Final SWMU B34 Decision Document

SWMU B34
Building 104-3 Catchment Pit

May 2012
Version 01

Hawthorne Army Depot
Hawthorne, Nevada

U.S. Army Corps of Engineers – Sacramento District
Contract W91238-06-D-0019
Task Order 0004

FINAL
DECISION DOCUMENT

SWMU B34
Building 104-3 Catchment Pit

Hawthorne Army Depot, Nevada

Contract No. W91238-06-D-0019

May 2012

Prepared for:

U.S. Army Environmental Command

Hawthorne Army Depot
Hawthorne, Nevada

Prepared by:

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TABLE OF CONTENTS

1.0 INTRODUCTION 1-1
1.1 Site Name and Location 1-1
1.2 Statement of Basis and Purpose 1-1
1.3 Description of Selected Remedy 1-1
1.4 Regulatory Setting 1-1
1.5 Authorizing Signatures 1-2
2.0 DECISION SUMMARY 2-1
2.1 Site Name, Location, and Description 2-1
2.2 Physical Setting 2-1
2.3 Investigation History 2-1
2.3.1 Site Assessment (1991) 2-3
2.3.2 Site Investigation (2011) 2-3
2.4 Nature and Extent of Contamination 2-3
2.5 Decommissioning Activities 2-4
3.0 CONCLUSIONS 3-1
4.0 REFERENCES 4-1

List of Tables

Table 2-1 Summary of Previous Investigations 2-2
Table 3-1 Site Evaluation for SWMU B34 3-1

List of Figures

Figure 1 Regional Location Map
Figure 2 Regional Site Location Map
Figure 3 Site Location Map

List of Appendices

Appendix A – Supporting Documentation
- 1991 Site Inspection Documentation
- 2011 Site Investigation Sample Location Map
- 2011 Site Investigation Analytical Results

ACRONYMS

Army ..... United States Army Environmental Command
Bay West ..... Bay West, Inc.
bgs..... below ground surface
COPCs ..... Contaminants of Potential Concern
HWAAP..... Hawthorne Army Ammunition Plant
HWAD..... Hawthorne Army Depot
mg/kg..... milligrams per kilogram
NDEP..... Nevada Division of Environmental Protection
NFA ..... No Further Action
PAH ..... Polyaromatic Hydrocarbon
RCRA ..... Resource Conservation & Recovery Act
RSLs..... Regional Screening Levels
SA..... Site Assessment
SI ..... Site Investigation
SWMU ..... Solid Waste Management Unit
SVOC ..... Semi-volatile Organic Compound
µg/kg..... micrograms per kilogram
USACE ..... United States Army Corps of Engineers
USEPA ..... United States Environmental Protection Agency
VOC..... Volatile Organic Compound

1.0 INTRODUCTION

1.1 Site Name and Location

Facility Name: Hawthorne Army Depot

Site Location: Hawthorne, Nevada

Operable Unit/Site: Solid Waste Management Unit (SWMU) B34

1.2 Statement of Basis and Purpose

This decision document describes the rationale for the selected remedy of No Further Action (NFA), industrial scenario, at SWMU B34 at Hawthorne Army Depot (HWAD), hereafter referred to as SWMU B34 (**Figure 1** and **2**).

Remedial investigations of hazardous substances, pollutants, or contaminants at SWMU B34 have demonstrated that the:

- Contaminants of Potential Concern (COPCs) were below USEPA Regional Screening Levels (RSLs) for industrial soil.
- The vertical and horizontal extents of COPCs below the industrial scenario have been defined to be isolated and limited to the near surface soils.

1.3 Description of Selected Remedy

It has been determined that no remedial action is necessary at SWMU B34. Based on investigative and remedial action results, the Army, with concurrence from NDEP, has determined that no significant risks or threats to human health or the environment exist at this time.

1.4 Regulatory Setting

The USEPA provides regulatory oversight of contamination assessment and corrective measures at Resource Conservation and Recovery Act (RCRA) SWMUs under Section 3004 (u) of the 1984 Hazardous and Solid Waste Amendments to RCRA. Corrective action for releases of hazardous wastes or constituents is required under 40 CFR Part 264.101 (a), (b), and (c).

The HWAD also maintains RCRA Permit No. NEV HW0017 (renewed in August 2005), which requires corrective actions for any hazardous waste or hazardous constituents released from any SWMUs at the facility. Authority and responsibility for the implementation of RCRA has been delegated by the USEPA to the State of Nevada, making the NDEP the lead regulatory agency for all RCRA investigations and corrective actions at HWAD.

1.5 Authorizing Signatures

This signature sheet documents the Army approval and NDEP concurrence of the remedy selected in the Decision Document for SWMU B34 at HWAD.

This remedy decision may be reviewed and modified in the future if information becomes available that indicates the presence of contamination may cause unacceptable risk to human health or the environment.

Kirk L. Bausman
Deputy to the Commander
Hawthorne Army Depot

Date

Greg Lovato
Chief, Bureau of Corrective Actions
Nevada Division of Environmental Protection

Date

2.0 DECISION SUMMARY

The Decision Summary identifies the selected remedy, explains how the remedy fulfills statutory and regulatory requirements, and provides a substantive summary of the Administrative Record file that supports the remedy selection decision.

2.1 Site Name, Location, and Description

SWMU B34 is in the southern portion of HWAD's central magazine area in the Building 104 Group, approximately 3,600 feet north of U.S. Highway 95 and approximately 1,000 feet east of Mine Road (**Figure 2**). SWMU B34 consists of one catchment pit, approximately 20 feet by 75 feet by four feet deep, east of the fence between Building 104-2 and 104-3 (**Figure 3**). In June 1991, SWMU B34 was recommended to be placed in the HWAD Environmental Restoration Program because of potential contamination from wastewater containing explosive constituents. Available historical site documentation has been included as **Appendix A**.

2.2 Physical Setting

HWAD is located in Mineral County, Nevada, approximately 140 miles southeast of Reno, Nevada. The depot is approximately 150,000 acres in size and encloses three sides of the town of Hawthorne. SWMU B34 site layout and catchment pit location are shown on **Figure 3**.

2.3 Investigation History

A Site Assessment (SA) and Site Investigation (SI) have been completed at SWMU B34. **Table 2-1**, next page**,** provides a brief summary of these investigations.

Table 2-1 Summary of Previous Investigations

Date	Area and Purpose of Investigation	Company	Area Assessed	Major Findings	Recommendations
1991	Site Assessment (SA).	United States Army Corps of Engineers (USACE)	SWMU B34, Building 104-3 Catchment Pit. Visual Inspection.	The catchment pit located at SWMU B34 received steam blow-down from the boiler plant, Building 104-2, and waste water from Building 104-3, via drain line. The 1991 site inspection also references the Gates Report which states: Liquids in pit.	Recommended sampling the catchment pit for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives including ammonium picrate, and Resource Conservation and Recovery Act (RCRA) Metals including mercury.
2011	Site Investigation (SI) Evaluate presence or absence of COPCs within catchment pit. If COPCs exceed USEPA Industrial RSLs, determine the nature and extent of COPCs.	Bay West, Inc. (Bay West)	SWMU B34, Building 104-3 Catchment Pit. Three hand auger borings were completed. Soil samples were collected from 1 and 4 feet below ground surface (bgs) in each boring. All samples were analyzed for VOCs, SVOCs, Polyaromatic Hydrocarbons (PAHs), RCRA metals, and explosives including ammonium picrate.	Benzo(a)pyrene concentrations exceeded EPA Residential RSLs, but were below EPA Industrial RSLs, at two sample locations at 1 foot bgs. VOCs, remaining SVOCs, RCRA metals, and explosives were below established background and/or EPA Residential RSLs.	No further investigation.

2.3.1 Site Assessment (1991)

In June 1991, a visual SA was completed at SWMU B34. As documented in the SA Summary, (**Appendix A**), the catchment pit located at SWMU B34 received steam blow-down from boiler plant, building 104-2, and wastewater from building 104-3, via drain line. The 1991 site inspection also references the Gates Report which states: Liquids in pit (Bay West, 2012).

Based on installation activities it was determined that all impoundments potentially are impacted by various VOCs, SVOCs, explosives including ammonium picrate, and RCRA Metals including mercury (Bay West, 2011).

2.3.2 Site Investigation (2011)

In February 2011, a SI was completed. The SI consisted of three hand auger borings completed within the catchment pit, **Appendix A,** Figure 2-1. Borings were placed at either end of the catchment pit in the event that the catchment pit was sloped to one side or the other. The third boring was placed in the center, near the potential outfall pipe/drain line. Two soil samples were collected from each boring, one at one foot bgs, and another at four feet bgs. The six soil samples collected during the SI were analyzed for VOCs, SVOCs, polyaromatic hydrocarbons (PAHs), explosives including ammonium picrate, and RCRA Metals including mercury. Soil analytical results are included in **Appendix A**.

A total of 23 organic constituents (VOCs and SVOCs) were detected in one or more soil samples collected from the hand auger borings. The concentrations of benzo(a)pyrene in two soil samples, B34-02-S-01 and B34-03-S-01, exceeded the USEPA Residential RSL of 15 micrograms per kilogram (µg/kg), but were below the USEPA Industrial RSL of 210 µg/kg. The concentrations of all other target VOCs and SVOCs were below their respective USEPA Residential RSLs (Bay West, 2012).

A total of seven inorganic constituents were detected in soil samples collected from the hand auger borings: mercury, arsenic, barium, cadmium, chromium, lead, and silver. Results from the soil samples are as follows:

- Chromium was detected at a concentration of 14 milligrams per kilogram (mg/kg) in soil sample B34-02-S-04. The result is slightly above the HWAD Background Screening Level (13.76 mg/kg). However, a USEPA Residential or Industrial RSL does not exist for total chromium.
- Lead was detected at a concentration of 20 mg/kg in soil sample B34-02-S-04. The result is above the HWAD Background Screening Level (16.7 mg/kg), but below the USEPA Residential RSL (400 mg/kg).
- Arsenic was detected above the USEPA Industrial RSL (1.6 mg/kg), but below HWAD Background Screening Level (18.1 mg/kg).

Explosives were not detected above laboratory detection limits in the soil samples collected at SWMU B34.

2.4 Nature and Extent of Contamination

During the SI, 23 organics and seven inorganics were detected above laboratory detection limits in the soil samples collected from within the catchment pit. Explosives were not detected above laboratory detection limits in the soil samples collected from within the catchment pit. Constituents analyzed were below USEPA RSLs for industrial soil. Furthermore, the vertical and horizontal extents of COPCs below the industrial scenario have been defined to be isolated and limited to the near surface soils.

Groundwater was not evaluated as part of the SI completed in 2011. The leachability of the contaminants detected in soil samples collected from the catchment pit is not known. However, the contaminants are potentially stable and will not migrate downward significantly. Residual contamination is limited vertically to less than four feet bgs since COPCs were not detected above the USEPA residential or industrial RSLs in the four foot soil samples. Therefore, near-surface soil impacts are unlikely to impact groundwater which is approximately 200 feet bgs in the vicinity of SWMU B34 (Bay West, 2012).

2.5 Decommissioning Activities

On 07 February 2012, the catchment pit was backfilled. The pit was backfilled, wheel compacted, and sloped in a manner that allows water to move away from the catchment pit area (Bay West, 2012).

