Removal Action Report
for a Release During the Caltech Submillimeter Observatory Decommissioning
Mauna Kea Mountain Summit, Hawaii Island

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Prepared for: The California Institute of Technology
"Caltech"

Report Date: September 29, 2024

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1.0 Introduction and Purpose

The project site is located near the summit of Mauna Kea Mountain, within the Mauna Kea Science Reserve on Hawaii Island. The existing Caltech Submillimeter Observatory, pump house, single-story outbuilding, and cesspool have been decommissioned. The project included removing asphalt paving, slab-on-grade and below-grade foundations, and utility decommissioning. The land under the buildings was then graded to match the existing natural countours. No development is planned in the future at the project site.

The purpose of this Removal Action Report is to document a hydraulic fluid oil spill, and subsequent cleanup, that occurred during the decommissioning. The spill occurred due to a rupture in a hydraulic hose on a high-reach excavator while it was situated on an asphalt ground surface adjacent to the Submillimeter Observatory structure. Approximately 10-15 gallons of hydraulic fluid was released onto the asphalt and into cracks in the asphalt at the project site. This amount is less than the State Department of Health (HDOH) reportable quantity of 25 gallons.

2.0 Background

2.1. Site Description

2.1.1 Climate

The project site is located near the summit of Mauna Kea at an elevation of approximately 13,000 feet above mean sea level (Figure 1). Mean minimum temperatures at the summit are around 0 degrees Celsius in the summer and -4 degrees Celsius in the winter. The mean annual precipitation at the summit of Mauna Kea is 15 centimeters, most of which falls as snow during the winter (WRCC, 2024).

2.1.2 Soil and Geology

The project site is located on the summit of Mauna Kea, the highest of the four major volcanoes on Hawaii Island. Soil at the project site includes Lava flows-Cinder land complex, 2 to 40 percent slopes, and excessively drained gravels, cobbles, and bedrock (USDA, 2024).

