intend to hand-deliver your information, please call first to ensure that someone is in and available to discuss your project with you.

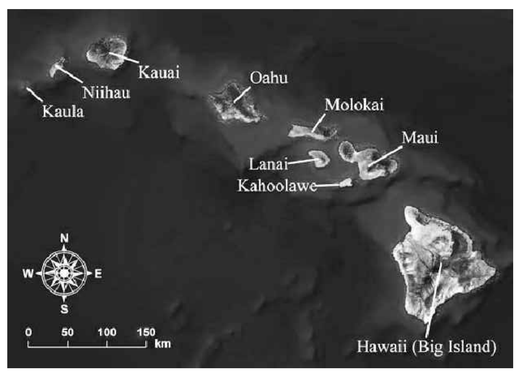
SHPD does not sign the permit; we will send you a review letter which you will attach to the permit application. Do not send us your original permit application form; send us a copy so that we may keep it on file at SHPD.

Pursuant to the Hawaii Revised Statutes, Chapter 6E-11(c) "It shall be unlawful for any person to take, appropriate, excavate, injure, destroy or alter any historic property or burial site during the course of land development or land alteration activities to which §6E-42 applies, without obtaining the required approval."

Hawaii Island Community Development Corporation
Site Remediation & Grading Plans

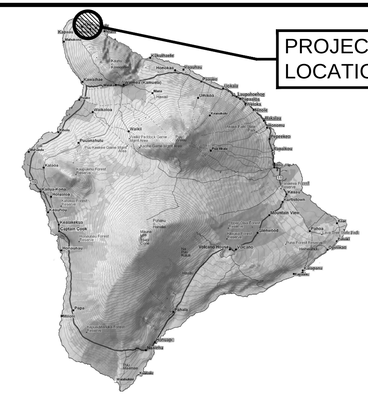
Hawi, Big Island, Hawai'i

TMK: 5-5-019:025
TMK: 5-5-008:047
TMK: 5-5-008:059
TMK: 5-5-008:018



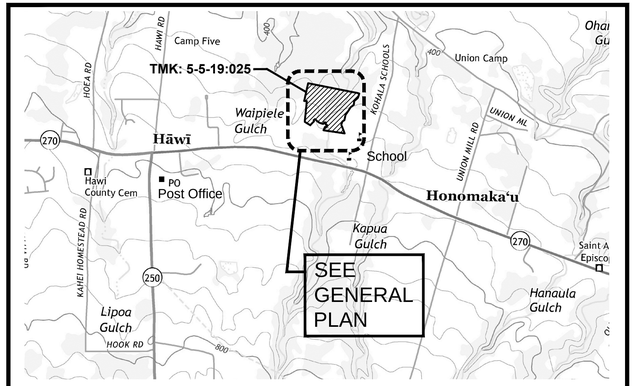
State Map
Scale : NTS

NORTH



Island Map
Scale : NTS

NORTH



USGS MAP
Scale : NTS

NORTH

PROJECT OWNER:

Hawaii Island Community Development Corporation
100 Pauchi St. #204
Hilo, Hawaii 96720

PROJECT ENGINEER:

CIVIL ENGINEER:
ADVANCED COMPLIANCE SOLUTIONS, INC.

DENNIS POMA
94-515 UKEE ST, SUITE 301
WAIPAHU, HI 96797
OFFICE 808.369.7116
E-MAIL dennis.poma@acsihawaii.com

DRAWING INDEX

SHEET NO.	SHEET TITLE
T-1	Title Sheet, Vicinity Maps & Index to Drawings
C-1	General Plan & Notes
C-2	Road Access Plan, Grading Plan, Profile & Sections
C-3	Sections & Details

ACSI
Advanced Compliance Solutions, Inc.
94-515 Uke'e Street, #301
Waipahu, Hawaii 96797

DENNIS S. POMA
LICENSED PROFESSIONAL ENGINEER
10776-C
HAWAII, U.S.A.
EXP. DATE: 4-30-16

This project was prepared by me or under my supervision and construction of this project will be under my observation.

PROJECT
OWNER: Hawaii Island Community Development Corporation
ADDRESS: Kumakua Street, Hawi, Hawaii