Image of:
The backfilled catchment pit at SWMU B34.

Date:
February 07, 2012

SWMU B34, Building 104-3 Catchment Pit

3.0 CONCLUSIONS

Analytical soil sampling results indicate that no present or future receptors are likely to be adversely impacted by site contamination at SWMU B34. NFA is requested following NAC 445A.227 guidelines, under which the following issues were addressed (**Table 3-1**):

Table 3-1 Site Evaluation for SWMU B34

Assessment Criteria		Response
A	Depth of any groundwater	Depth to groundwater is estimated to be approximately 200 feet bgs based on groundwater levels collected from monitoring wells IRPMW51 and IRPMW52, which are located approximately 2,000 feet northwest of SWMU B34.
B	Distance to irrigation or drinking water wells	The distance to water supply well #2 is approximately 1,600 feet south of SWMU B34.
C	The type of soil that is contaminated	Sand, silty sand, and silt.
D	The annual precipitation	Annual precipitation for Hawthorne, Nevada, is 4.6 inches.
E	The type of waste or substance released	The catchment pits received steam blow-down from boiler plant at Building 104-2 and wastewater from Building 104-3. Based on previous documentation, COPCs were determined to be VOCs, SVOC, explosives including ammonium picrate, RCRA metals including mercury.
F	The extent of the contamination	Concentrations of all analyzed COPCs were below USEPA Industrial RSLs.
G	The present and potential use for the land	The site is presently used for industrial purposes. Future land use is also expected to be industrial.
H	The preferred routes of migration	Downward, due to gravity.
I	The location of structures and impediments	Located near buildings 104-3 and 104-2. Structures are shown in **Figure 3**.
J	The potential for a hazard related to fire, vapor, or explosion	There are no such identified hazards at SWMU B34.
K	Other site-specific factors	No other site-specific factors have been noted.

4.0 REFERENCES

Bay West, 2011. Final SWMU B34 Abbreviated Work Plan, Hawthorne, Nevada, February.

Bay West, 2012. Final SWMU B34 Technical Memorandum. Hawthorne, Nevada. April.

Figures

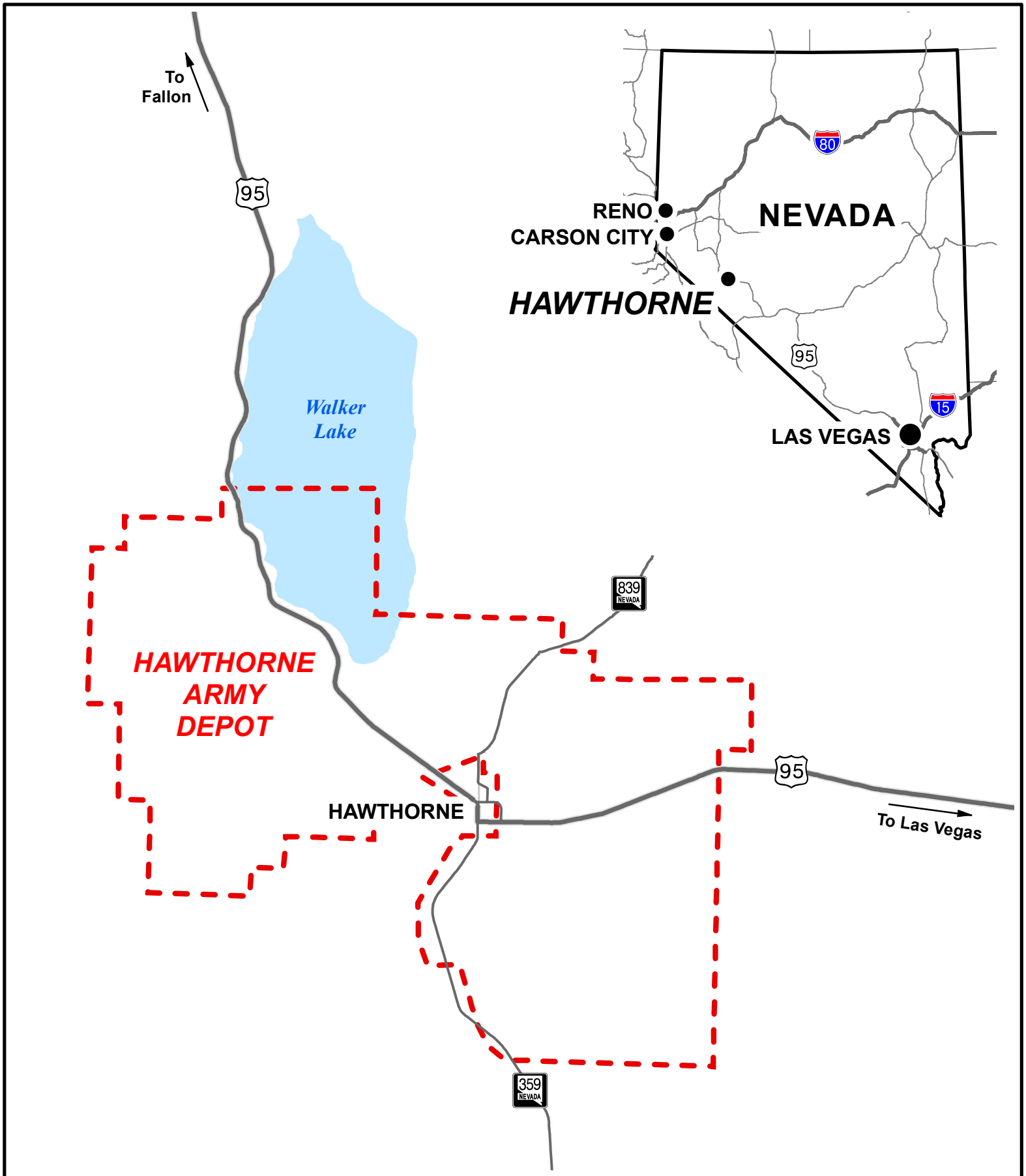


Figure 1

Hawthorne Army Depot

Bay West

Customer-Focused Environmental & Industrial Solutions

N

0 3 6 Miles

0 4 8 Kilometers

Legend

Installation Boundary

Data is Projected in the NAD83 UTM Zone 11N
Aerial Photo: ArcGIS Online Map server
Figure Create Using ArcMap 9.3.1

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_SACRAMENTO\Hawthorne_AAP\090499\MapDocs\I07\I07 Regional Map.mxd

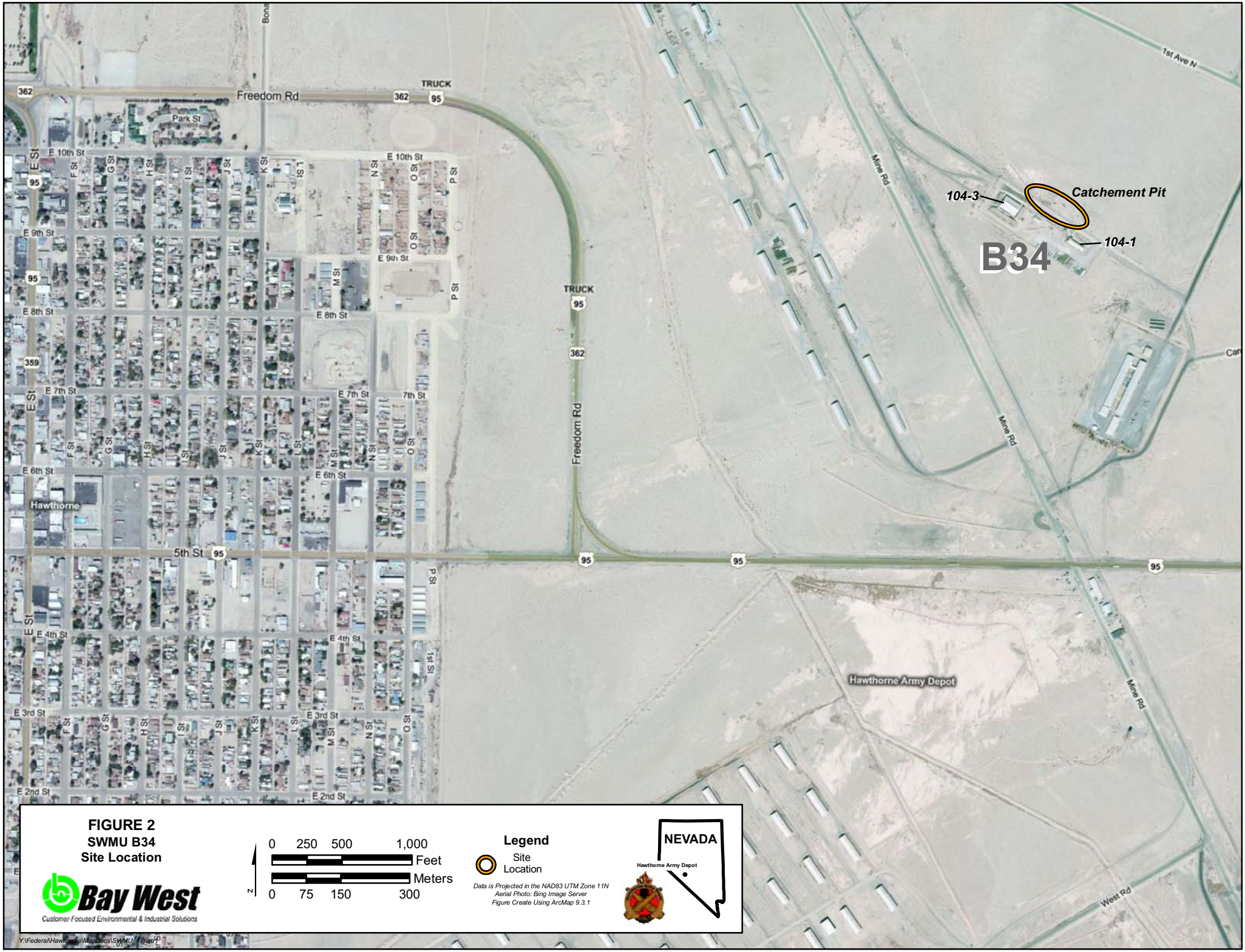


FIGURE 2
SWMU B34
Site Location

Y:\Federal\Hawthorne\Mapdocs\SWMU_Figure1

FIGURE 3
SWMU B34
Site Features

Appendix A
Supporting Documentation

HAWTHORNE ARMY AMMUNITION PLANT

SUMMARY SHEET

SITE B34: 104-3 CATCHMENT PIT

DATE: june 1991

BACKGROUND: unlined surface impoundment received steam blowdown from boiler plant 104-2 and wastewater from Bld. 104-3. Liquids in pit (Gates Report).

June 1991: no visable contamination. Pit is wind and water gullied. Ground surface disturbed Northwest of pit on east side of fence.

AIR: Potential for air release is LOW.

SURFACE WATER: Potential for surface water release is low.

GROUNDWATER: No wells in area. DTW aprox. 160 ft.

NEXT MOVE: Require soil and groundwater sampling program for impoundment. Closure?