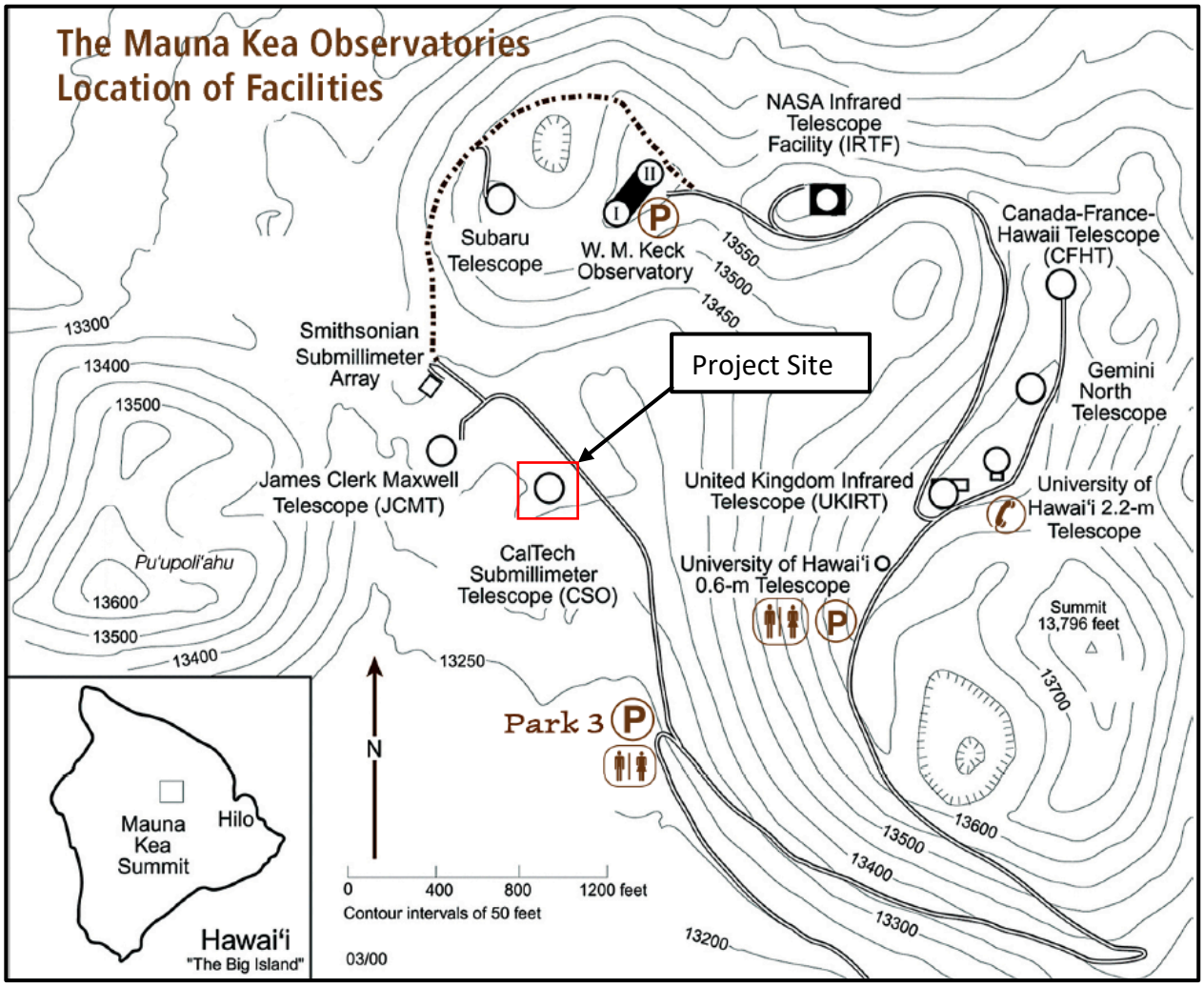
2.1.3 Surface Water

The closest surface water body is Lake Waiau, which is located approximately 0.75 miles south of the project site. Lake Waiau is an alpine glacier lake fed by snow melt from the mountain peaks. There are no other significant surface water features within the vicinity of the project site.

2.1.4 Ground Water

There is no ground water in proximity to the site (Intera, 2019).

Figure 1: Site Location Map



2.2. Current/Future Land Use

The project site was previously occupied and used by the Caltech Submillimeter Observatory. The activity ongoing at the time of the release was the decommissioning of the observatory and the restoration of the project site. There are currently no plans for future use of the project site.

3.0 Description of Release

3.1. Situation Preceding Decision to Conduct Removal

On April 30, 2024, there was a rupture in a hydraulic fluid hose on a high-reach excavator in use for decommissioning of the Submillimeter Observatory structure. About 10-15 gallons of hydraulic fluid were released from the engine compartment onto the asphalt surface on which the excavator was situated. The machine was immediately shut off and personnel began containment. Within one minute of the spill, absorbent "snakes" contained the perimeter of the oil, and within two minutes, absorbent materials had been spread over the spill area. Additional absorbent materials were added over the next several minutes, and the area stayed under close monitoring. The oil-absorbent mats and pillows were collected and additional granular absorbent was spread over the spill area, which was later collected once it had fully absorbed the residual fluid.

The amount of fluid spilled, 10-15 gallons, was below the HDOH reporting requirement of 25 gallons.

While the spill was contained, preexisting cracks in the asphalt motivated sampling of the soil under the asphalt later in the decommissioning process after the asphalt had been removed. Multi-incremental soil samples were collected from the impacted soil area (CSO DU-4) on June 11, 2024 (see Sections 5 and 6). The impacted soil was tested for the following COPCs:

- Total 8 RCRA metals
- TCLP – lead
- Volatile and Semi Volatile Organic Compounds
- PCBs
- TPH in the gasoline, diesel and residual ranges
- Cyanide

Soil sample laboratory analytical results for the impacted soil revealed the presence of TPH-R above its unrestricted Tier 1 HDOH EAL and barium and chromium at levels below their unrestricted HDOH EALs. No other COPCs were detected at or above their respective HDOH unrestricted Tier 1 HDOH EALs (LEI, 2024a).