T.M.K. : 5-5-19:025, 5-5-8:047, 5-5-8:059, 5-5-8:018

SHEET TITLE
Title Sheet, Vicinity Maps,
Index of Drawings

REVISIONS	BY

Date	04/30/15
Scale	NTS
By	gg/ts/dp
Job	
Sheet	T-1

1 of 4 Sheets

14-108-hicdc-pahoa grading sheets.dwg
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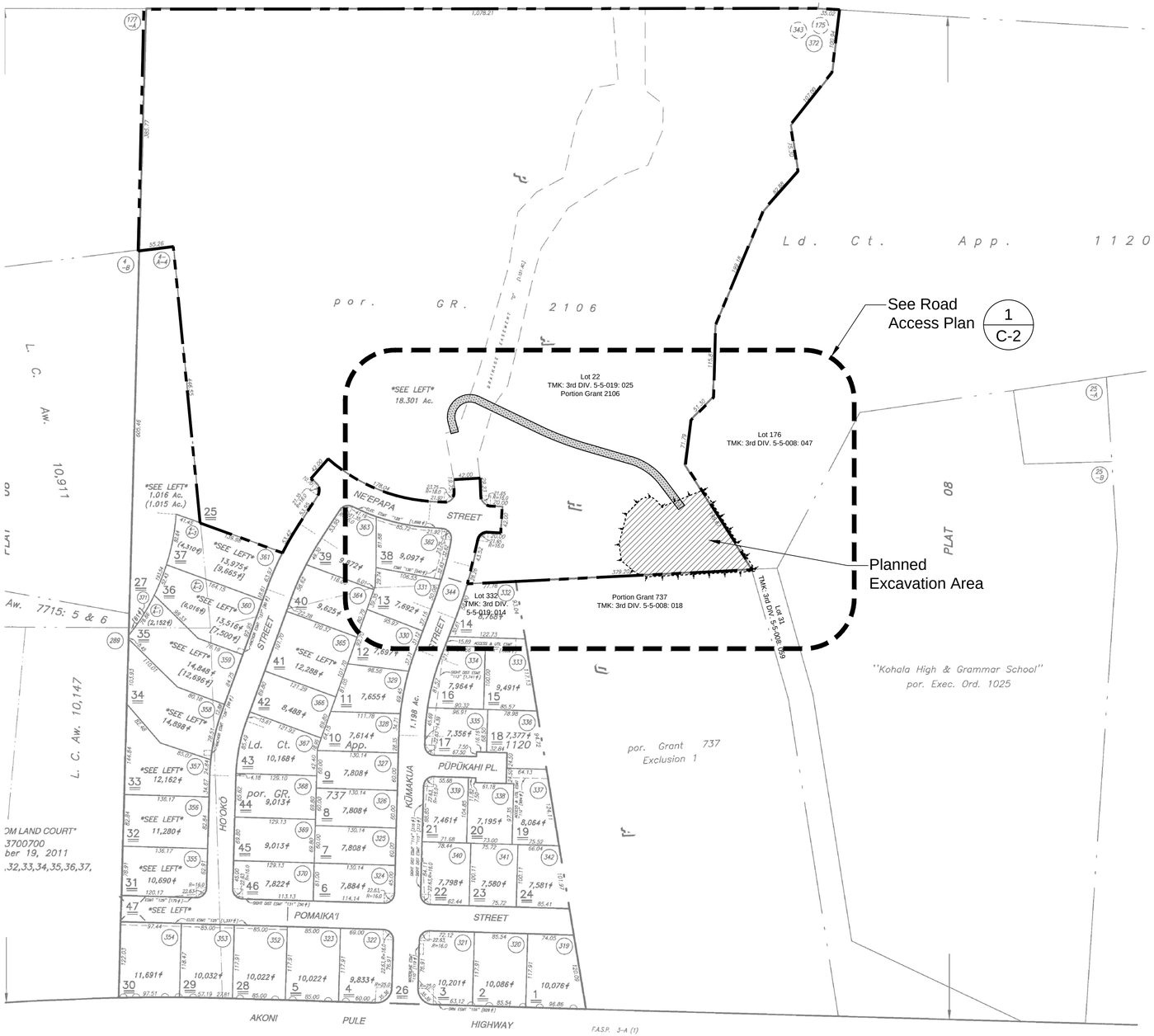

1 / C-1 General Plan

Scale : 1" = 100' - 0"

GENERAL CONSTRUCTION NOTES

1. All excavation work called for on the plans and not itemized and all excavation work not called for but required for the construction of this project shall be considered incidental.
2. All abandoned pipe openings shall be plugged with class DWS 2000 concrete to a depth of 1-1/2 times the diameter of the pipe.
3. Verify and check all dimensions, elevations and details shown on the drawings prior to the start of construction. Any discrepancy shall be immediately brought to the attention of the client's project manager for direction.
4. No contractor shall perform any construction activity so as to cause falling rock, soil or debris in any form to fall, slide or flow onto adjoining properties, streets or natural water courses. Should such violations occur, the costs incurred for any remedial action shall be payable by the contractor.
5. The underground pipes, cable or ductlines known to exist by the engineer from his search of records are indicated on the plans. The contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. All damaged portions shall be replaced in accordance with the standards responsibility. Personal injury resulting from contact with existing utilities shall be the contractors responsibility, wherever connections of new utilities to existing utilities are shown on the plans, the contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for new lines.
6. The contractor shall restore to their original condition or better, at no cost to this project, all improvements damaged as a result of the construction, including pavements, embankments, curbs, signs, landscapings, structures, utilities, walls, fences, etc. unless provided for specifically in the proposal. Demolition and restoration of existing items shall be incidental and included within the amount paid for unclassified trench excavation.

GRADING NOTES

1. All grading work shall conform to Chapter 10 of the Hawaii County Code. Should a grading permit be required, no work shall commence until the Department of Public Works (DPW) approves a grading permit.The Contractor shall remove all silt and debris deposited in drainage facilities, roadways and other areas resulting from his work. The costs incurred for any necessary remedial action by the DPW shall be payable by the Contractor.
2. The Contractor, at his own expense, shall keep the project and surrounding areas free from dust nuisances. The work shall be in conformance with the Air Pollution Control rules of the State Department of Health, HAR 11-60.1, Fugitive Dust.
3. All grading operations shall be performed in conformance with the applicable provisions of the Hawaii Administrative Rules, Title 11, Chapter 55, Water Pollution Control and Chapter 54, Water Quality Standards, and to the Erosion and Sedimentation Control Standards and Guidelines of the Department of Public Works, County of Hawaii.
4. The Contractor shall sod or plant all slopes and exposed areas immediately after the grading work has been completed.
5. Fills on slopes steeper than 5:1 shall be keyed.
6. The Contractor shall inform the DPW of the location of the disposal and/or borrow site(s) required for this project when an application for a grading permit is made. The disposal and/or borrow site(s) must also fulfill the requirements of the grading ordinance.
7. No grading work shall be done on Saturdays, Sundays and holidays anytime without prior approval from the Department of Public Works. Grading work on normal working days shall be between the hours of 7:00 a.m. to 4:30 p.m.
8. Fills shall be compacted to 95 percent (95%) of maximum density per ASTM D-1 557 test.
9. The Contractor shall remove all vegetation before placing fills on natural ground surface.
10. If existing water lines are encountered, they shall be cut, removed and capped at open ends.