All impoundments/catch pits potentially received Ammonium picrate, ammonium nitrate, TNT, Domestic sewage, RDX, Dimethyl hydrazine, pentaerythritol tetranitrate, 1,1,1-TCA, cresylic acid, PCE, acetone, calcium chloride, nitrocellulose, ethylene oxide, powdered aluminum, NaS, NaOH, Nitric acid, cyclohexanone, MEK, toluene.

UTM Grid 361 4266

Aerial Fig 37

HAWTHORNE ARMY AMMUNITION PLANT

SUMMARY SHEET

SITE B34: ~~101-51~~ 104-3 CATCHMENT PIT

DATE: May 1991

BACKGROUND: unlined surface impoundment received steam blowdown(?) from boiler plant 104-2 and wastewater from Bld. 104-3. Liquids in pit. Active 1940's to Present (TNT & RDX)

AIR: Potential for air release is LOW.

SURFACE WATER: Potential for surface water release is low.

GROUNDWATER: No wells in area. DTW aprox. 160 ft.

NEXT MOVE: Require soil and groundwater sampling program for impoundment. Closure?

All impoundments/catch pits potentially received Ammonium picrate, ammonium nitrate, TNT, Domestic sewage, RDX, Dimethyl hydrazine, pentaerythritol tetranitrate, 1,1,1-TCA, cresylic acid, PCE, acetone, calcium chloride, nitrocellulose, ethylene oxide, powdered aluminum, NaS, NaOH, Nitric acid, cyclohexanone, MEK, toluene.

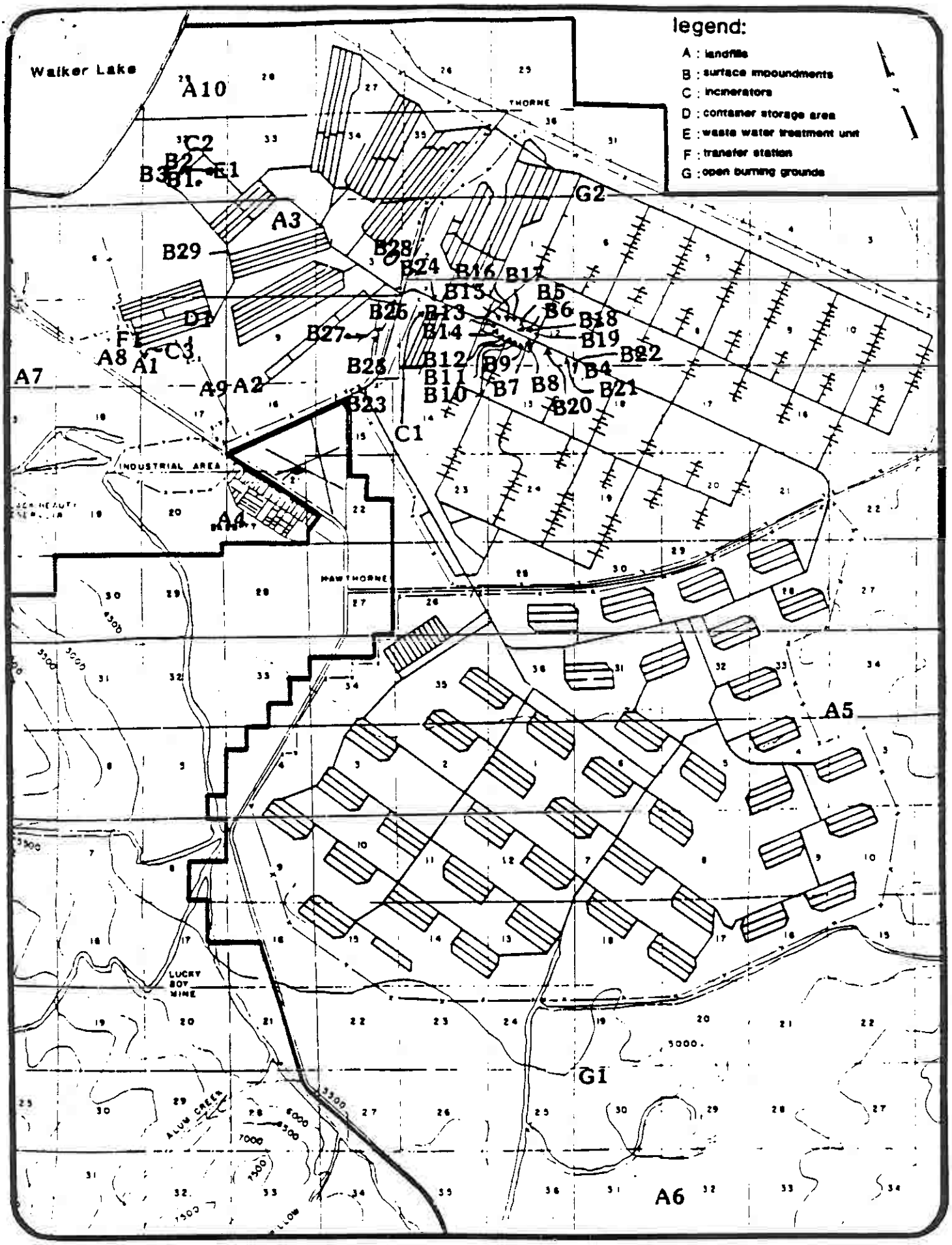
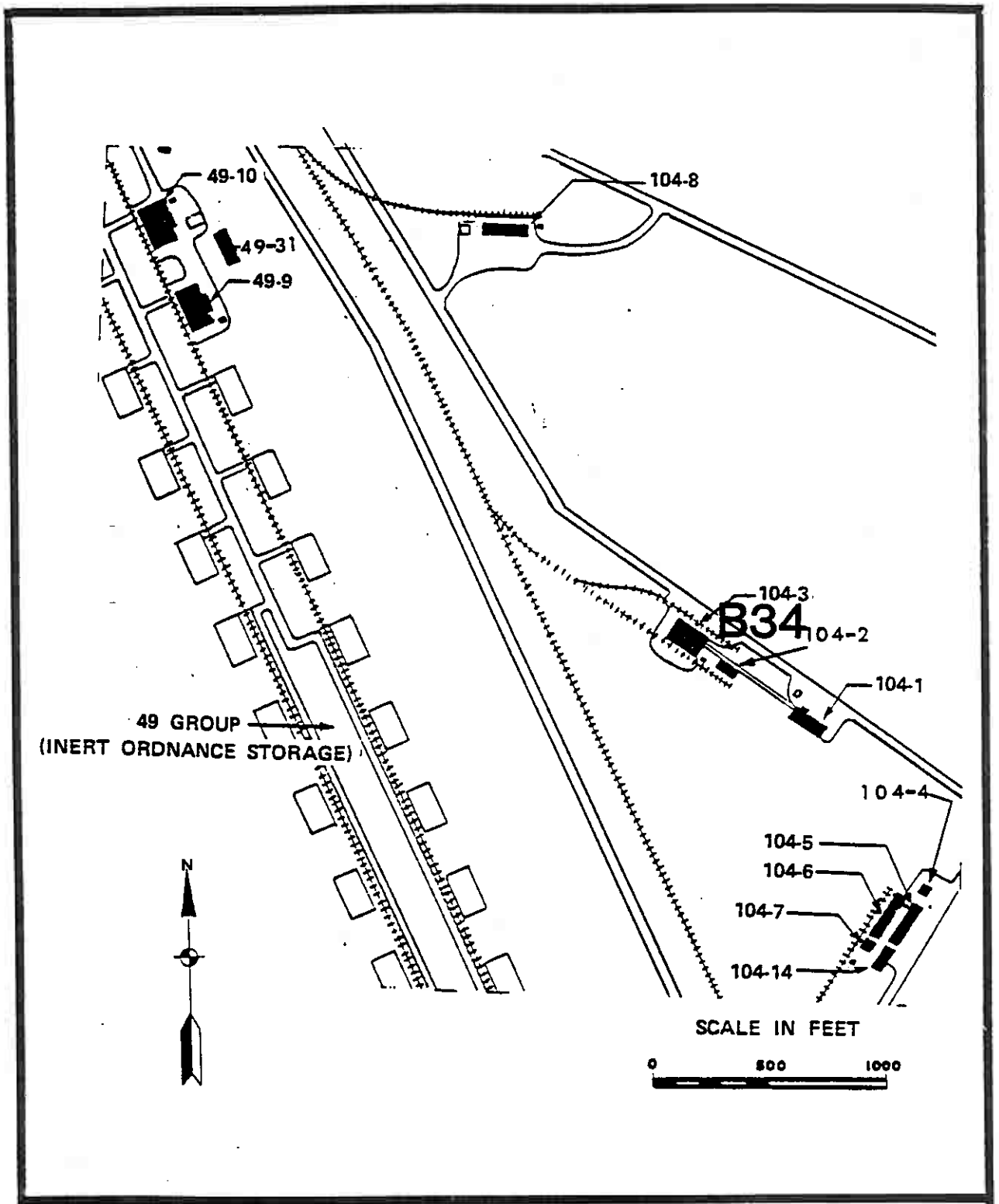


Figure 2-2. Location of Solid Waste Management Units (SWMU)