3.2. Applicable Remedial Action Levels

Given the sensitive environment at the project site, which includes land located in the State of Hawaii Conservation District on the summit of Mauna Kea, the most restrictive land use scenario was used to determine the proper EAL screening level for soil: unrestricted land use, drinking water resource, less than 150 meters from the nearest water body. The EAL for TPH-R in this land use scenario is 500 milligrams per kilogram (mg/kg) (HDOH, 2024).

4.0 Removal Action Tasks

4.1. Removal Project Goal

The goal of the removal project is to address and mitigate the potential soil contamination ensuing from the hydraulic fluid release described in Section 3.

4.2. Removal Action Alternatives Considered

Alternative 1: Bury Impacted Soil Onsite

This alternative included burying the impacted soil onsite and placing clean backfill on top of the impacted soil to keep it from migrating via stormwater/wind erosion. This alternative was abandoned given the environmentally and culturally sensitive location.

Alternative 2: Treat Impacted Soil Onsite

This alternative included stockpiling the impacted soil onsite and allowing it to naturally attenuate with exposure to the open air. This alternative was abandoned given the high wind speeds and sensitive environment at the project site.

Alternative 3: Remove and Dispose of Impacted Soil Offsite

This alternative included over-excavating the impacted soil and disposing of it at the West Hawaii Sanitary Landfill in accordance with county, landfill, and state rules. This alternative was selected as the alternative that best met the needs of the sensitive location summit by completely removing the impacted soil and disposing of it properly.

4.3. Scope of Work

The scope of work for the removal action consisted of Alternative 3 above.

4.4. Description of the Removal Action

On June 18, 2024, after asphalt removal, approximately 900 sq ft of soil in the spill area was excavated to a depth of approximately one foot below ground surface. This excavated area was adjacent to and under the former observatory building slab, as shown in the map in Figure 2 (CSO DU-4). Sampling was done of the excavated material during the excavation process (see Sections 5 and 6) and of the excavated area after excavation was complete (also see Sections 5 and 6).

The excavated soil was temporarily stockpiled on-site during analysis of the samples taken. The stockpile, consisting of approximately 40 cubic yards of soil, was placed onto 10 mil thick plastic sheeting and covered with the same material to prevent erosion/migration of the impacted soil.

For the purpose of transport off-site, the stockpile was then moved into two plastic-lined roll-off bins and stored there until sample analysis was completed. Once the analysis described in Sections 5 and 6 demonstrated that the excavated area and the stockpile both did not exceed unrestricted Tier 1 HDOH EALs, it was determined that no further excavation was necessary and the stockpile could be taken to the West Hawaii Sanitary Landfill for disposal. The bulk of the material in the roll-off bins was transferred to an end-dump truck for transport off the summit. The end-dump was not large enough to contain the entire stockpile, so one of the two roll-off bins retained some material and was also transported off the summit. Both loads were covered with plastic. The two soil loads were taken to the DeLuz yard for overnight storage until permission to drop off the soil at the landfill was granted. At the DeLuz yard, the soil from the partially filled roll-off bin was transferred to a second end-dump truck and both end-dump trucks transported the soil to the landfill and deposited it there.

4.5. Resources Expended

Minimal additional resources were expended since the excavator and truck used to excavate and haul the impacted soil were already being used for the observatory decommissioning project. Two roll-off containers were brought up specifically for storage and transport of the contaminated soil. .

5.0 Description of Sampling Method for Confirmation Testing of Removal Action

5.1. Soil Sampling Activities

A multi-incremental soil sampling approach was conducted in accordance with the HDOH Technical Guidance Manual for the Implementation of the Hawai‘i State Contingency Plan (TGM).

One Decision Unit (DU) included the soil stockpile excavated from the spill area, totaling approximately 40 cubic yards, and the second DU included the ground surface (0-6 inches below ground surface) of the area from which the impacted soil was excavated. This DU (CSO DU-4) included an approximately 900 square foot area adjacent to and

under the former observatory building slab. A map showing the location of the spill area (CSO DU-4) is included as Figure 2.