SOLID WASTE NOTES

1. Unless otherwise specified the contractor is responsible for the proper handling, storage and/or disposal of all waste generated by this construction including grubbing and excess excavated material.
2. All green wastes generated by construction, including grubbing, demolition, and excess excavation material may be brought to the West Hawaii or the Hilo Landfill. A per ton fee shall be included in the contractor's bid sum. It is the contractor's responsibility to verify the current/applicable fees.
3. Construction and grubbing materials shall not be deposited as any of the County Transfer Stations, but shall be transported for disposal as either the West Hawaii or Hilo Landfill.

CONDITIONS-GRUBBING, GRADING, STOCKPILING

1. The contractor shall remove all silt and debris deposited in drainage facilities, roadways and other areas resulting from this work. The costs incurred for any necessary remedial action by the owner or DPW shall be payable by the contractor.
2. Fills on slopes steeper than 5:1 shall be keyed.
3. should any unanticipated archaeological site(s) be uncovered, all work shall cease in the immediate area and the DLNR, Historic preservation Division (933-0482) shall be notified. No work shall resume until clearance has been obtained from the Historic Preservation Division.
4. The contractor shall exercise caution to preserve all boundary markers. Boundary markers disturbed by the contractor shall be replaced by a licensed land surveyor and all associated expenses shall be borne by the contractor.

EROSION AND TEMPORARY DUST CONTROL

1. During construction, preventative measures shall be used to control foreseeable dust, erosion or sedimentation problems which may arise as the job progresses.
2. Measure to control erosion and other pollutants shall be in place before and clearing and grubbing work is initiated. these measures shall be properly constructed and maintained throughout the construction period.
3. Fugitive dust and solid waste disposal during grubbing activities shall meet requirements of Administrative Rules, Title II, Chapter 60, Air Pollution Control and Chapter 58, Solid Waste Management Control.
4. All control measures shall be checked and repaired as necessary.
5. The contractor, at his own expense, shall keep the project area and surrounding area free from dust nuisance. The work shall be in conformance with the Air Pollution Control Standards and Regulations of the State Department of Health.
6. Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 20 calendar days prior to site overflow.
7. Storm water flowing toward the construction area shall be diverted by using appropriate control measures as practical.

BEST MANAGEMENT PRACTICE (BMP)

1. The contractor shall install stabilized entrances at ingress and egress sites.
2. Install silt fence.
3. Water shall be used to control dust.
4. The contractor shall maintain all temporary BMP measures until, the entire area is completely stabilized. all BMP measures shall be removed immediately after the area is completely stabilized.

EARTHWORK QUANTITIES

Area Graded = 0.48 Acres
Excavation = 4,034 C.Y.
Embankment = 2,700 C.Y.
Spoil = 1,141 C.Y.

100' 0 100' 200'
SCALE: 1"=100'-0"

ACSI
Advanced Compliance Solutions, Inc.
94-515 Uke'e Street, #301
Waipahu, Hawaii 96797

DENNIS S. POMA LICENSED PROFESSIONAL ENGINEER 10776-C HAWAII, U.S.A.
EXP. DATE: 4-30-16

This project was prepared by me or under my supervision and construction of this project will be under my observation.

PROJECT
OWNER: Hawaii Island Community Development Corporation
ADDRESS: Kumakua Street, Hawi, Hawaii