source: EPA Project File for HAAP



104 PRODUCTION AREAS, HWAAP - B34: DISPOSAL PIT.

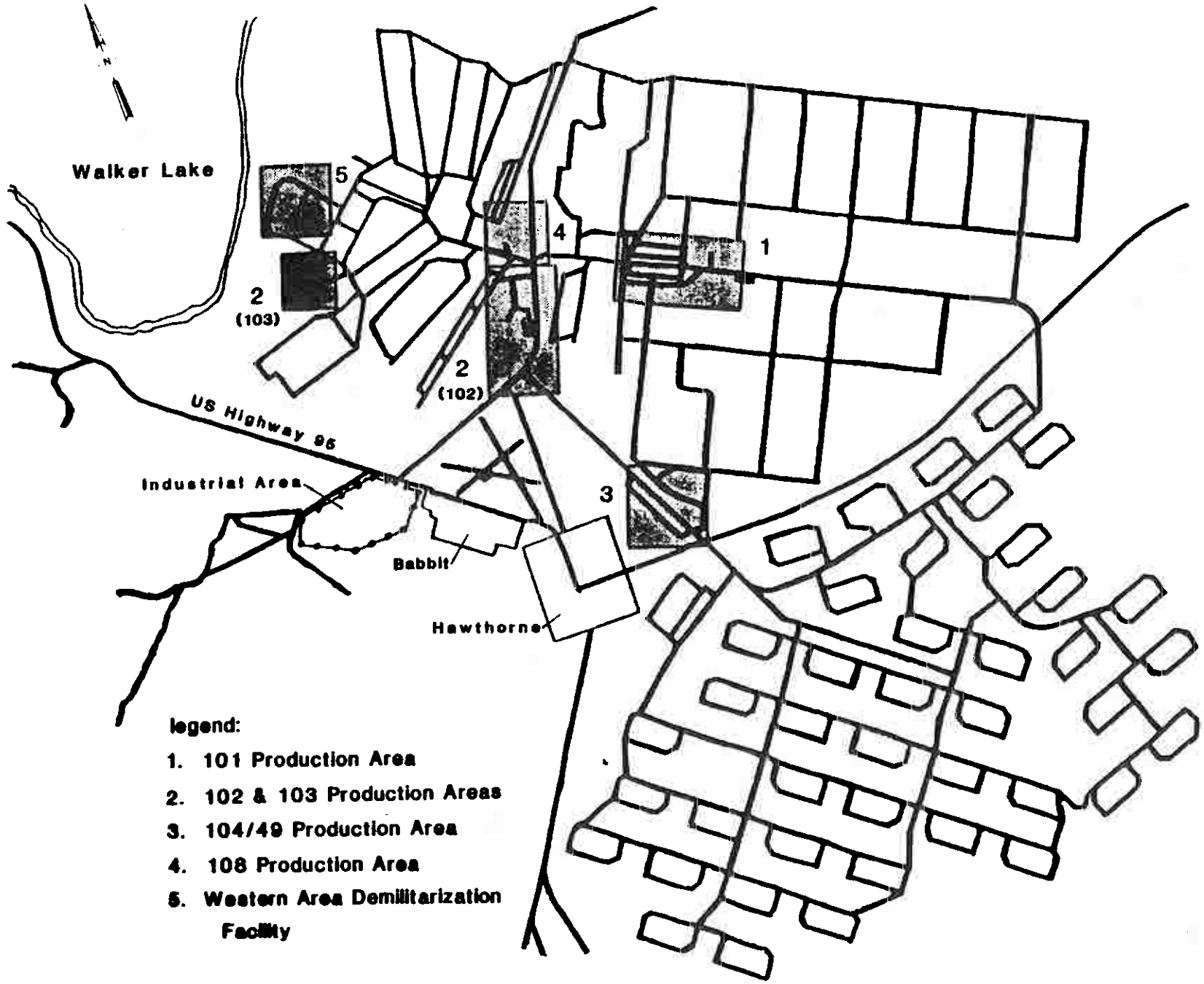
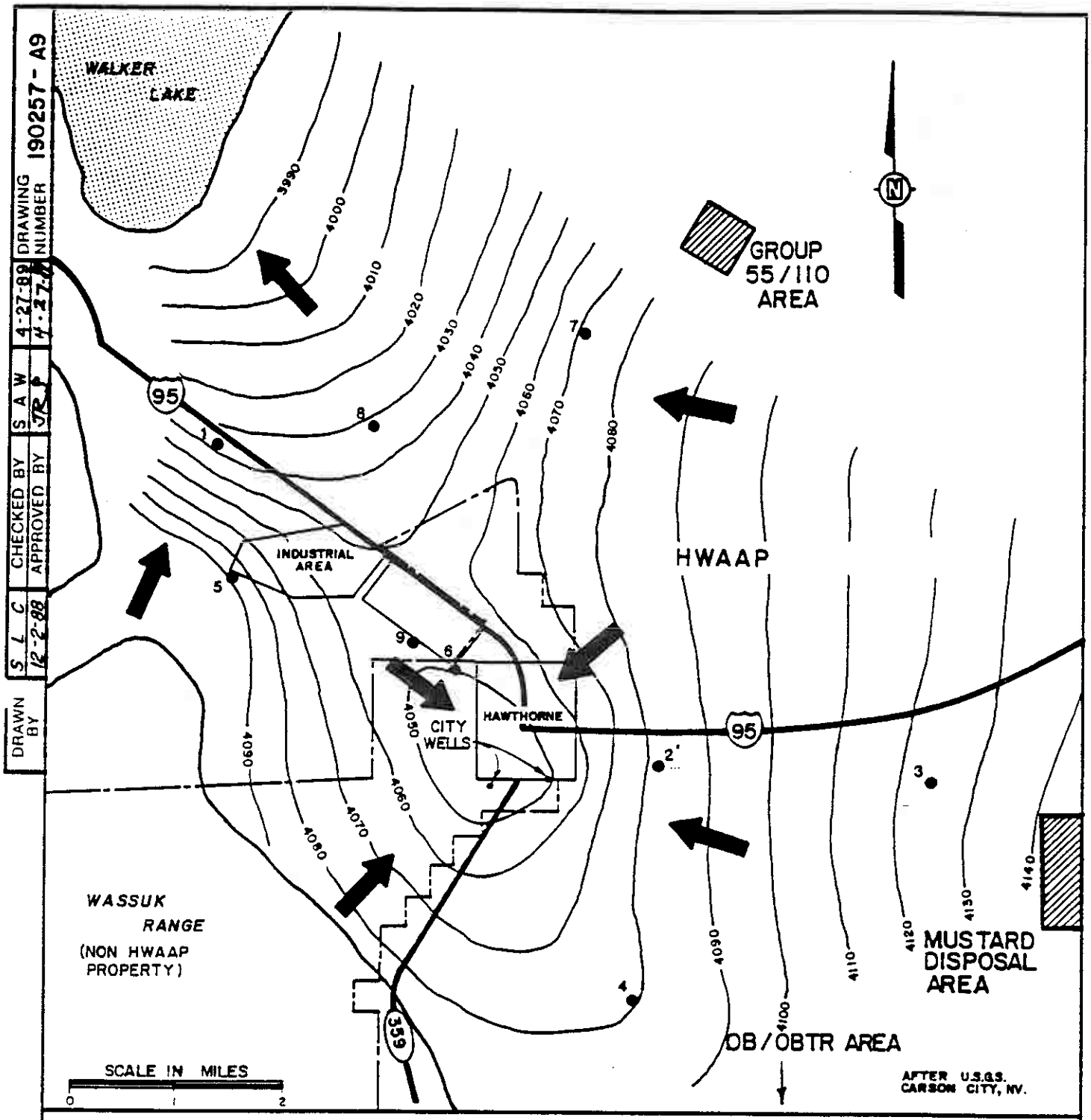


Figure 2-1. Five Major Production Areas At HAAP.

source: RCRA Part B Application



DRAWN BY	S L C	12-2-88
CHECKED BY	S A W	4-27-89
APPROVED BY	JR P	4-27-89
DRAWING NUMBER	190257 - A9	

LEGEND

4020 — WATER LEVEL CONTOURS; CONTOUR INTERVAL 10 FEET (3.0 M), DATUM IS MEAN SEA LEVEL

DIRECTION OF GROUND WATER FLOW

HWAAP WATER WELLS

HWAAP BOUNDARY

REFERENCE: INSTALLATION ASSESSMENT, NAVAL AMMUNITIONS DEPOT, USATHAMA 1977

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Do Not Scale This Drawing

FIGURE 2-3

GENERALIZED GROUND WATER LEVELS IN THE HAWTHORNE AREA, 1974

PREPARED FOR

ORDNANCE & ENVIRONMENTAL INVESTIGATION
HAWTHORNE ARMY AMMUNITION PLANT
HAWTHORNE, NEVADA

IT ... Creating a Safer Tomorrow

FIGURE 2-1
SWMU B34
Sample Locations

2011 SITE INVESTIGATION
VALIDATED RESULTS OF DETECTED CHEMICALS IN SOIL
SWMU B34

Analyte	Method	Units	EPA RSLs (2010) Residential	EPA RSLs (2010) Industrial	HWAD Background Screening Levels	Sample Location													
						B34-01-S-01		B34-01-S-04		B34-01-S-04-Z		B34-02-S-01*		B34-02-S-04		B34-03-S-01		B34-03-S-04	
						2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11	
						1 ft BGS		4 ft BGS		Duplicate		1 ft BGS		4 ft BGS		1 ft BGS		4 ft BGS	
						Test America		Test America		Test America		Test America		Test America		Test America		Test America	
						Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Resource Conservation and Recovery Act (RCRA) Metals																			
Mercury	7471A	ug/Kg	5,600	34,000		**21** J	5.1	**8.1** J	5.4	**7.0** J	5.4	**10** J	5.4	**16** J	6.6	**8.1** J	5	**8.9** J	5.8
Arsenic	6010C	mg/Kg	0.39	1.6	18.1	**2.3**	0.62	**3.9**	0.62	**4.2**	0.64	**3.7**	0.64	**7.5**	0.75	**3.7**	0.65	**7.7**	0.67
Barium	6010C	mg/Kg	15,000	190,000	447	**46** Q	0.072	**95** Q	0.071	**95** Q	0.074	**92** Q	0.074	**310** Q	0.086	**83** Q	0.074	**280** Q	0.078
Cadmium	6010C	mg/Kg	70	800	1.08	**0.43** J	0.039	**0.15** J	0.038	**0.13** J	0.04	**0.19** J	0.04	**0.51** J	0.046	**2**	0.04	**0.23** J	0.042
Chromium	6010C	mg/Kg			13.76	**3.3** Q	0.055	**4.5** Q	0.054	**4.6** Q	0.056	**4.6** Q	0.056	**14** Q	0.066	**3.4** Q	0.057	**9.1** Q	0.059
Lead	6010C	mg/Kg	400	800	16.7	**3.2**	0.26	**5.2**	0.25	**5.3**	0.26	**10**	0.26	**20**	0.31	**5.2**	0.26	**13**	0.28
Silver	6010C	mg/Kg	390	5,100		0.19 U	0.15	**0.16** J	0.15	0.19 U	0.16	0.16 J	0.16	0.23 U	0.18	**0.21** J	0.16	0.2 U	0.16
Semi Volatile Organic Compounds - Low Level																			
Anthracene	8270_SIM	ug/Kg	17000000	170000000		**0.22** J	0.13	0.34 U	0.13	0.35 U	0.13	**16**	0.14	**0.78** J	0.15	**10**	0.12	0.37 U	0.14
Acenaphthene	8270_SIM	ug/Kg	3,400,000	33,000,000		**0.17** J	0.16	0.34 U	0.15	0.35 U	0.16	**13**	0.33	**0.73** J	0.19	**9.3**	0.15	0.37 U	0.17
Acenaphthylene	8270_SIM	ug/Kg				**0.23** J	0.17	0.34 U	0.16	0.35 U	0.17	**1.4** J	0.18	0.41 U	0.2	**0.62** J	0.16	0.37 U	0.18
Benzo[a]anthracene	8270_SIM	ug/Kg	150	2,100		**1.8** J	0.14	0.34 U	0.14	0.35 U	0.14	**64**	0.3	**2.9** J	0.17	**32**	0.14	**0.75** J	0.16
Benzo[b]fluoranthene	8270_SIM	ug/Kg	150	2,100		**4.7** J MK	0.14	0.34 U	0.14	0.35 U	0.14	**98** M	0.3	**5.3** J K	0.17	**49** M	0.14	0.37 U	0.15
Benzo[k]fluoranthene	8270_SIM	ug/Kg	1,500	21,000		0.34 U K	0.13	0.34 U	0.13	0.35 U	0.13	**42** M	0.14	0.41 U K	0.15	**17** M	0.12	0.37 U	0.14
Benzo[a]pyrene	8270_SIM	ug/Kg	15	210		**2.6** J M	0.14	0.34 U	0.14	0.35 U	0.14	**90**	0.15	**3.2** J	0.17	**41**	0.13	0.37 U	0.15
Benzo[g,h,i]perylene	8270_SIM	ug/Kg				**1.7** J	0.19	0.34 U	0.19	0.35 U	0.2	**42**	0.21	**1.7** J	0.23	**20**	0.19	**0.48** J	0.21
Chrysene	8270_SIM	ug/Kg	15,000	210,000		**3** J	0.19	0.34 U	0.19	0.35 U	0.19	**83**	0.4	**3.8** J	0.22	**42**	0.18	**1** J	0.2
Dibenz(a,h)anthracene	8270_SIM	ug/Kg	15	210		**0.43** J	0.24	0.34 U	0.23	0.35 U	0.24	**10**	0.25	0.41 U	0.28	**4.6** J	0.23	0.37 U	0.26
Fluoranthene	8270_SIM	ug/Kg	2,300,000	22,000,000		**4.9**	0.2	**0.23** J	0.2	**0.22** J	0.21	**180**	0.44	**8.1**	0.24	**95**	0.2	**2.2** J	0.22
Fluorene	8270_SIM	ug/Kg	2,300,000	22,000,000		0.34 U	0.22	0.34 U	0.22	0.35 U	0.22	**12**	0.24	**0.6** J	0.26	**7.9**	0.21	0.37 U	0.24
Indeno[1,2,3-cd]pyrene	8270_SIM	ug/Kg	150	2,100		**1.8** J	0.24	0.34 U	0.24	0.35 U	0.24	**48**	0.51	**2.1** J	0.28	**25**	0.23	**0.54** J	0.26
Naphthalene	8270_SIM	ug/Kg	3,600	18,000		0.34 U	0.32	0.34 U Q	0.31	0.35 U	0.32	**2.4** J	0.34	0.38 J	0.38	**2.2** J	0.31	0.37 U	0.35
Phenanthrene	8270_SIM	ug/Kg				**2.3** J	0.3	0.34 U	0.3	0.35 U	0.31	**120**	0.65	**5.9**	0.36	**72**	0.29	**1.4** J	0.33
Pyrene	8270_SIM	ug/Kg	1,700,000	17,000,000		**4.6** J	0.17	**0.2** J	0.17	**0.19** J	0.18	**170** J	0.18	**7.5**	0.21	**88**	0.17	**2.1** J	0.19
1-Methylnaphthalene	8270_SIM	ug/Kg	22,000	99,000		0.34 U	0.25	0.34 U Q	0.25	0.35 U	0.26	**2.5** J	0.54	0.41 U	0.3	**1.8** J	0.24	0.37 U	0.28
2-Methylnaphthalene	8270_SIM	ug/Kg	310,000	4,100,000		0.34 U	0.3	0.34 U Q	0.3	0.35 U	0.31	**1.4** J	0.32	0.41 U	0.36	**1.2** J	0.29	0.37 U	0.33
Semi-Volatile Organic Compounds																			
Benzidine	8270	ug/Kg	0.5[a]	7.5[a]		4000 U	990	3800 U	940	4100 U	1000	4200 U	1000	4500 U	1100	3700 U	930	4200 U	1000
Benzo[a]anthracene	8270	ug/Kg	150	2,100		**21** J	20	31 U	19	34 U	21	**71** J	21	38 U	23	31 U	19	35 U	21
Benzo[b]fluoranthene	8270	ug/Kg	150	2,100		33 U	26	31 U	25	34 U	27	**130** J K	28	38 U	30	**33** J K	25	35 U	28
Fluoranthene	8270	ug/Kg	2,300,000	22,000,000		**41** J	36	63 U	34	69 U	37	**200** J	38	75 U	41	**49** J	34	70 U	38
Chrysene	8270	ug/Kg	15,000	210,000		33 U	27	31 U	26	34 U	28	**99** J	28	38 U	31	**27** J	25	35 U	28
Benzo[a]pyrene	8270	ug/Kg	15[a]	210		33 U	20	31 U	19	34 U	21	**77** J	21	38 U	23	**20** J	19	35 U	21
Indeno[1,2,3-cd]pyrene	8270	ug/Kg	150	2,100		33 U	22	31 U	21	34 U	23	**39** J	23	38 U	25	31 U	21	35 U	23
Pyrene	8270	ug/Kg	1,700,000	17,000,000		**37** J	12	31 U	12	34 U	13	**180** J	13	38 U	14	**47** J	11	35 U	13
Phenol	8270	ug/Kg	18,000,000	180,000,000		33 U	18	31 U	17	34 U	19	**20** J	19	**33** J	21	31 U	17	35 U	19
N-Nitrosodimethylamine	8270	ug/Kg	2.3[a]	34[a]		66 U	37	63 U	35	69 U	38	70 U	39	75 U	42	62 U	35	70 U	39
Bis(2-ethylhexyl) phthalate	8270	ug/Kg	35,000	120,000		**100** J	46	**140** J	44	**100** J	48	**120** J	49	**130** J	52	**100** J	43	**110** J	48
Volatile Organic Compounds																			
1,1-Dichloroethene	8260	ug/Kg	240,000	1,100,000		**2.5** J	0.65	**2.4** J	0.65	**2.5** J	0.66	**0.93** J	0.65	**1.6** J	0.71	**1.7** J	0.59	**1.2** J	0.65
Naphthalene	8260	ug/Kg	3,600	18,000		1.1 U	0.7	**0.9** J	0.69	1.1 U	0.7	1.1 U	0.7	1.2 U Q	0.76	1 U	0.64	1.1 U Q	0.7

Notes:

RSLs - Regional Screening Levels
HWAD - Hawthorne Army Depot
MDL - Method Detection Limit
BGS - Below Ground Surface
mg/kg - milligram per kilogram
ug/kg - microgram per kilogram

NE- Not Established
Bold - results above laboratory detection limit
Highlighted in yellow - above EPA RSL (residential)
Highlighted in red - above EPA RSL (industrial)

Laboratory Qualifiers

J - Estimated: The analyze was positively identified; the quantitation is an estimation
J - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
Q - One or more quality control criteria failed.
U - Undetected at the Limit of Detection.
M - Manual integrated compound.
a - The sample specific detetion limit does not suppor the regulatory requirement.

2011 SITE INVESTIGATION
VALIDATED RESULTS OF ALL CHEMICALS IN SOIL
SWMU B34
HAWTHORNE ARMY DEPOT, NEVADA

			Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location	
			B34-01-S-01		B34-01-S-04		B34-01-S-04-Z		B34-02-S-01		B34-02-S-04		B34-03-S-01		B34-03-S-04	
			2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11	
			1 ft BGS		4 ft BGS		Duplicate		1 ft BGS		4 ft BGS		1 ft BGS		4 ft BGS	
			Test America		Test America		Test America		Test America		Test America		Test America		Test America	
Analyte	Method	Units	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Resource Conservation and Recovery Act (RCRA) Metals																
Mercury	7471A	ug/Kg	**21** J J	5.1	**8.1** J	5.4	**7** J	5.4	**10** J	5.4	**16** J	6.6	**8.1** J	5	**8.9** J	5.8
Arsenic	6010C	mg/Kg	**2.3**	0.62	**3.9**	0.62	**4.2**	0.64	**3.7**	0.64	**7.5**	0.75	**3.7**	0.65	**7.7**	0.67
Barium	6010C	mg/Kg	**46** Q	0.072	**95** Q	0.071	**95** Q	0.074	**92** Q	0.074	**310** Q	0.086	**83** Q	0.074	**280** Q	0.078
Cadmium	6010C	mg/Kg	**0.43** J	0.039	**0.15** J	0.038	**0.13** J	0.04	**0.19** J	0.04	**0.51** J	0.046	**2**	0.04	**0.23** J	0.042
Chromium	6010C	mg/Kg	**3.3** Q	0.055	**4.5** Q	0.054	**4.6** Q	0.056	**4.6** Q	0.056	**14** Q	0.066	**3.4** Q	0.057	**9.1** Q	0.059
Lead	6010C	mg/Kg	**3.2**	0.26	**5.2**	0.25	**5.3**	0.26	**10**	0.26	**20**	0.31	**5.2**	0.26	**13**	0.28
Selenium	6010C	mg/Kg	1.4 U	0.81	1.4 U	0.8	1.5 U	0.83	1.5 U	0.84	1.7 U	0.97	1.5 U	0.84	1.5 U	0.88
Silver	6010C	mg/Kg	0.19 U	0.15	**0.16** J	0.15	0.19 U	0.16	0.16 J	0.16	0.23 U	0.18	**0.21** J	0.16	0.2 U	0.16
Explosives																
2-Amino-4,6-dinitrotoluene	8330B	mg/Kg	0.038 U	0.031	0.04 U	0.033	0.037 U	0.03	0.038 U	0.032	0.04 U	0.033	0.039 U	0.032	0.04 U M	0.033
4-Amino-2,6-dinitrotoluene	8330B	mg/Kg	0.038 U	0.029	0.04 U	0.03	0.037 U	0.027	0.038 U	0.029	0.04 U	0.03	0.039 U	0.029	0.04 U	0.03
2,4-Dinitrotoluene	8330B	mg/Kg	0.038 U	0.014	0.04 U	0.015	0.037 U	0.014	0.038 U	0.014	0.04 U	0.015	0.039 U	0.014	0.04 U	0.015
2,6-Dinitrotoluene	8330B	mg/Kg	0.038 U	0.018	0.04 U	0.019	0.037 U	0.018	0.038 U	0.018	0.04 U	0.019	0.039 U	0.018	0.04 U	0.019
2-Nitrotoluene	8330B	mg/Kg	0.077 U	0.045	0.079 U	0.047	0.074 U	0.043	0.077 U	0.045	0.079 U	0.047	0.077 U	0.046	0.08 U	0.047
3-Nitrotoluene	8330B	mg/Kg	0.077 U	0.061	0.079 U	0.064	0.074 U	0.059	0.077 U	0.061	0.079 U	0.063	0.077 U	0.062	0.08 U	0.064
Nitrobenzene	8330B	mg/Kg	0.096 U	0.081	0.099 U	0.084	0.092 U	0.078	0.096 U	0.082	0.099 U	0.084	0.097 U	0.082	0.099 U	0.084
4-Nitrotoluene	8330B	mg/Kg	0.096 U	0.035	0.099 U	0.036	0.092 U	0.034	0.096 U	0.035	0.099 U	0.036	0.097 U	0.035	0.099 U	0.036
1,3,5-Trinitrobenzene	8330B	mg/Kg	0.038 U	0.013	0.04 U	0.014	0.037 U	0.013	0.038 U	0.013	0.04 U	0.014	0.039 U	0.013	0.04 U	0.014
1,3-Dinitrobenzene	8330B	mg/Kg	0.038 U	0.016	0.04 U	0.016	0.037 U	0.015	0.038 U	0.016	0.04 U	0.016	0.039 U	0.016	0.04 U	0.017
HMX	8330B	mg/Kg	0.038 U	0.022	0.04 U	0.023	0.037 U	0.021	0.038 U	0.022	0.04 U	0.023	0.039 U	0.022	0.04 U	0.023
RDX	8330B	mg/Kg	0.077 U	0.041	0.079 U	0.043	0.074 U	0.04	0.077 U	0.041	0.079 U	0.043	0.077 U	0.042	0.08 U	0.043
Tetryl	8330B	mg/Kg	0.077 U	0.042	0.079 U	0.044	0.074 U	0.04	0.077 U	0.042	0.079 U	0.044	0.077 U	0.042	0.08 U	0.044
2,4,6-Trinitrotoluene	8330B	mg/Kg	0.038 U	0.029	0.04 U	0.03	0.037 U	0.028	0.038 U	0.029	0.04 U	0.03	0.039 U	0.03	0.04 U	0.031
Picric acid	8330B	mg/Kg	0.038 U	0.054	0.04 U	0.056	0.037 U	0.052	0.038 U	0.054	0.04 U	0.056	0.039 U	0.054	0.04 U	0.056
Ammonium Picrate	8330B	mg/Kg	0.038 U	0.058	0.04 U	0.06	0.037 U	0.056	0.038 U	0.058	0.04 U	0.06	0.039 U	0.059	0.04 U	0.06
Semi Volatile Organic Compounds - Low Level																
Anthracene	8270_SIM_DoD	ug/Kg	**0.22** J	0.13	0.34 U	0.13	0.35 U	0.13	**16**	0.14	**0.78** J	0.15	**10**	0.12	0.37 U	0.14
Acenaphthene	8270_SIM_DoD	ug/Kg	**0.17** J	0.16	0.34 U	0.15	0.35 U	0.16	**13**	0.33	**0.73** J	0.19	**9.3**	0.15	0.37 U	0.17
Acenaphthylene	8270_SIM_DoD	ug/Kg	**0.23** J	0.17	0.34 U	0.16	0.35 U	0.17	**1.4** J	0.18	0.41 U	0.2	**0.62** J	0.16	0.37 U	0.18
Benzo[a]anthracene	8270_SIM_DoD	ug/Kg	**1.8** J	0.14	0.34 U	0.14	0.35 U	0.14	**64**	0.3	**2.9** J	0.17	**32**	0.14	**0.75** J	0.16
Benzo[b]fluoranthene	8270_SIM_DoD	ug/Kg	**4.7** J M K	0.14	0.34 U	0.14	0.35 U	0.14	**98** M	0.3	**5.3** J M K	0.17	**49** M	0.14	0.37 U	0.15
Benzo[k]fluoranthene	8270_SIM_DoD	ug/Kg	0.34 U K	0.13	0.34 U	0.13	0.35 U	0.13	**42** M	0.14	0.41 U K	0.15	**17** M	0.12	0.37 U	0.14
Benzo[a]pyrene	8270_SIM_DoD	ug/Kg	**2.6** J M	0.14	0.34 U	0.14	0.35 U	0.14	**90**	0.15	**3.2** J M	0.17	**41**	0.13	0.37 U	0.15
Benzo[g,h,i]perylene	8270_SIM_DoD	ug/Kg	**1.7** J	0.19	0.34 U	0.19	0.35 U	0.2	**42**	0.21	**1.7** J	0.23	**20**	0.19	**0.48** J	0.21
Chrysene	8270_SIM_DoD	ug/Kg	**3** J	0.19	0.34 U	0.19	0.35 U	0.19	**83**	0.4	**3.8** J	0.22	**42**	0.18	**1** J	0.2
Dibenz(a,h)anthracene	8270_SIM_DoD	ug/Kg	**0.43** J	0.24	0.34 U	0.23	0.35 U	0.24	**10**	0.25	0.41 U	0.28	**4.6** J	0.23	0.37 U	0.26

2011 SITE INVESTIGATION
VALIDATED RESULTS OF ALL CHEMICALS IN SOIL
SWMU B34
HAWTHORNE ARMY DEPOT, NEVADA

			Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location	
			B34-01-S-01		B34-01-S-04		B34-01-S-04-Z		B34-02-S-01		B34-02-S-04		B34-03-S-01		B34-03-S-04	
			2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11	
			1 ft BGS		4 ft BGS		Duplicate		1 ft BGS		4 ft BGS		1 ft BGS		4 ft BGS	
			Test America		Test America		Test America		Test America		Test America		Test America		Test America	
Analyte	Method	Units	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Fluoranthene	8270_SIM_DoD	ug/Kg	**4.9**	0.2	**0.23** J	0.2	**0.22** J	0.21	**180**	0.44	**8.1**	0.24	**95**	0.2	**2.2** J	0.22
Fluorene	8270_SIM_DoD	ug/Kg	0.34 U	0.22	0.34 U	0.22	0.35 U	0.22	**12**	0.24	**0.6** J	0.26	**7.9**	0.21	0.37 U	0.24
Indeno[1,2,3-cd]pyrene	8270_SIM_DoD	ug/Kg	**1.8** J	0.24	0.34 U	0.24	0.35 U	0.24	**48**	0.51	**2.1** J	0.28	**25**	0.23	**0.54** J	0.26
Naphthalene	8270_SIM_DoD	ug/Kg	0.34 U	0.32	0.34 U Q	0.31	0.35 U	0.32	**2.4** J	0.34	0.38 J	0.38	**2.2** J	0.31	0.37 U	0.35
Phenanthrene	8270_SIM_DoD	ug/Kg	**2.3** J	0.3	0.34 U	0.3	0.35 U	0.31	**120**	0.65	**5.9**	0.36	**72**	0.29	**1.4** J	0.33
Pyrene	8270_SIM_DoD	ug/Kg	**4.6** J	0.17	**0.2** J	0.17	**0.19** J	0.18	**170** J	0.18	**7.5**	0.21	**88**	0.17	**2.1** J	0.19
1-Methylnaphthalene	8270_SIM_DoD	ug/Kg	0.34 U	0.25	0.34 U Q	0.25	0.35 U	0.26	**2.5** J	0.54	0.41 U	0.3	**1.8** J	0.24	0.37 U	0.28
2-Methylnaphthalene	8270_SIM_DoD	ug/Kg	0.34 U	0.3	0.34 U Q	0.3	0.35 U	0.31	**1.4** J	0.32	0.41 U	0.36	**1.2** J	0.29	0.37 U	0.33
Semi Volatile Organic Compounds																
Anthracene	8270_DoD	ug/Kg	33 U	17	31 U	16	34 U	18	35 U	18	38 U	19	31 U	16	35 U	18
Benzidine	8270_DoD	ug/Kg	4000 U	990	3800 U	940	4100 U	1000	4200 U	1000	4500 U	1100	3700 U	930	4200 U	1000
Benzo[a]anthracene	8270_DoD	ug/Kg	**21** J	20	31 U	19	34 U	21	**71** J	21	38 U	23	31 U	19	35 U	21
Benzoic acid	8270_DoD	ug/Kg	660 U	330	630 U	310	690 U	340	700 U	350	750 U	380	620 U	310	700 U	350
Benzo[b]fluoranthene	8270_DoD	ug/Kg	33 U	26	31 U	25	34 U	27	**130** J K	28	38 U	30	**33** J K	25	35 U	28
Benzo[k]fluoranthene	8270_DoD	ug/Kg	66 U	40	63 U	38	69 U	42	70 U K	42	75 U	46	62 U K	38	70 U	42
Benzyl alcohol	8270_DoD	ug/Kg	33 U	10	31 U	9.5	34 U	10	35 U	11	38 U	11	31 U	9.4	35 U	11
Bis(2-chloroethoxy)methane	8270_DoD	ug/Kg	66 U	23	63 U	22	69 U	24	70 U	24	75 U	26	62 U	22	70 U	24
Bis(2-chloroethyl)ether	8270_DoD	ug/Kg	33 U	17	31 U	16	34 U	17	35 U	18	38 U	19	31 U	16	35 U	17
Butyl benzyl phthalate	8270_DoD	ug/Kg	66 U	43	63 U	41	69 U	45	70 U	45	75 U	49	62 U	40	70 U	45
2,4-Dimethylphenol	8270_DoD	ug/Kg	130 U	66	120 U	63	140 U	69	140 U	70	150 U	75	120 U	62	140 U	70
2,4-Dinitrophenol	8270_DoD	ug/Kg	670 U	330	640 U	320	700 U	350	710 U	350	760 U	380	630 U	310	710 U	350
2,4-Dinitrotoluene	8270_DoD	ug/Kg	130 U	66	120 U	63	140 U	69	140 U	70	150 U	75	120 U	62	140 U	70
2,6-Dinitrotoluene	8270_DoD	ug/Kg	66 U	28	63 U	27	69 U	29	70 U	30	75 U	32	62 U	26	70 U	29
Fluoranthene	8270_DoD	ug/Kg	**41** J	36	63 U	34	69 U	37	**200** J	38	75 U	41	**49** J	34	70 U	38
Fluorene	8270_DoD	ug/Kg	33 U	18	31 U	17	34 U	19	35 U	19	38 U	21	31 U	17	35 U	19
1,2-Diphenylhydrazine	8270_DoD	ug/Kg	33 U	22	31 U	21	34 U	23	35 U	23	38 U	25	31 U	21	35 U	23
Hexachlorobenzene	8270_DoD	ug/Kg	66 U	29	63 U	28	69 U	30	70 U	31	75 U	33	62 U	27	70 U	31
Hexachlorobutadiene	8270_DoD	ug/Kg	66 U	10	63 U	9.5	69 U	10	70 U	11	75 U	11	62 U	9.4	70 U	11
Hexachloroethane	8270_DoD	ug/Kg	33 U	21	31 U	20	34 U	22	35 U	22	38 U	24	31 U	20	35 U	22
N-Nitrosodiphenylamine	8270_DoD	ug/Kg	33 U	21	31 U	20	34 U	22	35 U	22	38 U	24	31 U	20	35 U	22
N-Nitrosodi-n-propylamine	8270_DoD	ug/Kg	66 U	31	63 U	30	69 U	32	70 U	33	75 U	35	62 U	29	70 U	33
1,4-Dichlorobenzene	8270_DoD	ug/Kg	33 U	14	31 U	13	34 U	14	35 U	14	38 U	16	31 U	13	35 U	14
2-Chloronaphthalene	8270_DoD	ug/Kg	33 U	10	31 U	9.5	34 U	10	35 U	11	38 U	11	31 U	9.4	35 U	11
2-Chlorophenol	8270_DoD	ug/Kg	33 U	21	31 U	20	34 U	22	35 U	22	38 U	24	31 U	20	35 U	22
Chrysene	8270_DoD	ug/Kg	33 U	27	31 U	26	34 U	28	**99** J	28	38 U	31	**27** J	25	35 U	28
Dibenz(a,h)anthracene	8270_DoD	ug/Kg	33 U	19	31 U	18	34 U	20	35 U	20	38 U	22	31 U	18	35 U	20
Dibenzofuran	8270_DoD	ug/Kg	33 U	20	31 U	19	34 U	21	35 U	21	38 U	23	31 U	19	35 U	21
Benzo[a]pyrene	8270_DoD	ug/Kg	33 U	20	31 U	19	34 U	21	**77** J	21	38 U	23	**20** J	19	35 U	21
1,2-Dichlorobenzene	8270_DoD	ug/Kg	33 U	22	31 U	21	34 U	23	35 U	23	38 U	25	31 U	21	35 U	23
Diethyl phthalate	8270_DoD	ug/Kg	33 U	26	31 U	25	34 U	27	35 U	27	38 U	30	31 U	24	35 U	27
1,3-Dichlorobenzene	8270_DoD	ug/Kg	33 U	12	31 U	11	34 U	12	35 U	13	38 U	14	31 U	11	35 U	13
3,3'-Dichlorobenzidine	8270_DoD	ug/Kg	330 U	90	310 U	86	340 U	94	350 U	95	380 U	100	310 U	85	350 U	95
2,4-Dichlorophenol	8270_DoD	ug/Kg	66 U	10	63 U	9.5	69 U	10	70 U	11	75 U	11	62 U	9.4	70 U	11
Indeno[1,2,3-cd]pyrene	8270_DoD	ug/Kg	33 U	22	31 U	21	34 U	23	**39** J	23	38 U	25	31 U	21	35 U	23
Isophorone	8270_DoD	ug/Kg	33 U	17	31 U	16	34 U	18	35 U	18	38 U	19	31 U	16	35 U	18
Naphthalene	8270_DoD	ug/Kg	66 U	31	63 U	30	69 U	32	70 U	33	75 U	35	62 U	29	70 U	33
4-Nitroaniline	8270_DoD	ug/Kg	130 U	73	120 U	69	140 U	75	140 U	77	150 U	83	120 U	68	140 U	76
Nitrobenzene	8270_DoD	ug/Kg	33 U	22	31 U	21	34 U	23	35 U	23	38 U	25	31 U	21	35 U	23
Pyrene	8270_DoD	ug/Kg	**37** J	12	31 U	12	34 U	13	**180** J	13	38 U	14	**47** J	11	35 U	13
Pentachlorophenol	8270_DoD	ug/Kg	670 U	330	640 U	310	700 U	340	710 U	350	760 U	380	630 U	310	710 U	350
2,4,5-Trichlorophenol	8270_DoD	ug/Kg	130 U	10	120 U	9.5	140 U	10	140 U	11	150 U	11	120 U	9.4	140 U	11
2,4,6-Trichlorophenol	8270_DoD	ug/Kg	66 U	10	63 U	9.5	69 U	10	70 U	11	75 U	11	62 U	9.4	70 U	11

2011 SITE INVESTIGATION
VALIDATED RESULTS OF ALL CHEMICALS IN SOIL
SWMU B34
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			Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location	
			B34-01-S-01		B34-01-S-04		B34-01-S-04-Z		B34-02-S-01		B34-02-S-04		B34-03-S-01		B34-03-S-04	
			2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11	
			1 ft BGS		4 ft BGS		Duplicate		1 ft BGS		4 ft BGS		1 ft BGS		4 ft BGS	
			Test America		Test America		Test America		Test America		Test America		Test America		Test America	
Analyte	Method	Units	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Result	MDL
Hexachlorocyclopentadiene	8270_DoD	ug/Kg	66 U	50	63 U	48	69 U	52	70 U	53	75 U	57	62 U	47	70 U	53
Phenol	8270_DoD	ug/Kg	33 U	18	31 U	17	34 U	19	**20** J	19	**33** J	21	31 U	17	35 U	19
N-Nitrosodimethylamine	8270_DoD	ug/Kg	66 U	37	63 U	35	69 U	38	70 U	39	75 U	42	62 U	35	70 U	39
Bis(2-ethylhexyl) phthalate	8270_DoD	ug/Kg	**100** J	46	**140** J	44	**100** J	48	**120** J	49	**130** J	52	**100** J	43	**110** J	48
4-Chloroaniline	8270_DoD	ug/Kg	130 U	82	120 U	78	140 U	85	140 U	86	150 U	93	120 U	77	140 U	86
2,6-Dichlorophenol	8270_DoD	ug/Kg	130 U	69	120 U	66	140 U	72	140 U	73	150 U	79	120 U	65	140 U	73
N-Nitrosopyrrolidine	8270_DoD	ug/Kg	130 U	64	120 U	61	140 U	67	140 U	68	150 U	73	120 U	60	140 U	67
Pyridine	8270_DoD	ug/Kg	66 U	130	63 U	120	69 U	140	70 U	140	75 U	150	62 U	120	70 U	140
Acetophenone	8270_DoD	ug/Kg	33 U	20	31 U	19	34 U	21	35 U	21	38 U	23	31 U	19	35 U	21
Aniline	8270_DoD	ug/Kg	66 U	130	63 U	120	69 U	140	70 U	140	75 U	150	62 U	120	70 U	140
Dimethoate	8270_DoD	ug/Kg	33 U	68	31 U	65	34 U	71	35 U	72	38 U	78	31 U	64	35 U	72
1,4-Dioxane	8270_DoD	ug/Kg	130 U	66	120 U	63	140 U	69	140 U	70	150 U	75	120 U	62	140 U	70
Disulfoton	8270_DoD	ug/Kg	33 U	59	31 U	56	34 U	61	35 U	62	38 U	67	31 U	56	35 U	62
Methyl parathion	8270_DoD	ug/Kg	33 U	140	31 U	130	34 U	140	35 U	140	38 U	160	31 U	130	35 U	140
Phorate	8270_DoD	ug/Kg	33 U	59	31 U	56	34 U	61	35 U	62	38 U	67	31 U	56	35 U	62
2,3,4,6-Tetrachlorophenol	8270_DoD	ug/Kg	33 U	140	31 U	130	34 U	140	35 U	140	38 U	160	31 U	130	35 U	140
Caprolactam	8270_DoD	ug/Kg	330 U	110	310 U	100	340 U	110	350 U	110	380 U	120	310 U	100	350 U	110
Atrazine	8270_DoD	ug/Kg	130 U	37	120 U	35	140 U	38	140 U	39	150 U	42	120 U	35	140 U	39
1,1'-Biphenyl	8270_DoD	ug/Kg	33 U	50	31 U	48	34 U	52	35 U	53	38 U	57	31 U	47	35 U	53
Benzaldehyde	8270_DoD	ug/Kg	67 U	39	64 U	37	70 U	41	71 U	41	76 U	44	63 U	37	71 U	41
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	8260_DoD	ug/Kg	1.1 U	0.62	1.1 U	0.61	1.1 U	0.62	1.1 U	0.62	1.2 U Q	0.67	1 U	0.56	1.1 U	0.62
1,1,1-Trichloroethane	8260_DoD	ug/Kg	1.1 U	0.58	1.1 U	0.57	1.1 U	0.58	1.1 U	0.58	1.2 U	0.63	1 U	0.52	1.1 U	0.58
1,2,3-Trichloropropane	8260_DoD	ug/Kg	1.1 U	0.9	1.1 U	0.89	1.1 U	0.9	1.1 U	0.9	1.2 U Q	0.97	1 U	0.82	1.1 U Q	0.9
1,2,3-Trichlorobenzene	8260_DoD	ug/Kg	1.1 U	0.83	1.1 U	0.82	1.1 U	0.83	1.1 U	0.83	1.2 U Q	0.9	1 U	0.76	1.1 U Q	0.83
1,1-Dichloroethane	8260_DoD	ug/Kg	1.1 U	0.23	1.1 U	0.23	1.1 U	0.23	1.1 U	0.23	1.2 U	0.25	1 U	0.21	1.1 U	0.23
1,2,4-Trichlorobenzene	8260_DoD	ug/Kg	1.1 U	0.81	1.1 U	0.8	1.1 U	0.81	1.1 U	0.81	1.2 U Q	0.88	1 U	0.74	1.1 U Q	0.81
1,2-Dibromo-3-Chloropropane	8260_DoD	ug/Kg	1.1 U	0.67	1.1 U	0.66	1.1 U	0.67	1.1 U	0.67	1.2 U Q	0.72	1 U	0.6	1.1 U Q	0.66
1,1-Dichloroethene	8260_DoD	ug/Kg	**2.5** J	0.65	**2.4** J	0.65	**2.5** J	0.66	**0.93** J	0.65	**1.6** J	0.71	**1.7** J	0.59	**1.2** J	0.65
1,1,2-Trichloroethane	8260_DoD	ug/Kg	1.1 U	0.98	1.1 U	0.97	1.1 U	0.98	1.1 U	0.98	1.2 U	1.1	1 U	0.89	1.1 U	0.98
1,1,2,2-Tetrachloroethane	8260_DoD	ug/Kg	1.1 U	0.68	1.1 U	0.67	1.1 U	0.68	1.1 U	0.68	1.2 U Q	0.73	1 U	0.61	1.1 U Q	0.68
1,2,4-Trimethylbenzene	8260_DoD	ug/Kg	1.1 U	0.64	1.1 U	0.64	1.1 U	0.65	1.1 U	0.64	1.2 U Q	0.7	1 U	0.58	1.1 U Q	0.64
1,2-Dichlorobenzene	8260_DoD	ug/Kg	1.1 U	0.5	1.1 U	0.49	1.1 U	0.5	1.1 U	0.5	1.2 U Q	0.54	1 U	0.45	1.1 U Q	0.5
1,2-Dichloroethane	8260_DoD	ug/Kg	1.1 U	0.78	1.1 U	0.77	1.1 U	0.78	1.1 U	0.78	1.2 U	0.84	1 U	0.71	1.1 U	0.78
1,3-Dichloropropane	8260_DoD	ug/Kg	1.1 U	0.57	1.1 U	0.56	1.1 U	0.57	1.1 U	0.57	1.2 U Q	0.61	1 U	0.51	1.1 U	0.57
1,3,5-Trimethylbenzene	8260_DoD	ug/Kg	1.1 U	0.63	1.1 U	0.63	1.1 U	0.63	1.1 U	0.63	1.2 U Q	0.69	1 U	0.57	1.1 U Q	0.63
2-Butanone (MEK)	8260_DoD	ug/Kg	11 U	2	11 U	2	11 U	2	11 U	2	12 U	2.2	10 U	1.8	11 U	2
1,4-Dichlorobenzene	8260_DoD	ug/Kg	1.1 U	0.86	1.1 U	0.86	1.1 U	0.87	1.1 U	0.86	1.2 U Q	0.94	1 U	0.79	1.1 U Q	0.86
1,2-Dichloropropane	8260_DoD	ug/Kg	1.1 U	0.61	1.1 U	0.6	1.1 U	0.61	1.1 U	0.61	1.2 U	0.66	1 U	0.55	1.1 U	0.61
2-Hexanone	8260_DoD	ug/Kg	11 U	5.4	11 U	5.4	11 U	5.4	11 U	5.4	12 U	5.9	10 U	4.9	11 U	5.4
Benzene	8260_DoD	ug/Kg	1.1 U	0.52	1.1 U	0.52	1.1 U	0.52	1.1 U	0.52	1.2 U	0.57	1 U	0.47	1.1 U	0.52
Acetone	8260_DoD	ug/Kg	11 U	6	11 U	5.9	11 U	6	11 U	6	12 U	6.5	10 U	5.4	11 U	6
Bromobenzene	8260_DoD	ug/Kg	1.1 U	0.54	1.1 U	0.54	1.1 U	0.55	1.1 U	0.54	1.2 U Q	0.59	1 U	0.49	1.1 U Q	0.54
Bromoform	8260_DoD	ug/Kg	1.1 U	0.25	1.1 U	0.25	1.1 U	0.26	1.1 U	0.25	1.2 U Q	0.28	1 U	0.23	1.1 U	0.25
Bromomethane	8260_DoD	ug/Kg	1.1 U	0.55	1.1 U	0.55	1.1 U	0.56	1.1 U	0.55	1.2 U	0.6	1 U	0.5	1.1 U	0.55
Carbon tetrachloride	8260_DoD	ug/Kg	1.1 U	0.7	1.1 U	0.69	1.1 U	0.7	1.1 U	0.7	1.2 U	0.76	1 U	0.64	1.1 U	0.7
Carbon disulfide	8260_DoD	ug/Kg	1.1 U	0.47	1.1 U	0.46	1.1 U	0.47	1.1 U	0.47	1.2 U	0.5	1 U	0.42	1.1 U	0.47
2-Chlorotoluene	8260_DoD	ug/Kg	1.1 U	0.57	1.1 U	0.56	1.1 U	0.57	1.1 U	0.57	1.2 U Q	0.61	1 U	0.51	1.1 U Q	0.57
4-Chlorotoluene	8260_DoD	ug/Kg	1.1 U	0.86	1.1 U	0.86	1.1 U	0.87	1.1 U	0.86	1.2 U Q	0.94	1 U	0.79	1.1 U Q	0.86
Chlorobenzene	8260_DoD	ug/Kg	1.1 U	0.6	1.1 U	0.59	1.1 U	0.6	1.1 U	0.6	1.2 U Q	0.65	1 U	0.54	1.1 U	0.6
Chlorobromomethane	8260_DoD	ug/Kg	1.1 U	0.33	1.1 U	0.33	1.1 U	0.33	1.1 U	0.33	1.2 U	0.36	1 U	0.3	1.1 U	0.33
Chloroform	8260_DoD	ug/Kg	1.1 U	0.32	1.1 U	0.32	1.1 U	0.32	1.1 U	0.32	1.2 U	0.35	1 U	0.29	1.1 U	0.32

2011 SITE INVESTIGATION
VALIDATED RESULTS OF ALL CHEMICALS IN SOIL
SWMU B34
HAWTHORNE ARMY DEPOT, NEVADA

			Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location		Sample Location	
			B34-01-S-01		B34-01-S-04		B34-01-S-04-Z		B34-02-S-01		B34-02-S-04		B34-03-S-01		B34-03-S-04	
			2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11		2-Feb-11	
			1 ft BGS		4 ft BGS		Duplicate		1 ft BGS		4 ft BGS		1 ft BGS		4 ft BGS	
			Test America		Test America		Test America		Test America		Test America		Test America		Test America	
Analyte	**Method**	**Units**	**Result**	MDL	**Result**	MDL	**Result**	MDL	**Result**	MDL	**Result**	MDL	**Result**	MDL	**Result**	MDL
Chloromethane	8260_DoD	ug/Kg	1.1 U	0.85	1.1 U	0.84	1.1 U	0.86	1.1 U	0.85	1.2 U	0.93	1 U	0.78	1.1 U	0.85
cis-1,2-Dichloroethene	8260_DoD	ug/Kg	1.1 U	0.62	1.1 U	0.61	1.1 U	0.62	1.1 U	0.62	1.2 U	0.67	1 U	0.56	1.1 U	0.62
cis-1,3-Dichloropropene	8260_DoD	ug/Kg	2.2 U	1.4	2.2 U	1.4	2.2 U	1.4	2.2 U	1.4	2.4 U	1.6	2 U	1.3	2.2 U	1.4
Dibromomethane	8260_DoD	ug/Kg	1.1 U	0.93	1.1 U	0.92	1.1 U	0.93	1.1 U	0.93	1.2 U	1	1 U	0.85	1.1 U	0.93
Dichlorobromomethane	8260_DoD	ug/Kg	1.1 U	0.24	1.1 U	0.24	1.1 U	0.24	1.1 U	0.24	1.2 U	0.26	1 U	0.22	1.1 U	0.24
Dichlorodifluoromethane	8260_DoD	ug/Kg	1.1 U	0.58	1.1 U	0.57	1.1 U	0.58	1.1 U	0.58	1.2 U	0.63	1 U	0.52	1.1 U	0.58
Ethylbenzene	8260_DoD	ug/Kg	1.1 U	0.74	1.1 U	0.74	1.1 U	0.75	1.1 U	0.74	1.2 U Q	0.81	1 U	0.68	1.1 U	0.74
Hexachlorobutadiene	8260_DoD	ug/Kg	1.1 U	0.61	1.1 U	0.6	1.1 U	0.61	1.1 U	0.61	1.2 U Q	0.66	1 U	0.55	1.1 U Q	0.61
Methylene Chloride	8260_DoD	ug/Kg	**1.3** J	0.83	**1.7** J	0.82	**1.1** J	0.83	**1.6** J	0.83	**1.5** J	0.9	**1.2** J	0.76	**0.95** J	0.83
Methyl tert-butyl ether	8260_DoD	ug/Kg	1.1 U	0.38	1.1 U	0.37	1.1 U	0.38	1.1 U	0.38	1.2 U	0.41	1 U	0.34	1.1 U	0.38
m-Xylene & p-Xylene	8260_DoD	ug/Kg	2.2 U	1.2	2.2 U	1.1	2.2 U	1.2	2.2 U	1.2	2.4 U Q	1.3	2 U	1	2.2 U	1.2
Naphthalene	8260_DoD	ug/Kg	1.1 U	0.7	**0.9** J	0.69	1.1 U	0.7	1.1 U	0.7	1.2 U Q	0.76	1 U	0.64	1.1 U Q	0.7
N-Propylbenzene	8260_DoD	ug/Kg	1.1 U	0.64	1.1 U	0.64	1.1 U	0.65	1.1 U	0.64	1.2 U Q	0.7	1 U	0.58	1.1 U Q	0.64
o-Xylene	8260_DoD	ug/Kg	1.1 U	0.68	1.1 U	0.67	1.1 U	0.68	1.1 U	0.68	1.2 U Q	0.73	1 U	0.61	1.1 U	0.68
Styrene	8260_DoD	ug/Kg	1.1 U	0.7	1.1 U	0.69	1.1 U	0.7	1.1 U	0.7	1.2 U Q	0.76	1 U	0.64	1.1 U	0.7
trans-1,2-Dichloroethene	8260_DoD	ug/Kg	1.1 U	0.43	1.1 U	0.43	1.1 U	0.43	1.1 U	0.43	1.2 U	0.47	1 U	0.39	1.1 U	0.43
trans-1,3-Dichloropropene	8260_DoD	ug/Kg	1.1 U	0.74	1.1 U	0.74	1.1 U	0.75	1.1 U	0.74	1.2 U	0.81	1 U	0.68	1.1 U	0.74
Tetrachloroethene	8260_DoD	ug/Kg	1.1 U	0.65	1.1 U	0.65	1.1 U	0.66	1.1 U	0.65	1.2 U Q	0.71	1 U	0.59	1.1 U	0.65
Toluene	8260_DoD	ug/Kg	1.1 U	0.76	1.1 U	0.76	1.1 U	0.77	1.1 U	0.76	1.2 U	0.83	1 U	0.7	1.1 U	0.76
Trichloroethene	8260_DoD	ug/Kg	1.1 U	0.25	1.1 U	0.25	1.1 U	0.26	1.1 U	0.25	1.2 U	0.28	1 U	0.23	1.1 U	0.25
Trichlorofluoromethane	8260_DoD	ug/Kg	2.2 U	1.2	2.2 U	1.1	2.2 U	1.2	2.2 U	1.2	2.4 U	1.3	2 U	1	2.2 U	1.2
Vinyl chloride	8260_DoD	ug/Kg	2.2 U	1.5	2.2 U	1.5	2.2 U	1.5	2.2 U	1.5	2.4 U	1.6	2 U	1.4	2.2 U	1.5
Xylenes, Total	8260_DoD	ug/Kg	1.1 U	1.1	1.1 U	1.1	1.1 U	1.1	1.1 U	1.1	1.2 U	1.2	1 U	1	1.1 U	1.1
Vinyl acetate	8260_DoD	ug/Kg	11 U	1.2	11 U	1.2	11 U	1.2	11 U	1.2	12 U	1.3	10 U	1.1	11 U	1.2
1,4-Dioxane	8260_DoD	ug/Kg	89 U	62	88 U	62	89 U	62	89 U	62	96 U	67	81 U	57	89 U	62
Acrolein	8260_DoD	ug/Kg	8.9 U	7.8	8.8 U	7.7	8.9 U	7.8	8.9 U	7.8	9.6 U	8.4	8.1 U	7.1	8.9 U	7.8
Acrylonitrile	8260_DoD	ug/Kg	8.9 U	5.3	8.8 U	5.3	8.9 U	5.4	8.9 U	5.3	9.6 U	5.8	8.1 U	4.9	8.9 U	5.3
cis-1,4-Dichloro-2-butene	8260_DoD	ug/Kg	3.5 U	1.2	3.5 U	1.2	3.6 U	1.2	3.5 U	1.2	3.8 U	1.3	3.2 U	1.1	3.5 U	1.2
trans-1,4-Dichloro-2-butene	8260_DoD	ug/Kg	1.8 U	0.74	1.8 U	0.74	1.8 U	0.75	1.8 U	0.74	1.9 U	0.81	1.6 U	0.68	1.8 U	0.74
Cyclohexane	8260_DoD	ug/Kg	1.8 U	0.44	1.8 U	0.44	1.8 U	0.45	1.8 U	0.44	1.9 U	0.48	1.6 U	0.4	1.8 U	0.44
Ethyl methacrylate	8260_DoD	ug/Kg	0.89 U	0.67	0.88 U	0.66	0.89 U	0.67	0.89 U	0.67	0.96 U	0.72	0.81 U	0.6	0.89 U	0.66
Methyl acetate	8260_DoD	ug/Kg	4.4 U	3	4.4 U	3	4.5 U	3.1	4.4 U	3	4.8 U	3.3	4 U	2.8	4.4 U	3
2-Chloro-1,3-butadiene	8260_DoD	ug/Kg	0.89 U	0.58	0.88 U	0.57	0.89 U	0.58	0.89 U	0.58	0.96 U	0.63	0.81 U	0.52	0.89 U	0.58
Acetonitrile	8260_DoD	ug/Kg	35 U	3	35 U	3	36 U	3.1	35 U	3	38 U	3.3	32 U	2.8	35 U	3
Methyl methacrylate	8260_DoD	ug/Kg	1.8 U	1.1	1.8 U	1.1	1.8 U	1.1	1.8 U	1.1	1.9 U	1.2	1.6 U	1	1.8 U	1.1
Cyclohexanone	8260_DoD	ug/Kg	71 U	60	70 U	59	71 U	60	71 U	60	77 U	65	65 U	54	71 U	60
Tetrahydrofuran	8260_DoD	ug/Kg	7.1 U	3.5	7 U	3.5	7.1 U	3.5	7.1 U	3.5	7.7 U	3.8	6.5 U	3.2	7.1 U	3.5

Notes:

HWAD - Hawthorne Army Depot
MDL - Method Detection Limit
BGS - Below Ground Surface
mg/kg - milligram per kilogram
ug/kg - microgram per kilogram
NE- Not Established
Bold - results above laboratory detection limit

Laboratory Qualifiers:

J - Estimated: The analyze was positively identified; the quantitation is an estimation
J - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
Q - One or more quality control criteria failed.
U - Undetected at the Limit of Detection.
M - Manual integrated compound.
a - The sample specific detetion limit does not suppor the regulatory requirement.