5.2. Laboratory Sample Preservation Procedures

Samples were collected by LEI in accordance with HDOH guidance and landfill requirements. Soil increments were placed into triple-lined resealable bags, labeled, and placed in sealed coolers on ice for preservation. Soil samples were shipped to Advanced Analytical Laboratory in Honolulu and analyzed for TPH-R and TPH in the diesel range. The soil stockpile sample was also analyzed for TCLP — barium and chromium — in accordance with landfill requirements since earlier soil sampling revealed low levels of these metals in the soil, below their HDOH unrestricted Tier 1 EALs (LEI, 2024a).

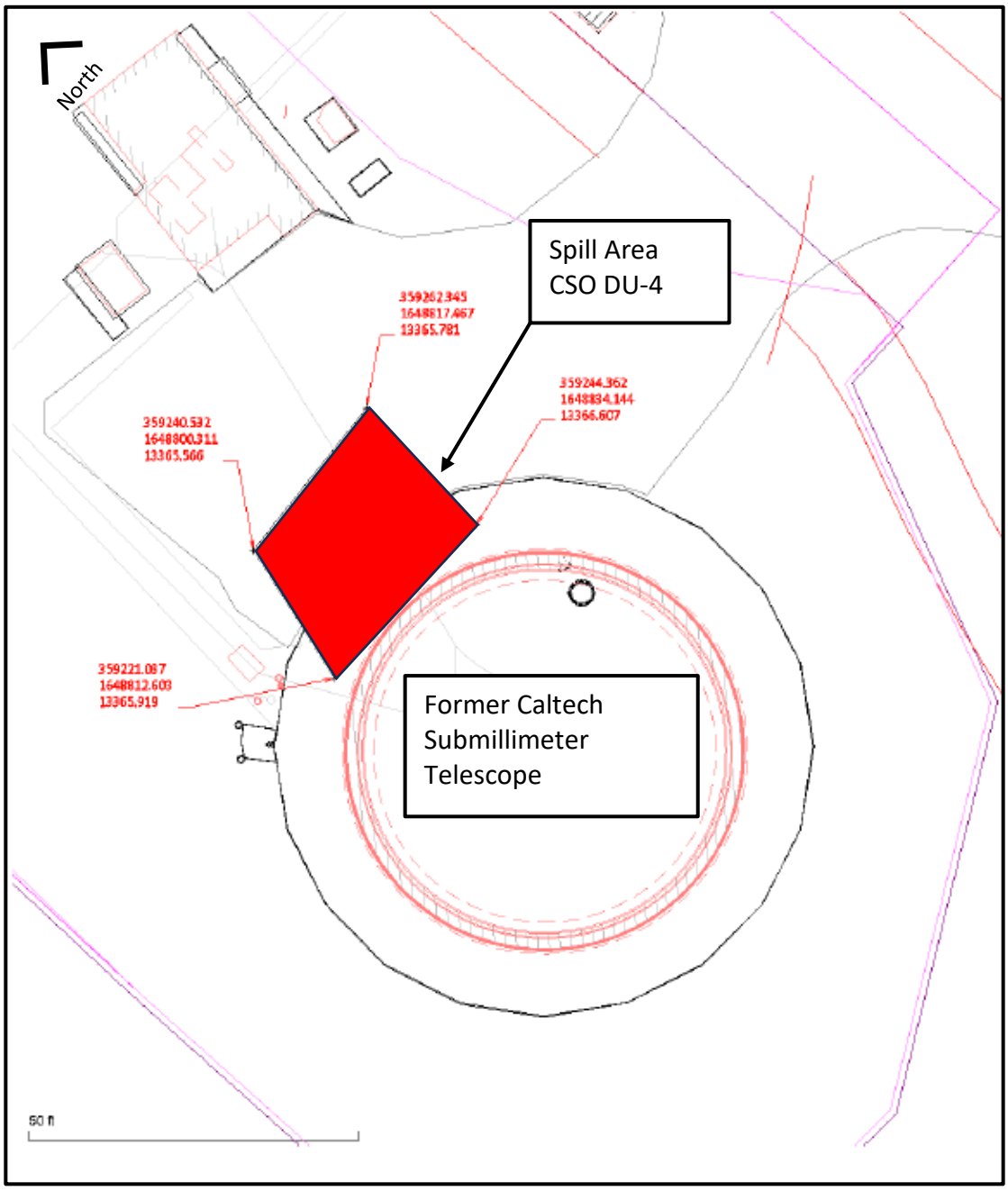
5.3. Laboratory Analytical Procedures

Table 1 below includes the laboratory analytical procedures conducted on the soil samples.