T.M.K. : 5-5-19:025, 5-5-8:047, 5-5-8:059, 5-5-8:018

SHEET TITLE
General Plan & Notes

REVISIONS	BY

Date	04/30/15
Scale	NTS
By	gg/ts/dp
Job	

Sheet C-1
2 of 4 Sheets

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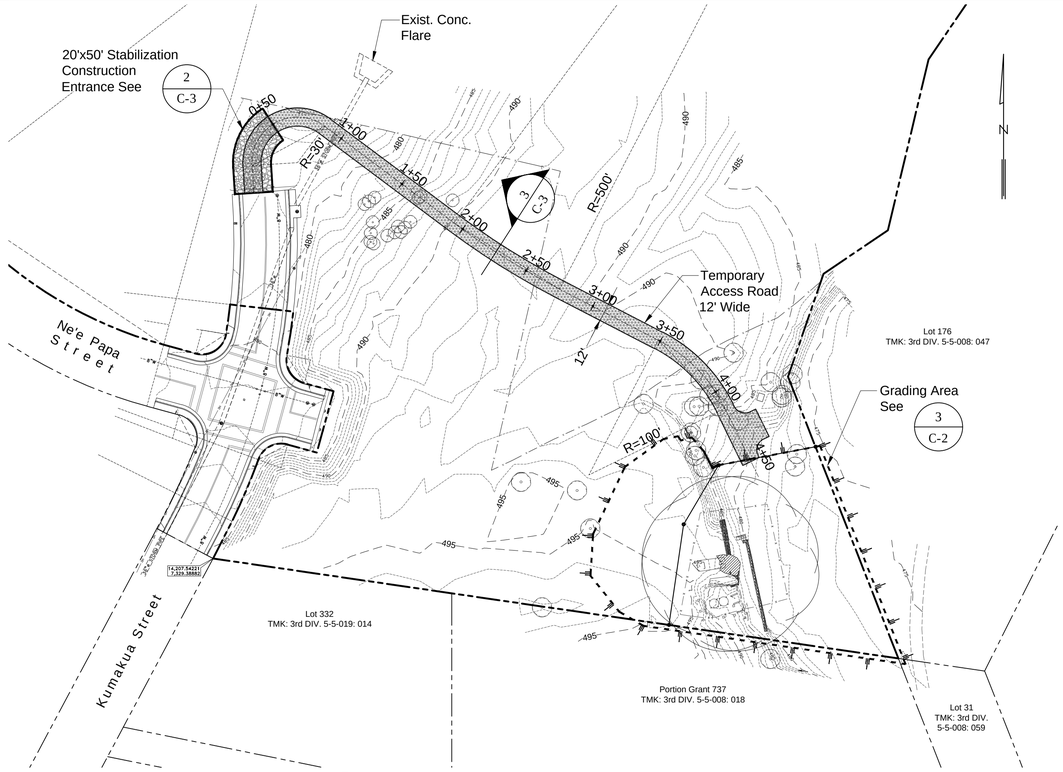
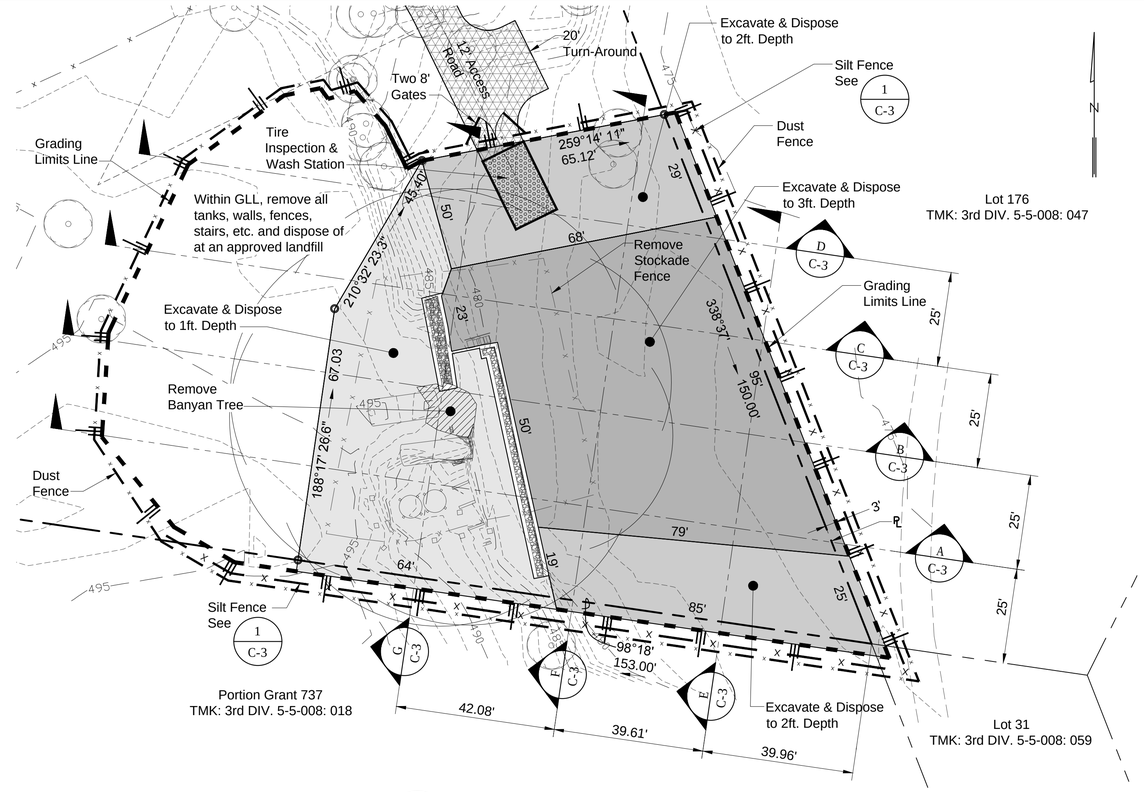


1 C-2 Road Access Plan
Scale : 1" = 50' - 0"

SCALE: 50' 0 50' 100' 1"=50'-0"



3 C-2 Soil Removal Plan
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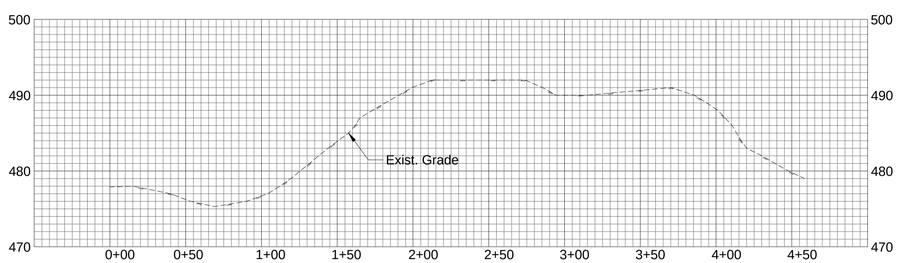
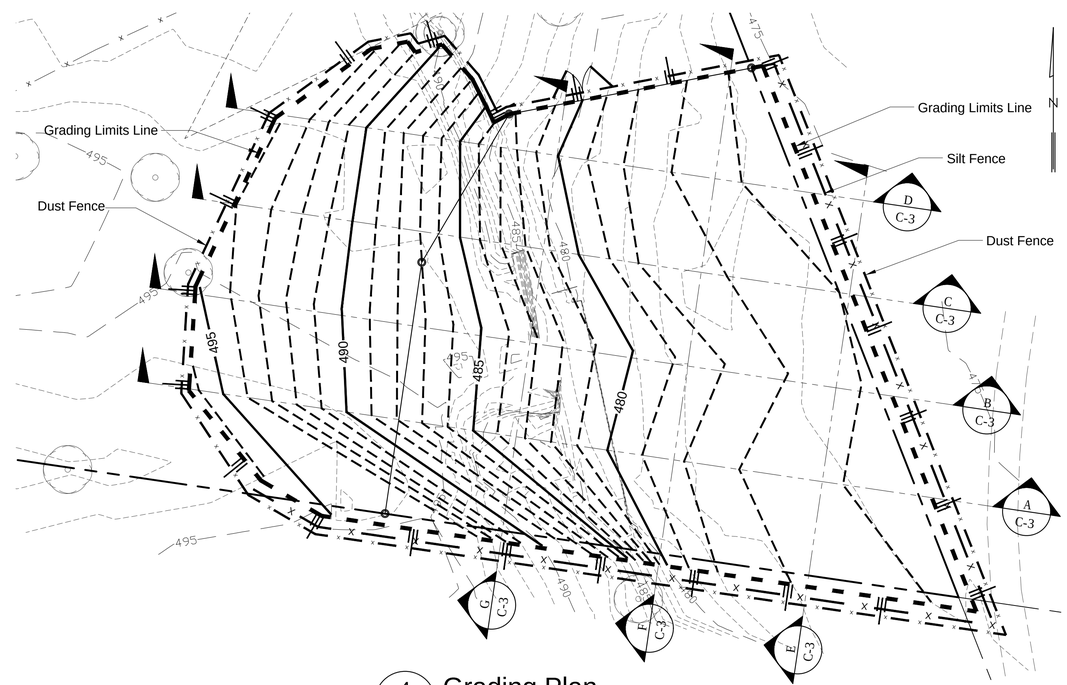


2 C-2 Road Access Profile
Scale : Horz. 1"=50' Vert. 1"=10'

SCALE: 10' 0 10' 20' 1"=10'-0"

SCALE: 20' 0 20' 40' 1"=20'-0"



4 C-2 Grading Plan
Scale : 1" = 20' - 0"

LEGEND:

- Storm Drain Manhole
- Water Valve Box / Clean Out
- Water Valve
- Tree / Ironwood
- Grading Limits Line
- Temporary Access Road
- Excavate & Dispose to 3ft. Depth
- Excavate & Dispose to 2ft. Depth
- Excavate & Dispose to 1ft. Depth

14-108-hicdc-pahoa grading sheets.dwg
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ACSI
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94-515 Uke'e Street, #301
Waipahu, Hawaii 96797

DENNIS S. POMA LICENSED PROFESSIONAL ENGINEER 10776-C HAWAII, U.S.A.
EXP. DATE: 4-30-16

This project was prepared by me or under my supervision and construction of this project will be under my observation.

PROJECT
OWNER: Hawaii Island Community Development Corporation
ADDRESS: Kumakua Street, Hawi, Hawaii

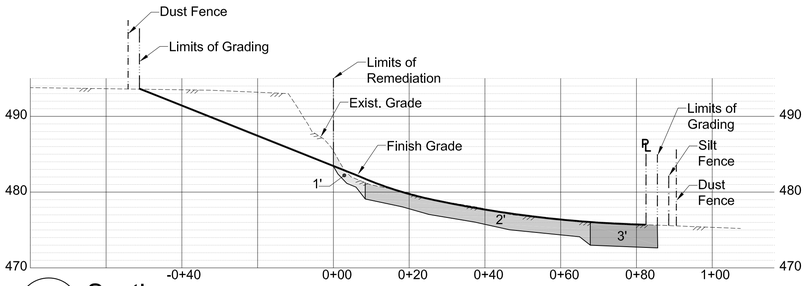
T.M.K. : 5-5-19:025, 5-5-8:047, 5-5-8:059, 5-5-8:018

SHEET TITLE
Road Access Plan, Grading Plan, Profile & Sections

REVISIONS	BY

Date	04/30/15
Scale	As Noted
By	gg/ts/dp
Job	

Sheet
C-2
3 of 4 Sheets



D C-3 **Section**
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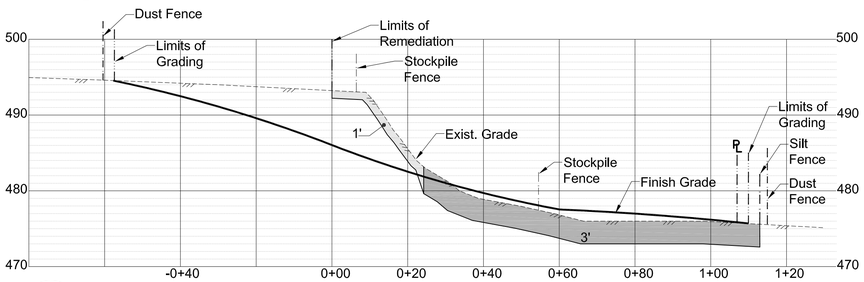

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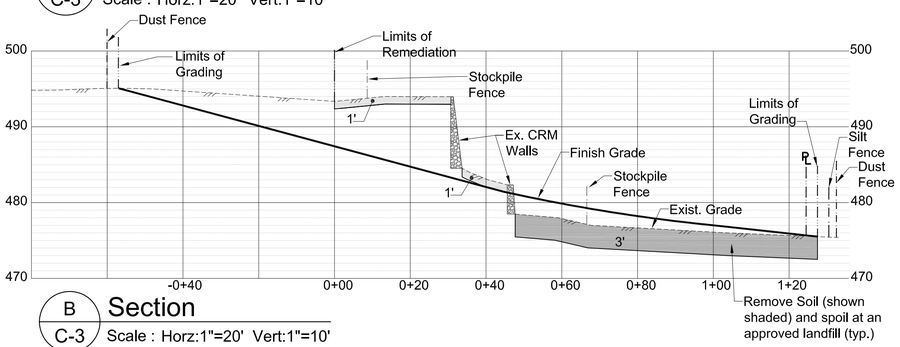

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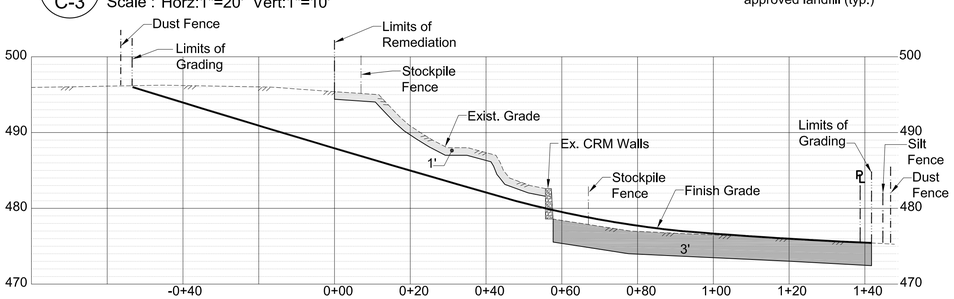
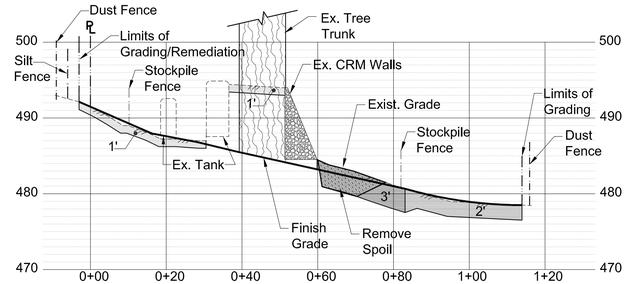


A C-3 **Section**
Scale : Horz:1"=20' Vert:1"=10'

SCALE: 10' 0 10' 20' 1"=10'-0"
SCALE: 20' 0 20' 40' 1"=20'-0"



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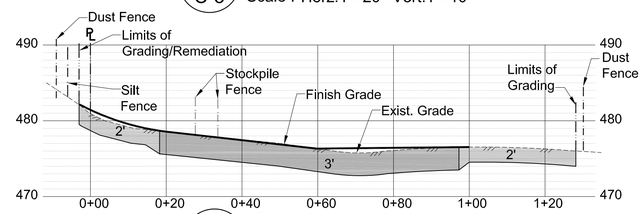

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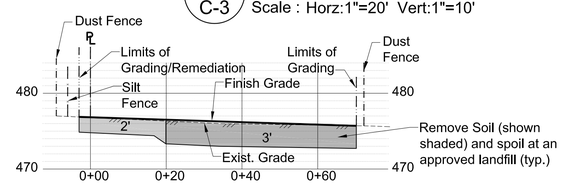

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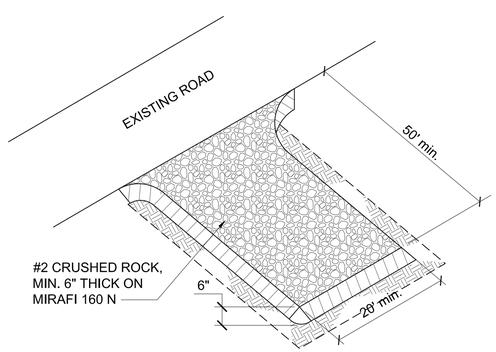
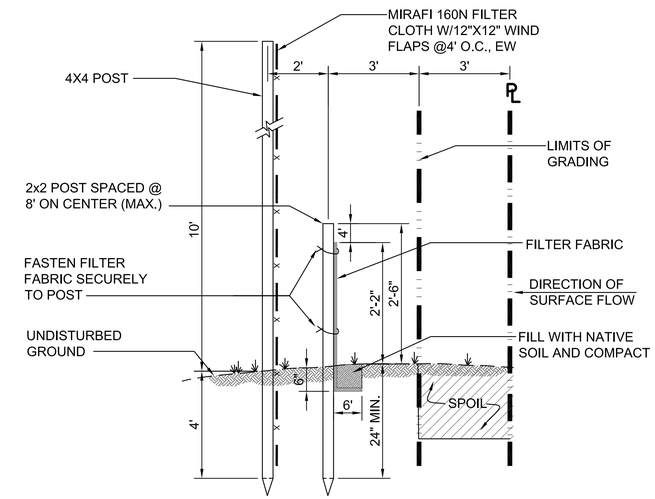


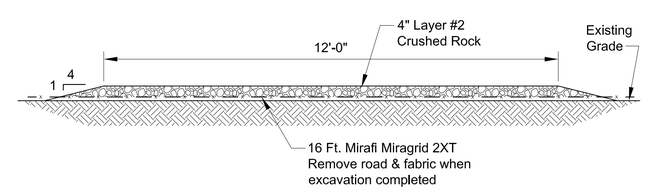
2 C-3 **Stabilization Construction Entrance**
Scale : NTS

LEGEND:

- Excavate & Dispose to 3ft. Depth
- Excavate & Dispose to 2ft. Depth
- Excavate & Dispose to 1ft. Depth



1 C-3 **Dust & Silt Fence Detail**
Scale : NTS



3 C-3 **Typical Road Section**
Scale : NTS

ACSI
Advanced Compliance Solutions, Inc.
94-515 Uke'e Street, #301
Waipahu, Hawaii 96797

DENNIS S. POMA LICENSED PROFESSIONAL ENGINEER 10776-C HAWAII, U.S.A.
EXP. DATE: 4-30-16

This project was prepared by me or under my supervision and construction of this project will be under my observation.

PROJECT
OWNER: Hawaii Island Community Development Corporation
ADDRESS: Kumakua Street, Hawi, Hawaii

T.M.K. : 5-5-19:025, 5-5-8:047, 5-5-8:059, 5-5-8:018

SHEET TITLE
Sections & Details

REVISIONS	BY

Date	04/30/15
Scale	As Noted
By	gg/ts/dp
Job	

Sheet C-3
4 of 4 Sheets

14-108-hicdc-pahoa grading sheets.dwg
Friday, May 01, 2015 4:42:43 PM

APPENDIX E

WASTE MANAGEMENT INC.
WASTE PROFILE APPROVAL

Non-Hazardous WAM Approval

Requested Management Facility: West Hawaii Sanitary Landfill

Profile Number: 341845HI

Waste Approval Expiration Date: 10/02/2014

APPROVAL DETAILS

Approval Decision: ☑ Approved ☐ Not Approved

Profile Renewal: ☐ Yes ☑ No

Management Method: Direct Landfill

Generator Name: Hawaii Island Community Development Corporati

Management Facility Precautions, Special Handling Procedures or Limitation on approval:

- Shall not contain free liquid
- Shipment must be scheduled into disposal facility
- Approval Number must accompany each shipment
- Waste Manifest or applicable shipping document must accompany load
- Shall not pose a dust nuisance
- Shall not pose a odor nuisance
- Analysis provided shall be representative of all material shipped under this non-hazardous waste profile
- Shall comply with applicable DOT and OSHA labeling, packaging and manifesting requirements
- Shall notify WM disposal location of changes associated with original waste generating process prior to shipment
- Waste Management has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Additional Conditions:

WM Authorization Name: Kristin Castner

Title: Waste Approval Manager

WM Authorization Signature:

Date: 10/02/2013

Agency Authorization (if Required):

Date:

©2013 Waste Management, Inc.

EZ Profile™ Renewal Form

Profile Number: 341845HI

Material Name: Pesticide/Herbicide Impacted Soil

Generator Name: Hawaii Island Community Development Corporati

WM Management Facility: West Hawaii Sanitary Landfill

1. Does the previous waste characterization continue to be representative of the material described by this profile?

☑ Yes ☐ No (If No, please complete and submit a new EZ Profile™.)

Please attach any updated analytical or other documents (e.g., revised Safety Data Sheets) that are representative of the waste and you would like WM to include with the profile in WMSolutions. Use the box below to provide any additional description or details regarding the attachments (e.g., applicable sample IDs).

RECERTIFICATION STATEMENT

By signing this EZ Profile™ Renewal Form, I hereby certify that:

- All information included in this and any attached document is true, accurate and complete;
- All changes in the character of the material will be disclosed prior to providing the material to WM;
- If I am an agent signing on behalf of the Generator, I have the authority to do so.

Name (Print): Dennis Poma Date: 01/29/2015

Title: President

Company: ACSI

Certification Signature

Dennis Poma

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WASTE MANAGEMENT

EZ Profile™

Requested Facility: _____ ☐ Unsure Profile Number: 341845HI

☐ Multiple Generator Locations (Attach Locations) ☐ Request Certificate of Disposal ☑ Renewal? Original Profile Number: 341845HI

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Hawaii Island Community Development Corp.
2. Site Address: Kumakua Street
   (City, State, ZIP) Hawi HI 96719
3. County: _____
4. Contact Name: Brian Nishimura
5. Email: nishimura.brian@gmail.com
6. Phone: (808) 896-0593 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☐ SAME AS GENERATOR

1. Billing Name: Hawaii Island Community Development
2. Billing Address: 101 Aupuni Street, Suite 217
   (City, State, ZIP) Hilo HI 96720
3. Contact Name: Brian Nishimura
4. Email: nishimura.brian@gmail.com
5. Phone: (808) 896-0593 6. Fax: _____
7. WM Hauled? ☐ Yes ☐ No
8. P.O. Number: _____
9. Payment Method: ☐ Credit Account ☐ Cash ☐ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Pesticide/Herbicide Impacted Soil
   Describe Process Generating Material: ☐ See Attached
   Soil removed from former Pesticide Mixing Area during remediation
2. Material Composition and Contaminants: ☐ See Attached

1. Soil	100 %
2.	
3.	
4.	
Total composition must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: Brown
5. Physical State at 70˚F: ☑ Solid ☐ Liquid ☐ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ☐ Yes ☐ No Describe: _____
9. Flash Point: ☐ <140˚F ☐ 140˚–199˚F ☐ ≥200˚ ☐ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ☐ Yes* ☐ No
   Code: _____
2. State Hazardous Waste? ☐ Yes ☐ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ☐ Yes* ☐ No
4. Contains Underlying Hazardous Constituents? ☐ Yes* ☐ No
5. From an industry regulated under Benzene NESHAP? ☐ Yes* ☐ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes* ☐ No
7. CERCLA or State-mandated clean-up? ☐ Yes* ☐ No
8. NRC or State-regulated radioactive or NORM waste? ☐ Yes* ☐ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ☐ Yes ☐ No
   a. Regulated by 40 CFR 761? ☐ Yes ☐ No
   b. Remediation under 40 CFR 761.61 (a)? ☐ Yes ☐ No
   c. Were PCB imported into the US? ☐ Yes ☐ No
10. Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☐ No
11. Contains Asbestos? ☐ Yes ☐ No
    → If Yes: ☐ Non-Friable ☐ Non-Friable – Regulated ☐ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☐ Yes
   Please identify applicable samples and/or lab reports:
2. Other information attached (such as MSDS)? ☐ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ☐ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 1,600
   ☑ Tons ☐ Yards ☐ Drums ☐ Gallons ☐ Other: _____
3. Container Type and Size: 20 ton Back Dump
4. USDOT Proper Shipping Name: ☐ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Dennis Poma Date: 01/29/2015

Title: President

Company: ACSI

Certification Signature

Dennis Poma

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WASTE MANAGEMENT

EZ Profile™

Requested Facility: West Hawaii Sanitary Landfill ❑ Unsure Profile Number: 341845HI

❑ Check if there are multiple generator locations. Attach locations. ❑ COD ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Hawaii Island Community Development
2. Site Address: Kumaka Street
   (City, State, ZIP) Hawi HI 96719
3. County: _____
4. Contact Name: Brian Nishimura
5. Email: btnishi@hawaiiantel.net
6. Phone: (808) 935-7692 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ❑ SAME AS GENERATOR

1. Billing Name: Hawaii Island Development Coroporation
2. Billing Address: 101 Aupuni Street, Suite 217
   (City, State, ZIP) Hilo HI 96720
3. Contact Name: Brian Nishimura
4. Email: btnishi@hawaiiantel.net
5. Phone: (808) 935-7692 6. Fax: _____
7. WM Hauled? ❑ Yes ❑ No
8. P.O. Number: _____

C. MATERIAL INFORMATION

1. Common Name: Pesticide/Herbicide Impacted Soil
   Describe Process Generating Material: ❑ See Attached
   Soil removed from former Pesticide Mixing Area during remediation
2. Material Composition and Contaminants: ❑ See Attached

1. Soil	100 %
2.	
3.	
4.	
	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: Brown
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A (Solid)
7. pH: _____ to _____ ☑ N/A (Solid)
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A (Solid)

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. Contains benzene **and** subject to Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:
   Please see the Memo attached above identifying where you can find summary data tables, analytical laboratory reports and written descriptions of the proposed waste
2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 1,600
   ☑ Tons ❑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: 20 ton Back Dump
4. USDOT Proper Shipping Name: ❑ N/A
   _____

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Dennis Poma Date: 10/01/2013

Title: President

Company: ACSI

Certification Signature

Dennis Poma

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Advanced Compliance Solutions, Inc
PO Box 30094
Honolulu, HI 96819
Ph. (808) 349-9076

ACSI Advanced Compliance Solutions, Inc.

Memo

To: WM Solutions

From: Mr. Dennis Poma, Advanced Compliance Solutions, Inc.

CC:

Date: 10/1/2013

Re: Waste Profile Submission No. 341845HI

TRANSMITTAL:

To aid in your review of Waste Profile No. 341845HI, attached is the Draft Removal Action Report (September 22, 2013) describing alternatives considered for proper handling of pesticide impacted soils from the former Kohala Sugar Company Pesticide Mixing Site. The recommended action is to remove and dispose of impacted soils at the West Hawaii Landfill. The Draft Removal Action Report is currently being reviewed by the Hawaii Department of Health and we anticipate approval to proceed with the recommended action within the next few months. Relevant sections characterizing the proposed waste soil described in Waste Profile No. 341845HI can be found in the following sections of the report:

- Section 3 – Environmental Hazard Evaluation
- Figure 5 – Decision Units and Sample IDs
- Figure 6 – Waste Characterization Sampling Areas
- Table 1 – Surface Soil Sampling Results and Environmental Hazard Screening
- Table 3 – Waste Characterization Soil Sampling Results
- Appendix A through E – Laboratory Reports

Should you need further explanation please contact me by phone at the information provided in the header address.

Sincerely,

Dennis Poma

ATTACHMENTS:

Draft Removal Action Report, Former Kohala Sugar Pesticide Mixing Site, September 22, 2013.