

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA HAPPY VALLEY PLANNED EXCAVATION CYN-1

Introduction

This report presents supporting detailed information for the July 16, 2009 in-situ characterization of prospective soil wastes from planned ISRA excavations at Happy Valley.

Background

In-situ characterization of soil destined to be excavated from Happy Valley in accordance with the ISRA Workplan was performed. A step-by-step approach was followed to accomplish characterization of the soil prior to excavation. The first step was to review available information regarding historical area usage and existing analytical data from past soil sampling in the Happy Valley (HV). The objective was to identify all substances that could have an impact on the determination of whether soil in each planned excavation footprint was hazardous or not.

The next step was to develop a random sampling plan for each of the planned excavation footprints to determine whether any of the identified substances are present at concentrations that require further investigation. An evaluation of the results of the initial random sampling was performed to determine whether the data was adequate for waste characterization based on the exhibited variance of any detected analytes and the relative difference between detected concentrations and regulatory thresholds. The soil was characterized non-hazardous when analyte concentrations among the samples exhibited a reasonably small variance and there was satisfactory margin between the mean of the samples and applicable regulatory thresholds. Otherwise, additional samples were collected and subjected to analysis or the soil was characterized as hazardous.

The review of historical information and existing analytical data relevant to planned excavation CYN-1, which was later reduced in size, was based largely on the Group 1A RFI results. No major concerns with respect to hazardous waste characterization were revealed by the review, but it did suggest that any further analysis should focus on regulated metals. This is a small excavation area. To obtain additional data relating to regulated metals, a random sampling plan was developed for collection of four (4) samples from the planned excavation footprint. However, changes were made in the excavation plans after sampling was already completed. The original area was reduced, but this resulted in exclusion of some of the original sample collection points from the new footprint. Accordingly, an additional two (2) samples were collected to account for the new excavation footprint of CYN-1. The samples were all analyzed for CAM 17 metals. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the CYN-1 planned excavation area are presented in TestAmerica reports ISG0122, issued on 7/15/09 and ISH1607, issued on 9/9/09. With the exception of one sample with elevated Lead concentrations, all regulated metals were well below applicable regulatory thresholds. Chromium was the most significant of the detected metals from a regulatory standpoint, but in five of the six samples collected, it was well below the RCRA and California hazardous waste thresholds. Chromium ranged from 16 ppm to 28 ppm in these samples compared to the TCLP 20 X threshold of 100 ppm, the CA TTLC threshold of 2,500 ppm, and the CA STLC 10 X threshold of 50 ppm.

Although Lead was generally observed only at low concentrations, one of the samples collected during the second round of sampling did exhibit Lead at 75 ppm. As this concentration exceeded the CA STLC 10 X threshold (i.e., 50 ppm) requiring leachate testing (WET), the required analysis was performed. The CA WET yielded a 2.7 mg/L concentration for Lead in the sample with the elevated concentration, well below the CA STLC hazardous waste threshold of 5 mg/L. Taking into consideration all of the data from the randomly selected representative samples, the average properties of the soil to be removed during excavation from CYN-1 do not exceed hazardous waste regulatory thresholds.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of Happy Valley CYN-1:

- Is Not a Listed Waste (generator knowledge)
- Is Not ignitable (generator knowledge)
- Is Not corrosive (generator knowledge)
- Is Not reactive (generator knowledge)
- Is Not toxic (analytical results and generator knowledge)
 - Is Not Extremely or Acutely Hazardous Waste
 - Does Not exceed any RCRA or Title 22 thresholds
 - Is Not subject to the Prop. 65 listing
 - Is Not subject to Title 22 Appendix X list
 - Is Not known by experience or testing to pose a hazard to human health or environment because of its carcinogenicity, acute toxicity, chronic toxicity, bio-accumulative properties, or persistence in the environment.

The soil in CYN-1 is NON-HAZARDOUS.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 008

**CYN-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			ISWC0041	ISWC0042	ISWC0094	ISWC0095
			Sample Name:			ISWC0041S001	ISWC0042S001	ISWC0094S001	ISWC0095S001
			Collection Date:			7/1/2009	7/1/2009	8/17/2009	8/17/2009
			Sample Depth (feet):			0 - 0.3	0 - 0.5	0.0 - 0.5	0.0 - 0.3
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT	RESULT	RESULT	RESULT
METALS									
Antimony	mg/kg	500	150	--	--	<10	<10	<10 M2	<10
Arsenic	mg/kg	500	50	100	--	4.4	4.4	8.1	7.3
Barium	mg/kg	10,000	1,000	2,000	--	77	56	51	52
Beryllium	mg/kg	75	7.5	--	--	0.5	0.52	0.54	0.48 J
Cadmium	mg/kg	100	10	20	--	<0.5	<0.5	<0.5	0.58
Chromium	mg/kg	500	50	100	--	16	16	25	28
Cobalt	mg/kg	8,000	800	--	--	6	5.5	6.2	6.6
Copper	mg/kg	2,500	250	--	--	16	8.3	14	15
Lead	mg/kg	1,000	50	100	--	3.8	3.9	6.6	75
Lead, WET	mg/L	--	--	--	5	--	--	--	2.7
Mercury	mg/kg	20	2	4	--	0.0088 J	0.01 J	<0.033	<0.033
Molybdenum	mg/kg	3,500	3,500	--	--	0.86 J	0.56 J	0.44 J	0.61 J
Nickel	mg/kg	2,000	200	--	--	12	12	17	17
Selenium	mg/kg	100	10	20	--	<2	<2	<2	<2
Silver	mg/kg	500	50	100	--	<1	<1	0.95 J	0.94 J
Thallium	mg/kg	700	70	--	--	1.1 J	1.3 J	<10	<10
Vanadium	mg/kg	2,400	240	--	--	29	29	35	31
Zinc	mg/kg	5,000	2,500	--	--	42	40	54	77
RADIONUCLIDES									
	--	--	--	--	R	R	R	R	R

NOTES

--" - not applicable

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

B - analyte was detected in the associated method blank

J - Result is estimated

M2 - the matrix spike and/or matrix spike duplicate were below the acceptance limits due to matrix interference

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

R - Radiological analysis includes gamma spectroscopy (Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241), strontium-90, and tritium. Boeing has prepared a document dated August 17, 2009 that provides the radiological results and statistical analysis of the Outfall 008 waste characterization samples. Based on the results, the document certifies the soil represented by these waste characterization samples to be "radiologically" acceptable for shipment to Class 1, 2, and/or 3 disposal facilities. The analysis and data interpretation complies with procedures approved by the California Department of Public Health.

This table presents only those waste characterization sample results that actually fall within the boundaries of the final, revised excavation footprints. Other results may have been used in the initial soil characterization, but no longer fall within the final excavation footprints. These results are not included in this table, but have been reassigned as data gap information and are reported elsewhere.