Table 1: Laboratory Analytical Methods

Laboratory Analytical Method	***Chemicals analyzed***	***Preservation Requirements***
EPA 8015M	TPH in the diesel and residual ranges	Cool 4-6 degrees Celsius
EPA 6020/3010A/1311	TCLP – Barium, Chromium	Cool 4-6 degrees Celsius

Figure 2: Spill Impact Area



6.0 Analytical Results of Confirmation Testing

6.1. Analytical Results of Soil Samples

Laboratory analysis of the confirmation samples revealed that, for both the excavated area and the stockpile, none of the COPCs were at or above the laboratory detection limits. Therefore, both samples were below the most restrictive EALs. All replicate sample results were within acceptable statistical agreement (LEI, 2024b). The laboratory analytical results summary table for the confirmation soil samples is included as Attachment 1. The raw laboratory analytical results report is included as Attachment 2.

6.2. Waste Profiling

The decommissioning contractor completed a waste profile sheet that included soil laboratory analytical results from the confirmation soil sampling. Following submittal of laboratory analytical results and completion of landfill waste profile information, the landfill authorized disposal of the stockpile (now determined to be non-hazardous). The transport to the landfill was described in Section 4. The waste profile sheet and shipment manifest are included as Attachment 1.

7.0 References

HDOH 2024. Environmental Action Level Surfer, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater (Spring 2024; last updated 7/10/24): Hawaii Department of Health, Hazard Evaluation and Emergency Response Office.

HDOH, 2023. State of Hawaii Department of Health HEER Office Technical Guidance Manual for Implementation of the Hawaii State Contingency Plan. July, 2023.

INTERA, 2019, Intera Inc., Hydrogeological and Geological Evaluation: Decommissioning of the California Institute of Technology Submillimeter Observatory, September, 2019. (Appendix E of CSO Decommissioning Final Environmental Assessment, available from http://www.cso.caltech.edu/wiki/cso/outreach/outreach#documents.)

LEI, 2024a. Soil Sampling and Analysis Report, Caltech Submillimeter Observatory Decommissioning Project, Mauna Kea Summit, Mauna Kea, Big Island, Hawaii. June 28, 2024.

LEI, 2024b. Confirmation Soil Sampling and Analysis After the Removal of Soils with COPC Above HDOH Tier 1 EALs, Caltech Submillimeter Observatory Decommissioning Project, Mauna Kea Summit, Mauna Kea, Big Island, Hawaii. June 28, 2024.

Mink and Lau, 1993. Aquifer Identification and Classification for the Island of Hawaii: Groundwater Protection Strategy for Hawaii. Technical Report No. 191. May, 1993. Water Resources Research Center, University of Hawaii at Manoa, Honolulu, Hawaii 96822

WRCC, 2024. Western Regional Climate Center. Accessed at: wrcc.di.edu.

USDA, 2024. USDA Web Soil Survey. Accessed at: websoilsurvey.nrcs.usda

Attachment 1: Soil Disposal Documentation

EZ Profile™

Requested Facility: West Hawaii Sanitary Landfill ☐ Unsure Profile Number: 346282HI

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

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Caltech Submillimeter Observatory
2. Generator Site Address: Maunakea Summit
   (City, State, ZIP) Maunakea, Hawaii HI 96743
3. County: Hawaii
4. Contact Name: Jon Steen
5. Email: jons@goodfellowbros.com
6. Phone: (808) 443-8698 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☐ SAME AS GENERATOR

1. Billing Name: Edwin DeLuz Trucking
2. Billing Address: PO BOX 9
   (City, State, ZIP) KAMUELA HI 96743
3. Contact Name: Kevin Balog
4. Email: blogranch@aol.com
5. Phone: (808) 960-1407 6. Fax: _____
7. P.O. Number: 567050
8. Payment Method: ☑ Credit Account ☐ Cash ☐ Credit Card at Gate

C. MATERIAL INFORMATION

1. Common Name: Petroleum impacted soil

   Describe Process(es) Generating Material: ☐ See Attached

   Soil from under demolished asphalt parking lot where a 12 gallon hydraulic oil spill occurred.

