Outfall 008, HVS-3 & HVS-4
Pre-Excavation Sample Results

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Planned Excavation Area
- Previously Excavated Area
- Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
- Surface Water Drainage
- Elevation Contour
- Sample On Hold

ISRA Constituents of Concern
Copper, Lead, Dioxins

2005 Background Comparison Concentrations
Copper: 29 mg/kg
Lead: 34 mg/kg
Dioxins (TCDD TEQ): 0.87 pg/g

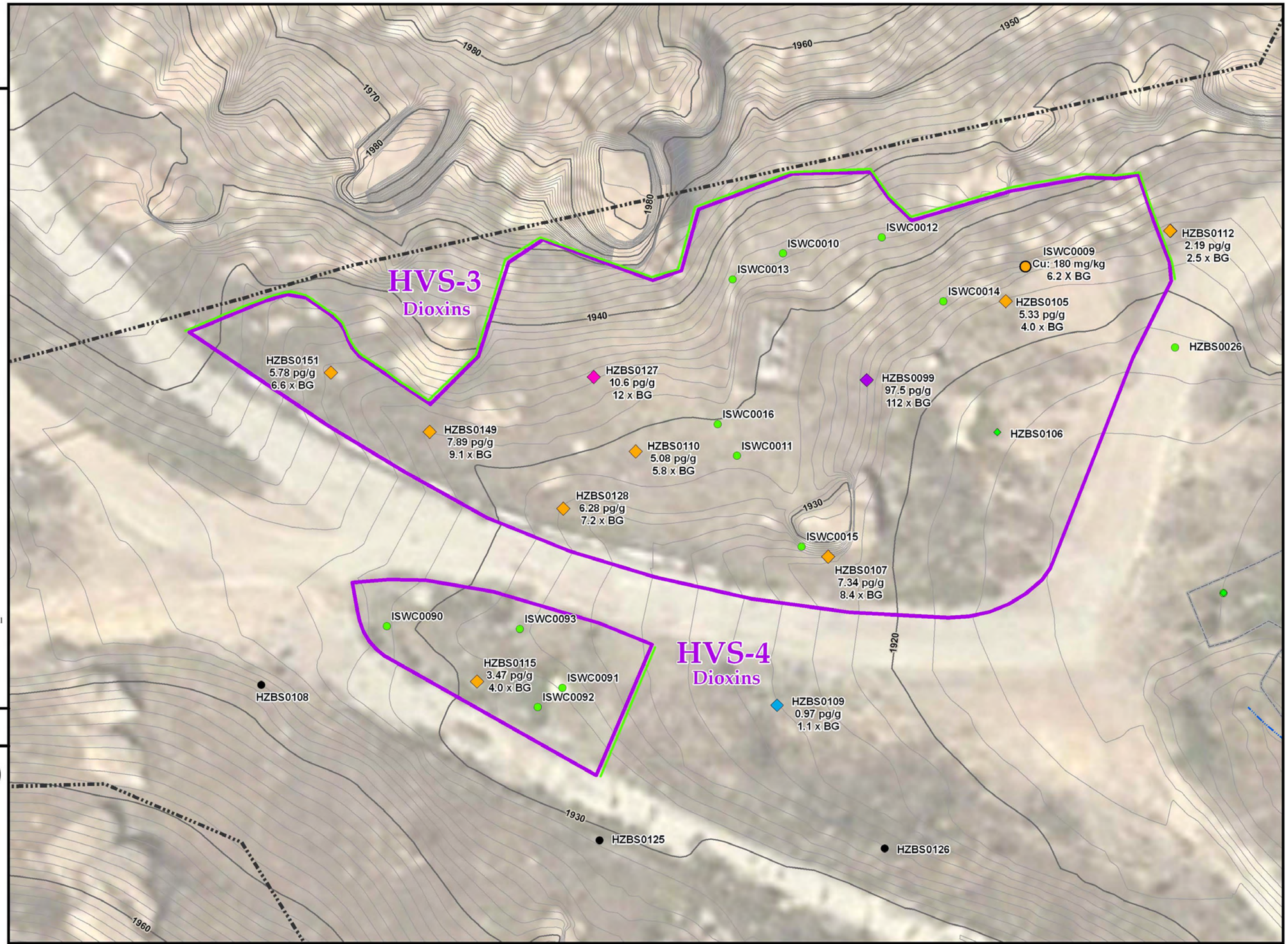
Copper and/or Lead Sample Location (<2 feet bgs)
- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG

Dioxin Sample Location (<2 feet bgs)
- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG
- ≥100x BG

Note:
1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ.
2. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
3. Sample IDs shown represent ISRA data gap, ISRA waste characterization and RCRA RFI samples located in the vicinity of the ISRA area.
4. Aerial imagery from Google Earth, 2007.
5. Topographic contours from Sage, July 2009.

Date: August 24, 2009

0 10 20 40 Feet



SANTA SUSANA FIELD LABORATORY

MWH FIGURE E-9.1

Printing Date: March 31, 2010 File: \\uspas1netapp1\DEI\rocketdyne gis\MasterGISFiles\ISRA_Projects\ISRA_MXD\Outfall 008\Final\008 ISRA_HVS-3_PreExcavationSamplesFinal.mxd

TABLE E-9.1 HVS-3 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZBS0026**	**HZBS0099**	**HZBS0105**	**HZBS0106**	**HZBS0106**	**HZBS0107**	**HZBS0107**	**HZBS0110**	**HZBS0112**
		Sample Name:		HZBS0026S001	HZBS0099S001	HZBS0105S001	HZBS0106S001	HZBS0106S002	HZBS0107D001	HZBS0107S001	HZBS0110S001	HZBS0112S001
		Collection Date:		7/29/2008	3/20/2009	4/9/2009	4/9/2009	4/9/2009	4/9/2009	4/9/2009	6/1/2009	6/1/2009
		Sample Depth (feet bgs):		0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	3.5 - 4.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5
		Status		In Place	Excavated	Excavated	Excavated	Excavated	Excavated	Excavated	Excavated	In Place
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS												
Aluminum	mg/kg	20,000	--	7,980	--	--	--	--	--	--	--	--
Antimony	mg/kg	8.7	--	<0.318	--	--	--	--	--	--	--	--
Arsenic	mg/kg	15	--	2.2	--	--	--	--	--	--	--	--
Barium	mg/kg	140	--	66.2	--	--	--	--	--	--	--	--
Beryllium	mg/kg	1.1	--	0.45	--	--	--	--	--	--	--	--
Boron	mg/kg	9.7	--	2 J	--	--	--	--	--	--	--	--
Cadmium	mg/kg	1	--	0.33	--	--	--	--	--	--	--	--
Chromium	mg/kg	36.8	--	10.6 J	--	--	--	--	--	--	--	--
Cobalt	mg/kg	21	--	3.6 J	--	--	--	--	--	--	--	--
Copper	mg/kg	29	29	6.1 J	--	44.5 J	--	--	--	--	--	8.07 J
Lead	mg/kg	34	34	8	--	--	--	--	--	--	--	--
Mercury	mg/kg	0.09	--	0.015 J	--	--	--	--	--	--	--	--
Molybdenum	mg/kg	5.3	--	0.55	--	--	--	--	--	--	--	--
Nickel	mg/kg	29	--	7.3 J	--	--	--	--	--	--	--	--
Selenium	mg/kg	0.655	--	<0.495	--	--	--	--	--	--	--	--
Silver	mg/kg	0.79	--	0.1 J	--	--	--	--	--	--	--	--
Thallium	mg/kg	0.46	--	<0.25	--	--	--	--	--	--	--	--
Vanadium	mg/kg	62	--	20.6	--	--	--	--	--	--	--	--
Zinc	mg/kg	110	--	50.2	--	--	--	--	--	--	--	--
DIOXINS												
TCDD TEQ	pg/g	0.87	3.0	--	97.5	5.32	0.036	0.006	6.85	7.35	5.04	2.14

