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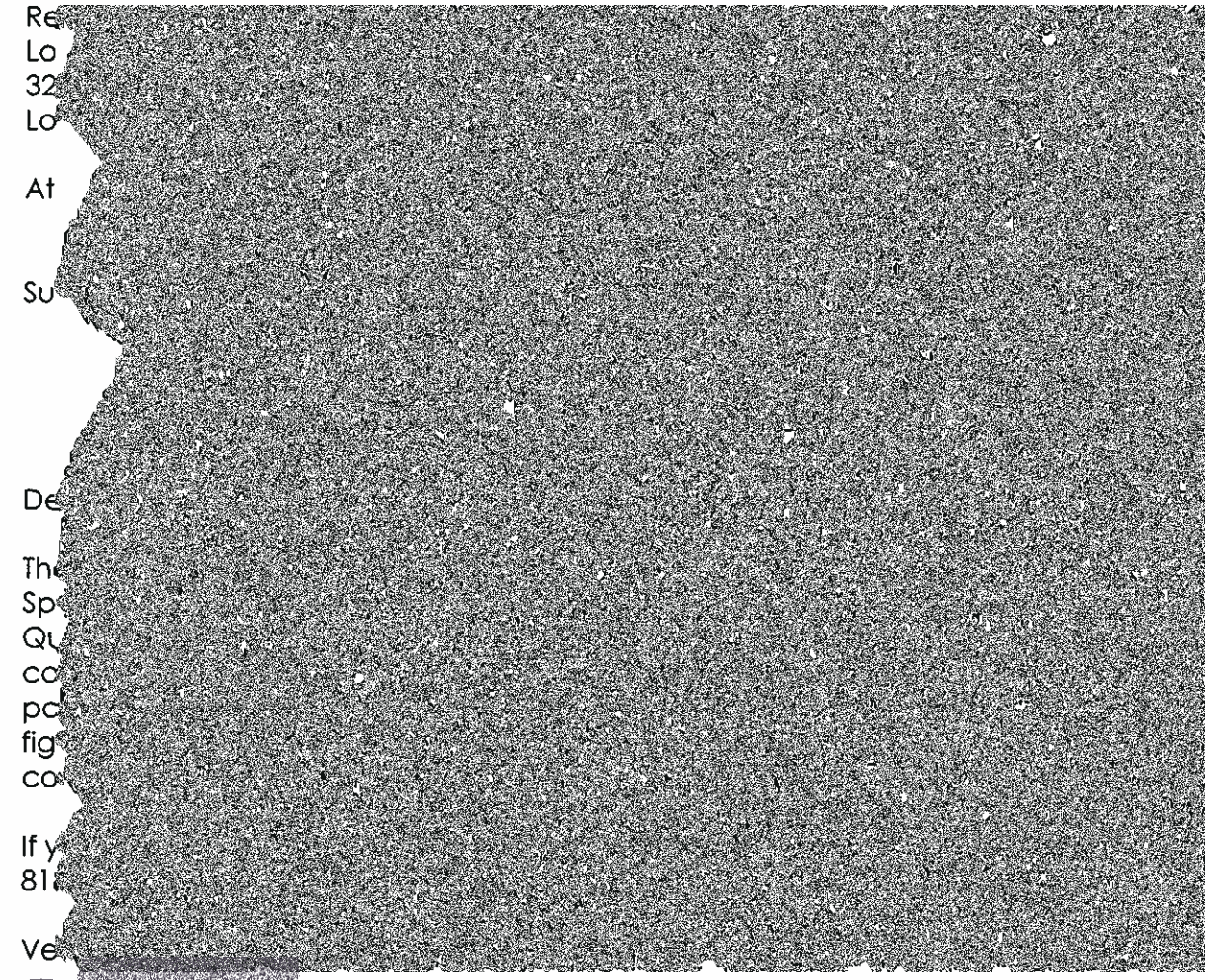
June 14, 2010
In reply refer to SHEA-110063



Tom Gallacher
Director, Santa Susana Field Laboratory
Environment, Health, and Safety

LNB:bjc
Attachment: Response to RWQCB and DTSC Comments Memorandum

cc: Ms. Cassandra Owens, RWQCB
Mr. Rick Brausch, DTSC
Mr. Buck King, DTSC
Mr. Allen Elliott, NASA
Mr. Steve Slaten, NASA

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MEMORANDUM

TO:	Art Lenox/Lori Blair, Boeing Allen Elliott/Steve Slaten, NASA	DATE:	June 11, 2010
CC:	Randy Dean, CH2M HILL	REF:	1008208/1008209
FROM:	Dixie Hambrick/Alex Fischl, MWH		
SUBJECT:	Response to RWQCB and DTSC Comments on the 2010 ISRA Work Plan Addendum		

This memorandum provides responses to Regional Water Quality Control Board (RWQCB) and Department of Toxic Substances Control (DTSC) comments on the 2010 Interim Source Removal Action (ISRA) Work Plan Addendum (Work Plan Addendum) (MWH, 2010). The Work Plan Addendum summarizes the results of the ISRA evaluation process and presents recommended remedial actions to control releases of constituents of concern (COCs) to surface water for the remaining areas within the Outfall 009 watershed at the Santa Susana Field Laboratory (SSFL). The Work Plan Addendum supplements the Preliminary ISRA Work Plan (MWH, 2009a), the Final ISRA Work Plan (MWH, 2009b) along with other work plan addenda (MWH 2009c, MWH 2009d, MWH 2009e, and NASA, 2009). The Work Plan Addendum was prepared by MWH and CH2M HILL on behalf of The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA) pursuant to a California Water Code Section 13304 Cleanup and Abatement Order (CAO) issued by the Los Angeles Regional Water Quality Control Board (RWQCB) dated December 3, 2008 (RWQCB, 2008).

This memorandum was prepared to respond to RWQCB and DTSC comments on the Work Plan Addendum. RWQCB and DTSC comments were provided verbally to Boeing and NASA during a teleconference on May 19, 2010. DTSC provided additional comments in an email on May 26, 2010. Comments from the RWQCB and DTSC on the Work Plan Addendum are reproduced below in their entirety, and a response is provided below each comment. An errata package for the Work Plan Addendum is provided as an attachment to this memorandum. The errata

appendix that incorporate the responses to RWQCB and DTSC comments and other inaccuracies identified since publication of

Comment #5: Work Plan Figure 2-14 (Refined Preliminary ISRA Evaluation Areas Outfall 009 - LOX-1) represents dioxin data with black triangles, but black triangles are not identified in the legend.

Response: The black triangles on Figure 2-14 should have been yellow. Figure 2-14 has been revised and is included in the errata package attached to this memorandum.

Comment #6: Work Plan text states bedrock was encountered at approximately 1.5 feet bgs within the AP/STP-1 ISRA area (page 2-13, 1st paragraph), please confirm this is true.

Response: The text has been revised to clarify the depth bedrock was encountered during the ISRA investigation at PEA-AP/STP-1 (varies from 0.4 feet to greater than 5.0 feet). Page 2-13 has been revised and is included in the errata package attached to this memorandum.

Comment #7: Page 2-18, First full paragraph, Typo error in description of Area 1 Landfill ISRA area as "A2LF-1". Text should be corrected to indicate A1LF-1.

Response: The text should have stated A1LF-1 instead of A2LF-1. Page 2-18 has been revised and is included in the errata package attached to this memorandum.

Comment #8: Work Plan Tables 2-1 and 2-4 do not include TCE as a non-ISRA COC for the IEL-2 ISRA Area, please confirm this is true.

Response: Tables 2-1 and 2-4 should have included TCE as a non-ISRA COC for IEL-2. In addition, the list of non-ISRA COCs for A1LF-1 on Table 2-4 was incorrect and should have matched the list presented on Table 2-1. Tables 2-1 and 2-4 have been revised and are included in the errata package attached to this memorandum.

Comment #9: Include a summary of each former operational site (RFI Site) which is collocated with or located near a 2010 ISRA Area.

Response: A summary of available information on the RFI Sites associated with ISRA Areas recommended for action in the Work Plan Addendum, including the B-1 Area, the Instrument and Equipment Laboratories (IEL), the Area I Landfill (A1LF), the Component Testing Laboratory I (CTL-I), the former LOX Plant, the Area II Landfill (A2LF), and the Incinerator Ash Pile/Sewage Treatment Plant (AP/STP) Area have been compiled and are included in the errata package attached to this memorandum as a new appendix (Appendix C) to the Work Plan Addendum. In addition, Figure 1-2 has been revised to show the location of CTL-I.

ATTACHMENT

2010 ISRA Work Plan Addendum Errata Package

REFERENCES

MWH, 2009a. Preliminary Interim Source Removal Action (ISRA) Work Plan, Santa Susana Field Laboratory, Ventura County, California. February.

MWH, 2009b. Final Interim Source Removal Action (ISRA) Work Plan, Santa Susana Field Laboratory, Ventura County, California. May.

MWH, 2009c. Addendum to the Final Interim Source Removal Action (ISRA) Work Plan Submitted in Response to California Water Code Section 13304 Order (NPDES NO. CA0001309, CI NO. 6027, SCP NO. 1111, Site ID NO. 2040109); Response to RWQCB and DTSC Comments on the Final ISRA Work Plan, Letter to RWQCB. June 19.

MWH, 2009d. HVS-2A Soil Collapse Feature and Pipeline Removal Summary and Plan, Letter Amendment to the Final Interim Source Removal Action (ISRA) Work Plan, California Water Code Section 13304 Order (NPDES NO. CA0001309, CI NO. 6027, SCP NO. 1111, Site ID NO. 2040109). September 18.

MWH, 2009e. Happy Valley South Underground Septic Tank Removal Plan, California Water Code Section 13304 Order (NPDES No. CA0001309, CI No. 6027, SCP NO. 1111, Site ID NO. 2040109), Letter to RWQCB. October 9.

MWH, 2010. 2010 Interim Source Removal Action (ISRA) Work Plan Addendum, Santa Susana Field Laboratory, Ventura County, California. April.

NASA, 2009. Additional Removals [Areas in the Outfall 009 Watershed], Email to RWQCB. September 18.

MEMORANDUM

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Tables

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ABBREVIATIONS AND ACRONYMS

AL1F	Area 1 Landfill
ASTM	American Society for Test and Materials
bgs	below ground surface
Boeing	The Boeing Company
CAO	Cleanup and Abatement Order
CDFG	California Department of Fish and Game
CM	culvert maintenance
COC	constituents of concern
CWA	Clean Water Act
cy	cubic yards
DTSC	Department of Toxic Substances Control
ELV	Expendable Launch Vehicle
EPA	United States Environmental Protection Agency
Geosyntec	Geosyntec Consultants, Inc.
HSP	health and safety plan
ISRA	Interim Source Removal Action
LOX	liquid oxygen
mg/kg	milligrams per kilogram
NASA	National Aeronautics and Space Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NWP	Nationwide Permit
MRCA	Mountains Recreation Conservancy Authority
PCBs	polychlorinated biphenyls
PEA	preliminary evaluation area
pg/g	picograms per gram
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RUSLE	Revised Universal Soil Loss Equation, Version 2
RWQCB	Los Angeles Regional Water Quality Control Board

2.0 OUTFALL 009 ISRA AREA IDENTIFICATION AND REMEDIAL PLANNING

There are eight ISRA PEAs that were identified in the Preliminary ISRA Work Plan (MWH, 2009a) based on available soil data, but have not been evaluated in previous work plans and work plan addenda. Four of the ISRA PEAs are located in the eastern portion of the Outfall 009 watershed and five are located in the western portion of the Outfall 009 watershed, shown in Figures 1-3 and 1-4. Although these figures display only surface soil data, subsurface soil data were also considered in the identification of ISRA PEAs in the Preliminary ISRA Work Plan; all subsurface soil COC detections above SRGs were collocated with surficial COC impacts.

As described in previous work plans, the ISRA PEAs identified in the Preliminary ISRA Work Plan were highly generalized and approximate due to data limitations. Additional soil samples have been collected at and near these ISRA PEAs to further delineate areas exceeding SRGs for the ISRA COCs, and assess concentrations of ISRA COCs near and/or down-gradient of former operational areas previously not investigated (see Section 2.1). This section summarizes the sampling activities and results1270a9(h)20(o)-20(w)-18(n)20(m)-2(m-59-70e)4vtecE s i

2.1.1 Sampling Approach and Plan

Source delineation and data gap soil sampling in the vicinity of the eight remaining ISRA PEAs was performed to further refine the extent and magnitude of COCs within the Outfall 009 watershed. Source delineation and step out sampling locations performed between June 2009 and March 2010 are shown on Figures 2-1 to 2-6.

In general, the sampling approach and methods followed those presented in the Final ISRA Work Plan (MWH, 2009b). Source delineation and step out samples were collected approximately 25 to 50 feet from previous sample location(s) with COCs exceeding SRGs and approximately 25 to 50 feet from other source delineation sample locations. The sample spacing considered the surface area of the impact and the likely depositional method, with greater spacing for larger areas and those possibly impacted by air dispersion. Source delineation samples were also collected proximate to existing sample locations for which the vertical extent

ENBS0162 to ENBS0165, ENBS0167 to ENBS0170, ENBS0172 to ENBS0174, ENBS0176 to ENBS0179, ENBS0181 and ENBS0184, ENBS0186 to ENBS0189, and ENBS0194) did not have a sample analyzed either because samples were not collected due to refusal prior to reaching the desired sample depth, or analysis of collected samples was not needed for source delineation. The source delineation sampling locations are shown on Figure 2-4. PEA-LOX-2 consists of four drainages which are labeled CM-2, CM-3, CM-4 and CM-10 after the culvert maintenance activities. The average depth of all four drainages was 1.5 feet bgs, and the maximum depth to bedrock was located in the CM-2 drainage basin up to 6.5 feet bgs.

Two soil samples collected from 2 locations were analyzed for lead and 11 soil samples collected from 10 locations were analyzed for dioxins. Results of chemical testing for lead and dioxins are presented in Appendix A. The following is a summary of the results:

- **Metals.** Of the 2 soil samples (surface samples) analyzed for lead, 1 soil sample contained lead above the SRG of 34 mg/kg. Lead was detected up to 124 mg/kg at ENBS0195.
- **Dioxins.** Of the 11 soil samples (10 surface samples and 1 duplicate sample) analyzed for dioxins, no samples contained dioxins above the SRG.

PEA-A2LF-2

Eleven borings were advanced during source delineation sampling at PEA-A2LF-2. A total of

were assumed to have concentrations of ISRA COCs equal to the greatest concentration detected within that particular PEA. The analysis also assumed background concentrations for sediments within the watershed.

Based on the analysis, all but 5 of the 23 ISRA PEAs are believed to contribute less than 6% of the annual pollutant yield within the watershed for the ISRA COCs (Geosyntec, 2010). The model indicates PEA-A1LF-1 and PEA-B1-1 contribute the most to the annual -13(s)9( )3p9s d -16(n)2035p1(2lJ T*[(m)3( )-150(20120(d) [(-18(o)-20(4a)-16(l)]TJ T*22(e)4( )-10(t)-222-7(1)-30(c)4(o)-20(n)

Based o e22( )-170(C)7 T*[(-16(n)2035p1(2lJ)]TJ 0 -38.88 TD [(B)7Io)-4tec050(2010)]TJ0( )(P)-4(E)-90(

tet-22(h)20(a)-16(n)20
23id 8(b(h)20(e)4( )-10(w)2(a)4(t)-22(e)4((l)18(-16(l)18s)9(h)20(e)4(d.)-10( )-1c)4(,)-3( )-150(2c( )-1 d)20-10(7

PEA-CTLI-2, PEA-IEL-4, PEA-IEL-5, and PEA-IEL-6, are not considered ISRA areas and will not be carried forward for the remedial alternatives evaluation.

2.3

Revised

Table 1-1
Summary of NPDES Permit Limit Exceedances - Outfalls 008 and 009
(Page 1 of 1)

Analyte	Sample Date	Result	Units	2009 Benchmark Limit	Units	Data Type
Outfall 008, Happy Valley Drainage						
Copper	18-Feb-05	15	g/L	14.0	g/L	Monitoring-only
Lead	20-Oct-04	9.8	g/L	5.2	g/L	Monitoring-only
Lead	27-Oct-04	9	g/L	5.2	g/L	Monitoring-only
Lead	28-Dec-04	6.4	g/L	5.2	g/L	Monitoring-only
Lead	18-Feb-05	13	g/L	5.2	g/L	Monitoring-only
Lead	18-Oct-05	120	g/L	5.2	g/L	Monitoring-only
Lead	1-Jan-06	20	g/L	5.2	g/L	Monitoring-only
Lead	15-Apr-06	18	g/L	5.2	g/L	Compliance
Lead	25-Jan-08	6.3	g/L	5.2	g/L	Benchmark
Dioxins / TCDD TEQ	18-Feb-05	4.46E-08	g/L	2.80E-08	g/L	Monitoring-only

0 0 1 313.4399 550.9198 Tm (m)Tj ET Q BT /T13 7.32 Tf 1 0 411 317.6399 574.5598 Tm (g)8(/)-1(L)-4094(5)-8(.)4(2)]TJ 1 0 411 317.63980E-08

Table 2-1
Outfall 009 ISRA PEA Chemical and Physical Characteristics
(Page 1 of 5)

Site Name	ISRA COCs Exceeding Soil Remediation Goals in Soil < 2 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil < 2 ft bgs[b,c]	ISRA COCs Exceeding Soil Remediation Goals in Soil 2-10 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil 2-10 ft bgs[b,c]	Surface Area, Range of Exceedance Depth, Average Exceedance Depth, and Volume Estimate[d]	Surface Conditions[e]	Other Physical Parameters of ISRA Area[f,g,h]
PEA-A1LF-1	Cadmium: 5.4x SRG (4) Copper: 1.6x SRG (1) Lead: 160x SRG (1) Mercury: 5.8x SRG (4)	Arsenic: 1.0x BG (1) Zinc: 8.0x BG (3) Aroclor 1254: 3.9x Eco RBSL (4)	Cadmium: 66x SRG (11) Copper: 2.9x SRG (4) Lead: 97x SRG (5) Mercury: 8.2x SRG (10)	Arsenic: 2.5x BG (7) Cobalt: 2.1x BG (2) Manganese: 2.1x BG (4) Nickel: 4.6x BG (1) Silver: 270x BG (3) Vanadium: 2.1x BG (2) Zinc: 440x BG (11) Aroclor 1254: 13x Eco RBSL (8) Aroclor 1260: 1.7x Eco RBSL (2)	Surface Area = 11,900 yd² Depth Range = 0 - ~25 ft bgs Depth Average = 9.8 ft bgs Volume = 38,870 cy	Impermeable Cover = 15 % Vegetated Cover = 85 % Type of Vegetation = Bare Soil Surface Relief = Smooth	Soil Texture = Medium-Fine Slope Length = 120 feet Elevation Change = 54 feet % Slope = 45% Distance from Drainage = 0 feet Depth to Groundwater = > 10 feet
PEA-A1LF-2	Cadmium: 2.6x SRG (7) Dioxins: 3.5x SRG (4) Lead: 1.3x SRG (1) Mercury: 6.3x SRG (3)	Silver: 13x BG (11) Zinc: 1.1x BG (1) Total Aroclors: 4.1x Eco RBSL (8)	Cadmium: 2.8x SRG (6) Mercury: 3.7x SRG (1)	Silver: 2.7x BG (1) Zinc: 1.4x BG (3)	Surface Area = 914 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs Volume = 610 cy	Impermeable Cover = 5 % Vegetated Cover = 95 % Type of Vegetation = Bushes Surface Roughness = Dissected	Soil Texture = Medium-Fine Slope Length = 270 feet Elevation Change = 25 feet % Slope = 9% Distance from Drainage = 0 feet Depth to Groundwater = > 10 feet
PEA-A2LF-2	Mercury: 1.9x SRG (2)	PAHs: 2.3x Res HH RBSL (6)	--	--	Surface Area = 2,711 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs Volume = 1,810 cy	Impermeable Cover = 0 % Vegetated Cover = 100 % Type of Vegetation = Bushes Surface Roughness = Smooth	Soil Texture = Medium Slope Length = 250 feet Elevation Change = 81 feet % Slope = 32% Distance from Drainage = 191 feet Depth to Groundwater = > 10 feet
PEA-AP/STP-1A	Dioxins: 11x SRG (1)	--	--	--	Surface Area = 106 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs Volume = 70 cy	Impermeable Cover = 0 % Vegetated Cover = 60 % Type of Vegetation = Bushes Surface Roughness = Smooth	Soil Texture = Medium-Fine Slope Length = 46 feet Elevation Change = 3 feet % Slope = 7% Distance from Drainage = 278 feet Depth to Groundwater = > 10 feet
PEA-AP/STP-1B	Cadmium: 4.9x SRG (4) Copper: 1.8x SRG (1) Lead: 88x SRG (3)	--	--	--	Surface Area = 2,293 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs Volume = 1,530 cy	Impermeable Cover = 0 % Vegetated Cover = 100 % Type of Vegetation = Bushes Surface Roughness = Smooth	Soil Texture = Medium Slope Length = 115 feet Elevation Change = 14 feet % Slope = 12% Distance from Drainage = 0 feet Depth to Groundwater = > 10 feet

Table 2-1
Outfall 009 ISRA PEA Chemical and Physical Characteristics
(Page 3 of 5)

Site Name	ISRA COCs Exceeding Soil Remediation Goals in Soil < 2 ft bgs[a]	Non-ISRA COCs

Table 2-1
Outfall 009 ISRA PEA Chemical and Physical Characteristics
(Page 4 of 5)

Site Name	ISRA COCs Exceeding Soil Remediation Goals in Soil < 2 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil < 2 ft bgs[b,c]	ISRA COCs Exceeding Soil Remediation Goals in Soil 2-10 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil 2-10 ft bgs[b,c]	Surface Area, Range of Exceedance Depth, Average Exceedance Depth, and Volume Estimate[d]	Surface Conditions[e]	Other Physical Parameters of ISRA Area[f,g,h]
PEA-IEL-5	Lead: 1.2x SRG (1)	--	--	--	Surface Area = 44 yd^2 Depth Range = 0 - 1 ft bgs Depth Average = 1 ft bgs Volume = 10 cy		

Table 2-1
Outfall 009 ISRA PEA Chemical and Physical Characteristics
(Page 5 of 5)

Site Name	ISRA COCs Exceeding Soil Remediation Goals in Soil < 2 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil < 2 ft bgs[b,c]	ISRA COCs Exceeding Soil Remediation Goals in Soil 2-10 ft bgs[a]	Non-ISRA COCs Exceeding Screening Levels in Soil 2-10 ft bgs[b,c]	Surface Area, Range of Exceedance Depth, Average Exceedance Depth, and Volume Estimate[d]	Surface Conditions[e]	Other Physical Parameters of ISRA Area[f,g,h]

General Notes:
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Acronyms:
BG - Background comparison concentration
COC - constituent of concern
cy - cubic yards
DTSC - Department of Toxic Substances Control
Eco RBSL - Ecological Risk-based Screening Level
ft bgs - feet below ground surface
PAHs - polycyclic aromatic hydrocarbons
PEA - preliminary evaluation area
RCRA - Resource Conservation and Recovery Act
Res HH RBSL - Residential Human Health Risk-Based Screening Level
RFI - RCRA Facility Investigation
SRG - soil remediation goal
TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)
TCE - trichloroethene
VOC - volatile organic compound
yd^2 - square yards

References:

Table 2-4
Outfall 009 ISRA Area Remedial Action Summary
(Page 1 of 4)

Site Name

Table 2-4
Outfall 009 ISRA Area Remedial Action Summary
(Page 2 of 4)

Site Name	ISRA COCs Exceeding Soil Remediation Goals[a]	Non-ISRA COCs Exceeding Screening Levels[b,c]	Surface Area, Range of Exceedance Depth, Average Exceedance Depth, and *Ex Situ* Volume Estimate[d]	Remedial Action	Soil Remediation Goals
AP/STP-1E	Dioxins	--	Surface Area = 2,369 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs (0.7 yards) Volume = 2,050 cy	Excavation	Dioxins = 3 pg/g
AP/STP-1F	Dioxins	--	Surface Area = 1,160 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs (0.7 yards) Volume = 1,000 cy	Excavation	Dioxins = 3 pg/g
B1-1	Cadmium Dioxins Mercury	--	Surface Area = 3,323 yd² Depth Range = 0 - 5 ft bgs Depth Average = 3 ft bgs (1.0 yards) Volume = 4,320 cy	Excavation	Cadmium = 1 mg/kg Dioxins = 3 pg/g Mercury = 0.09 mg/kg
B1-2	Cadmium Copper Dioxins Lead	Selenium	Surface Area = 911 yd² Depth Range = 0 - 5 ft bgs Depth Average = 5 ft bgs (1.7 yards) Volume = 1,980 cy	Excavation	Cadmium = 1 mg/kg Copper = 29 mg/kg Dioxins = 3 pg/g Lead = 34 mg/kg
CTLI-1	Copper Dioxins Lead	Benzo(a)pyrene Zinc	Surface Area = 1,248 yd² Depth Range = 0 - 5 ft bgs Depth Average = 3 ft bgs (1.0 yards) Volume = 1,630 cy	Excavation	Copper = 29 mg/kg Dioxins = 3 pg/g Lead = 34 mg/kg
CTLI-2	Lead	--	Surface Area = 160 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs (0.7 yards) Volume = 140 cy	No Action	Lead = 34 mg/kg
IEL-1	Mercury	--	Surface Area = 91 yd² Depth Range = 0 - 2 ft bgs Depth Average = 2 ft bgs (0.7 yards) Volume = 80 cy	Excavation	Mercury = 0.09 mg/kg
IEL-2	Cadmium Lead Mercury	TCE	Surface Area = 524 yd² Depth Range = 0 - 5.5 ft bgs Depth Average = 5 ft bgs (1.7 yards) Volume = 1,130 cy	Excavation	Cadmium = 1 mg/kg Lead = 34 mg/kg Mercury = 0.09 mg/kg

Table 2-4
Outfall 009 ISRA Area Remedial Action Summary
(Page 4 of 4)

Site Name	ISRA COCs Exceeding Soil Remediation Goals[a]	Non-ISRA COCs Exceeding Screening Levels[b,c]	Surface Area, Range of Exceedance Depth, Average Exceedance Depth, and *Ex Situ* Volume Estimate[d]	Remedial Action	Soil Remediation Goals

General Notes:

Acronyms:

BG - Background comparison concentration
COC - constituent of concern
cy - cubic yards
DTSC - Department of Toxic Substances Control
Eco RBSL - Ecological Risk-based Screening Level
ft bgs - feet below ground surface
mg/kg - milligrams per kilogram
PAHs - polycyclic aromatic hydrocarbons
PEA - preliminary evaluation area
pg/g - picograms per gram
RCRA - Resource Conservation and Recovery Act
Res HH RBSL - Residential Human Health Risk-Based Screening Level
RFI - RCRA Facility Investigation
SRG - soil remediation goal
TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

Outfalls 008 an

(SWMU 420)

Happy Valley South

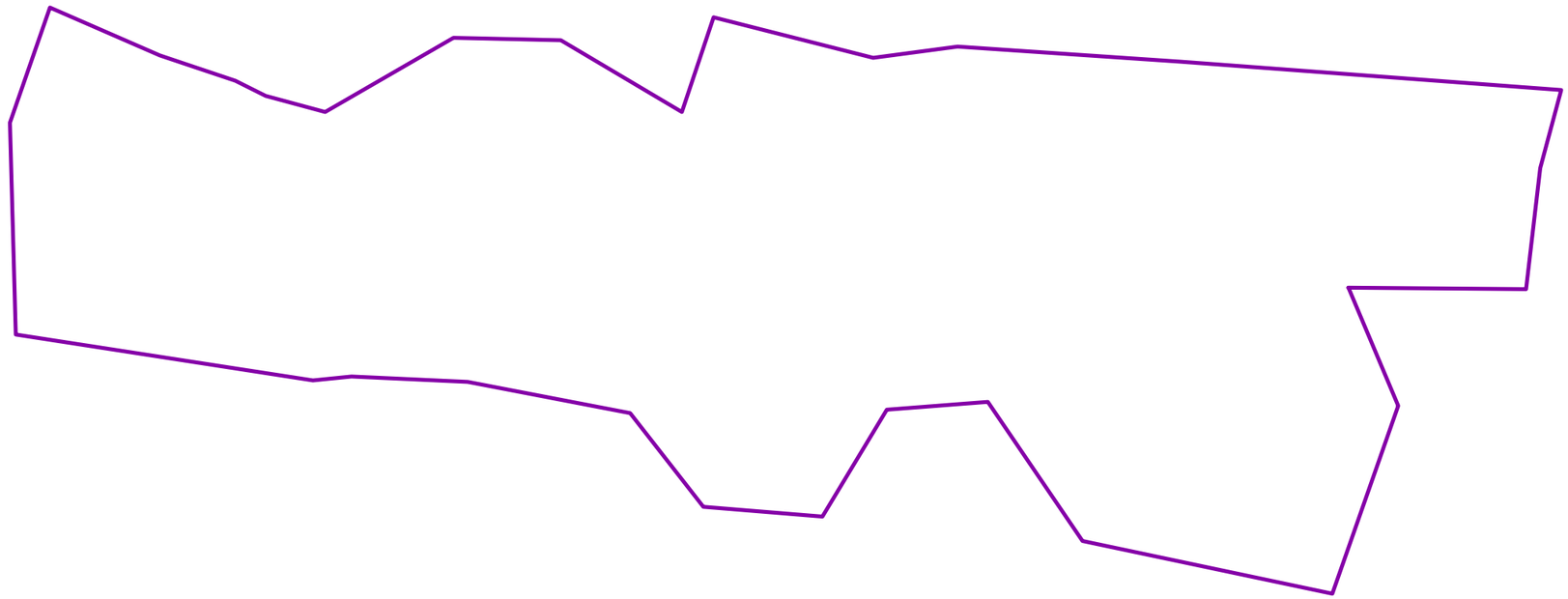
Canyon

Feet

UNDEVELOPED LAND

MWH

(Revised)



Map Document: (O:\NASA\SSFL\maps\ISRA\LOX1_Refined_ISRA_PEA.mxd)

APPENDIX C

OVERVIEW OF HISTORICAL OPERATIONS IN THE VICNITY OF ISRA AREAS RECOMMENDED FOR ACTION

The 19 Interim Source Removal Action (ISRA) Areas recommended for remediation in the 2010 ISRA Work Plan Addendum are located within or in the vicinity of one of the following seven historical operational areas, including the B-1 Area, the Instrument and Equipment LRAp6oratories (IEL), the Area I LRApndfill (A1LF), the Component Test LRAp6oratory I (CTL-I), the former Liquid Oxygen (LOX) Plant, the Area II LRdfill (A2LF), and the Incinerator Ash Pile/Sewage Treatment Plant (AP/STP) Area (Figure 1-2). These seven areas are being investigated as part of the Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI). A brief historical operational summary of these seven RFI sites is provided below. A more comprehensive description of these features is provided in the Group 1A RApnd Group 2 RFI Reports (MWH, 2009; NASA, 2008).

B-1. The B-1 Area is RApn Rpproximate 7.7-acre Rrea that used to test jet engines using jet propellant (JP)-4, at three test stands, and using "exotic" fuels at a fourth test stand between the early 1950s RApnd the mid 1970s. JP-4 is a mixture of gasoline RApnd diesel fuels, RApnd "exotic" materials were not defined, but may have included hydrazine or pentaborane fuels. Engines were flushed with solvents following testing. Support facilities, such as fuel and waste storage tanks, machine shops/workshops and explosive RApnd equipment storage, were also present at the site. Following use as an engine test facility, the B-1 Area was used for equipment and document storage until the site was dismantled in early 2000. Other operational facilities included a warehouse, pump houses/stations, cooling towers, transformers, and drum storage.

IEL. The IEL RFI Site is RApn approximate 25-acre area primarily used for the service, repair, assembly, cleaApning, RApnd testing of engine valves, manifolds, RApnd instruments. ChemicaApls used included solvents, acids, lubricaApnt and hydraulic oils, and petroleum-based cleaApners. Support facilities, such as a trichloroethane (TCA) distillation area, solvent supply and waste tanks / pipelines, RApn acid wash bay, test cells and structures, machine shops, Rnd a hydraulic pump

house, were also present at the site. Other operations and supporting facilities included a chemistry laboratory, photographic laboratories, paint shop and storage, fuel tanks, tower / test structure for a sodium mockup facility experiment and igniter development, a propellant laboratory and possible industrial dry well, LOX/fuel safety demonstration area, and equipment storage areas.

A1LF. The A1LF is an approximate 2.4-acre area that was used for disposal of materials generated during construction activities in Area I, including excess fill soils, bedrock, and construction debris, such as asphalt, concrete, timber, and scrap metal. Primary landfill use occurred in the 1950s through 1970. The area on top of the landfill has also been used as a fuel truck staging area and for equipment storage, and included various storage buildings (now removed). Also, a leach field was identified in the eastern portion of the landfill.

CTL-I. The CTL-I Area is included in the LETF/CTL-I RFI Site due to the proximity and related historical operations and together the Laser Engineering Test Facility (LETF)/CTL-I RFI Site consists of approximately 8.1 acres located in the central portion of Area I. The CTL-I was constructed to perform turbo pump, bearing, and seal testing for testing rocket engine components. Building 1309 within CTL-I was used as a component testing laboratory for rocket engines in the 1950s and 1960s, laser diagnostic studies from the 1970s through 1995, and has been utilized as a machine shop since 1996 (Boeing, 2005). The Building 1309 Leach Field, located east of Building 1309, was used for sanitary waste disposal (SAIC, 1994). The northern septic leach field served the northern portion of Building 1309 prior to the workshop building addition in 1956. Three 50,000 gallon water tanks were sited on a 150 foot hillside north of the CTL-I area that supplied water to CTL-I.

LOX. The LOX Plant was located on 42 acres in the northern part of Area I, with the plant buildings occupying approximately 6 acres. LOX was produced using a cryogenic process in which air is liquefied and the oxygen is separated from the nitrogen. The LOX Plant buildings and tanks were removed in the early 1970s. A former waste oil sump and clarifier were located north of the driveway leading to the LOX Plant. A suspected leach pit was identified while the sump and clarifier were being excavated during the LOX Plant removal. As part of an accelerated cleanup program in 1993, the sump, clarifier, and leach pit were excavated and

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