2. Material Composition and Contaminants: ☐ See Attached

1. Soil	99 %
2. Petroleum oil	1 %
3.	
4.	
Total comp. 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. Does the material contain benzene? ☐ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ☐ Yes* ☑ No
8. NRC, State-regulated, NORM or TENORM 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? ☐ Yes ☐ No
   c. Were PCBs 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
12. Contains Dioxins? (If Yes, please attach analysis) ☐ Yes ☑ No

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes

   Please identify Lab Report(s) and list specific representative Sample ID#s:

   Attached "Complete Laboratory Report....". The only relevant sample for stockpiled soil disposal is Sample #: CSO DU-4 Stockpile. "Soil Results" is the initial sampling laboratory report.

2. Other information attached (such as SDS)? ☐ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ☐ Repeat Event/Ongoing Business
2. Estimated Annual Quantity/Unit of Measure: 30
   ☐ Tons ☑ Yards ☐ Drums ☐ Gallons ☐ Other _____
3. Container Type and Size: 30yd rolloff & end dump
4. USDOT Proper Shipping Name ☑ N/A

   _____
5. Estimated Start Date 06/27/2024
6. Transportation Needed? ☐ Yes* ☑ No

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

By signing this Waste Management ("WM") Profile, 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 WM prior to providing the material to WM. I am aware that there are significant penalties for knowingly submitting false information.

☑ I am authorized to sign on behalf of the Generator and I have confirmed with the Generator that information contained in this profile, as well as supporting documents provided, are accurate and complete.

☐ I am a duly authorized employee of Generator holding a position of technical responsibility with direct knowledge of the waste stream and the information contained in this profile, and I confirm that information contained in this profile, as well as supporting documents are accurate and complete.

Name (Print): Jon Steen
Title: Project Manager
Company: Goodfellow Brothers, LLC
Date: 06/26/2024

Certification Signature

Jon Steen

619fce43b6...

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

WASTE SHIPMENT MANIFEST

Work Site Name & Address	Owner's Name	Owner's Telephone No.
CSO Mauna Kea Summit	Caltech	626-676-6236

Consultant Contact	Operator's Telephone No.
Sunil Golwala	808-443-8698

Waste Disposal Facility	Facility Telephone No.
West Hawaii Landfill 71-111 Queen Kaahumanu Hwy Waikoloa, HI 96738	(808) 886-0940
Name & Address of Responsible Agency	
Hawaii State Department of Health - 919 Ala Moana Blvd., Room 203 Honolulu, HI 96814	(808) 586-5800

Description of Materials	No. of Containers	Total Quantity, Cubic Yard
Contaminated Soil Profile Number: 346282HI	8 loads	40 yds

Special Handling Instruction and Additional Information

Waste must follow approval criterial listed on page two of profile. No free liquids, loads leaking and wet for whatever reason, will be rejected. Excessive odors will also be rejected.

Operator's Certification: *I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable government regulations.*

Type/Print Name & Title	Signature	Date
Jon Steen, GBI Project Manager	Jon Steen	6/27/24

Transporter #1 (Acknowledge Receipt of Materials)

Type/Print Name & Title	Signature	Date
John Martines Jr.	John Martines Jr.	6/28/24

Edwin Deluz Trucking + Gravel LLC P.O. Box 9 Kamela HI 96743 808-885-9346

Company Name, Address, and Telephone Number

Transporter #2 (Acknowledge Receipt of Materials)

Type/Print Name & Title	Signature	Date

Company Name, Address, and Telephone Number

Discrepancy Indications

Waste Disposal Site: West Hawaii Sanitary Landfill

Type/Print Name & Title: N-Hui

Signature:

Date Received: 6/28/24

WM Profile No:

Attachment 2: Laboratory Analytical Results Summary Table

Table 1. Soil Sampling Summary for June 19, 2024 sampling
CSO Decommissioning

			Descriptive Sample ID	CSO DU-4A EXC (Primary)			CSO DU-4B EXC (Duplicate)			CSO DU-4C EXC (Triplicate)		
			Sample Description	Exposed soils within 1' depth excavation area			Exposed soils within 1' depth excavation area			Exposed soils within 1' depth excavation area		
Analyte	**Laboratory Analytical Method**	**DOH EAL Unrestricted Land Use (mg/kg)**	**DOH EAL Commercial/ Industrial Land Use (mg/kg)**	**Result (mg/kg)**	**Practical Quantitation Limit (PQL) (mg/kg)**	**Pass/Fail**	**Result (mg/kg)**	**Practical Quantitation Limit (PQL) (mg/kg)**	**Pass/Fail**	**Result (mg/kg)**	**Practical Quantitation Limit (PQL) (mg/kg)**	**Pass/Fail**
Total Petroleum Hydrocarbons (TPHs)												
TPH-Diesel	EPA 8015M	180	680	ND	50	Pass	ND	50	Pass	ND	50	Pass
TPH-Oil	EPA 8015M	500	1000	ND	100	Pass	ND	100	Pass	ND	100	Pass

Notes:
ND = Not detected above the laboratory detection limit
DOH = State of Hawai'i Department of Health
EPA = Environmental Protection Agency
EAL = Environmental Action Level
mg/kg = Milligrams per kilogram

Attachment 3: Laboratory Analytical Results Report

ADVANCED ANALYTICAL LABORATORY INC

AAL Project #Z540

Lehua Environmental Inc.

Client Project #: Method 8015M

Client Project Name: CSO Asphalt spill stockpile Matrix: Soil

CLIENT SAMPLE ID	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	SURROGATE RECOVERY	FLAGS	DATE ANALYZED
Blank	nd	nd	109%		6/24/2024
CSO DU-4 Stockpile	nd	nd	112%		6/24/2024
CSO DU-4A EXC	nd	nd	110%		6/24/2024
CSO DU-4B EXC	nd	nd	106%		6/24/2024
CSO DU-4C EXC	nd	nd	104%		6/24/2024
PQL	50	100	Acceptable Range		
MDL	20	35	70%-130%		

QA/QC DATA

QC BATCH # 062424	TPH-DIESEL [mg/kg]	TPH-OIL [mg/kg]	Acceptable Range
Lab Control Spike (LCS)	534	436	350-650
Matrix Spike (MS)	494	443	350-650
Matrix Spike Dup (MSD)	502	444	350-650
Recovery LCS	107%	87%	70%-130%
Recovery MS	99%	89%	70%-130%
Recovery MSD	100%	89%	70%-130%
RPD of MS/MSD	1.6%	0.2%	20%

Analyst: U. Baumgartner, Ph.D.

Data review: E. Young

544 OHOHIA STREET #10 HONOLULU HAWAII 96819
TEL (808) 836-2252

ACCU LABORATORY

12524 130th Lane NE
Kirkland WA 98034

Tel: (425) 214-5858
(425) 214-5868
Email: lisa@accu-lab.com
website: www.accu-lab.com

Analytical Report

Client	**Advanced Analytical Laboratory**	**Acculab WO#**	**24-AL0625-2**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	6/19/2024
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	6/25/2024
Project Name	**CSO Asphalt spill stockpile**	Date Reported	6/26/2024
Client Project#			
Project#	**Z540**		

Metals in Soil TCLP by EPA 6020B/3010A/1311

Accu Lab Batch# AL062524-10

Client sample ID					**TCLP CSO DU-4 Stockpile**	**TCLP MS**	**TCLP MSD**	**TCLP RPD**
Lab ID	**MRL**	**Unit**	**MTH BLK**	**LCS**	24-AL0625-2-1	24-AL0625-1-1	24-AL0625-1-1	24-AL0625-1-1
Matrix			TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract	TCLP Extract
Date Extracted			6/25/2024	6/25/2024	6/25/2024	6/25/2024	6/25/2024	6/25/2024
Date Analyzed			6/26/2024	6/26/2024	6/26/2024	6/26/2024	6/26/2024	6/26/2024
Barium (Ba)	0.50	mg/l	nd	90%	nd	119%	120%	1%
Chromium (Cr)	0.10	mg/l	nd	93%	nd	110%	108%	2%