TABLE E-9.1 HVS-3 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZBS0127**	**HZBS0128**	**HZBS0149**	**HZBS0151**	**ISWC0009**	**ISWC0010**	**ISWC0011**	**ISWC0012**	**ISWC0013**
		Sample Name:		HZBS0127S001	HZBS0128S001	HZBS0149S001	HZBS0151S001	ISWC0009S001	ISWC0010S001	ISWC0011S001	ISWC0012S001	ISWC0013S001
		Collection Date:		6/30/2009	6/30/2009	7/15/2009	7/21/2009	7/1/2009	7/1/2009	7/1/2009	7/1/2009	7/1/2009
		Sample Depth (feet bgs):		0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	0.2 - 0.7	0.3 - 0.8	0.0 - 0.5	1.1 - 1.6	1.5 - 2.0
		Status		Excavated	Excavated	Excavated	Excavated	Excavated	Excavated	Excavated	Excavated	Excavated
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**
METALS												
Aluminum	mg/kg	20,000	--	--	--	--	--	--	--	--	--	--
Antimony	mg/kg	8.7	--	--	--	--	--	<0.88	<0.88	<0.88	<0.88	<0.88
Arsenic	mg/kg	15	--	--	--	--	--	4.6	4.3	4.9	3.8	4.3
Barium	mg/kg	140	--	--	--	--	--	66	51	53	59	48
Beryllium	mg/kg	1.1	--	--	--	--	--	0.55	0.54	0.55	0.56	0.57
Boron	mg/kg	9.7	--	--	--	--	--	--	--	--	--	--
Cadmium	mg/kg	1	--	--	--	--	--	0.45 J	<0.3	1.8	<0.2	<0.2
Chromium	mg/kg	36.8	--	--	--	--	--	13	12	14	12	16
Cobalt	mg/kg	21	--	--	--	--	--	4.4	3.5	4.1	3.7	3.4
Copper	mg/kg	29	29	--	--	--	--	180	6.8	9.7	7	6.8
Lead	mg/kg	34	34	--	--	--	--	25	10	10	9.4	8.9
Mercury	mg/kg	0.09	--	--	--	--	--	0.05	0.011 J	0.014 J	0.014 J	0.0072 J
Molybdenum	mg/kg	5.3	--	--	--	--	--	0.86 J	0.56 J	0.58 J	0.63 J	0.53 J
Nickel	mg/kg	29	--	--	--	--	--	9.9	8.7	9.2	8.2	8.9
Selenium	mg/kg	0.655	--	--	--	--	--	<1	<1	<1	<1	<1
Silver	mg/kg	0.79	--	--	--	--	--	1	<0.8	<0.8	<0.8	<0.8
Thallium	mg/kg	0.46	--	--	--	--	--	<0.8	<0.8	<0.8	<0.8	<0.8
Vanadium	mg/kg	62	--	--	--	--	--	23	21	23	21	24
Zinc	mg/kg	110	--	--	--	--	--	66	58	87	44	100
DIOXINS												
TCDD TEQ	pg/g	0.87	3.0	10.64	6.28	7.89	5.78	--	--	--	--	--

TABLE E-9.1 HVS-3 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**ISWC0014**	**ISWC0015**	**ISWC0016**
		Sample Name:		ISWC0014S001	ISWC0015S001	ISWC0016S001
		Collection Date:		7/1/2009	7/1/2009	7/1/2009
		Sample Depth (feet bgs):		0.0 - 0.5	0.0 - 0.5	0.0 - 0.5
		Status		Excavated	Excavated	Excavated
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**
METALS						
Aluminum	mg/kg	20,000	--	--	--	--
Antimony	mg/kg	8.7	--	<0.88	<0.88	<0.88
Arsenic	mg/kg	15	--	3.6	5.9	4.8
Barium	mg/kg	140	--	47	54	51
Beryllium	mg/kg	1.1	--	0.44 J	0.45 J	0.58
Boron	mg/kg	9.7	--	--	--	--
Cadmium	mg/kg	1	--	<0.2	<0.2	0.25 J
Chromium	mg/kg	36.8	--	11	12	16
Cobalt	mg/kg	21	--	3.3	3.7	4.1
Copper	mg/kg	29	29	8.4	29	10
Lead	mg/kg	34	34	12	20	14
Mercury	mg/kg	0.09	--	0.016 J	0.013 J	0.013 J
Molybdenum	mg/kg	5.3	--	0.54 J	0.69 J	0.74 J
Nickel	mg/kg	29	--	7.4	8.5	8.9
Selenium	mg/kg	0.655	--	<1	1.5 B, J	<1
Silver	mg/kg	0.79	--	<0.8	<0.8	<0.8
Thallium	mg/kg	0.46	--	<0.8	<0.8	<0.8
Vanadium	mg/kg	62	--	19	21	25
Zinc	mg/kg	110	--	67	78	82
DIOXINS						
TCDD TEQ	pg/g	0.87	3.0	--	--	--

TABLES E-9.1 HVS-3 FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[b] ISRA SRGs are established for ISRA Constituents of Concern, which include constituents that were detected at concentrations that exceeded NPDES permit limits/benchmarks. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[c] Waste characterization sample results not validated

B - Analyte was detected in the associated Method Blank.

bgs - below ground surface

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds the Soil Remediation Goal (SRG).

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

M2 - The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

SRG - Soil Remediation Goal

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

TABLE E-9.2 HVS-4 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZBS0109**	**HZBS0115**	**ISWC0090**	**ISWC0091**	**ISWC0092**	**ISWC0093**
		Sample Name:		HZBS0109S001	HZBS0115S001	ISWC0090S001	ISWC0091S001	ISWC0092S001	ISWC0093S001
		Collection Date:		6/1/2009	6/1/2009	7/29/2009	7/29/2009	7/29/2009	7/29/2009
		Sample Depth (feet bgs):		0.0 - 0.5	0.0 - 0.5	0.1 - 0.2	0.5 - 1.0	0.0 - 0.3	0.5 - 1.0
		Status:		In Place	Excavated	Excavated	Excavated	Excavated	Excavated
ANALYTE	**UNITS**	**Background [a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**
Metals									
Antimony	mg/kg	8.7	--	--	--	<0.88	<0.88	<0.88	<0.88
Arsenic	mg/kg	15	--	--	--	5	4	4.9	5.8
Barium	mg/kg	140	--	--	--	73	77	67	77
Beryllium	mg/kg	1.1	--	--	--	0.49 J	0.42 J	0.45 J	0.47 J
Cadmium	mg/kg	1	--	--	--	<0.2	<0.2	<0.2	<0.2
Chromium	mg/kg	36.8	--	--	--	15	13	15	16
Cobalt	mg/kg	21	--	--	--	5.2	4.3	4.4	5.5
Copper	mg/kg	29	29	--	--	15	9.2	11	12
Lead	mg/kg	34	34	--	--	12	9.4	11	9.5
Mercury	mg/kg	0.09	--	--	--	0.0094 J	0.012 J	0.013 J	0.021 J
Molybdenum	mg/kg	5.3	--	--	--	<0.2	<0.2	<0.2	<0.2
Nickel	mg/kg	29	--	--	--	12	8.8	10	13
Selenium	mg/kg	0.655	--	--	--	<1	<1	<1	<1
Silver	mg/kg	0.79	--	--	--	<0.8	<0.8	<0.8	<0.8
Thallium	mg/kg	0.46	--	--	--	<0.8	<0.8	<0.8	<0.8
Vanadium	mg/kg	62	--	--	--	30	25	26	32
Zinc	mg/kg	110	--	--	--	60	46	47	49
Dioxins									
TCDD TEQ	pg/g	0.87	3.0	0.972	3.43	--	--	--	--

TABLE E-9.2 HVS-4 FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[b] ISRA SRGs are established for ISRA Constituents of Concern, which include constituents that were detected at concentrations that exceeded NPDES permit limits/benchmarks. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[c] Waste characterization sample results not validated

B - Analyte was detected in the associated Method Blank.

bgs - below ground surface

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds the Soil Remediation Goal (SRG).

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

M2 - The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

SRG - Soil Remediation Goal

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Outfall 008, HVS-3 & HVS-4 Confirmation Sample Results

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Planned Excavation Area
- Actual Excavation Area
- Previously Excavated Area
- Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
- Elevation Contour

Soil Remediation Goals (SRGs)

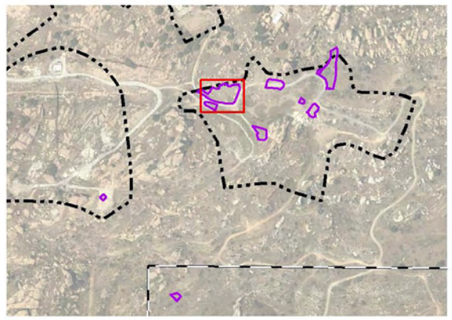
Copper = 29 mg/kg
Lead = 34 mg/kg
Dioxins = 3.0 pg/g

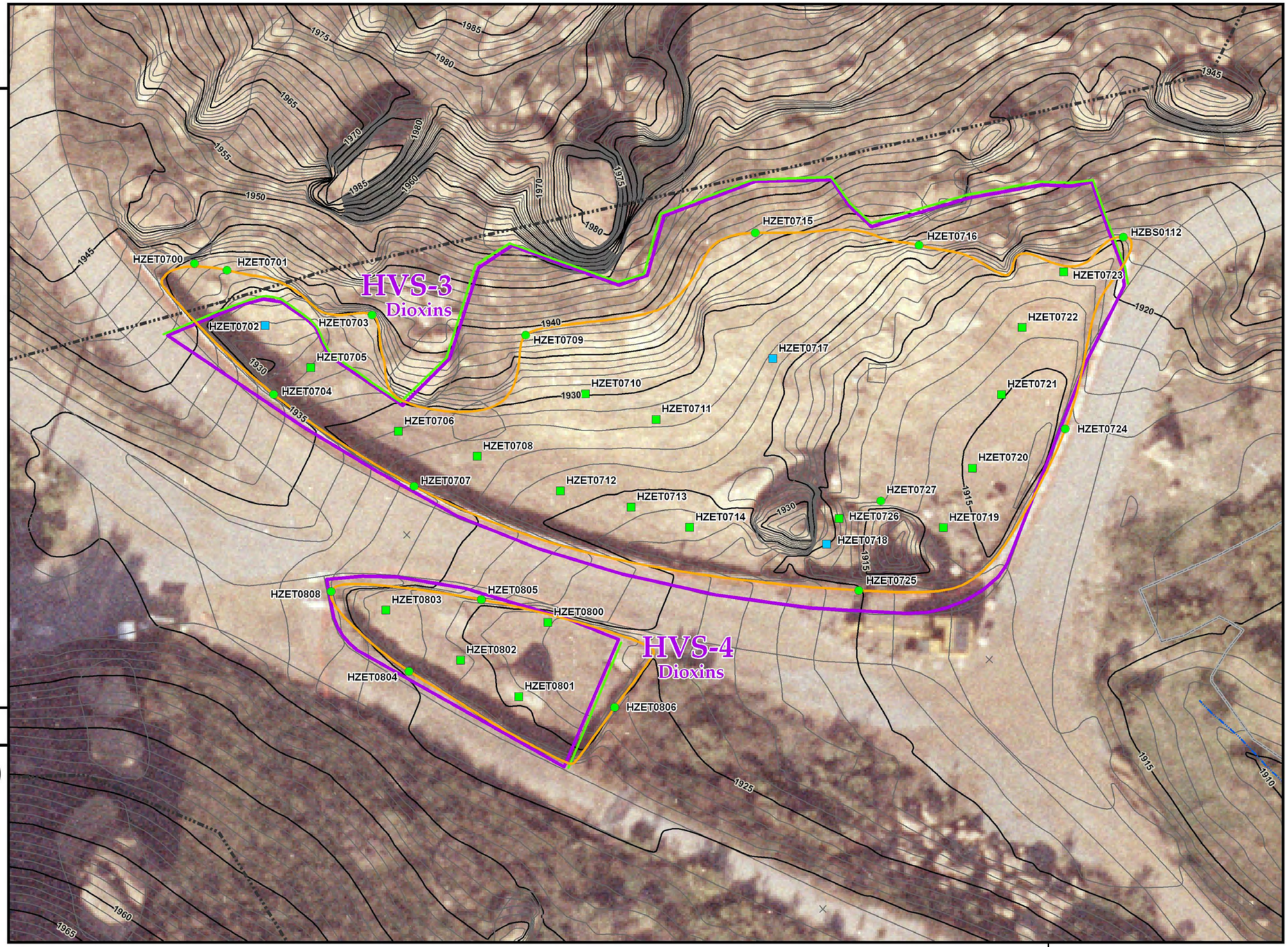
- Floor Sample On Hold
- Floor Sample > SRGs
- Floor Sample <= SRGs
- Sidewall Sample On Hold
- Sidewall Sample >SRGs
- Sidewall Sample <= SRGs

Note:
1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ.
2. Sample IDs shown represent ISRA excavation confirmation samples.
3. Copper and Lead SRG is equal to the 2005 background comparison concentration, and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
4. Aerial imagery from Sage, November 2009.
5. Topographic contours from Sage, November 2009.

Date: November 13, 2009

0 10 20 40 Feet





SANTA SUSANA FIELD LABORATORY

MWH FIGURE E-9.2

Printing Date: March 29, 2010 File: \\uspas1netapp1\DEI\rocketdyne gis\MasterGISFiles\ISRA_Projects\ISRA_MXD\Outfall 008\Final\008 ISRA_HVS-3_ConfirmationSamplesFinal.mxd

TABLE E-9.3 HVS-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZBS0112**	**HZET0700**	**HZET0701**	**HZET0702**	**HZET0703**	**HZET0704**	**HZET0705**	**HZET0706**	**HZET0707**
		Sample Name:		HZBS0112S001	HZET0700S001	HZET0701S001	HZET0702S001	HZET0703S001	HZET0704S001	HZET0705S001	HZET0706S001	HZET0707S001
		Collection Date:		6/1/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009
		Sample Type:		Sidewall	Sidewall	Sidewall	Floor	Sidewall	Sidewall	Floor	Floor	Sidewall
		Sample Depth (feet)[a]:		0.0 - 0.5	2.8 - 3.0	0.3 - 0.5	3.25 - 3.75	0.8 - 1.0	1.05 - 1.25	3.5 - 4.0	3.25 - 3.75	1.3 - 1.5
		Status:		In Place	In Place	In Place	Excavated	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS												
Copper	mg/kg	29	29	8.07 J	6.74 J	28.7 J	11.9 J	5.49 J	5.13 J	5.53 J	7.06 J	5.26 J
DIOXINS												
TCDD TEQ	pg/g	0.87	3	2.14	0.166	1.02	14.6	0.0727	0.938	0.208	0.389	0.0149

TABLE E-9.3 HVS-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZET0708**	**HZET0709**	**HZET0710**	**HZET0710**	**HZET0710**	**HZET0711**	**HZET0712**	**HZET0713**	**HZET0714**
		Sample Name:		HZET0708S001	HZET0709S001	HZET0710S001	HZET0710S001SP	HZET0710S001-RWQCB	HZET0711S001	HZET0712S001	HZET0713S001	HZET0714S001
		Collection Date:		9/24/2009	9/24/2009	9/25/2009	9/25/2009	9/25/2009	9/24/2009	9/24/2009	9/24/2009	9/24/2009
		Sample Type:		Floor	Sidewall	Floor	Floor	Floor	Floor	Floor	Floor	Floor
		Sample Depth (feet)[a]:		2.75 - 3.25	0.3 - 0.5	1.0 - 1.5	1.0 - 1.5	1.0 - 1.5	3.0 - 3.5	3.25 - 3.75	3.0 - 3.5	2.25 - 2.75
		Status:		In Place	In Place	In Place	In Place	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS												
Copper	mg/kg	29	29	8.34 J	23.1 J	12.4 J	16	10	11.2 J	9.03 J	9.99 J	6.49 J
DIOXINS												
TCDD TEQ	pg/g	0.87	3	0.000534	1.53	0.467	0.212	0.517	0.149	0.0217	0 *	0.147

TABLE E-9.3 HVS-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZET0715**	**HZET0716**	**HZET0717**	**HZET0717**	**HZET0718**	**HZET0719**	**HZET0720**	**HZET0721**	**HZET0722**
		Sample Name:		HZET0715S001	HZET0716S001	HZET0717S001	HZET0717S001-RWQCB	HZET0718S001	HZET0719S001	HZET0720S001	HZET0721S001	HZET0722S001
		Collection Date:		9/24/2009	9/24/2009	9/25/2009	9/25/2009	9/30/2009	9/30/2009	9/30/2009	9/30/2009	9/30/2009
		Sample Type:		Sidewall	Sidewall	Floor	Floor	Floor	Floor	Floor	Floor	Floor
		Sample Depth (feet)[a]:		0.3 - 0.6	0.3 - 0.6	2.0 - 2.5	2.0 - 2.5	1.2 - 1.5	2.5 - 2.6	2.8 - 3.0	2.9 - 3.0	3.0 - 3.2
		Status:		In Place	In Place	Excavated	Excavated	Excavated	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS												
Copper	mg/kg	29	29	6.57 J	7.83 J	13.0 J	8.7	9.91 J	6.26 J	5.41 J	5.19 J	4.21 J
DIOXINS												
TCDD TEQ	pg/g	0.87	3	0.745	1.40	5.90	2.29	4.24	0.0513	0.0369	0.0396	0.0844

TABLE E-9.3 HVS-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZET0723**	**HZET0724**	**HZET0725**
		Sample Name:		HZET0723S001	HZET0724S001	HZET0725S001
		Collection Date:		9/30/2009	9/30/2009	9/30/2009
		Sample Type:		Floor	Sidewall	Sidewall
		Sample Depth (feet)[a]:		3.0 - 3.2	2.3 - 2.5	1.5 - 1.7
		Status:		In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**
METALS						
Copper	mg/kg	29	29	2.99 J	6.11 J	7.96 J
DIOXINS						
TCDD TEQ	pg/g	0.87	3	0.0430	0 *	0.235

TABLE E-9.3 CONFIRMATION FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not applicable, not analyzed

* - Zero value for TCDD TEQ result indicates that all the analyitical results used to calculate the TEQ were non-detect.

[a] feet below pre-existing ground surface

[b] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[c] SRGs are for ISRA COCs. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds SRG[c]

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

RWQCB - Regional Water Quality Control Board split samples.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 008

TABLE E-9.4 HVS-4 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZET0800**	**HZET0801**	**HZET0802**	**HZET0802**	**HZET0803**	**HZET0804**	**HZET0805**	**HZET0805**	**HZET0806**
		Sample Name:		HZET0800S001	HZET0801S001	HZET0802S001	HZET0802S001-RWQCB	HZET0803S001	HZET0804S001	HZET0805D001	HZET0805S001	HZET0806S001
		Collection Date:		9/23/2009	9/23/2009	9/23/2009	9/23/2009	9/23/2009	9/23/2009	9/23/2009	9/23/2009	9/23/2009
		Sample Type:		Floor	Floor	Floor	Floor	Floor	Sidewall	Sidewall	Sidewall	Sidewall
		Sample Depth (feet)[a]:		4.5 - 5.0	4.0 - 4.5	3.75 - 4.25	3.75	4.0 - 4.5	1.05 - 1.25	2.3 - 2.5	2.3 - 2.5	0.3 - 0.5
		Status:		In Place	In Place	In Place	In Place	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS												
TCDD TEQ	pg/g	0.87	3	0.00072	0.0062	1.63	0.840	0.0898	0.0522	0.103	0.126	0.475

TABLE E-9.4 HVS-4 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**HZET0806**	**HZET0808**
		Sample Name:		HZET0806S001-RWQCB	HZET0808S001
		Collection Date:		9/23/2009	9/29/2009
		Sample Type:		Sidewall	Sidewall
		Sample Depth (feet)[a]:		0.5	1.4 - 1.5
		Status:		In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**
DIOXINS					
TCDD TEQ	pg/g	0.87	3	0.0701	0.0192

TABLE E-9.4 ALL SITES CONFIRMATION FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not applicable, not analyzed

* - Zero value for TCDD TEQ result indicates that all the analyitical results used to calculate the TEQ were non-detect.

[a] feet below pre-existing ground surface

[b] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[c] SRGs are for ISRA COCs. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds SRG[c]

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

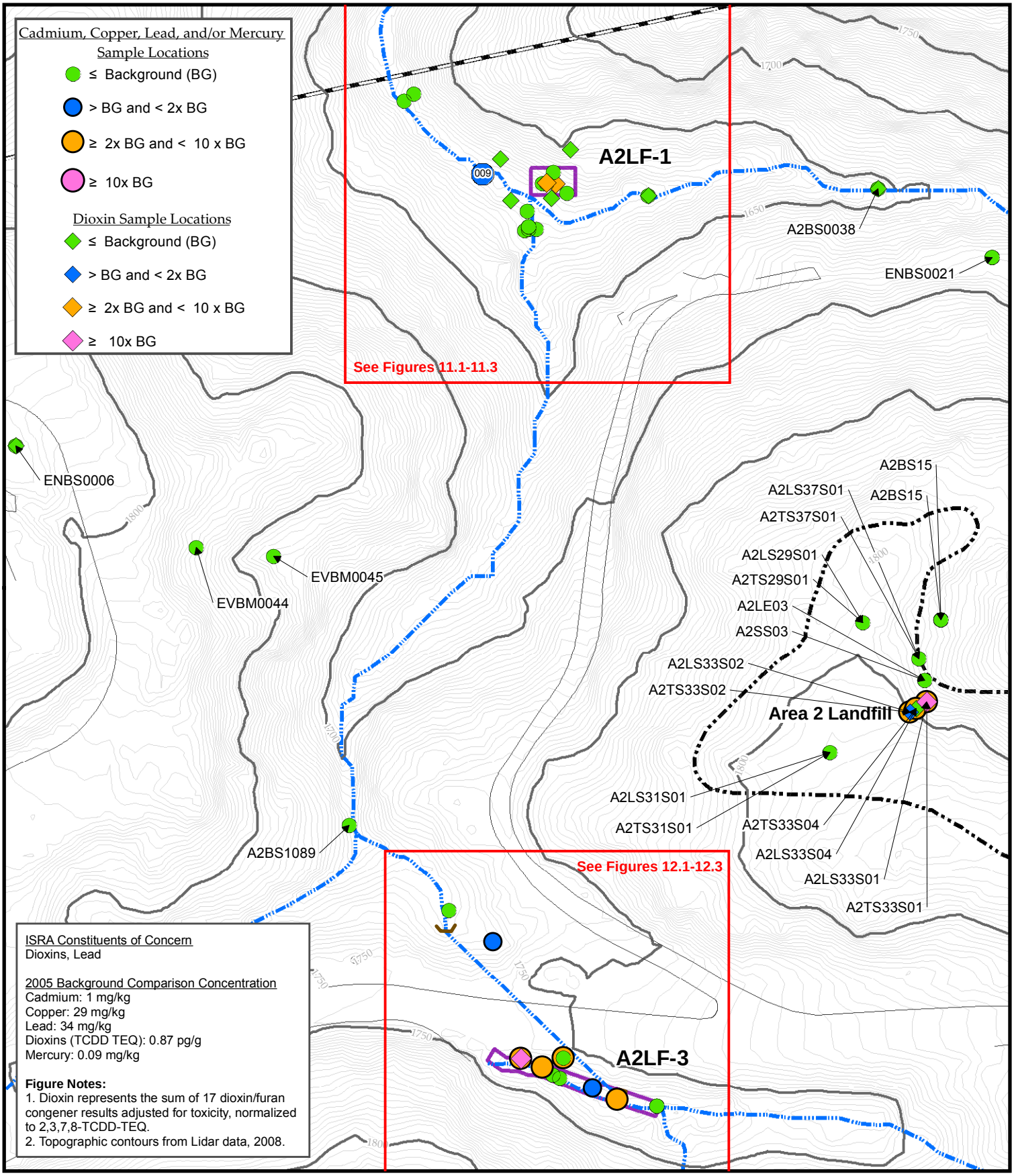
mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

RWQCB - Regional Water Quality Control Board split samples.



Outfall 009 Unaffiliated Samples near A2LF-1 and A2LF-3 Pre-Excavations Sample Results

MWH

FIGURE E-10.1

Document: ISRA_Plots_NASA_Unaffiliated_Samples.mxd

Date: Mar 25, 2010

Outfall 009, A2LF-1
Pre-Excavation Sample Results
Shallow Soil

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Cadmium, Copper, Lead, and/or Mercury Sample Locations (<2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

Dioxin Sample Locations (<2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

ISRA Constituents of Concern
Dioxin, Lead

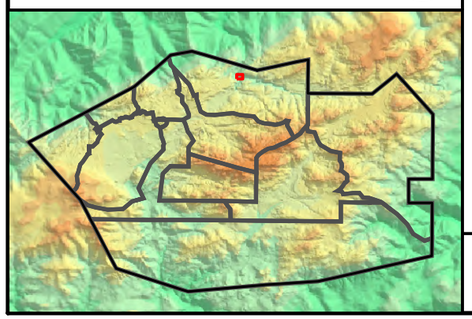
2005 Background Comparison Concentration
Cadmium: 1 mg/kg
Copper: 29 mg/kg
Lead: 34 mg/kg
Dioxin: 0.87 pg/g
Mercury: 0.09 mg/kg

Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Cadmium, cooper, lead and mercury SRG is equal to the 2005 background comparison concentration, and SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-1_Shallow_Pre.mxd Date: Mar 25, 2010

1 inch = 20 feet
0 20 40 Feet



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S A N T A S U S A N A F I E L D L A B O R A T O R Y

FIGURE E-11.1

Outfall 009, A2LF-1
Pre-Excavation Sample Results
Deeper Soil

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Cadmium, Copper, Lead, and/or Mercury Sample Locations (≥ 2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

Dioxin Sample Locations (≥ 2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

ISRA Constituents of Concern
Dioxin, Lead

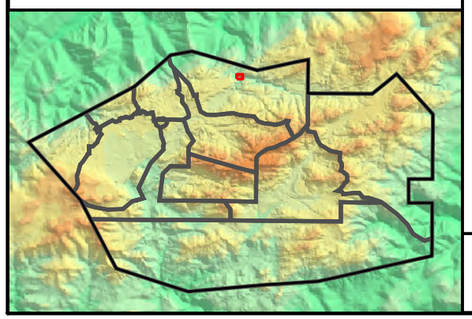
2005 Background Comparison Concentration
Cadmium: 1 mg/kg
Copper: 29 mg/kg
Lead: 34 mg/kg
Dioxin: 0.87 pg/g
Mercury: 0.09 mg/kg

Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Cadmium, cooper, lead and mercury SRG is equal to the 2005 background comparison concentration, and SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-1_Deep_Pre.mxd Date: Mar 25, 2010

1 inch = 20 feet
0 20 40 Feet



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SANTA SUSANA FIELD LABORATORY

FIGURE E-11.2

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

TABLE E-11.1 A2LF-1 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		A2BS0040	A2BS1074	A2BS1075	A2BS1076	A2BS1077	A2BS1093	ENBS0061	ISWC0104	ISWC0105
		Sample Name:		A2BS0040S001	A2BS1074S001	A2BS1075S001	A2BS1076S001	A2BS1077S001	A2BS1093S001	ENBS0061S001	ISWC0104S001	ISWC0105S001
		Collection Date:		1/2/2007	4/2/2009	4/2/2009	4/2/2009	4/2/2009	6/16/2009	9/16/2008	9/3/2009	9/3/2009
		Sample Depth (feet):		0.1 - 0.5	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	2.0 - 2.5	0.0 - 0.25	0.25 - 0.75	0.1 - 0.6	0.4 - 0.9
		Status:		In Place	In Place	In Place	In Place	Excavated	In Place	Excavated	Excavated	Excavated
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT[c]**	**RESULT[c]**
METALS												
Antimony	mg/kg	8.7	--	--	--	--	--	--	--	--	<10	<10
Arsenic	mg/kg	15	--	--	--	--	--	--	--	--	4.2	4.8
Barium	mg/kg	140	--	--	--	--	--	--	--	--	88	84
Beryllium	mg/kg	1.1	--	--	--	--	--	--	--	--	0.64	0.64
Cadmium	mg/kg	1	--	0.12	--	--	--	--	--	0.76	<0.50	<0.50
Chromium	mg/kg	36.8	--	--	--	--	--	--	--	--	23	23
Cobalt	mg/kg	21	--	--	--	--	--	--	--	--	5.8	5.9
Copper	mg/kg	29	29	5.4 J	--	--	--	--	--	16 J	9.5	8.8
Lead	mg/kg	34	34	9.4	--	--	--	--	--	29 J	13	4.5
Mercury	mg/kg	0.09	--	0.046	--	--	--	--	--	0.036	0.015 J	0.012 J
Molybdenum	mg/kg	5.3	--	--	--	--	--	--	--	--	<2.0	<2.0
Nickel	mg/kg	29	--	--	--	--	--	--	--	--	18	17
Selenium	mg/kg	0.655	--	--	--	--	--	--	--	--	<2.0	<2.0
Silver	mg/kg	0.79	--	--	--	--	--	--	--	--	<1.0	<1.0
Thallium	mg/kg	0.46	--	--	--	--	--	--	--	--	<10	<10
Vanadium	mg/kg	62	--	--	--	--	--	--	--	--	38	38
Zinc	mg/kg	110	--	--	--	--	--	--	--	--	62	54
DIOXINS												
TCDD TEQ	pg/g	0.87	3.0	0.242	0.0381	0.0393	0.0471	7.24	0.189	2.49	--	--

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

TABLE E-11.1 A2LF-1 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		ISWC0106	ISWC0107	NDET6055	NDET6056	NDET6056	NDET6057	NDET6058
		Sample Name:		ISWC0106S001	ISWC0107S001	NDET6055S001	NDET6056S001	NDET6056S002	NDET6057S001	NDET6058S001
		Collection Date:		9/3/2009	9/3/2009	7/8/2009	7/8/2009	7/8/2009	7/8/2009	7/8/2009
		Sample Depth (feet):		1.5 - 2.0	0.1 - 0.6	0.0 - 0.5	0.5 - 1.0	3.0 - 3.5	0.0 - 0.5	0.0 - 0.5
		Status:		Excavated	Excavated	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT[c]**	**RESULT[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS										
Antimony	mg/kg	8.7	--	<10	<10	--	--	--	--	--
Arsenic	mg/kg	15	--	4.2	4.4	--	--	--	--	--
Barium	mg/kg	140	--	61	70	--	--	--	--	--
Beryllium	mg/kg	1.1	--	0.58	0.57	--	--	--	--	--
Cadmium	mg/kg	1	--	<0.50	<0.50	--	--	--	--	--
Chromium	mg/kg	36.8	--	18	18	--	--	--	--	--
Cobalt	mg/kg	21	--	4.8	5.1	--	--	--	--	--
Copper	mg/kg	29	29	6.9	9.2	--	--	--	--	--
Lead	mg/kg	34	34	2.6	5.9	14.3	7.09	14.3	8.14	19.6
Mercury	mg/kg	0.09	--	0.0067 J	0.013 J	--	--	--	--	--
Molybdenum	mg/kg	5.3	--	<2.0	<2.0	--	--	--	--	--
Nickel	mg/kg	29	--	14	14	--	--	--	--	--
Selenium	mg/kg	0.655	--	<2.0	<2.0	--	--	--	--	--
Silver	mg/kg	0.79	--	<1.0	<1.0	--	--	--	--	--
Thallium	mg/kg	0.46	--	<10	<10	--	--	--	--	--
Vanadium	mg/kg	62	--	30	32	--	--	--	--	--
Zinc	mg/kg	110	--	43	50	--	--	--	--	--
DIOXINS										
TCDD TEQ	pg/g	0.87	3.0	--	--	--	--	--	--	--

TABLE E-11.1 A2LF-1 FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[b] ISRA SRGs are established for ISRA Constituents of Concern, which include constituents that were detected at concentrations that exceeded NPDES permit limits/benchmarks. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[c] Waste characterization sample results not validated

bgs - below ground surface

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds the Soil Remediation Goal (SRG).

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

SRG - Soil Remediation Goal

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Outfall 009, A2LF-1
Confirmation Sample Results

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Soil Remediation Goals (SRGs)
Dioxin = 3.0 pg/g

Confirmation Sample Location

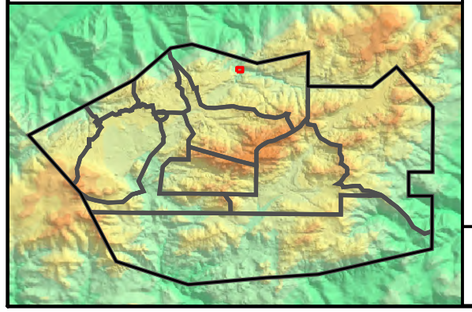
- Floor Sample ≤ SRGs
- Floor Sample > SRGs
- Sidewall Sample ≤ SRGs
- Sidewall Sample > SRGs

Note:
1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Sample IDs shown represent ISRA excavation confirmation samples.
3. SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
4. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-1_Confirmation.mxd Date: Mar 25, 2010

1 inch = 20 feet

0 20 40 Feet



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SANTA SUSANA FIELD LABORATORY

FIGURE E-11.3

TABLE E-11.2 A2LF-1 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**A2ET0100**	**A2ET0100**	**A2ET0101**	**A2ET0101**	**A2ET0101**	**A2ET0102**	**A2ET0102**
		Sample Name:		A2ET0100S001	A2ET0100S001-RWQCB	A2ET0101S001	A2ET0101S001SP	A2ET0101S001-RWQCB	A2ET0102S001	A2ET0102S001-RWQCB
		Collection Date:		11/10/2009	11/10/2009	11/10/2009	11/10/2009	11/10/2009	11/10/2009	11/10/2009
		Sample Type:		Sidewall	Sidewall	Floor	Floor	Floor	Floor	Floor
		Sample Depth (feet)[a]:		0.5 - 1.0	0.5 - 1.0	2.5 - 3.0	2.5 - 3.0	2.5 - 3.0	2.0 - 2.5	2.0 - 2.5
		Status:		In Place	In Place	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
DIOXINS										
TCDD TEQ	pg/g	0.87	3	0.0359	0.00164	0.0221	0.00[d]	0.0671	0.00[d]	0.0178

TABLE E-11.2 A2LF-1 CONFIRMATION FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] feet below pre-existing ground surface

[b] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[c] SRGs are for ISRA COCs. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[d] Dioxins/TCDD TEQ calculation has a value of zero when all congener results are non detect.

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

P - Preliminary data, data has not been validated

pg/g - picograms per gram

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

RWQCB - Regional Water Quality Control Board split samples.

RWQCB split samples are not being validated

Outfall 009, A2LF-3
Pre-Excavation Sample Results
Shallow Soil

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Cadmium, Copper, Lead, and/or Mercury
Sample Locations (<2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

Dioxin Sample Locations (<2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

ISRA Constituents of Concern
Dioxin, Lead

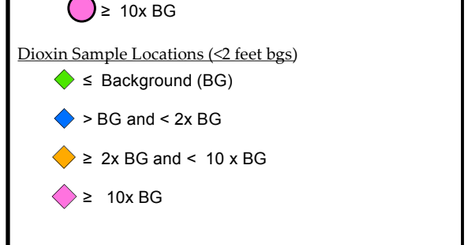
2005 Background Comparison Concentration
Cadmium: 1 mg/kg
Copper: 29 mg/kg
Lead: 34 mg/kg
Dioxin: 0.87 pg/g
Mercury: 0.09 mg/kg

Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Cadmium, cooper, lead and mercury SRG is equal to the 2005 background comparison concentration, and SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-3_Shallow_Pre.mxd Date: Mar 25, 2010

1 inch = 20 feet
0 20 40 Feet



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S A N T A S U S A N A F I E L D L A B O R A T O R Y

FIGURE E-12.1

Outfall 009, A2LF-3
Pre-Excavation Sample Results
Deeper Soil

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Cadmium, Copper, Lead, and/or Mercury Sample Locations (≥ 2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

Dioxin Sample Locations (≥ 2 feet bgs)

- ≤ Background (BG)
- > BG and < 2x BG
- ≥ 2x BG and < 10 x BG
- ≥ 10x BG

ISRA Constituents of Concern
Dioxin, Lead

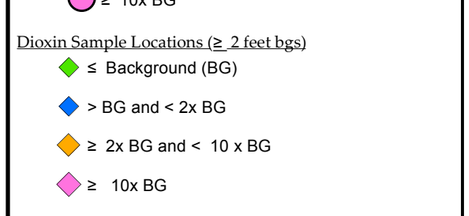
2005 Background Comparison Concentration
Cadmium: 1 mg/kg
Copper: 29 mg/kg
Lead: 34 mg/kg
Dioxin: 0.87 pg/g
Mercury: 0.09 mg/kg

Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Cadmium, cooper, lead and mercury SRG is equal to the 2005 background comparison concentration, and SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-3_Deep_Pre.mxd Date: Mar 25, 2010

1 inch = 20 feet
0 20 40 Feet



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SANTA SUSANA FIELD LABORATORY

FIGURE E-12.2

TABLE E-12.1 A2LF-3 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		A2BS1088	A2BS1090	A2BS1090	A2BS1091	A2BS1091	A2BS1092	A2BS1092	A2BS1095	A2BS1095	A2BS1096
		Sample Name:		A2BS1088S001	A2BS1090S001	A2BS1090S002	A2BS1091S001	A2BS1091S002	A2BS1092S001	A2BS1092S002	A2BS1095S001	A2BS1095S002	A2BS1096S001
		Collection Date:		4/3/2009	4/2/2009	4/2/2009	4/3/2009	4/3/2009	4/2/2009	4/2/2009	6/16/2009	6/16/2009	6/16/2009
		Sample Depth (feet):		3.0 - 3.5	0.0 - 0.25	4.5 - 5.0	0.0 - 0.5	4.5 - 5.0	0.0 - 0.25	4.5 - 5.0	0.0 - 0.5	4.0 - 5.0	0.0 - 0.25
		Status:		In Place	In Place	In Place	In Place	In Place	In Place	In Place	Excavated	Excavated	In Place
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS													
Antimony	mg/kg	8.7	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/kg	15	--	--	--	--	--	--	--	--	--	--	--
Barium	mg/kg	140	--	--	--	--	--	--	--	--	--	--	--
Beryllium	mg/kg	1.1	--	--	--	--	--	--	--	--	--	--	--
Cadmium	mg/kg	1	--	--	--	--	--	--	--	--	--	--	--
Chromium	mg/kg	36.8	--	--	--	--	--	--	--	--	--	--	--
Cobalt	mg/kg	21	--	--	--	--	--	--	--	--	--	--	--
Copper	mg/kg	29	29	--	--	--	--	--	--	--	--	--	--
Lead	mg/kg	34	34	10.2	67.6	12.1	33.3	241	11.7	2.9	338	25.6	16
Mercury	mg/kg	0.09	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/kg	5.3	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/kg	29	--	--	--	--	--	--	--	--	--	--	--
Selenium	mg/kg	0.655	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/kg	0.79	--	--	--	--	--	--	--	--	--	--	--
Thallium	mg/kg	0.46	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/kg	62	--	--	--	--	--	--	--	--	--	--	--
Zinc	mg/kg	110	--	--	--	--	--	--	--	--	--	--	--
DIOXINS													
TCDD TEQ	pg/g	0.87	3.0	--	--	--	--	--	--	--	--	--	--

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

TABLE E-12.1 A2LF-3 PRE-EXCAVATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		ENBS0020	ENBS0020	ISWC0108	ISWC0109	ISWC0110	ISWC0111
		Sample Name:		ENBS0020S001	ENBS0020S001SP	ISWC0108S001	ISWC0109S001	ISWC0110S001	ISWC0111S001
		Collection Date:		8/20/2008	8/20/2008	9/3/2009	9/3/2009	9/3/2009	9/3/2009
		Sample Depth (feet):		0.5 - 0.9	0.5 - 0.9	0.5 - 1.0	0.0 - 0.2	0.0 - 0.2	1.0 - 1.5
		Status:		Excavated	Excavated	Excavated	Excavated	Excavated	Excavated
ANALYTE	**UNITS**	**BACKGROUND[a]**	**ISRA SRG[b]**	**RESULT**	**RESULT**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**	**RESULT[c]**
METALS									
Antimony	mg/kg	8.7	--	--	--	<10	<10	<10	<10
Arsenic	mg/kg	15	--	--	--	7	5.4	5.7	4.7
Barium	mg/kg	140	--	--	--	91	78	90	68
Beryllium	mg/kg	1.1	--	--	--	0.74	0.69	0.61	0.56
Cadmium	mg/kg	1	--	0.25	0.27	<0.50	<0.50	<0.50	<0.50
Chromium	mg/kg	36.8	--	--	--	27	20	19	17
Cobalt	mg/kg	21	--	8.7 J	11	6.4	5.4	5.2	4.6
Copper	mg/kg	29	29	--	--	12	10	10	8.1
Lead	mg/kg	34	34	44.8 J	140	44	27	30	74
Mercury	mg/kg	0.09	--	0.013 J	0.023 J	0.020 J	0.034	0.028 J	0.015 J
Molybdenum	mg/kg	5.3	--	--	--	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	29	--	--	--	18	14	14	12
Selenium	mg/kg	0.655	--	--	--	<2.0	<2.0	<2.0	<2.0
Silver	mg/kg	0.79	--	--	--	<1.0	<1.0	<1.0	<1.0
Thallium	mg/kg	0.46	--	--	--	<10	<10	<10	<10
Vanadium	mg/kg	62	--	--	--	41	36	34	32
Zinc	mg/kg	110	--	--	--	70	58	61	53
DIOXINS									
TCDD TEQ	pg/g	0.87	3.0	0.0992	21.2	--	--	--	--

TABLE E-12.1 A2LF-3 FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[b] ISRA SRGs are established for ISRA Constituents of Concern, which include constituents that were detected at concentrations that exceeded NPDES permit limits/benchmarks. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[c] Waste characterization sample results not validated

bgs - below ground surface

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Grey highlighted cells indicate concentration exceeds the Soil Remediation Goal (SRG).

J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

SRG - Soil Remediation Goal

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Outfall 009, A2LF-3
Confirmation Sample Results

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Proposed Excavation Area
- Actual Excavation
- NPDES Outfall
- Drainage
- Surface Water Divide
- Elevation Contour

Soil Remediation Goals (SRGs)
Dioxin = 3.0 pg/g
Lead = 34 mg/kg

Confirmation Sample Location
- Floor Sample ≤ SRGs
- Floor Sample > SRGs
- Sidewall Sample ≤ SRGs
- Sidewall Sample > SRGs

Note:
1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD-TEQ.
2. Sample IDs shown represent ISRA excavation confirmation samples.
3. Lead SRG is equal to the 2005 background comparison concentration; SRG for dioxins is approximately 3 times the 2005 background comparison concentration.
4. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_NASA_A2LF-3_Confirmation.mxd Date: Mar 25, 2010

1 inch = 20 feet
0 20 40 Feet

MWH

SANTA SUSANA FIELD LABORATORY

FIGURE E-12.3

TABLE E-12.2 A2LF-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**A2BS1092**	**A2ET0200**	**A2ET0200**	**A2ET0201**	**A2ET0201**	**A2ET0202**	**A2ET0202**	**A2ET0203**
		Sample Name:		A2BS1092S001	A2ET0200S001	A2ET0200S001-RWQCB	A2ET0201S001	A2ET0201S001-RWQCB	A2ET0202S001	A2ET0202S001-RWQCB	A2ET0203S001
		Collection Date:		4/2/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009
		Sample Type:		Sidewall	Floor	Floor	Sidewall	Sidewall	Floor	Floor	Sidewall
		Sample Depth (feet)[a]:		0.0 - 0.25	4.5 - 5.0	4.5 - 5.0	1.5 - 2.0	1.5 - 2.0	2.0 - 2.5	2.0 - 2.5	3.0 - 3.5
		Status:		In Place	In Place	In Place	In Place	In Place	In Place	In Place	In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS											
Lead	mg/kg	34	34	11.7	6.3	7.1	6.66	7.6	6.93	7.5	17.3
DIOXINS											
TCDD TEQ	pg/g	0.87	3.0	--	0.00662	0.051	0.252	0.107	0.00217	0.0403	0.0930

TABLE E-12.2 A2LF-3 CONFIRMATION SAMPLE RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

		Object Name:		**A2ET0203**
		Sample Name:		A2ET0203S001-RWQCB
		Collection Date:		11/16/2009
		Sample Type:		Sidewall
		Sample Depth (feet)[a]:		3.0 - 3.5
		Status:		In Place
ANALYTE	**UNITS**	**BACKGROUND[b]**	**ISRA SRG[c]**	**RESULT**
METALS				
Lead	mg/kg	34	34	26
DIOXINS				
TCDD TEQ	pg/g	0.87	3.0	0.776

TABLE E-12.2 A2LF-3 CONFIRMATION FOOTNOTES
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[a] feet below pre-existing ground surface

[b] Soil background values from MWH (September 2005) Soil Background Report, Santa Susana Field Laboratory, Ventura County, California.

[c] SRGs are for ISRA COCs. SRGs for metals are equal to the 2005 background comparison concentration and the SRG for dioxins is approximately 3 times the 2005 background comparison concentration.

[d] Dioxins/TCDD TEQ calculation has a value of zero when all congener results are non detect.

Dioxins/ TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective 2005 World Health Organization (WHO) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. Non Detects are calculated as zero. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

P - Preliminary data, data has not been validated

pg/g - picograms per gram

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

RWQCB - Regional Water Quality Control Board split samples.

RWQCB split samples are not being validated