Acceptable Recovery Limits:

LCS	*80-120%*
MS/MSD	*75-125%*
Acceptable RPD limit:	*20%*

ACCU LABORATORY

12524 130th Lane NE
Kirkland WA 98034

Tel: (425) 214-5858
(425) 214-5868
Email: lisa@accu-lab.com
website: www.accu-lab.com

Analytical Report

Client	Advanced Analytical Laboratory	**Acculab WO#**	**24-AL0625-2**
	544 Ohohia Street #10		
	Honolulu, HI, 96819	Date Sampled	6/19/2024
Project Manager	Uwe Baumgartner/ Elisa Young	Date Received	6/25/2024
Project Name	**CSO Asphalt spill stockpile**	Date Reported	6/26/2024
Client Project#			
Project#	**Z540**		

Data Qualifiers and Comments:

Results reported on dry-weight basis for soil samples.

MRL- Method Reporting Limit
nd- Indicates the analyte is not detected at the listing reporting limit.
C- Coelution with other compounds.
M- % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
B- Indicates the analyte is detected in the method blank associated with the sample.
J- The analyte is detected at below the reporting limit.
E- The result reported exceeds the calibration range, and is an estimate.
D- Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
H- Sample was received or analyzed past holding time
Q- Sample was received with head space, improper preserved or above recommended temperature.
I- Due to insufficient sample, LCS/LCS DUP were analyzed in place of MS/MSD.
R- The recovery of this analyte in QC sample failed high, but the analyte was not detected in all related samples. No action was taken.
R-1- The RPD value for the MS/MSD was outside of QC acceptance limits however both recoveries were acceptable. All related samples were "nd". No action was taken.
R-2- The recovery of the surrogate in sample failed high, but all related analytes were not detected in the sample. No action was taken.

ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252 Fax:(808) 836 2250 Address: 544 Ohohia St., unit 10 Honolulu, HI 96819

TURNAROUND TIME: 24 hour TAT AAL PROJECT#: 7540

CLIENT:	Lehua Environmental Inc.	PROJECT NAME:	CSO Asphault spill stockpile
ADDRESS:	P.O. Box 1018, Kamuela, HI 96743	COLLECTOR:	Calvin John Arca
PHONE:	(808)494-0365 lehuaenvironmental@gmail.com	DATE OF COLLECTION:	6/19/2024
CLIENT PROJECT#:		PROJECT MANAGER:	K. Kobayashi

Sample Number	Time	Sample type	Container Type	Multi-Incremental Volatile	Multi-Incremental Non Volatile	8015M TPH Fuel Scan	8015M TPH Gasoline	8015M TPH Diesel	8015M TPH Oil	8260B Volatiles	8260 BTEX	Bioaccessible Arsenic	8270 PAH DOH 4	8270 PAH 17 analytes	8270 Semi Volatiles	TCLP Barium	8082 PCB	TCLP 8081 OrganoChlorind Pes	8081 Organochlorine Pesticides	TCLP Chromium	Total Lead	Total Cadmium	TCLP RCRA 8 Metals	Total RCRA 8 Metals	TPH Residual Range Organics	Field Notes	Number of containers	Number containers received
CSO DU-4 Stockpile		MI	zip lock bag		x			x	x						x				x								1	1
CSO DU-4A EXC		MI	zip lock bag		x			x	x																		1	1
CSO DU-4B EXC		MI	zip lock bag		x			x	x																		1	1
CSO DU-4C EXC		MI	zip lock bag		x			x	x																		1	1

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	6/20/24 10:00AM		6/21/24 1095
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS INTACT	N
RECEIVED IN GOOD CONDITION	Yes
TEMPERATURE	3.9°C
PAGE _ OF _	

LABORATORY NOTES: