Final
November 2018

Explanation of Significant Differences
OU A ROD
Former Adak Naval Complex
Adak Island, Alaska

Department of the Navy
Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, WA 98315

Signature sheet for the Explanation of Significant Differences for the Operable Unit A Record of Decision for the Former Adak Naval Complex, Adak Island, Alaska.

EPA signatory:

for 11/2/2018

Sheryl Bilbrey
Office Director, Environmental Cleanup Office
U.S. Environmental Cleanup Agency

Navy signatory:

Christopher Generous
Former Adak Naval Complex, Base Realignment and Closure Environmental Coordinator
U.S. Navy

ADEC signatory:

Melinda Brunner
Program Manager, Contaminated Sites
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Melinda Brunner
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EXECUTIVE SUMMARY

This explanation of significant differences (ESD) was prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617(c). The proposed changes are to adjust the surface water cleanup levels for three OU A landfill sites on Adak and marine fish/shellfish tissue risk-based action levels (RBALs) in Kuluk Bay and Sweeper Cove due to updated regulations and parameters used to calculate RBALs.

In 2016, the fourth five-year review was conducted for all OU A and petroleum sites on Adak with the current status of: Active or Cleanup Complete with Institutional Controls (ICs). Two recommendations in the fourth five-year review resulted in the need for an ESD to modify criteria set in the OU A Record of Decision (ROD). These two issues as described in the fourth five-year review are:

- Changes to surface water cleanup levels
- Changes to fish/shellfish RBALs

The OU A ROD referred to Applicable or Relevant and Appropriate Requirements (ARARs), specifically Title 18, Alaska Administrative Code (AAC), Chapter 70, or Title 40 of the Code of Federal Regulations (CFR), Section 131.36, to establish surface water cleanup levels for Solid Waste Management Units (SWMUs) 11, 18/19 and 25. Changes to 18 AAC 70 occurred in 2008 and in February 2017 which impacted some of the cleanup levels generated at the time of the OU A ROD signing. Upon additional review of ARARs, it was determined that the Clean Water Act (CWA) Section 303 and the ADEC Solid Waste Regulations also apply to the three landfill sites addressed in this ESD. Table ES-1 identifies the current values and revised new values for each contaminant of concern (COC) at the three OU A landfill sites that require surface water monitoring.

In addition, a review of the fish/shellfish tissue RBALs determined that common default parameters used by the Environmental Protection Agency (EPA) for exposure duration (ED) and body weight (BW) were revised in 2014 and are reported in EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9200.1-120 (U.S. EPA, 2014). These revised exposure parameters would result in lowering cancer risk and noncancer hazard estimates. The current RBALs and recalculated RBALs are shown in Table ES-1.

The changes in surface water cleanup levels are not expected to affect the monitoring requirements or needs for ICs at the landfill sites. However, the 2015 mean polychlorinated biphenyl (PCB) concentrations in shellfish and fish tissue were below the RBALs for all sampling scenarios except rock sole in Sweeper Cove. The decreased risk as a result of the revised exposure parameters may improve the evidence to support removal of the fish/shellfish advisories in Kuluk Bay and shellfish advisory in Sweeper Cove.

The remedies in place remain protective of human health and the environment for those sites where cleanup levels are lowered because the ICs remain in place.

Table ES-1. Summary of Surface Water Cleanup Levels and RBAL Changes

Analyte	Current Value (µg/L)	Revised Value (µg/L)
Surface Water Cleanup Levels		
1,1-Dichloroethene	320	7
cis-1,2-dichloroethene	None	70
trans-1,2-dichloroethene	None	360
Benzene	710	5
Ethylbenzene	3,280[(a)]	700
Toluene	424,000	520
Trichloroethene	810	5
Total Xylenes	None	10,000
Aluminum	87	87
Antimony	45,000	6
Arsenic	1.4[(b)]	1.4[(b)]
Beryllium	1.4	4
Cadmium	1.1	0.25
Chromium III	210	74
Chromium VI	11	10
Copper	12	8.96
Lead	3.2	2.5
Mercury	0.012	0.012
Nickel	100	52
Selenium	5	5
Silver	0.12	100
Thallium	48	0.47
Zinc	110	104.5
Fish/Shellfish RBALs (µg/kg)		
PCBs Fish	6.5	11.1
PCBs Shellfish	31.4	53.8

(a) Human health criteria for carcinogens come from EPA promulgation of human health criteria for carcinogens for Alaska at the 10^{-5} risk level in the National Toxics Rule (40 CFR 131.36), in accordance with on-line ADEC guidance.

(b) Human health criterion came from EPA National Recommended Water Quality Criteria and are based on a carcinogenicity of 10^{-5} risk (U.S. EPA, 2009).

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ACRONYMS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BTEX	benzene, toluene, ethylbenzene, and xylenes
BW	body weight
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMP	Comprehensive Monitoring Plan
COC	contaminant of concern
CSF	cancer slope factor
CWA	Clean Water Act
DCE	1,1-dichloroethene
ED	exposure duration
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
ESD	explanation of significant difference
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
HI	hazard index
IAS	initial assessment study
IC	institutional control
ICMP	Institutional Controls Management Plan
LTM	long-term monitoring
NACIP	Navy Assessment and Control of Installation Pollutants
NAF	Naval Air Facility
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POL	petroleum oil and lubricant
PSE	Preliminary source evaluation
RAB	Restoration Advisory Board
RBAL	risk-based action level
RCRA	Resource Conservation and Recovery Act

RFA	remedial facility assessment
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SA	source area
SARA	Superfund Amendments and Reauthorization Act
SAERA	State-Adak Environmental Restoration Agreement
SI	site inspection
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TAC	The Aleut Corporation
UST	underground storage tank
UU/UE	unrestricted use and unlimited exposure
VOC	volatile organic compound

1.0 INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

1.1 Site Name and Location

Former Adak Naval Complex
Adak Island, Alaska
Operable Unit (OU) A: Solid Waste Management Unit (SWMU) 11, SWMUs 18/19, SWMU 25 Sites and Kuluk Bay and Sweepers Cove

1.2 Identification of Lead and Support Agencies

The U.S. Navy is the lead agency for all environmental investigations and cleanup programs at Former Adak Naval Complex. The U.S. Environmental Protection Agency (EPA) Region 10 is the lead regulatory agency for the Former Adak Naval Complex. The State of Alaska, through the Department of Environmental Conservation (ADEC), provides regulatory oversight and review of the investigation and cleanup efforts, and resulting documentation.

1.3 Legal Authority

Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617(c), states that, after adoption of a final remedial action plan: (1) if any remedial action is taken; (2) if any enforcement under Section 9606 of this title is taken; or (3) if any settlement or consent decree under Section 9606 of this title is entered into, and if such action, settlement, or decree differs in any significant respects from the final plan, the President or State shall publish an explanation of significant differences (ESD) and the reasons such changes were made. As the lead agency for the site, the Navy shall publish the ESD. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the Code of Federal Regulations (CFR) Section 300.435(c)(2)(i), and Office of Solid Waste and Emergency Response (OSWER) Directive 9200.1-23P, indicate that an ESD, rather than a Record of Decision (ROD) amendment, is appropriate where the adjustments being made to the ROD are significant but do not fundamentally alter the remedy with respect to scope, performance, or cost. The Navy has determined that the adjustments to the April 13, 2000 ROD and ROD amendment dated September 4, 2003 provided in this ESD are significant but do not fundamentally alter the overall remedy for the OU A sites. Therefore, this ESD is being properly issued.

In accordance with Section 300.825(a)(2) of the NCP, this ESD will become part of the Administrative Record for the Site and will be available for public review at the EPA Region 10 Record Center in Seattle, Washington, at the Naval Facilities Engineering Command Administrative Record in Silverdale, Washington, and at Bob Reeves High School in Adak, Alaska.

The Administrative Record for this Site is also available through the BRAC PMO website (http://www.bracpmo.navy.mil/brac_bases/other_west/former_naf_adak/documents.html).

1.4 Overview of the ESD

The fourth five-year review was conducted in 2016 and two issues identified in the final report require an ESD for the recommended changes to be implemented into the Comprehensive Monitoring Plan (CMP) for several OU A sites that remain active at the Former Adak Naval Complex in Adak, Alaska. The two issues were:

- Issue #1: The 2000 OU A ROD referred to applicable or relevant and appropriate requirements (ARARs), specifically Title 18, Alaska Administrative Code (AAC), Chapter 70, or Title 40 of the Code of Federal Regulations (CFR), Section 131.36, to establish surface water cleanup levels for SWMUs 11, 18/19 and 25. Contaminants of concern (COCs) present at SWMUs 11, 18/19, and/or SWMU 25 include several volatile organic compounds (VOCs) and metal compounds. Changes to 18 AAC 70 occurred in 2008 and 2017 impacted some of the cleanup levels generated at the time of the OU A ROD signing. It was recommended that the cleanup levels be revised and to update CMP with the new values.
- Issue #2: EPA recently modified exposure and toxicity data assumptions in OSWER 9200.1-120, thus changing the cleanup levels for fish/shellfish in Kuluk Bay and Sweeper Cove. The COC for Kuluk Bay and Sweeper Cove is PCBs. It was recommended that the cleanup levels be revised using the new assumptions and to update the CMP with the new values.

1.5 Availability of Documents

In accordance with Section 300.825(a)(2) of the NCP, this ESD will become part of the Administrative Record for the Former Adak Naval Complex. The Administrative Record, including this ESD, is also available for public review at the following locations:

Bob Reeves High School
Mechanic Road
Adak, Adak Island, Alaska
907-592-4500

Administrative Record
Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, WA 98315

BRAC PMO Website
http://www.bracpmo.navy.mil/brac_bases/other_west/former_naf_adak/documents.html

2.0 SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 Site Description and History

Adak Island is located approximately 1,200 miles southwest of Anchorage, Alaska along the Aleutian Chain (Figure 2-1). Adak Island is about 32 miles long and 21 miles wide and is the largest of the Andreanof group of Aleutian Islands. The former Adak Naval Complex comprises 61,935 acres on the northern half of Adak. The U.S. Fish and Wildlife Service manages the southern portion of the island as a designated Wilderness Area within the Alaska Maritime National Wildlife Refuge System.

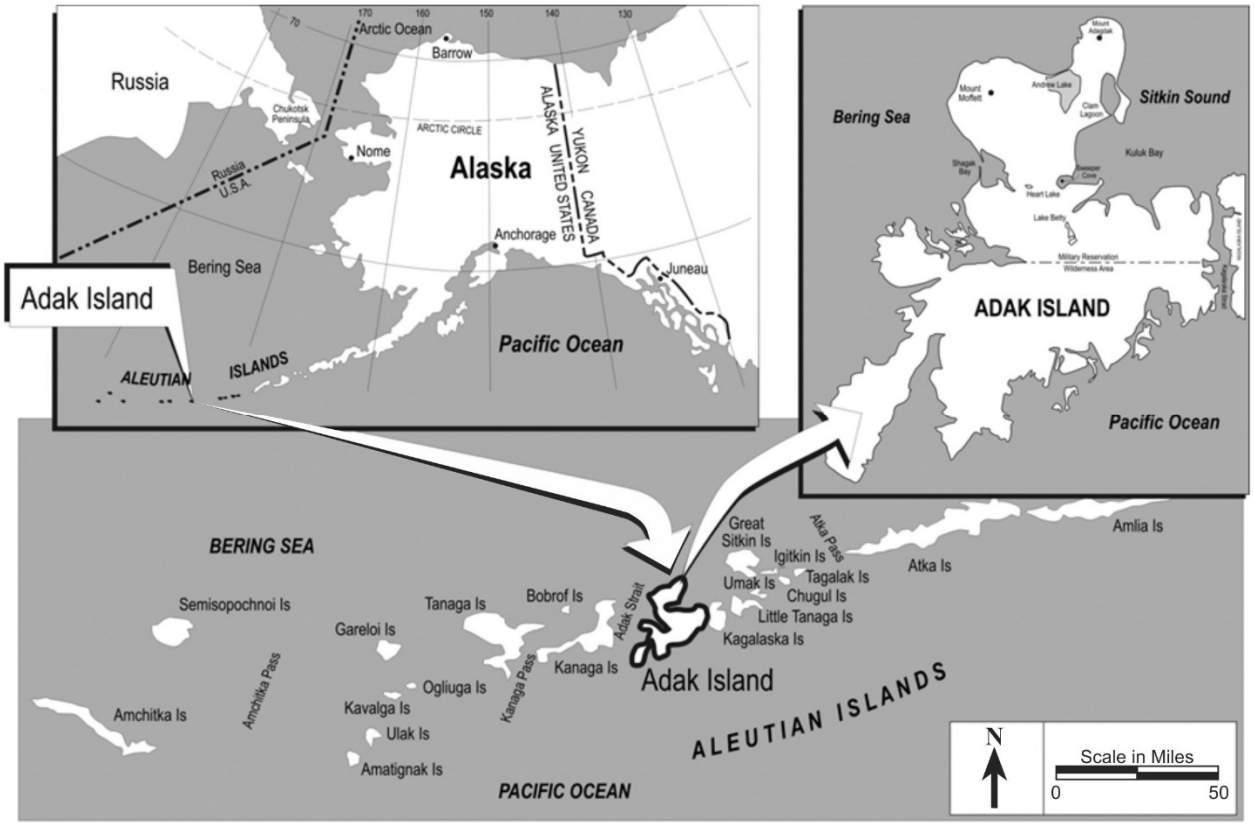

Figure 2-1. Adak Island Location Map

Adak Island was inhabited by the Aleuts over the past several thousand years while hunting whales, seals, otters, sea lions, and sea birds and fishing in Adak's freshwater streams and surrounding seas. The Aleuts lived in large communal subterranean structures of grass and earth built over driftwood and whalebone frames. Remnants of prehistoric Aleut settlements remain on Adak.

Russian mariners first visited the Aleutian Islands in the early 1740s and were trading with the Aleuts by 1750. By 1830, Russian settlers occupied Adak and relocated the Aleuts to Russian settlements on Kodiak, the Pribilof Islands, and Sitka. Adak Island became part of the Alaska Territory that was subsequently purchased from Russia by the United States in 1867. Adak Island was included in the 2.9-million-acre Aleutian Islands National Wildlife Refuge in 1913. In 1980, the name of the refuge was changed to the Alaska Maritime National Wildlife Refuge.

The island was unoccupied in 1942 when the U.S. Army arrived to take offensive action against Japanese forces occupying Attu and Kiska Islands. The Navy presence at Adak was officially recognized by Public Land Order 1949, dated August 19, 1959, which withdrew the northern portion of Adak Island, comprising approximately 76,800 acres, for use by the Navy for military purposes. The Navy also used the base to conduct a variety of Cold War-era military activities. Naval Air Facility (NAF) Adak was on the list of Department of Defense installations recommended for closure in 1995, and that recommendation became final when Congress did not disapprove the list. The active Navy mission ceased, and the base operationally closed on March 31, 1997. The Navy's Caretaker Site Office was closed in spring 2002, in anticipation of land transfer to The Aleut Corporation (TAC), a Native corporation.

Parts of the military reservation have been used for landfills, vehicle and aircraft maintenance and repair sites, fuel facilities (with associated tanks and piping), a minefield, military and nonmilitary firing ranges, and ammunition and ordnance disposal sites. In addition, all materials necessary to support the operation of NAF Adak were stored and used on the property, including potentially hazardous substances such as pesticides, solvents, transformer oil, and paints.

In September 2000, the federal government entered into a land transfer agreement with TAC, as documented in the Interim Conveyance document issued by the U.S. Department of the Interior, Bureau of Land Management. The actual conveyance occurred on March 17, 2004, and encompassed approximately 47,000 acres of the former Adak Naval Complex property. The land transfer included all the downtown area, housing units, and industrial facilities. TAC transferred the portion of the former Adak Naval Complex known as Adak Airport and associated facilities and aviation easements, not including Federal Aviation Administration navigation aids or weather reporting equipment, to the State of Alaska.

In 1986, an initial assessment study (IAS) was conducted on Adak as the first phase of the Navy Assessment and Control of Installation Pollutants (NACIP) Program. Thirty-two sites were examined during the IAS. In 1989, a site inspection (SI) was completed in which 19 sites were evaluated. In 1990, a Resource Conservation and Recovery Act (RCRA) remedial facility assessment (RFA) was completed by EPA, which identified and gathered information on potentially contaminated sites. A total of 68 sites, which includes the 19 sites identified in the SI, were identified in the RFA.

There were 84 SWMUs and source areas (SAs) identified on Adak, including the 68 sites in the RFA, five sites transferred from the original list of sites in the Federal Facility Compliance Agreement (FFCA), and 11 new sites. Preliminary source evaluations (PSEs) were required for most non-petroleum sites. Sites and water bodies warranting further study were evaluated in the remedial investigation/feasibility study (RI/FS) (U.S. Navy, 1997). The RI/FS identified the extent of contamination, assessed risk from chemical exposure, and evaluated remedial alternatives for sites with unacceptable risks. When warranted, contaminated sites were remediated as interim actions.

The Navy and the State of Alaska entered into a State-Adak Environmental Restoration Agreement (SAERA) in April 1994. Under SAERA, site assessments and/or evaluations were required for petroleum-affected sites. Cleanup of these sites is not regulated by CERCLA. The purpose of SAERA is to execute the assessment, containment, monitoring, and remediation of affected soil and groundwater at sites with petroleum oil and lubricants (POLs) and leaking underground storage tanks (USTs). Section 5 of the SAERA document outlines the process of a combined ROD for final decisions for CERCLA and SAERA sites. SAERA has been amended so that petroleum site cleanup decision documents are between the ADEC and the Navy.

OU A and SAERA address chemical releases to the environment throughout the entire military reservation. The investigation and remediation of OU A sites involved state regulations, as well as CERCLA and RCRA procedures. A total of 180 sites were evaluated under OU A. Two of the sites were deferred to OU B (SWMU 8 and SA 93). Of the remaining 178 sites, 121 were petroleum sites (investigated under SAERA), 50 were investigated under CERCLA (including the five water bodies), five were investigated under both CERCLA and SAERA, and two were investigated under both RCRA and SAERA.

During the evaluation process at 28 CERCLA sites, the Navy performed removal actions. Most of these actions were primarily incidental to investigation, such as removing drums or debris. Some of the actions were more significant (i.e., covering a landfill) and required the completion of an interim action ROD or an engineering evaluation/cost analysis (EE/CA) and an action memorandum.

An interim action ROD (URS, 1995) was signed in May 1995 so that an interim remedial action could be taken at SWMU 11 (Palisades Landfill) and SWMU 13 (Metals Landfill).

A description of all OU A and SAERA sites that are either cleanup complete with institutional controls (ICs) or active can be found in the fourth five-year review (U.S. Navy, 2016).

OU B addresses ordnance explosive safety hazards and human health and ecological risks associated with ordnance-related chemicals throughout the entire military reservation. SAERA and OU B sites are not affected by the ESD, and therefore, are not discussed in this report.

2.2 Enforcement History

EPA issued a FFCA in November 1990. Adak was proposed for the National Priorities List (NPL) in October 1992 (57 Federal Register 47204) and formally listed in May 1994 (59 Federal Register 27989). In 1993, the Navy, EPA, and ADEC signed the Adak Federal Facility Agreement (FFA), which incorporates the EPA's cleanup process under CERCLA, as amended by Superfund Amendments and Reauthorization Act (SARA). The CERCLA exclusion of petroleum as a hazardous substance required that cleanup of petroleum-related chemicals would follow State of Alaska regulations. Therefore, the FFA stated that petroleum-contaminated sites, such as those containing USTs and leaking underground fuel lines, would be evaluated under a separate two-party agreement between the Navy and the State of Alaska. This agreement, SAERA, was signed in April 1994 and amended in August 1996.

Operation, maintenance, and monitoring of the OU A remedies on Adak are specified in the CMP (U.S. Navy, 2014), which describes the monitoring requirements for ICs, groundwater, surface water, sediment, and tissue. The CMP is periodically revised, generally on a 2- to 3-year cycle. The CMP includes an overview of the status and types of monitoring to be conducted, and a summary of changes since the last revision. Appendices to the CMP include the groundwater monitoring plan, landfill monitoring plan, marine tissue monitoring plan, quality assurance project plan, and the Institutional Controls Management Plan (ICMP). The sixth revision of the CMP was finalized in 2014. Changes described in this document will be incorporated into the seventh revision of the CMP.

2.3 Site Contamination

The sites covered by this ESD include OU A landfills including SWMU 11, SWMUs 18/19, and SWMU 25 and two surface water bodies including Kuluk Bay and Sweeper Cove.

2.3.1 Landfill Sites with Surface Water Contamination

2.3.1.1 SWMU 11, Palisades Landfill

Palisades Landfill is located approximately 1 mile north of the main downtown area of Adak. It was used as a primary waste disposal area for all operations on Adak Island from the 1940s to approximately 1970. The landfill area, which is approximately 6 acres, covers portions of the coastal uplands immediately adjacent to Kuluk Bay and part of a steep ravine. The ravine is approximately 1,200-feet long, 5 to 300-feet wide, and 5 to 150-feet deep, with a small stream (Palisades Creek) running through it. The mouth of the ravine opens immediately to Kuluk Bay.

Approximately 80,000 to 100,000 cubic yards of solid waste are in the landfill. A wide variety of materials were reportedly disposed of at Palisades Landfill, including waste petroleum, oils, and lubricants; chlorinated and non-chlorinated solvents; paint waste; sanitary trash; scrap vehicles; lead and mercury batteries; and construction waste. The landfill was covered with local soils in the early 1970s after disposal practices were stopped. A portion of the disposed material within the ravine has no cover and is on a steep slope. The exposed waste in the ravine consists primarily of barrels, assorted metal debris, and building demolition waste. Groundwater occurs locally under the site and discharges into Kuluk Bay at the downgradient boundary.

Surface soil, surface water, groundwater, and stream sediment samples were collected during 1992 and 1998 site investigations. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganic analytes were detected in the sediment and surface water. Although no remedial investigation or risk assessment was performed at the time, the FFCA parties concluded that performing an interim remedial action was the best option for this site (U.S. Navy, 2017).

In the summer of 1996, Palisades Landfill was closed according to the 1995 interim action ROD as an interim remedial action. Closure entailed installation of a landfill cover, ICs for access and land use, surface water controls, a vegetative cover, and long-term monitoring (LTM). The final OU A ROD (U.S. Navy et al., 2000) determined that the selected interim actions met CERCLA requirements and no further remedial actions were required. Because of the presence of hazardous materials that do not allow for unrestricted use and unlimited exposure (UU/UE), Palisades Landfill continues to be evaluated under the CERCLA five-year review process.

Sediment and surface water have been sampled at Palisades Landfill periodically since May 1996. To date, 22 sampling events have occurred. In May 1996, prior to landfill closure, and in August and November 1996 following landfill closure, two surface water and sediment locations were sampled and analyzed for pesticides, PCBs, SVOCs, and total metals. Surface water samples were also analyzed for dissolved metals, benzene, toluene, ethylbenzene, and xylenes (BTEX), and turbidity. Sediment samples were also analyzed for total organic compounds. Sampling of sediment and surface water was performed at the same locations annually from 1997 through 2006 and again in 2008. Sediment sampling was performed annually from 2007 through 2011, and was reduced to biennially and performed again in 2013, 2014 (for the five-year review), and 2016 (U.S. Navy, 2017). Figure 2-2 shows the locations of the three surface water/sediment sampling locations at SWMU 11.

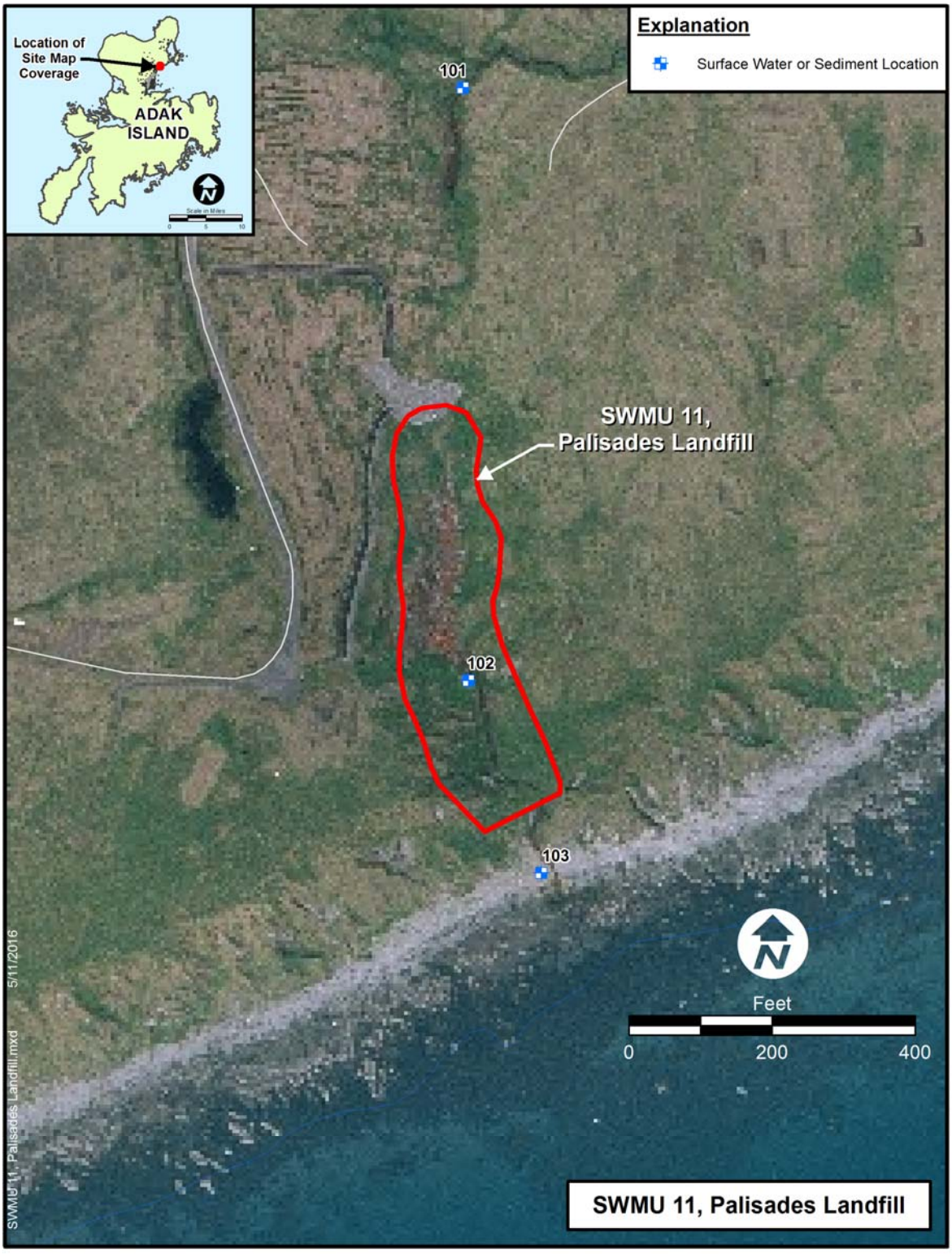

Figure 2-2. SWMU 11, Palisades Landfill Site Map with Sampling Locations

The contaminants of concern (COCs) at SWMU 11 include:

Surface Water/Sediment:

- Metals (antimony, arsenic, nickel)
- PCBs (sum of aroclors)
- Polycyclic aromatic hydrocarbons (PAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(a,h,i)perylene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, bis(2-ethylhexyl)phthalate) (U.S. Navy, 2014).

Surface water was last sampled at SWMU 11 in 2008 (at locations 101 and 102). Arsenic, zinc, copper, and lead were the only analytes detected. Of the four metals detected, arsenic is the only analyte identified as a COC at this site and the concentrations (0.53 to 0.61 µg/L) were below the cleanup levels listed in the 2014 CMP. Although mercury was not detected in any of the three surface water samples, the detection limit (0.2 µg/L) exceeded the cleanup level for mercury (0.012 µg/L). Eleven of the 15 samples collected at SWMU 11 between 1996 and 2008 had detection limits above the cleanup level for mercury.

During the most recent sampling event at SWMU 11 in 2016, aroclor, arsenic and nickel concentrations in sediment sample 102 and the arsenic concentration in sediment sample 101 exceeded cleanup levels.

Engineering controls that are implemented at SWMU 11 include excavation prohibition and use restriction signs and a soil cover with drainage swales.

2.3.1.2 SWMUs 18/19, White Alice Landfill

SWMUs 18/19, White Alice Landfill is in the vicinity of an abandoned quarry west of the downtown area, and it comprises the former South Sector Drum Disposal Area and the Quarry Metal Disposal Area. The South Sector Drum Disposal Area was located at the base of the abandoned quarry. Approximately twenty 55-gallon drums were disposed of on low-lying tundra. The drums were heavily rusted and were most likely deposited during the 1940s. No information is available on the contents of the drums, or any other history. The Quarry Metal Disposal Area was a small scrap metal disposal area located in the abandoned quarry. Scrap metal, including material from demolition of Quonset huts, had been placed on the floor of the quarry. The disposal area was active from 1980 to 1985. No information was available on the history of any contaminant releases at the site (U.S. Navy, 2015).

Once combined to form the White Alice Landfill, the areas received construction waste into the 1990s. In 1997, the landfill was closed according to the State of Alaska's solid waste regulations (18 AAC 60). Closure entailed placement of a landfill cover, grading and contouring, surface water/erosion controls, access restrictions in the form of a sign and a gate, and a vegetative cover.

Groundwater and surface water have been sampled at the White Alice Landfill periodically since March 1996. To date, 16 sampling events have occurred from 1996 through 2014. Sampling at the White Alice Landfill has consisted of four quarterly rounds (1996), eight annual rounds (1997 through 2004), and subsequent biennial rounds of sampling at two monitoring wells and three surface water seeps (2006, 2008, and 2010). Following 2010, sampling has been reduced to once every 5 years, but was conducted in 2014 to support the five-year review, with the next sampling event scheduled for 2019 (U.S. Navy, 2015). Figure 2-3 shows the three surface water/sediment sampling locations at SWMUs 18/19.

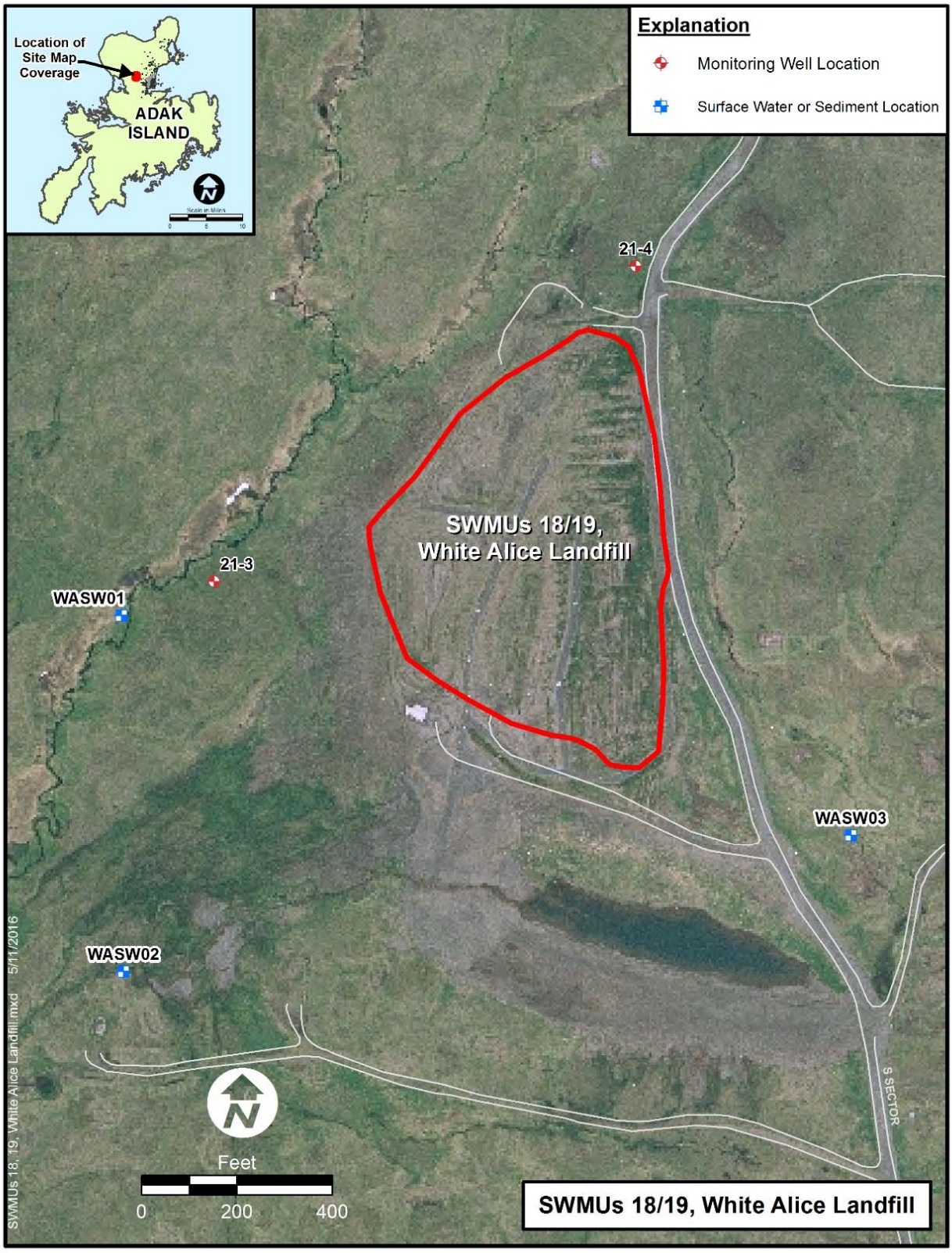

Figure 2-3. SWMUs 18/19, White Alice Landfill Site Map with Sampling Locations

The COCs at SWMUs 18/19 include:

Surface Water/Groundwater:

- Metals (arsenic, barium, chromium, nickel)

All COCs detected in surface water and groundwater samples during the most recent sampling event (2014) were below the cleanup levels currently reported in the 2014 version of the CMP (U.S. Navy, 2014). Although mercury was not detected in any of the surface water samples, the detection limit (0.2 µg/L) exceeded the cleanup level for mercury (0.012 µg/L). All samples collected at SWMU 18/19 have had detection limits above the cleanup level for mercury.

Engineering controls that are implemented at SWMUs 18/19 include excavation prohibition, use restriction signs and a soil cover with drainage swales.

2.3.1.3 SWMU 25, Roberts Landfill

Roberts Landfill is located approximately 1 mile southwest of the downtown area of Adak. The landfill covers approximately 15 acres. The landfill operated from the early 1950s until 1972 and from 1975 through 2002. During the initial operation, wastes included sanitary trash, metal debris, batteries, solvents, waste paints, and construction rubble. From 1975 until closure at the end of 2002, the landfill accepted only sanitary trash. Roberts Landfill is unlined. Closure activities initially began at Roberts Landfill in April 1997 and included placing a low permeability soil cover over the landfill, grading and contouring, implementing access restrictions, installing surface water/erosion controls, installing a vegetative cover, securing adjacent bunkers filled with asbestos materials, maintaining the cover, performing periodic monitoring, and providing ICs for land use. In March 2002, the Navy submitted a permit renewal application to extend operations at Roberts Landfill through 2002. The application was made to accommodate operation of an inert demolition waste mono-fill and one cell for disposal of approximately 10 cubic yards of asbestos-containing material. The fill operation was in support of the Navy's cabin demolition project, which was completed in September 2002, at which time the landfill was re-graded and covered. Following that activity, the Navy applied for and received approval for closure from ADEC at the end of 2002 (U.S. Navy, 2017).

Groundwater and surface water have been sampled at the Roberts Landfill periodically since March 1996. To date, 21 sampling events have occurred from 1996 through 2016. Historically, sampling at Roberts Landfill has consisted of four quarterly rounds (1996) and 15 annual rounds (1997 through 2011) of sampling at four monitoring wells and five surface water locations. Sampling was then reduced to biennially, and sampling occurred in 2013, 2014 (to support the five-year review), and 2016. In 2011, a seep was identified northwest of the landfill in the Adak Fuels Facility and collection of surface water at this location was added to the sampling program (U.S. Navy, 2017). Figure 2-4 shows the six surface water and four sediment sampling locations at SWMU 25.

The COCs at SWMU 25 include:

Surface Water:

- VOCs (1,1-dichloroethene [DCE], cis-1,2-DCE, trans-1,2-DCE, BTEX, trichloroethene)
- Metals (aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc).

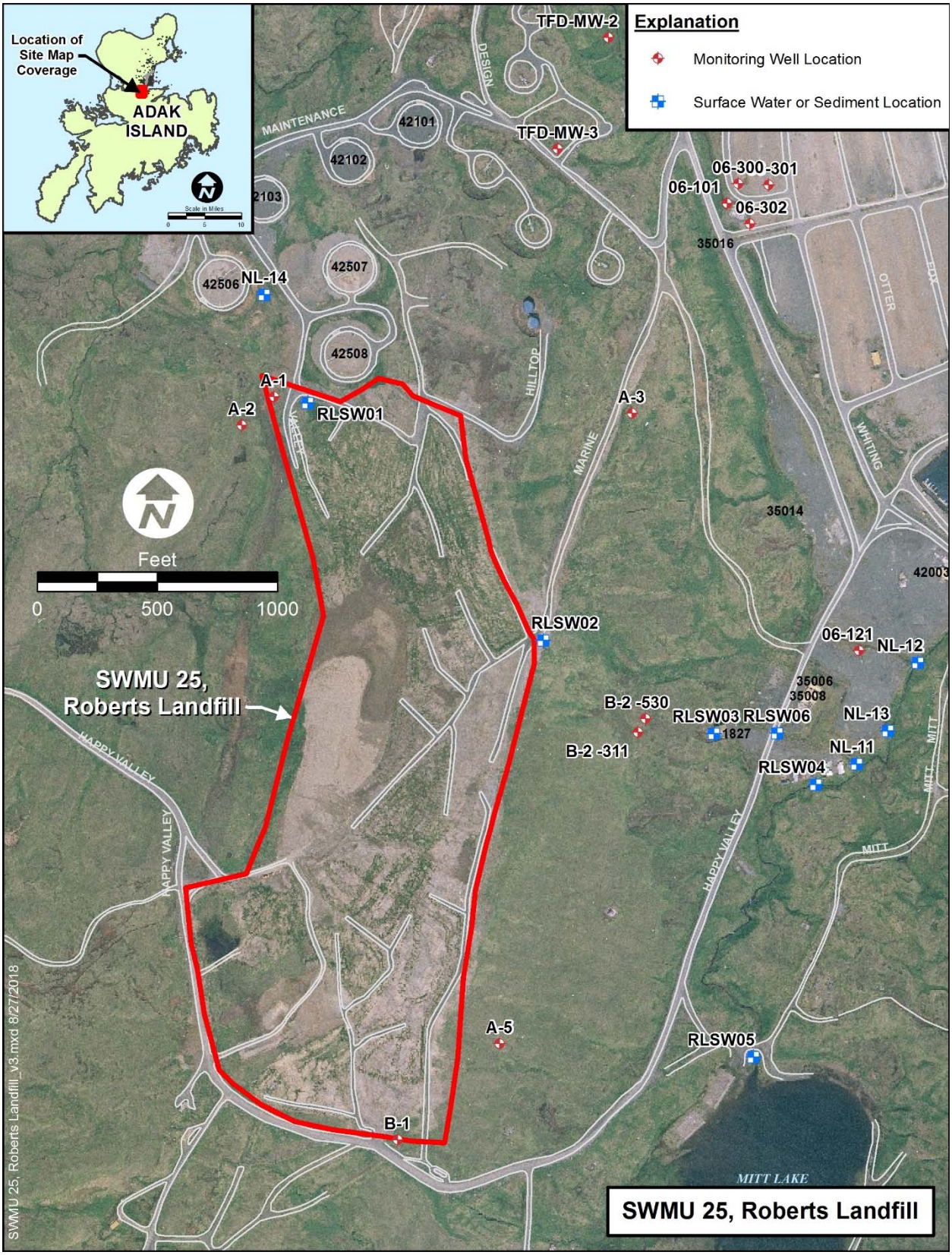

Figure 2-4. SWMU 25, Roberts Landfill Site Map with Sampling Locations

Groundwater:

- VOCs (1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, BTEX, tetrachloroethene, trichloroethene)
- Metals (aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc).

Five of the eight surface water samples collected at Roberts Landfill in 2016 had at least one detection that exceeded cleanup levels currently reported in the 2014 CMP (U.S. Navy, 2014). The following cleanup level exceedances were observed:

- RLSW01: total and dissolved zinc
- RLSW03: total and dissolved aluminum and copper
- RLSW05: total and dissolved copper
- NL-11: total and dissolved copper
- NL-12: total aluminum

In addition, although mercury was not detected in any of the surface water samples, the detection limit (0.02 µg/L) exceeded the cleanup level for mercury (0.012 µg/L). All samples collected at SWMU 25 have had detection limits above the cleanup level for mercury.

There were no exceedances of groundwater cleanup levels in any of the four groundwater samples collected at SWMU 25 in 2016 (U.S. Navy, 2017).

Engineering controls that are implemented at SWMUs 25 include excavation prohibition, use restriction signs and a soil cover with drainage swales.

2.3.2 Kuluk Bay and Sweeper Cove

2.3.2.1 Kuluk Bay

Kuluk Bay borders the most developed portion of Adak Island; both industrial and residential areas are located along its western shore. The Bayshore Highway runs along the shore of Kuluk Bay from the mouth of Sweeper Cove to the mouth of Clam Lagoon, affording easy access. The western shoreline of Kuluk Bay with its sandy beach is easily accessed by foot. Access to the northern and southern shorelines is limited, because of the steep cliffs and rocky shoreline (Figure 2-5).

Kuluk Bay is used primarily for recreational purposes, which include beachcombing, fishing, and shellfishing. Fishing from shore along the breakwater separating Sweeper Cove and Kuluk Bay for a variety of resident fish is common. Runs of pink salmon that occur in August and September in NAVFAC Creek and Airport Creek also attract onshore fishermen. Fishing by boat in Kuluk Bay for a variety of resident fish, including halibut, is expected to occur. Shellfishing in Kuluk Bay has not been previously documented. However, shellfish resources with potential uses are present. Extensive mussel beds that could be harvested are present along the rocky shoreline during low tide. The presence of other bivalves in subtidal sediments appears to be very limited.

Analytical results of sediment, surface water, rock sole, and blue mussels collected in 1995 and 1996 were used in a risk assessment specific to Kuluk Bay. The following fish and shellfish COC was identified in the OU A ROD because of exceedance above action levels based on risk-based levels:

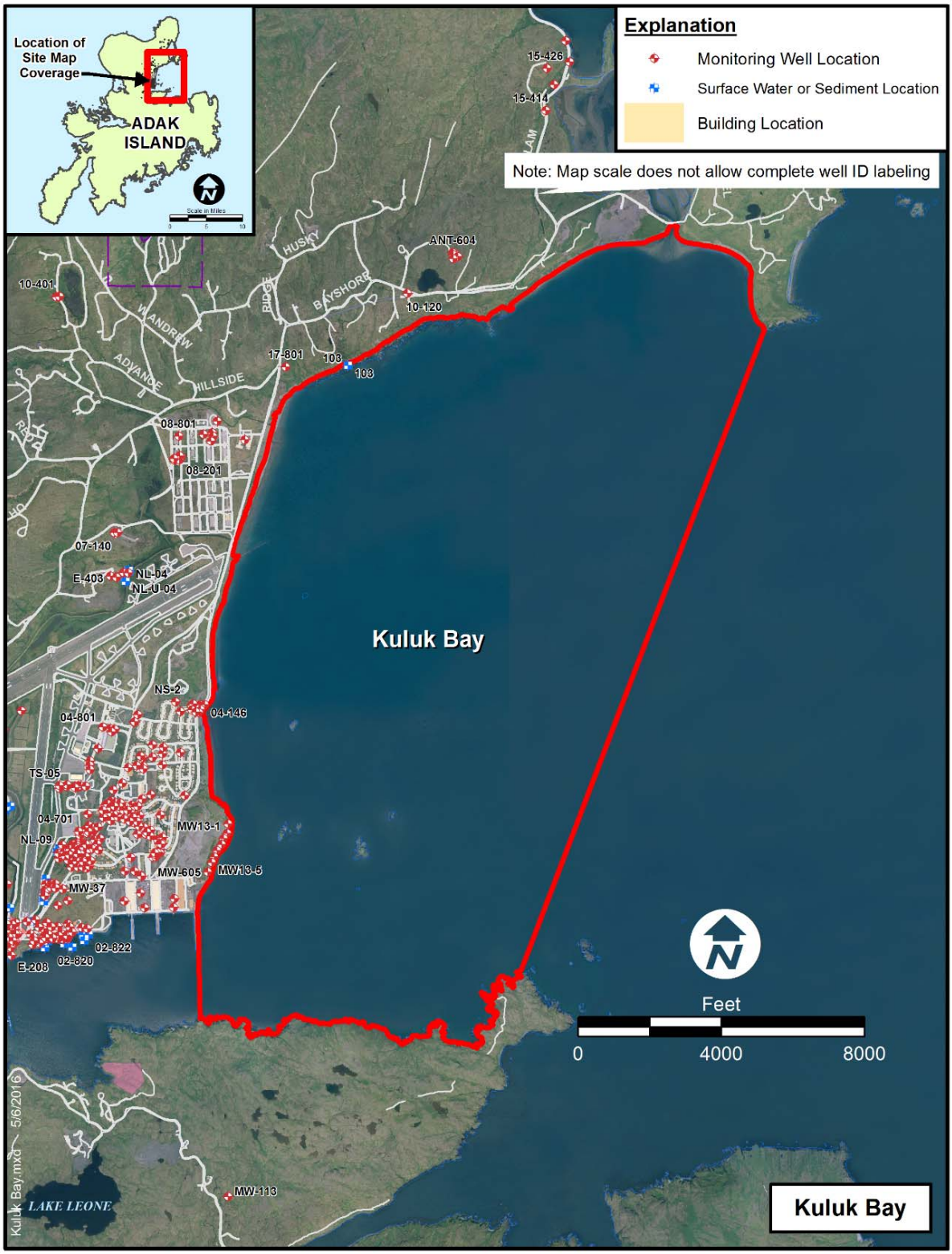

Figure 2-5. Kuluk Bay Site Map

Fish and Shellfish

- PCBs (Aroclor 1254)

The Aroclor 1254 action levels exceeded by fish and shellfish in Kuluk Bay were 6.5 µg/kg and 31 µg/kg, respectively. The 1997 Kuluk Bay risk assessment evaluated ecological and human health risks using exposures based on current and future recreational use and future subsistence use of Kuluk Bay. The most significant risks were identified for subsistence harvesters consuming fish and shellfish from Kuluk Bay. The cancer risk for the subsistence seafood harvester was primarily due to Aroclor 1254 (with a cancer risk of 5 E-05 and hazard index of 4 for fish) and arsenic (with a cancer risk of 6 E-05 for blue mussel). Arsenic risks are most likely overestimated because arsenic concentrations are mostly at background levels, therefore no cleanup levels were established for arsenic. The cleanup levels are risk-based concentrations and were derived using exposure parameters presented in the OU A ROD for subsistence fishers with a carcinogenic risk threshold of 1 E-05 and noncancer hazard index in excess of 1.0. It was estimated at the time of the ROD that it may take up to 75 years for tissue concentrations to reach the proposed cleanup levels (U.S. Navy, 2016).

An advisory to potential subsistence users of rock sole and blue mussels was deemed necessary in the nearshore marine ecosystem of Kuluk Bay because the RI/FS for OU A (U.S. Navy, 1997) identified risks to potential future subsistence seafood harvesters from consumption of fish and shellfish containing PCBs. Decisions on LTM design were made cooperatively by the Navy, EPA, and ADEC and documented in the ROD for OU A (U.S. Navy et al., 2000). In 2004, the advisory for the consumption of blue mussels from Kuluk Bay was removed because the mean PCB concentrations in blue mussel in Kuluk Bay for 1999 to 2003 were consistently below the risk-based action level (RBAL).

2.3.2.2 Sweeper Cove

Sweeper Cove is the most actively used water body at Adak, because it is adjacent to the main industrial portion of the downtown area.

Sweeper Cove is an estuary with a surface area of approximately 450 acres and receives drainage from approximately 4,511 terrestrial acres. The western portion of Sweeper Cove includes a shallow inlet that was developed into a small boat harbor. The northern shoreline has been altered by construction activities begun by the military in 1942. South Sweeper Creek and Mitt Creek are the primary drainages into Sweeper Cove (Figure 2-6).

The shoreline geology includes natural depositional areas of sands where some streams discharge into Sweeper Cove shorelines, exposed bedrock found on the southern shoreline of Sweeper Cove, and boulder riprap bulkheads constructed during the military development of the northern shoreline. The subtidal region is almost entirely sand, with an increasing percentage of fine material as the distance from shore increases.

Because Sweeper Cove has received the drainage from most of the developed area on Adak, the potential for contaminants to deposit in Sweeper Cove has been a concern. As part of the RI, samples of sediment, surface water, marine worm tissue, blue mussel tissue, and bottom fish tissue were collected in 1996 and analyzed. The following fish and shellfish COC was identified in the OU A ROD because of exceedance above action levels based on risk-based levels:

Fish and Shellfish

- PCBs (Aroclor 1260)

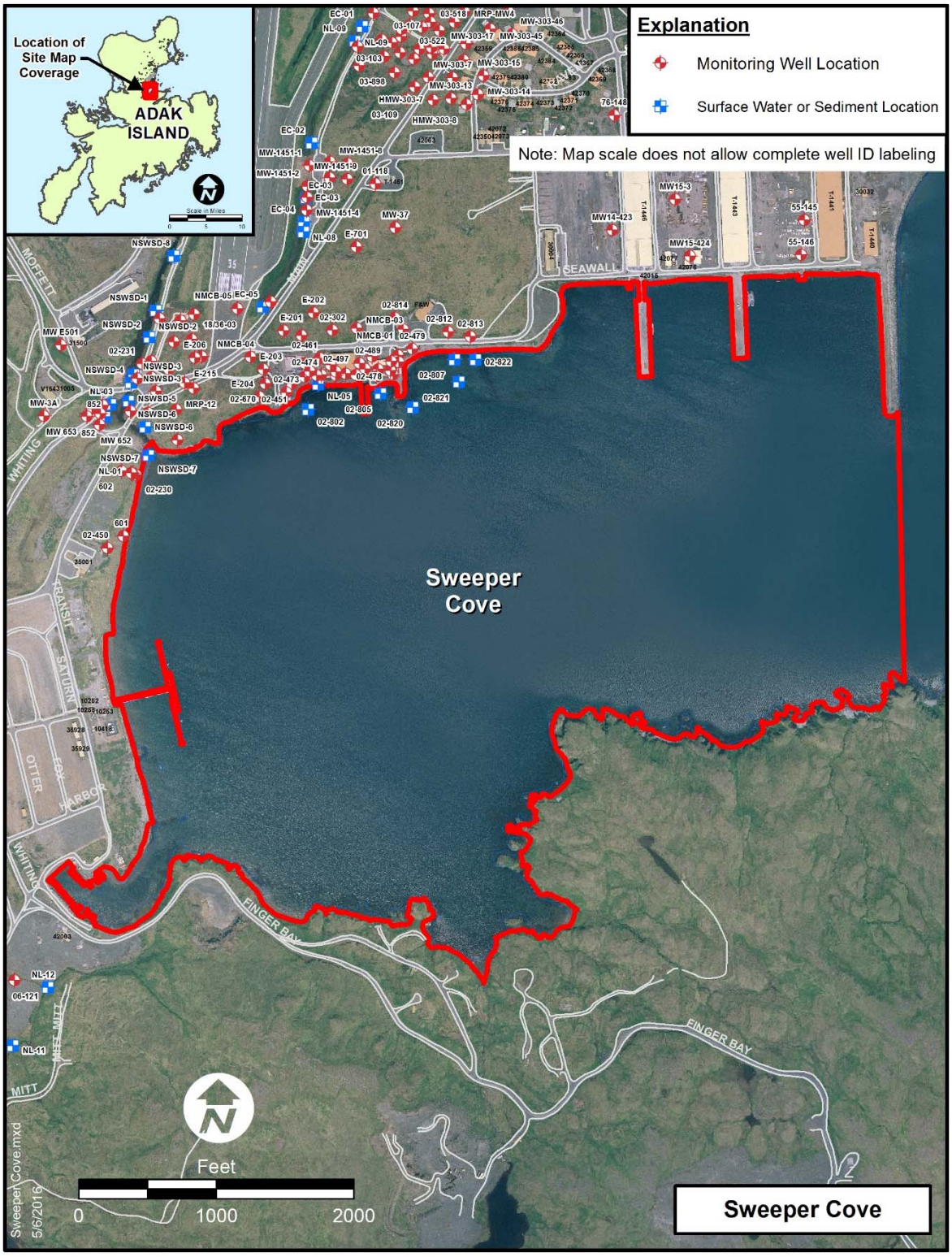

Figure 2-6. Sweeper Cove Site Map

In the OU A ROD action levels exceeded for Aroclor 1260 were 6.5 µg/kg for fish and 31 µg/kg for shellfish. According to the risk assessment, the cancer risk to the recreational user was 1E-05, and the cancer and noncancer risks to the subsistence fisher were 1E-03 and a hazard index (HI) of 10, respectively. Risk drivers causing cancer risks for the recreational user were Aroclor 1260 and arsenic in rock sole. Risk drivers causing cancer risks for the subsistence fisher were Aroclor 1260 and arsenic in rock sole and blue mussel. Risk drivers causing the noncancer risk for subsistence fishers were antimony, arsenic, and cadmium in rock sole. The risk assessment also concluded that there were significant ecological risks to benthic invertebrates (HIs between 10 and 100), based on sediment quality values and sediment toxicity test exceedances. Primary ecological risk drivers were PAHs. The cleanup levels are risk-based concentrations and were derived using exposure parameters in the OU A ROD for subsistence fishers with a carcinogenic risk threshold of 1 E-05 (U.S. Navy, 2016).

An advisory to potential subsistence users of rock sole and blue mussels was deemed necessary in the nearshore marine ecosystem of Sweeper Cove because the RI/FS for OU A (U.S. Navy, 1997) identified risks to potential future subsistence seafood harvesters from consumption of fish and shellfish containing PCBs. Decisions on LTM design were made cooperatively by the Navy, EPA, and ADEC and documented in the ROD for OU A (U.S. Navy et al., 2000).

2.4 Remedy Selected in the ROD

2.4.1 Landfill Sites with Surface Water Contamination

The ROD selected remedies for the three landfill sites, SWMU 11, SWMUs 18/19 and SWMU 25, were:

- SWMU 11: the placement of a cover over the landfill, monitoring, and ICs
- SWMUs 18/19: capping the landfill, monitoring, and ICs
- SWMU 25: capping the landfill, monitoring, and ICs.

Interim remedial actions at SWMU 11 were completed in 1996 and included constructing small interceptor ditches, covering 6 acres of the landfill, establishing vegetation on the cover, implementing ICs, and conducting a monitoring program. No additional remedy was required in the ROD.

SWMUs 18/19 were closed in 1997. Closure entailed placement of a soil cover over the landfill, grading and contouring, surface water/erosion controls, access restrictions, and installation of a vegetative cover per Alaska solid waste landfill closure requirements.

Closure activities at SWMU 25, which began in 1997, included placing a low-permeability soil cover over the landfill, grading and contouring, implementing access restrictions including signage and fencing, installing surface water/erosion controls, placing a vegetative cover, securing adjacent bunkers filled with asbestos materials, maintaining the cover, periodic monitoring, and ICs for land use.

ICs were determined to be the most effective strategy for protecting human health and the environment at landfill sites. To ensure the integrity of the landfill covers, containment, and monitoring systems, the U.S. Fish and Wildlife Service, the Department of the Navy, and any future landowner(s) and/or user(s) will be restricted from any activity that will adversely impact the cover and monitoring system or affect the drainage and erosion controls developed for the cover (including soils, cobbles, vegetation, gravel, paving, etc.). The following activities are prohibited:

- Any excavation below the surface grade of the cover other than routine maintenance and/or repair of the landfill cover and environmental monitoring systems

- Any excavation that will affect the drainage and erosion controls developed for the cover
- Any disturbance of equipment associated with the monitoring and/or maintenance of the site without prior approval from the Department of the Navy and appropriate state and local regulatory agencies.

The Department of the Navy conducts regular landfill inspections to observe and document site conditions and repairs the landfills, as necessary (U.S. Navy et al., 2000).

2.4.2 Kuluk Bay and Sweeper Cove

The selected remedy for the Kuluk Bay and Sweeper Cove CERCLA sites is:

- Monitoring of aquatic biota for PCBs and posting of an advisory concerning potential risks associated with consumption of fish and shellfish from Sweeper Cove and Kuluk Bay.

According to the OU A ROD (U.S. Navy et al., 2000), ICs are required to protect future human health effects from exposure to impacted fish and shellfish tissue along with monitoring fish and shellfish tissue in Sweeper Cove and Kuluk Bay for PCBs. ICs include fishing advisories for subsistence fishers regarding harvesting of marine fish and shellfish and signs placed along the shorelines of the affected water bodies.

The 2003 ROD amendment modifies the requirements in the OU A ROD related to subsistence fish advisory signs along the shores of Sweeper Cove and Kuluk Bay. It requires, in place of the signs, fact sheets primarily for the residents of the City of Adak. The fact sheets provide summary information about the past studies conducted, discuss the water bodies and fish/shellfish species that are monitored, and describe the methods of seafood collection and preparation that reduce potential exposure and consumption to contaminants in the food chain. Since 1999, the Navy has conducted a monitoring program for fish/shellfish from Sweeper Cove and Kuluk Bay. This monitoring effort has been executed by the Biological Resources Division of the U.S. Geological Survey and the Navy's contractor. The complete reports, based on fish/shellfish tissue samples collected as part of this monitoring program, are available for review in the Adak information repository, located on the second floor of Adak High School. Distribution of the fact sheets is accomplished by direct mailing and via web-based postings on https://www.bracpmo.navy.mil/brac_bases/other_west/former_naf_adak/documents.html.

Cancer risks for a subsistence use harvester included in the OU A ROD were above the upper end of the target risk range of 10^{-6} to 10^{-4} for both Sweeper Cove and Kuluk Bay (U.S. Navy, 2011).

3.0 BASIS OF THE DOCUMENT

In 2016, the fourth five-year review was conducted for all OU A sites on Adak with the current status of: 1) Active; or 2) Cleanup Complete with ICs. Two recommendations in the fourth five-year review resulted in the need for an ESD to modify criteria set in the OU A ROD. These two issues as described in the fourth five-year review are:

- Changes to surface water cleanup levels
- Changes to fish/shellfish RBALs

3.1 Changes to Surface Water Cleanup Levels

The OU A ROD referred to ARARs 18 AAC 70 or 40 CFR § 131.36 to establish surface water cleanup levels for SWMUs 11, 18/19 and 25. Changes occurred in 2008 and 2017 to 18 AAC 70 that impacted some of the cleanup levels generated at the time of the OU A ROD signing. In addition to the regulations listed in the OU A ROD, the Clean Water Act (CWA) Ambient Water Quality Criteria (AWQC) and ADEC Solid Waste regulations were also evaluated. After discussions with EPA and ADEC, it was determined that these regulations are applicable to the landfill sites. The CWA AWQC is a minimum standard that all surface water bodies are required to meet. In addition, landfill closure without ICs requires surface water monitoring in accordance with 18 AAC 60.810. Table 3-1 identifies the values from the CMP, Revision 6 (i.e., shaded values) and the new values (i.e., bolded values) based on updated and newly evaluated regulations.

No specific COCs were provided in the OU A ROD for the surface water monitoring that the ROD required at landfill SWMUs 11, 18/19, and 25. However, the ROD stated that surface water monitoring for SWMU 11 should follow the requirements listed for groundwater. Consequently, the CMP established the state water quality standards (18 AAC 70) as the cleanup levels and developed a list of COCs based on detected chemicals. The lower of the federal water quality criteria and state criteria was selected.

Table 3-1 lists the COCs and cleanup levels established in CMP, Revision 6 and compares them to current ARAR values for the surface water COCs monitored at landfill sites. Based on Table 3-1, several cleanup levels in the CMP, Revision 6 do not align with the current ARAR values for landfill COCs.

Historical data at SWMUs 11, 18/19, and 25 were compared to the current and revised ARAR values listed in Table 3-2. Data for analytes that exceeded the revised value in at least one sample were graphed and are presented in Appendix A. The data used to create the graphs are presented in Appendix B.

Four analytes exceeded the revised ARAR values in at least one sample location during the most recent sampling event. The following analytes had at least one exceedance:

- Aluminum (SWMUs 11 and 25)
- Copper (SWMU 25)
- Mercury (SWMUs 11, 18/19, and 25)
- Zinc (SWMU 25).

Table 3-1. Comparison of Current Surface Water Cleanup Levels to Updated ARARs Values

Analyte	Aquatic Life (Chronic) (µg/L)				Human Health (Organisms Only) (µg/L)				
	Rev 6 CMP	**40 CFR 131.36**	**CWA AWQC**	**18 AAC 70**	**Rev 6 CMP**	**40 CFR 131.36**	**CWA AWQC**	**18 AAC 70**	**Solid Waste Program[c]**
1,1-Dichloroethene	None	None	None	None	320[a]	320[a]	200,000[a]	None	**7**
cis-1,2-dichloroethene	None	None	None	None	None	None	None	None	**70**
trans-1,2-dichloroethene	None	None	None	None	None	None	4,000	140,000	**360**
Benzene	None	None	None	None	710[a]	710[a]	160-580[a]	None	**5**
Ethylbenzene	None	None	None	None	3,280[a]	290,000[a]	1,300[a]	29,000	**700**
Toluene	None	None	None	None	424,000	200,000	**520**	200,000	1,000
Trichloroethene	None	None	None	None	810[a]	810[a]	70[a]	None	**5**
Total Xylenes	None	None	None	None	None	None	None	None	**10,000**
Aluminum	87	None	**87**	**87**	None	None	None	None	None
Antimony	None	None	None	None	45,000	4,300	640	4,300	**6**
Arsenic	190	190	150	150	1.4[b]	**1.4**[b]	**1.4[b]**	None	10
Beryllium	190	None	None	None	1.4	None	None	None	**4**
Cadmium	1.1	1.03	0.72	**0.25**	None	None	None	None	5
Chromium III	210	178	**74**	**74**	None	None	None	None	None
Chromium VI	11	**10**	11	11	None	None	None	None	None
Copper	12	11.35	None	**8.96**	None	None	None	None	1,300
Lead	3.2	2.52	**2.5**	2.52	None	None	None	None	15
Mercury	0.012	**0.012**	None	0.9081	0.15	0.15	0.77	0.051	2
Nickel	160	157	**52**	**52**	100	4,600	4,600	4,600	390
Selenium	5	**5**	None	**5**	None	None	4,200	11,000	50
Silver	0.12	None	None	None	None	None	None	None	**100**
Thallium	None	None	None	None	48	6.3	**0.47**	6.3	2
Zinc	110	**104.5**	120	118	None	None	26,000	69,000	200

Shading indicates values in Revision 6 of the CMP are different than the current state and federal regulations for either aquatic life or human health.

Bold font indicates revised cleanup level which equates to the most conservative value.

(a) Human health criteria for carcinogens come from EPA promulgation of human health criteria for carcinogens for Alaska at the 10^{-5} risk level in the National Toxics Rule (40 CFR 131.36), in accordance with on-line ADEC guidance.

(b) Human health criterion came from EPA National Recommended Water Quality Criteria and are based on a carcinogenicity of 10^{-5} risk (U.S. EPA, 2009).

(c) Solid Waste cleanup values come from Technical Memorandum 18.02 (ADEC, 2018).

Concentrations of mercury were below analytical laboratory reporting limits in all but one sample at all three SWMUs. The reporting limit for mercury is typically around 0.02 µg/L, which is an order of magnitude above the current and revised cleanup value of 0.012 µg/L. The detected mercury values at these three SWMUs range from 0.018 to 0.165 µg/L in eight samples. These detected concentrations exceed the cleanup value for mercury but are less than the reporting limit for mercury. The current and revised aluminum cleanup value is the same at 87 µg/L. Copper and zinc results in several samples exceeded both the current and revised cleanup values (see Appendices A and B).

3.2 Changes to Fish/Shellfish RBALs

A review of the fish tissue RBALs determined that the oral cancer slope factor (CSF) of 2.0 $(mg/kg\text{-}day)^{-1}$ for total PCBs remains unchanged. However, EPA common default parameters for exposure duration (ED) and body weight (BW) were revised in 2014 and are reported in EPA OSWER Directive 9200.1-120 (U.S. EPA, 2014). The adult residential ED decreased from 24 years to 20 years for a revised total residential exposure of 26 years (20 years as an adult and 6 years as a child) instead of 30 years (24 years as an adult and 6 years as a child). Also, the adult BW of 70 kg increased to 80 kg. Use of these revised exposure parameters in the historical risk assessments would result in lowering cancer risk and noncancer hazard estimates. The RBALs were recalculated and are shown in Table 3-2. Both the fish and shellfish RBAL concentrations are higher when the updated default exposure parameters are used in the equation (see Table 3-2 for updated default exposure parameters and revised RBAL in bold, italic font).

Table 3-2. Comparison of OU A ROD and Revised Total PCB RBALs for Fish and Shellfish Tissue in Kuluk Bay and Sweeper Cove

Fish Ingestion		**ED**	**EF**	**IR**	**FI**	**CF**	**BW**	**AT**	**CSF**	**TR**	**RBAL**
		years	**days/yr**	**g/day**	**unitless**	**kg/g**	**kg**	**days**	**$(mg/kg\text{-}day)^{-1}$**	**unitless**	**µg/kg**
OU A ROD	Tot PCBs	30	365	126	1	0.001	70	25550	2.00E+00	1.E-05	6.5
2014 Revision	Tot PCBs	***20***	365	126	1	0.001	***80***	25550	2.00E+00	1.E-05	***11.1***
Shellfish Ingestion		**ED**	**EF**	**IR**	**FI**	**CF**	**BW**	**AT**	**CSF**	**TR**	**RBAL**
		years	**meals/yr**	**g/meal**	**unitless**	**kg/g**	**kg**	**days**	**$(mg/kg\text{-}day)^{-1}$**	**unitless**	**µg/kg**
OU A ROD	Tot PCBs	30	365	26	1	0.001	70	25550	2.00E+00	1.E-05	31.4
2014 Revision	Tot PCBs	***20***	365	26	1	0.001	***80***	25550	2.00E+00	1.E-05	***53.8***

Note: exposure parameters obtained from Table 6-2 in the 2000 OU A ROD. 2014 Revision refers to the EPA OSWER 9200.1-120 which includes changes in body weight and exposure duration parameters.

ED – Exposure Duration
IR - Ingestion Rate
BW – Body Weight
CSF – Cancer Slope Factor
RBAL – Risk-Based Action Level
EF – Exposure Frequency
CF – Conversion Factor
AT – Averaging Time
TR – Target Risk

The 2014 exposure parameter changes provided above would result in lowering the risk and hazard estimates. Therefore, changes in exposure parameter values do not affect the protectiveness of the remedy to recreational or commercial receptors, nor does it negatively impact risks to residential receptors because ICs continue to effectively prevent residential exposure. Historical PCB data at Sweeper Cove and Kuluk Bay were compared to the current and revised RBAL values listed in Table 3-2. Data were graphed and are presented in Appendix C. The mean PCB concentrations for blue mussels were below the current and revised RBALs in both Sweeper Cove and Kuluk Bay in 2015. In addition, mean PCB concentrations in rock sole were also below current and revised RBALs in Kuluk Bay in 2015. PCB concentrations in rock sole (53.5 µg/kg) continued to exceed both the current and revised RBALs in Sweeper Cove in 2015.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES OR NEW ALTERNATIVES

The remedy as described in the OU A ROD will not change at any of the OU A sites. The two changes that are proposed in this ESD are to the surface water cleanup levels and RBALs. Sections 3.1 and 3.2 provide an explanation as to why the surface water cleanup levels and RBALs should be adjusted. This section describes how the proposed actions will affect remedy scope, performance, and costs. This section also describes any changes in expected outcomes that will result from the ESD (such as changes in estimated time to achieve cleanup goals).

4.1 Remedy Scope

The scope of the remedy includes: (1) monitored natural attenuation at OU A sites where surface water contamination is present; and (2) marine monitoring of rock sole and blue mussel in Kuluk Bay and Sweeper Cove. The scope of the remedies is not expected to change because of the ESD.

4.2 Remedy Performance

The remedy will not be changed because of this ESD; therefore, the performance should not be affected.

4.3 Remedy Costs

The cost of the remedy is driven by the frequency and duration of sampling at the OU A sites. Sampling will continue at each of the sites until cleanup levels and RBALs are met.

4.3.1 Surface Water Cleanup Levels

For surface water cleanup levels, eight of the COCs will have aquatic life cleanup levels that are lower than the current cleanup levels and 7 of the COCs will have human health cleanup levels that are lower than the current cleanup levels. Three analytes (cis-1,2-dichloroethen, trans-1,2-dichloroethene, and xylenes) were listed in the CMP, Revision 6 with no endpoint criteria or cleanup level specified. Cleanup levels for those analytes shown in Tables ES-1 and 3-1 are from the Solid Waste Program regulations. This could result in a longer monitoring duration for several COCs that may be present at the sites. It is difficult to project the expected increase in cost for additional monitoring at these sites. Current LTM is projected out over 30 years.

Copper and zinc are present at SWMU 25 at concentrations that exceed both current and revised values. The revised values for both metals are only slightly lower than the current values. Therefore, costs are not expected to increase substantially due to these two metals.

Aluminum and mercury are also analytes that exceed the cleanup levels at all three SWMUs; however, the revised values are the same as the current values for these two metals so there would be no difference in remedy costs. In addition, mercury concentrations are typically reported as non-detect at these locations. The reporting limit for mercury exceeds the cleanup level in most samples.

4.3.2 PCB RBALs

For the PCB RBALs for Sweeper Cove and Kuluk Bay, the change in exposure parameters results in a higher (less conservative) RBAL. The revised RBALs are only slightly higher than the current RBALs; therefore, it is not expected to lower monitoring costs significantly.

Mean PCB concentrations in rock sole in Sweeper Cove exceed both the current and revised RBAL. All other mean PCB concentrations are below both current and revised RBALs for both rock sole (Kuluk Bay) and blue mussels (Kuluk Bay and Sweeper Cove). Therefore, changes in values should not have much of an effect on remedy costs. The amount of time to achieve the RBAL for rock sole in Sweeper Cove is likely to decrease with the revised RBAL.

4.4 Expected Outcomes

The remedies in place remain protective of human health and the environment for those sites where cleanup levels are lowered because the ICs in place remain. The time required to achieve surface water cleanup levels could increase at the OU A sites where surface contamination is present. Consequently, there will likely be an increase in monitoring costs.

The time required to achieve cleanup level (RBAL) at Kuluk Bay and Sweeper Cove may decrease. Because the change is slight, monitoring costs are not expected to decrease significantly.

5.0 SUPPORT AGENCY COMMENTS

The Draft ESD was reviewed by ADEC and EPA. Those comments were incorporated into the Draft Final ESD and are summarized below.

Table 5-1. Summary of Support Agency Comments

Commenter and Comment No.	Page/Line	Comment/Recommendation	Response	Accepted?
ADEC-1	Page ii, Executive Summary, Line 19	The most current version of 18 AAC 70 should be used as your reference. Please note that the 18 AAC 70 Water Quality Standards were last amended February 5, 2017. Change sentence to reflect the most current version of 18 AAC 70 and double check the remainder of the document references the most current version as appropriate.	Revised lines 18-22 as follows: Changes to 18 AAC 70 occurred in 2008 and in February 2017 which impacted some of the endpoint criteria values generated at the time of the OU A ROD signing. Table ES-1 identifies the current values and proposed new values for each contaminant of concern (COC) at the three OU A landfill sites that require surface water monitoring. Revised lines 240 & 754 (formerly lines 235 & 749 prior to other revisions)	
ADEC-2	Page 1, Section 1.3line 206	You should insert "(2)" after the first comma to be consistent.	Revised as recommended: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Section 9617(c), Section 117(c) states that, after adoption of a final remedial action plan, (1) if any remedial action is taken, (2) if any enforcement under Section 9606 of this title is taken, or (3) if any settlement or consent decree under Section 9606 of this title is entered into, and if such action, settlement, or decree differs in any significant respects from the final plan, the President or State shall publish an explanation of significant differences (ESD) and the reasons such changes were made.	
ADEC-3	Page 2, line 235	See comment 1	Revised, per comment ADEC-1	
ADEC-4	Page 8, line 455	Should "111" really be "103"? Sample locations on Figure 2-2 do not reflect a location for sample "111". Please correct reference to "111" or include location on Figure 2-2.	Location 103 is a sediment-only sample location. Sample ID 111 is used as a blind ID for a field duplicate of location 101. Revised text as follows: Surface water was last sampled at SWMU 11 in 2008 (at locations 101 and 102, ~~and 111~~).	
ADEC-5	Page 18, line 749	See comment 1	Revised, per comment ADEC-1	

Table 5-1. Summary of Support Agency Comments (continued)

Commenter and Comment No.	Page/Line	Comment/Recommendation	Response	Accepted?
EPA-1	P. 1, 219-222	Suggest mentioning that the Administrative Record is available on-line, as is mentioned in Section 1.5.	Added in a short paragraph following the referenced line numbers	
EPA-2	P. 12, 567	Replace: "SWMUs 18/19" with "SWMU 25."	Replaced as recommended	
EPA-3	P. 12, 582 & 583	What is "Naval Facilities Engineering Command (NAVFAC)" referring to? It appears to be a general reference to creeks within NAVFAC, but is not specific enough to know. Please either specify the names of the creeks or state it refers to creeks which flow through NAVFAC. Not sure why Airport Creek is specified as it is within former NAVFAC.	This statement is intended to refer to two creeks – Airport Creek and NAVFAC Creek which discharge to Kuluk Bay. NAVFAC Creek runs near the north end of the Contractor's Camp area (near the former NAVFAC compound), and Airport Creek is located near the south of the Contractor's Camp. Statement revised from "Naval Facilities Engineering Command (NAVFAC) and Airport Creeks..." to read as "NAVFAC Creek and Airport Creek..." for clarity.	
EPA-4	P. 16, 685-688	Include fencing as a component of the remedy and closure requirements at SWMU 25.	Revised as follows: "Closure activities at SWMU 25, which began in 1997, included placing a low-permeability soil cover over the landfill, grading and contouring, implementing access restrictions including signage and fencing, installing surface water/erosion controls, placing a vegetative cover, securing adjacent bunkers filled with asbestos materials, maintaining the cover, periodic monitoring, and ICs for land use."	
EPA-5	P. 21, 863-871	This discussion highlights the background for General Comment #1. Arsenic, Mercury, copper, lead and zinc are all potentially COCs due to analytical method. The Navy should consider using analytical methods that will provide detection limits below endpoint criterion. This may accelerate meeting cleanup goals of the OU A ROD.	The Navy will pursue this as revisions to the Comprehensive Monitoring Plan are made.	
EPA-6	Figure A1-1, A1-7 & A1-9	The proposed endpoint criterion is not depicted on the figure.	The current and proposed criterion are shown on the figures and appear to coincide at this scale of the Y-axis. Aluminum and Mercury are unchanged at 87 and 0.012 µg/L, respectively.	
EPA-7	Figure A1-2	The legend has switched the depictions for current and proposed endpoint criterion between figures A1-1 and A1-2. Please use consistent symbols in the figures.	Figure A1-1 line types revised for consistency.	

Table 5-1. Summary of Support Agency Comments (continued)

Commenter and Comment No.	Page/Line	Comment/Recommendation	Response	Accepted?
EPA-8	Figure A1-7	Trend line for sampling locations 101-101 are not depicted on the figure.	Footnote on figure indicates 101-101 and 101-102 lines overlap due to sampling being non-detect with the same reporting limit.	
EPA-9	Figures A1-1 thru A1-10	The figure does not represent a trend line for sample location 103. It is confusing why both trend lines include sample location 101 in the legend. Please review the figures for accuracy and clarity.	Figures A1-1 through A1-10 depict concentrations and trend lines for surface water samples at locations 101 and 102. Location 103 has historically been sampled only for sediment. Legends are revised to clarify the location names as "101" and "102".	
EPA-10	Appendix B	Include a legend for notes in the Tables (A, J, U, etc…)	The notes section for Appendix B tables have been expanded to define data qualifiers.	
EPA-11	Appendix B	SWMU 11 data representation ends in 2008, however 2.3.1.1 on page 8 indicates that surface water samples for metals was conducted in 2016. Please include all years of data in the table.	Surface water was last sampled at SWMU 11 in 2008. In 2016, sediment samples were collected at locations 101 and 102. These tables do have complete data for surface water samples.	
EPA-12	P. 18, 798	Does 18 AAC 70 "propose" these new values, or are these values something that the Navy created? The ESD should clarify this point.	The "proposed" values were selected based on what is currently in the regulations (18 AAC 70 and 40CFR 131.36). The word "proposed" has been changed to "revised" for surface water cleanup values and RBALs throughout the document.	
EPA-13	P. ii, 9	Are these cleanup levels? I don't know what "endpoint criteria" are. If they aren't CULs – how do they relate to CULs? This just isn't clear to me and since it says in the sentence before that it was prepared in accordance with CERCLA – it would be good to use CERCLA language.	"Endpoint criteria" are the same as CULs and the language has been changed throughout the document. "Endpoint criteria" has been changed to "cleanup levels" throughout the document.	
EPA-14	P. iii, 43	Suggest changing this to "revised value". Once the ESD is final, they are no longer proposed. Also, see comments on Table 3-1 re: some AWQC are lower than the numbers reported here.	Changed "Proposed" to "Revised" throughout document.	
EPA-15	P. iii, 43	Need to add units – ug/kg wet weight?	Added units as suggested	
EPA-16	P. 2, 275	Looks like there are two RODs for OU A, a 2000 ROD and a 2003 RODA. State whether the changes in this ESD pertain to both the ROD and the RODA, or just the original ROD.	"2000" was inserted in front of ROD to clarify that it was the 2000 ROD that this ESD pertains to.	

Table 5-1. Summary of Support Agency Comments (continued)

Commenter and Comment No.	Page/Line	Comment/Recommendation	Response	Accepted?
EPA-17	P.2, 284	I am not familiar with the original ROD so let me ask--did we set cleanup levels for tissue? We haven't at other sites so that's why I ask. We have set "tissue targets" which are not enforceable cleanup levels under CERCLA. I belabor this because we need to be clear about what is an enforceable cleanup level under CERCLA and what is a target. If they original ROD did include tissue CULs, then the terminology should be consistent with how CERCLA views it. If not, use this "endpoint criteria" language--just not if it's a cleanup level.	See Comment #EPA-13 above.	
EPA-18	P. 2, 291	They need to state the physical location(s) where the AR can be reviewed, not just the ESD. If some of these locations don't have the entire AR, but just the ESD, that should be clarified.	Changed to "The Administrative Record, including this ESD, is also available for public review at the following locations:" as suggested.	
EPA-19	P. 2, 304	Do you want to delete this? We don't typically maintain ARs for FFs in our Records Center.	Deleted EPA Region 10 Record Center.	
EPA-20	P. 2, 328	Probably not worth changing, but for future reference this section can be much shorter. The ESD just needs to provide a few paragraphs providing site history relevant to the changes in the ESD.	Noted.	
EPA-21	P. 5, 433	Again, this section could have been much shorter. It could be just a few paragraphs. For future reference, no need to change it now.	Noted.	
EPA-22	P. 17, 765	I think this is the first time the RODA is mentioned. As noted in previous comments, state in the introduction that there is a 2000 ROD and 2003 RODA for this OU, and this ESD only affects the 2000 ROD.	Added "2003" in front of "ROD amendment". The ROD amendment is also mentioned in Section 1.3.	
EPA-23	P. 18, 802	To comply with ARARs, they should be using the lowest of the two. State ARARs are only used if they are more stringent than federal ARARs. They should also be comparing to CWA 304 criteria (ambient water quality criteria), see CERCLA Section 121(d)(2)(A).	Changed to "The lower of the federal water quality criteria and state criteria was selected."	
EPA-24	P. 19, 822	AWQC values not included on Table 3-1.	AWQC and ADEC Solid Waste values have been added to Table 3-1.	

6.0 STATUTORY DETERMINATIONS

Considering the above-described adjustments to the cleanup levels set forth in the 2000 OU A ROD, the Navy believes that the remedy remains protective of human health and the environment and satisfies CERCLA Section 121.

7.0 PUBLIC PARTICIPATION

All public participation requirements set forth in Sections 117(c) and (d) of CERCLA, as well as Section 300.435(c)(2)(i) of the NCP, will be met. Although a formal public comment period is not required when issuing an ESD, this ESD and all documents that serve as the basis of this ESD are contained in the Administrative Record for the former Adak Naval Complex. The Navy included a discussion of the ESD at the April 2018 Restoration Advisory Board (RAB) meeting. No comments have been received from the RAB members.

8.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2018. Solid Waste Technical Memorandum 18.02. Alaska Department of Environmental Conservation. April.

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EPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 6.

EPA. 2009. National Recommended Water Quality Criteria. Office of Water, Office of Science and Technology.

URS. 1995. Record of Decision, Naval Air Facility Adak, Site 11 (Palisades Landfill) and Site 13 (Metals Landfill). Prepared for U.S. Navy CLEAN Contract N62474-89-D-9295. Seattle, Washington. February.

U.S. Navy. 2017. Draft Annual Groundwater and Landfill Monitoring Report 2016 Long-Term Monitoring, Operable Unit A, Former Naval Complex, Adak, Alaska. March.

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U.S. Navy. 1997. *Final Remedial Investigation/Feasibility Study Report, Operable Unit A, Adak Naval Complex, Adak Island, Alaska.* Prepared by URS Greiner, Inc., for Engineering Field Activity, Northwest, under CLEAN Contract No. N62474-89-D-9295. Poulsbo, Washington. September.

U.S. Navy, Alaska Department of Environmental Conservation (Alaska DEC), and U.S. Environmental Protection Agency (USEPA). 2003. *Adak Naval Air Station, Adak, Alaska (AK 4170024323), Operable Unit A Record of Decision, Amendment No. 1*. Prepared by Naval Facilities Engineering Command, Engineering Field Activity, Northwest. Poulsbo, Washington. September 4, 2003.

U.S. Navy, Environmental Protection Agency (EPA), Alaska Department of Environmental Conservation (ADEC). 2000. *Final Record of Decision for Operable Unit A, Former Adak Naval Complex, Adak Island, Alaska*. Prepared by URS Greiner, Inc., for Engineering Field Activity, Northwest, under CLEAN Contract No. N62474-89-D-9295. Poulsbo, Washington. April 13.

Appendix A-1: Metals Concentrations in Surface Water over Time at SWMU 11, Palisades Landfill

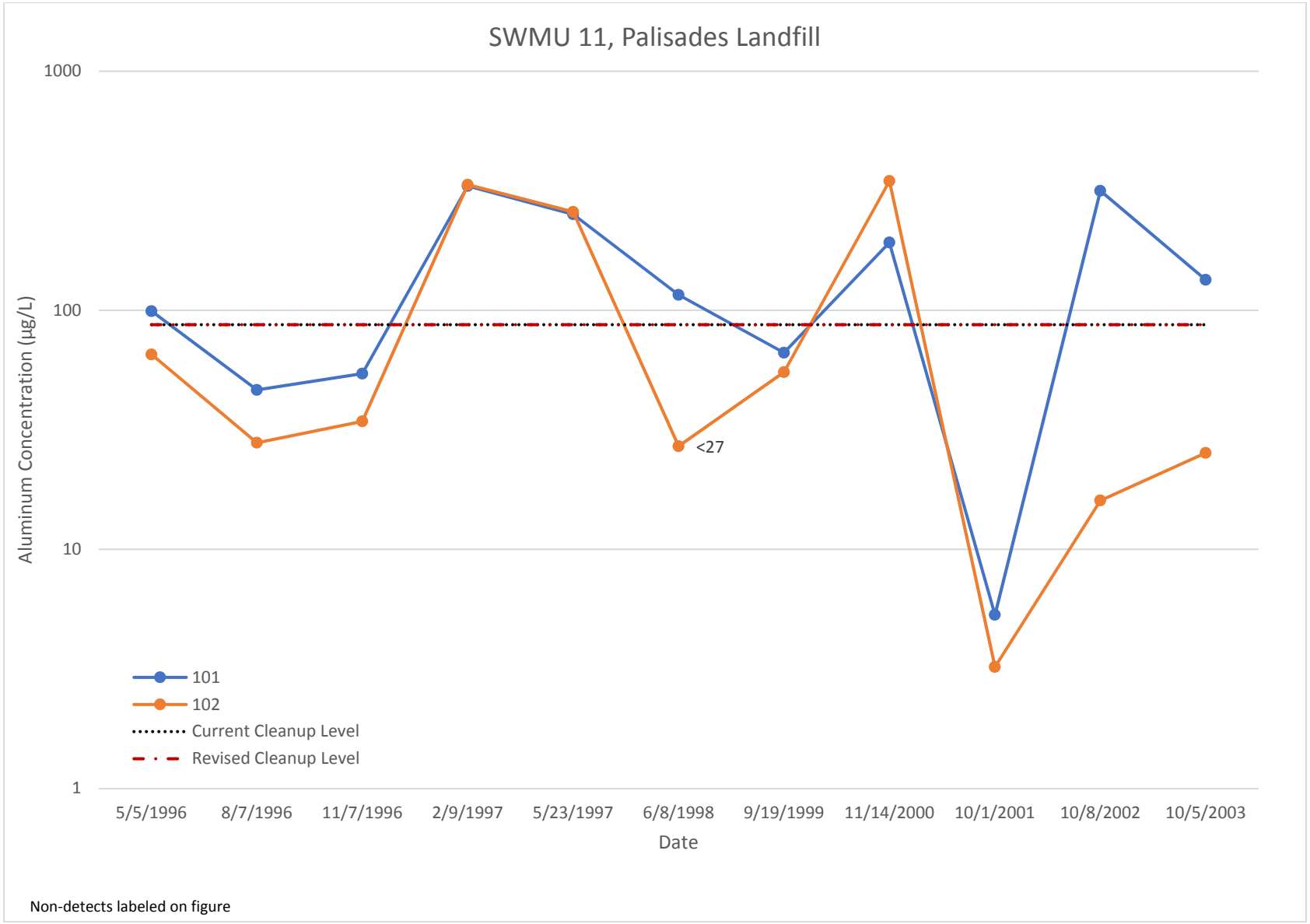


Figure A1-1: Aluminum Concentrations in SW at SWMU 11 from 1996 to 2008

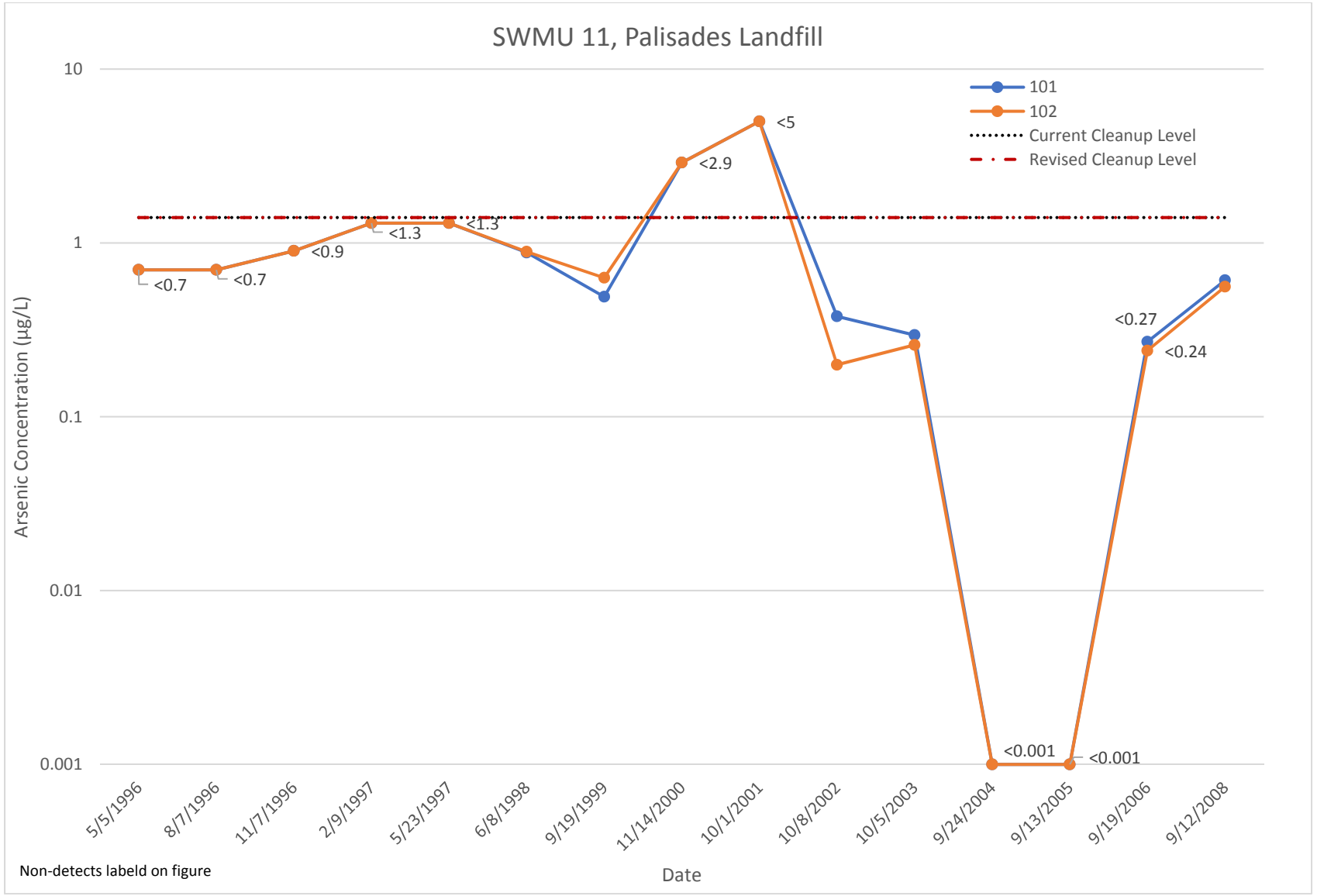


Figure A1-2: Arsenic Concentrations in SW at SWMU 11 from 1996 to 2008

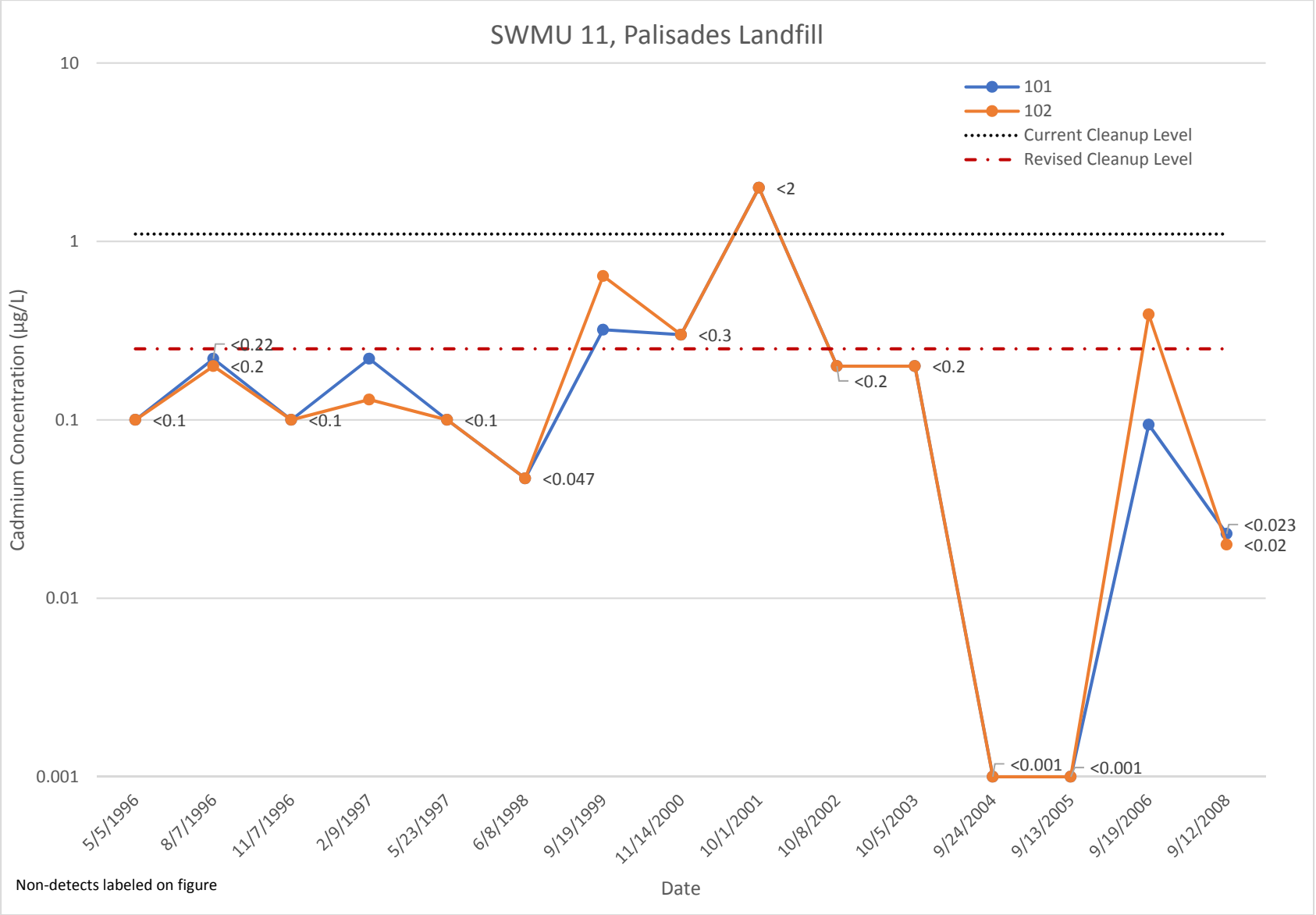


Figure A1-3: Cadmium Concentrations in SW at SWMU 11 from 1996 to 2008

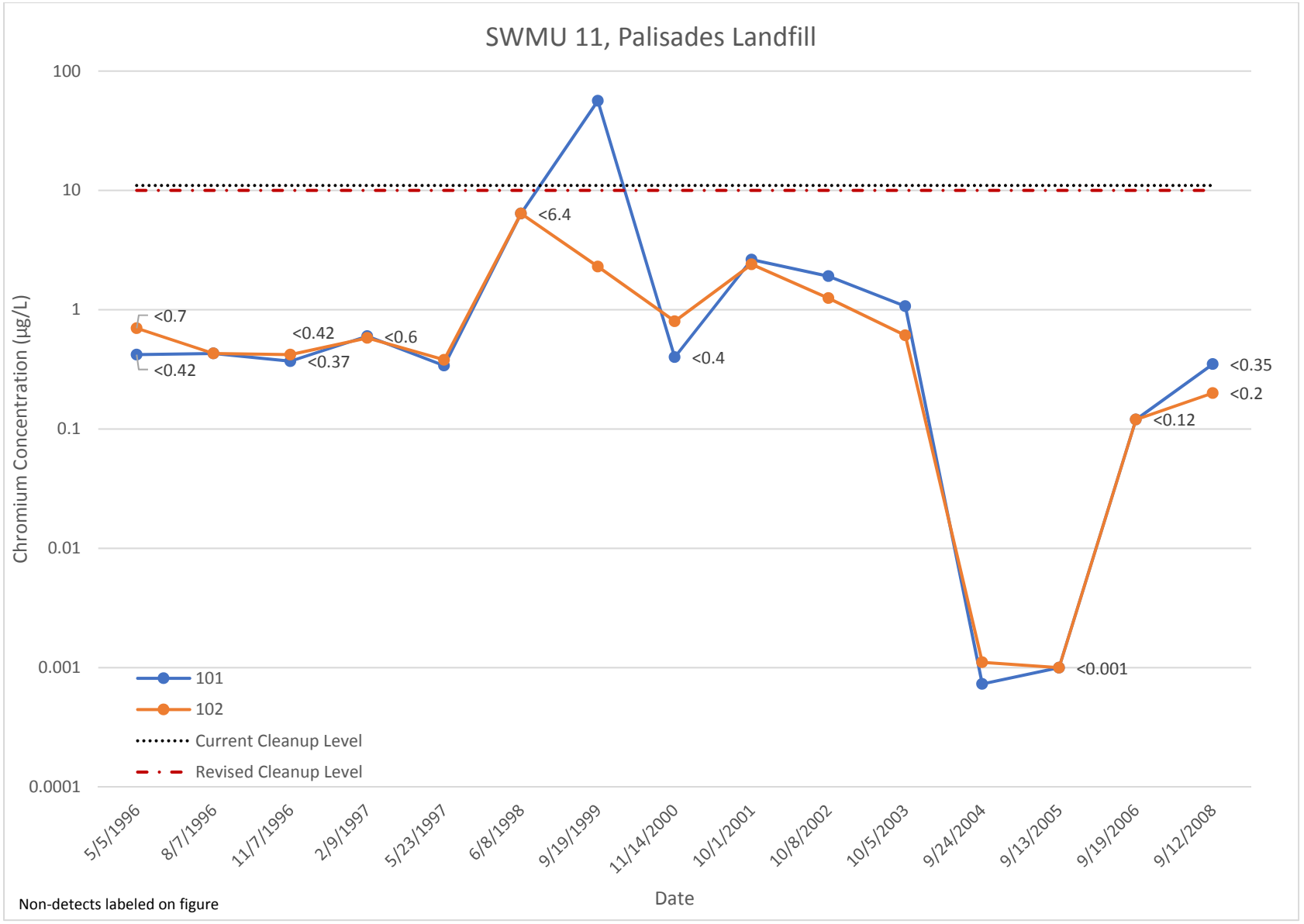


Figure A1-4: Chromium Concentrations in SW at SWMU 11 from 1996 to 2008

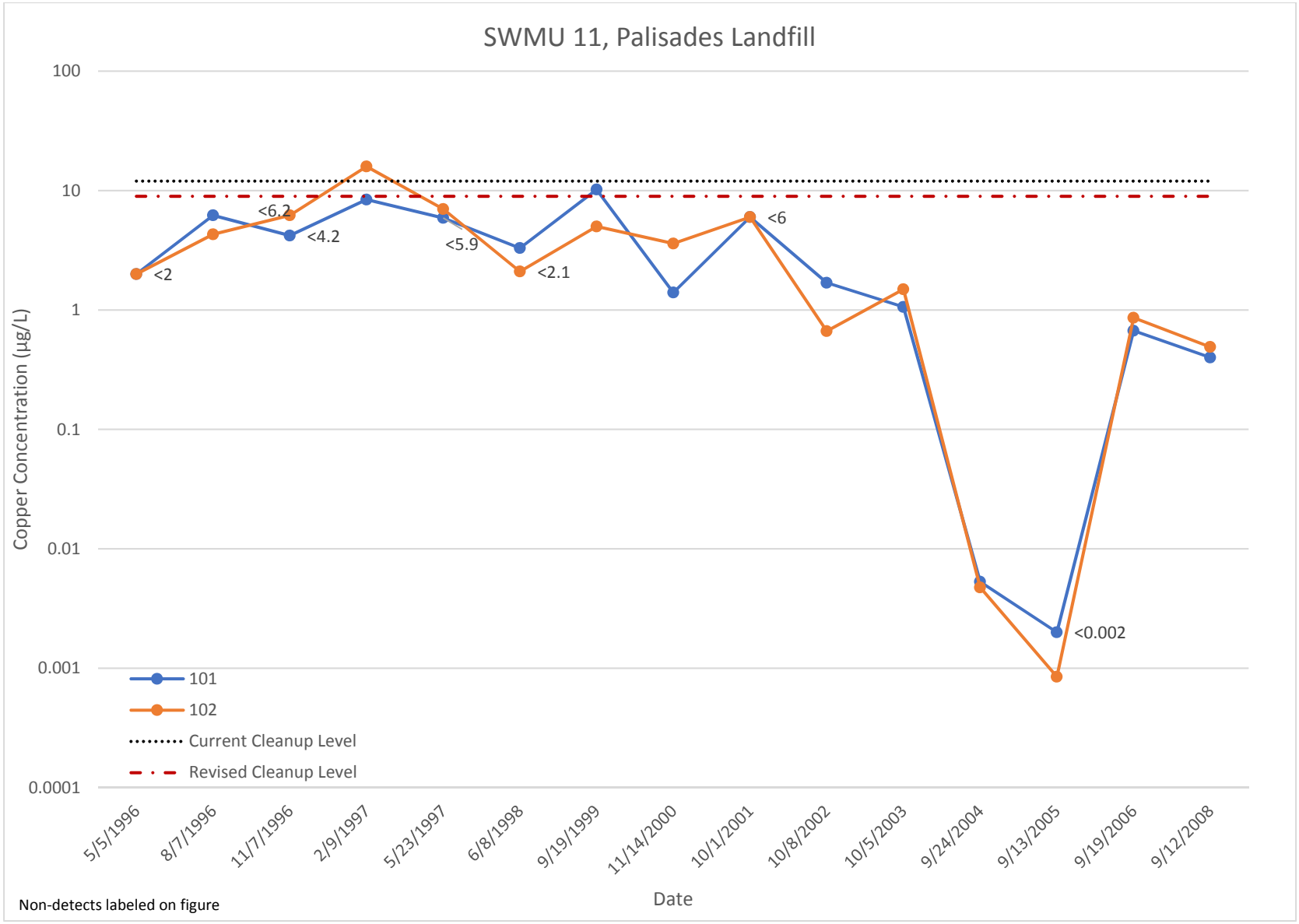


Figure A1-5: Copper Concentrations in SW at SWMU 11 from 1996 to 2008

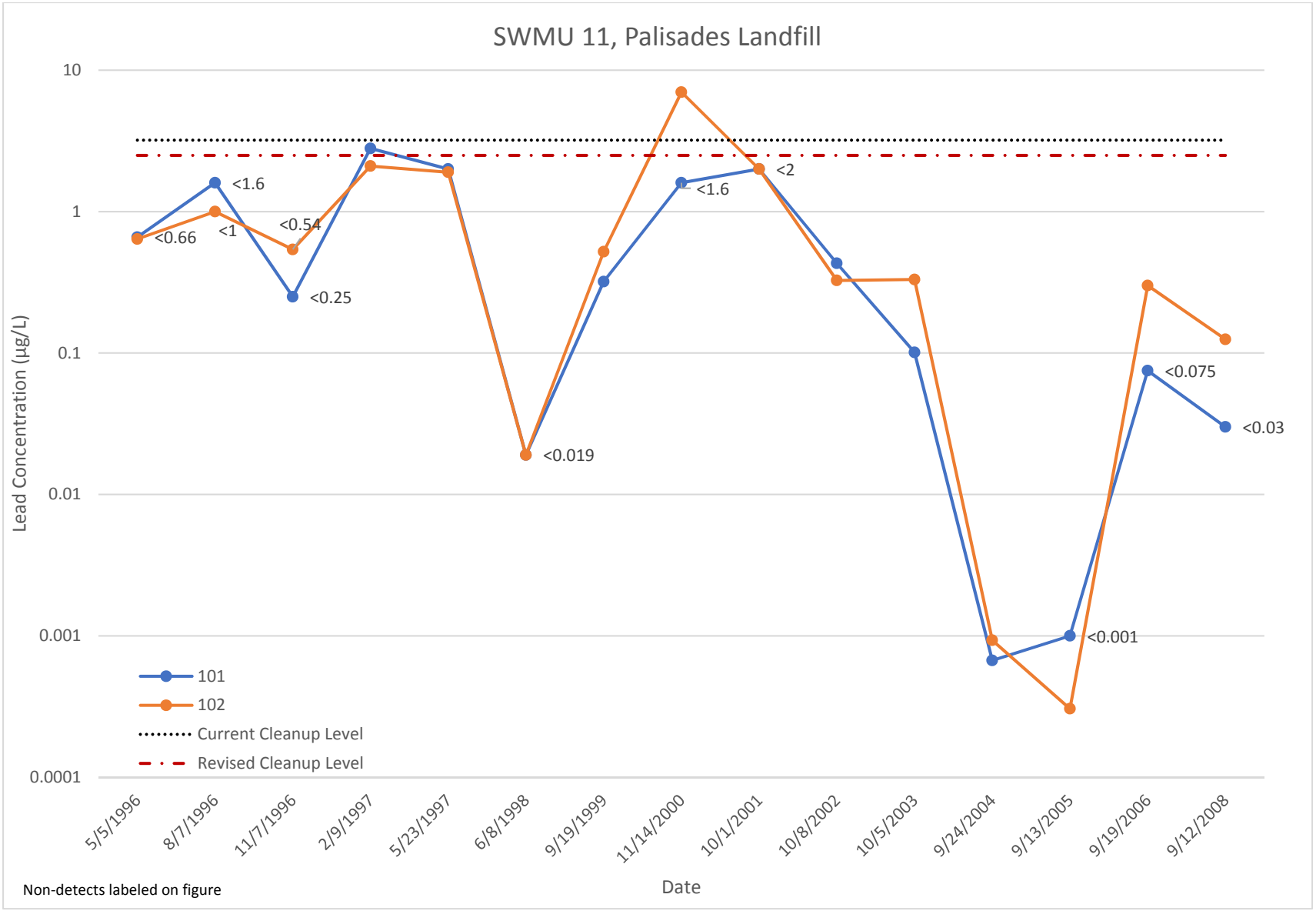
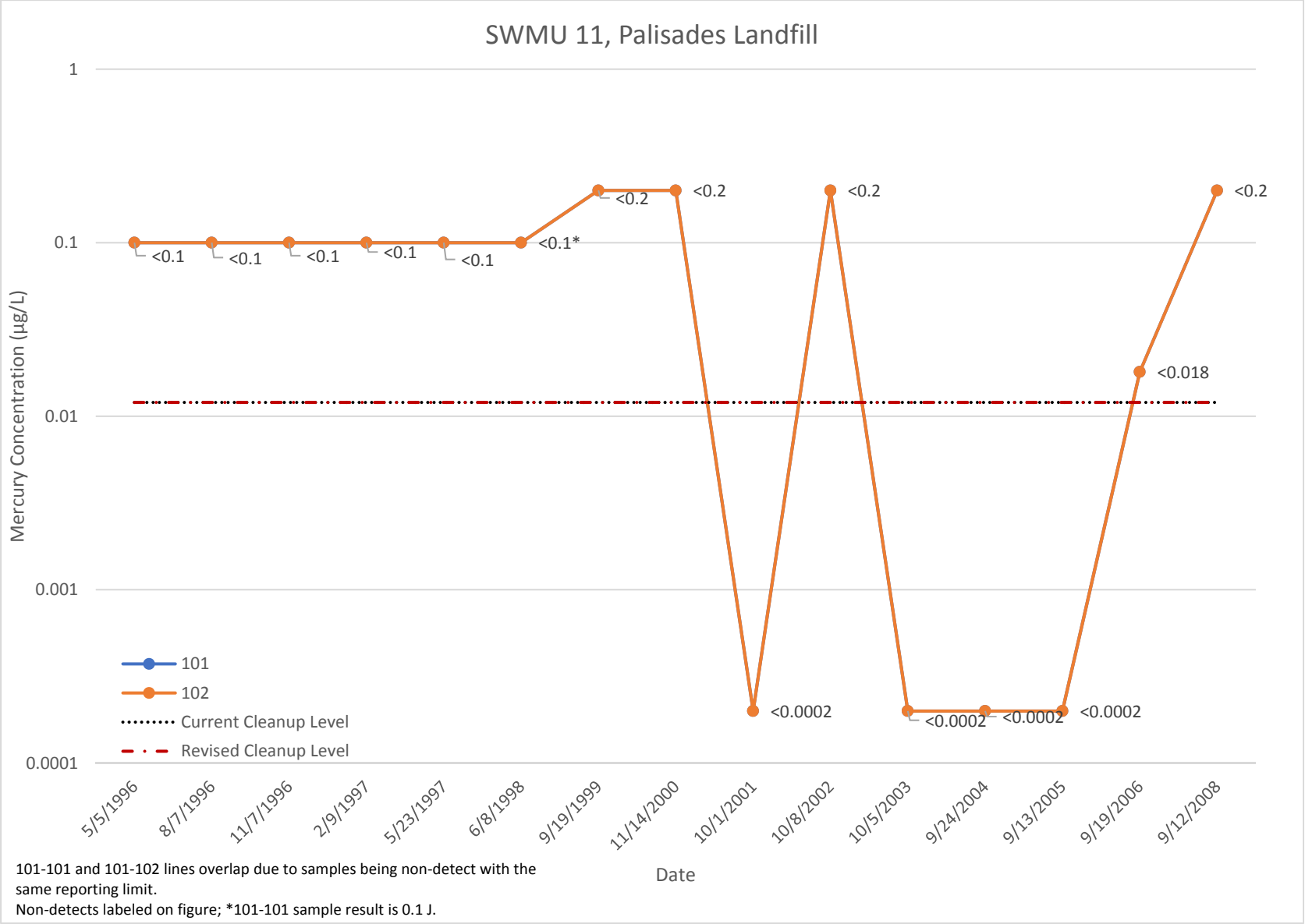


Figure A1-6: Lead Concentrations in SW at SWMU 11 from 1996 to 2008



101-101 and 101-102 lines overlap due to samples being non-detect with the same reporting limit.
Non-detects labeled on figure; *101-101 sample result is 0.1 J.

Figure A1-7: Mercury Concentrations in SW at SWMU 11 from 1996 to 2008

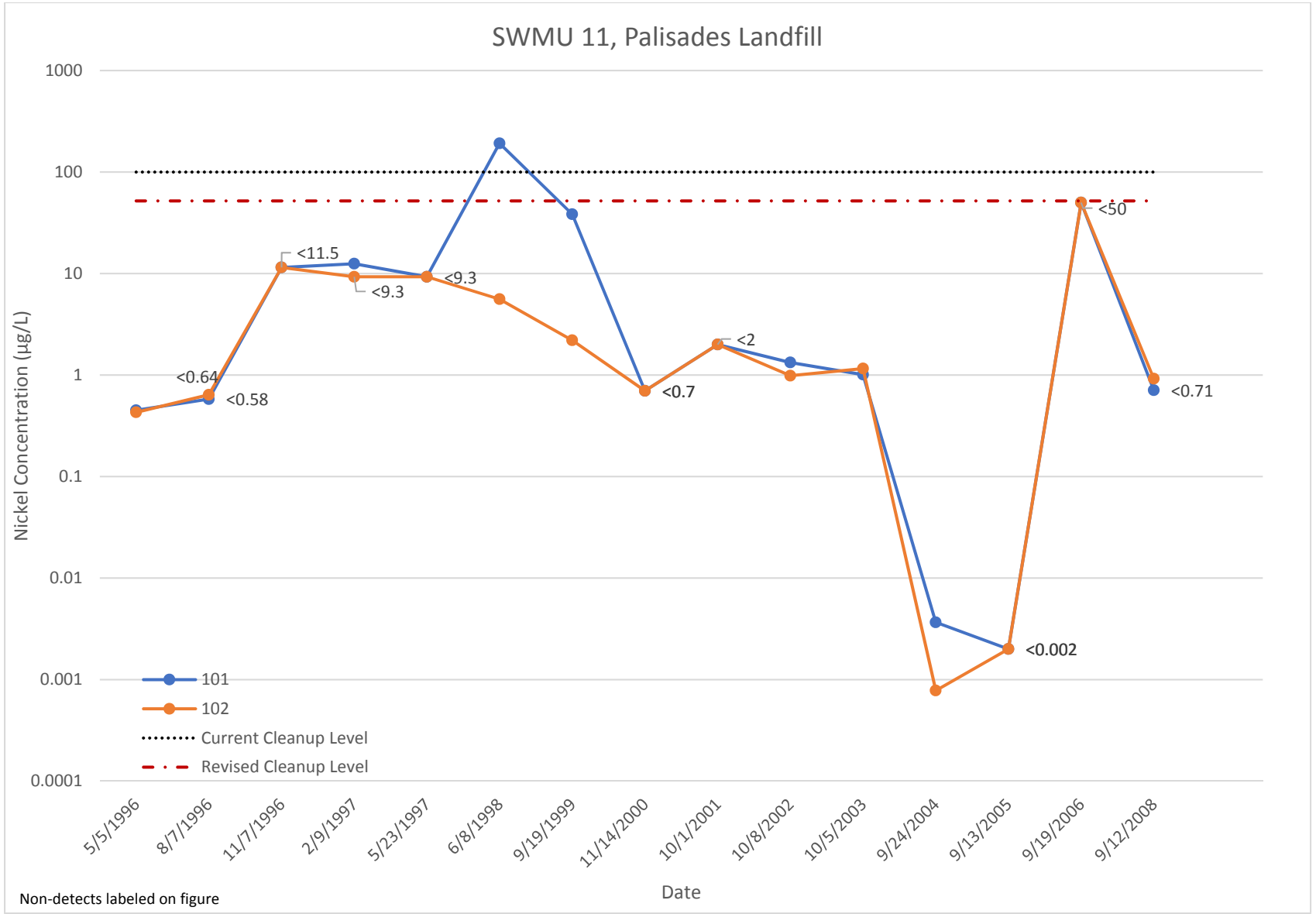


Figure A1-8: Nickel Concentrations in SW at SWMU 11 from 1996 to 2008

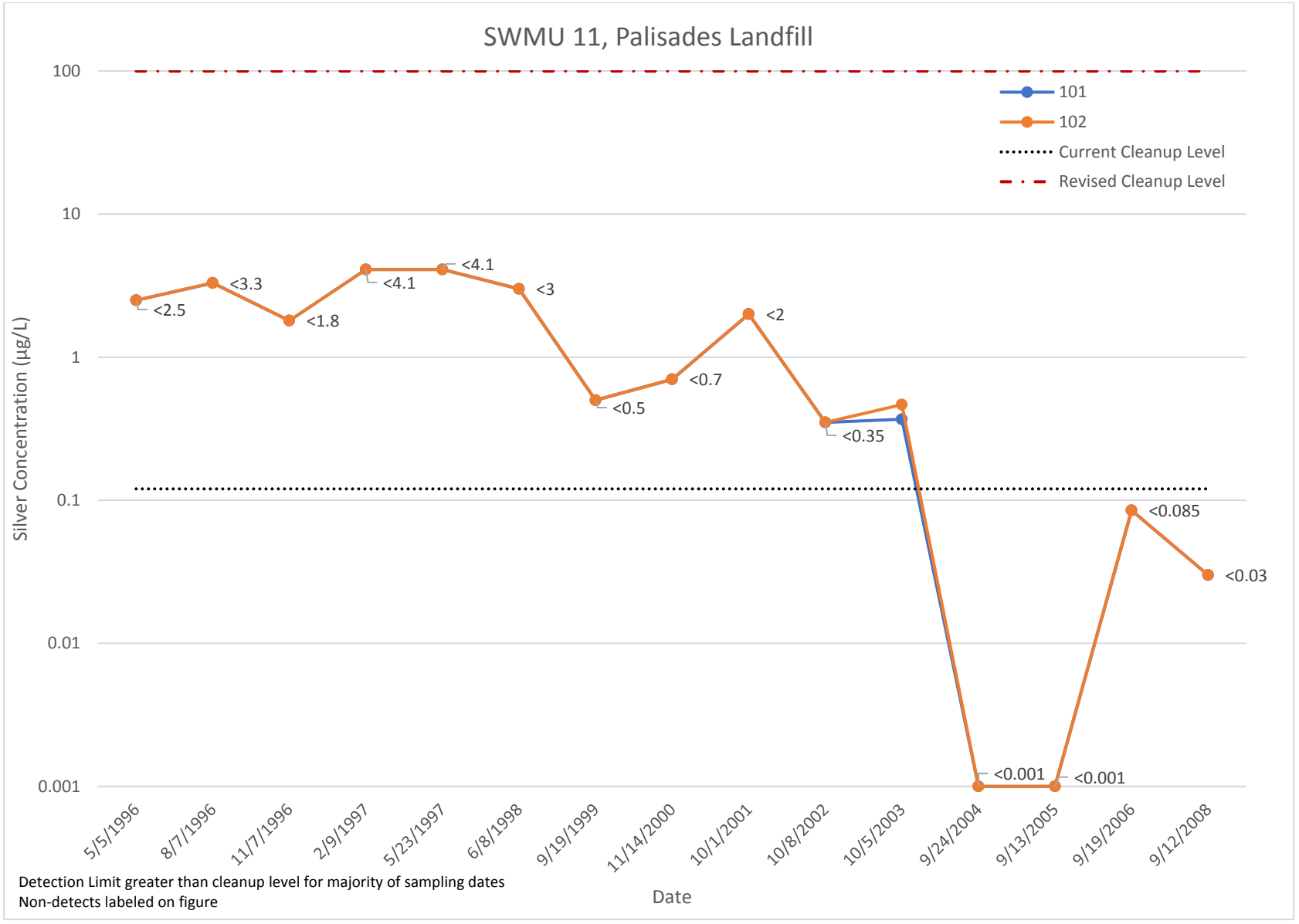


Figure A1-9: Silver Concentrations in SW at SWMU 11 from 1996 to 2008

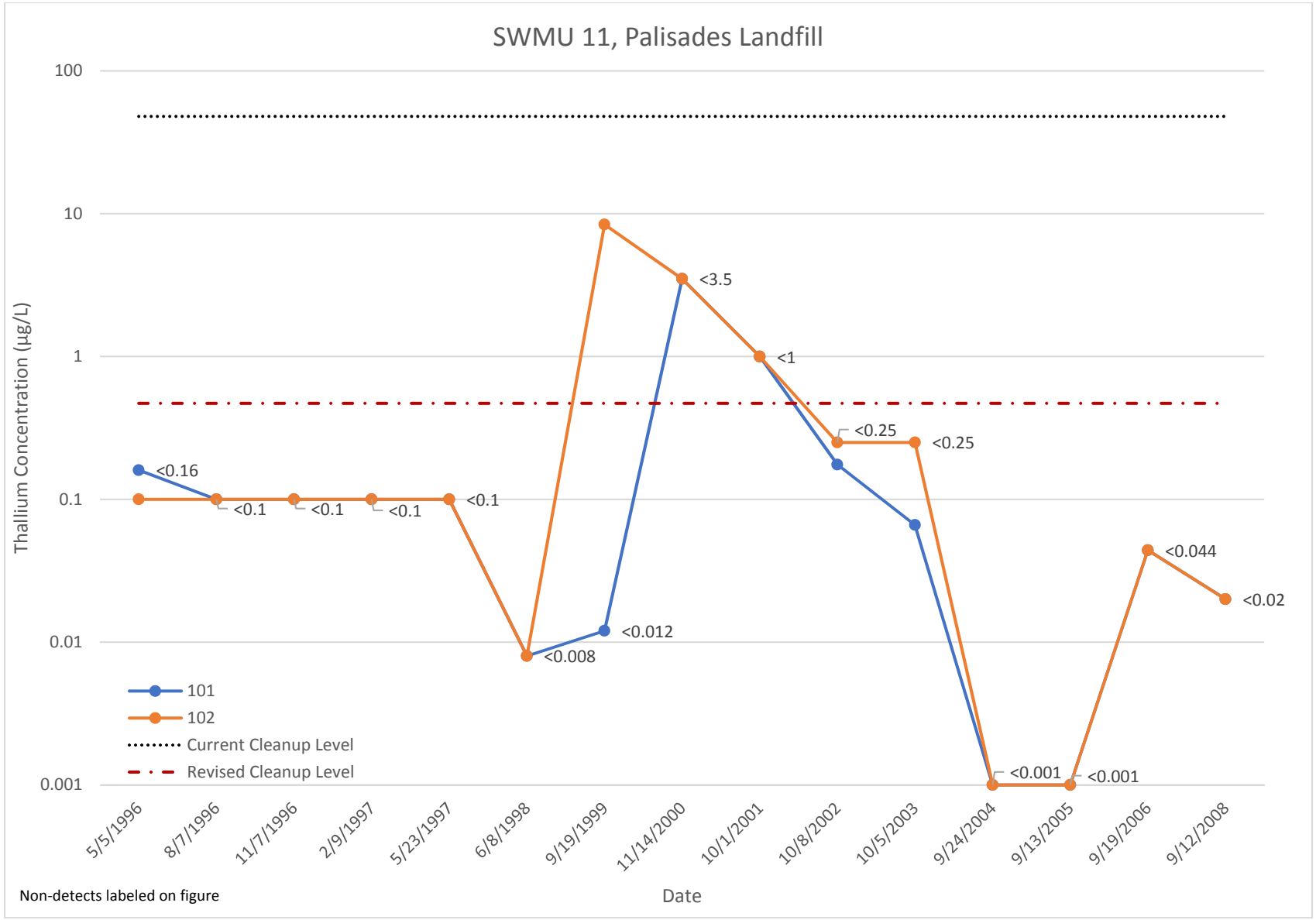


Figure A1-10: Thallium Concentrations in SW at SWMU 11 from 1996 to 2008

Appendix A-2: Metals Concentrations in Surface Water over Time at SWMUs 18/19, White Alice Landfill

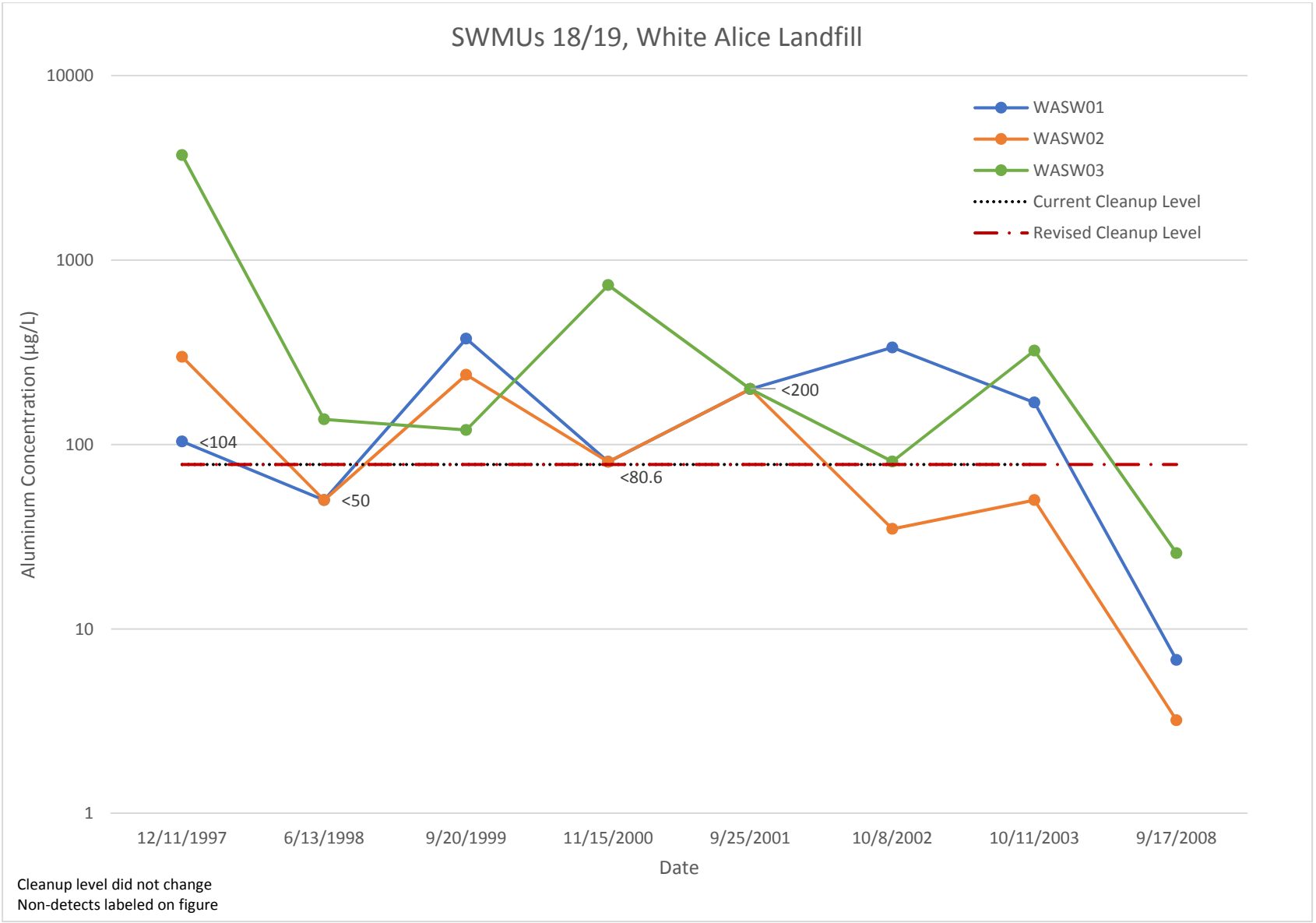


Figure A2-1: Aluminum Concentrations at in SW at SWMUs 18/19 from 1997 to 2014

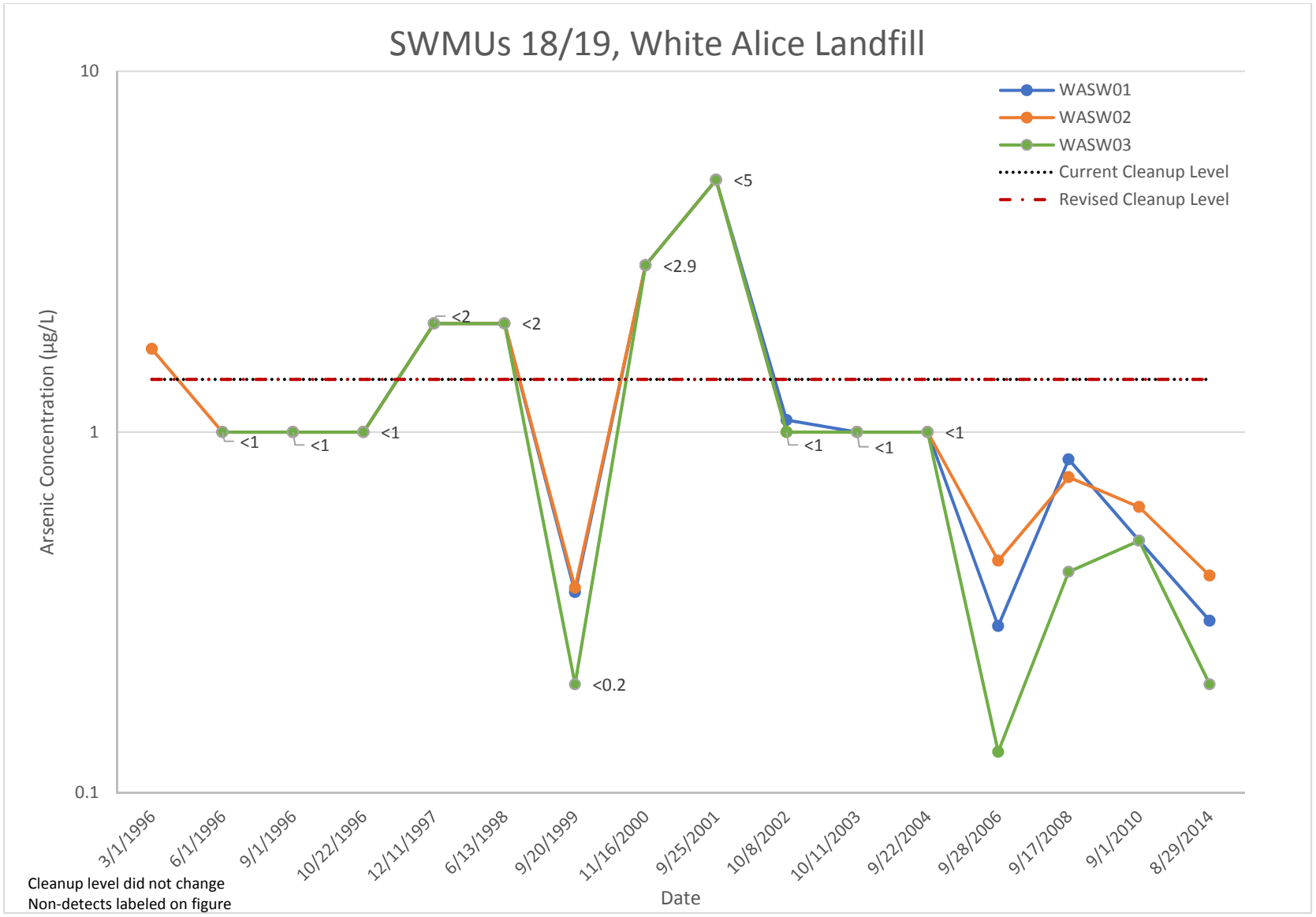


Figure A2-2: Arsenic Concentrations in SW at SWMUs 18/19 from 1996 to 2014

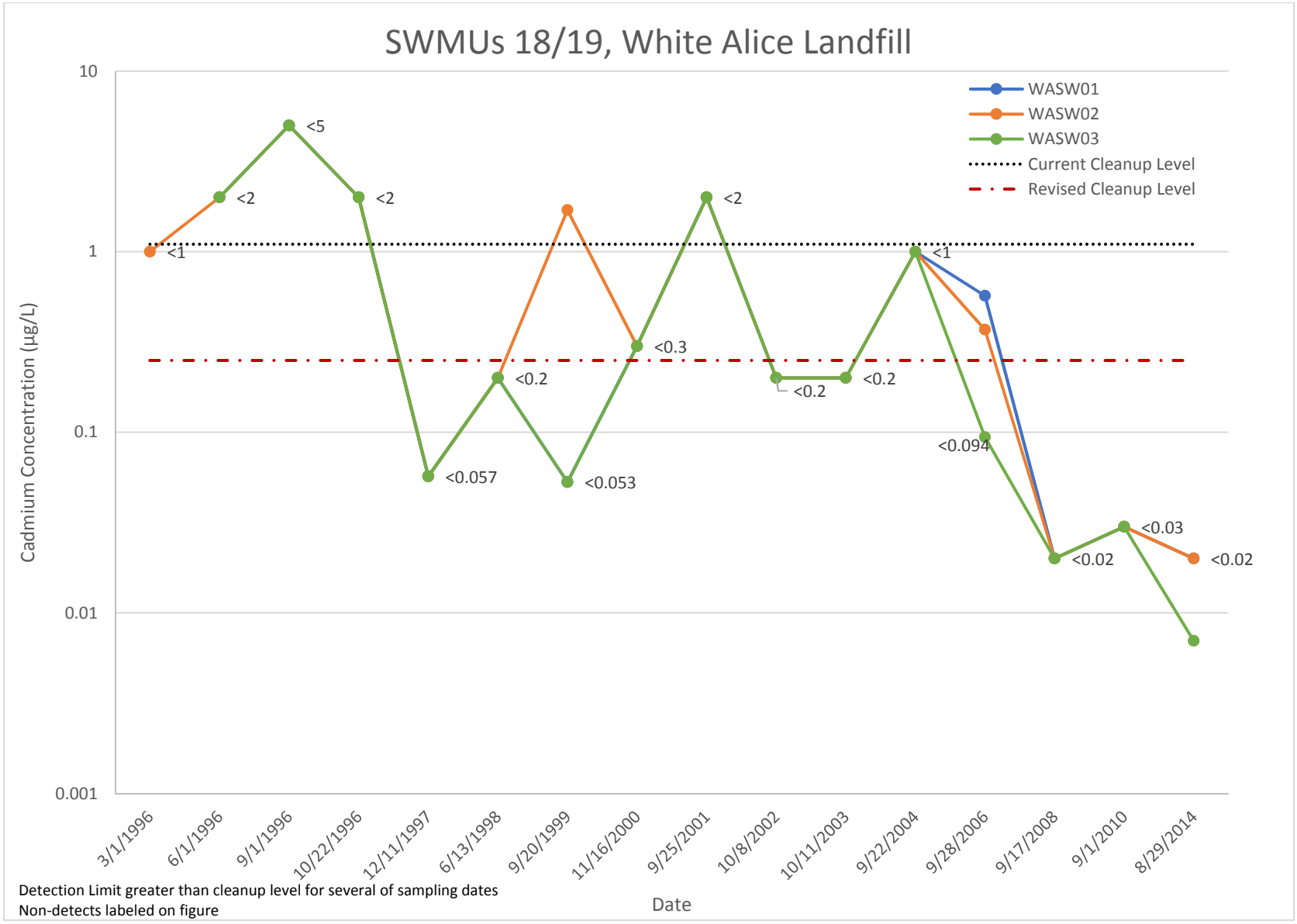


Figure A2-3: Cadmium Concentrations in SW at SWMUs 18/19 from 1996 to 2014

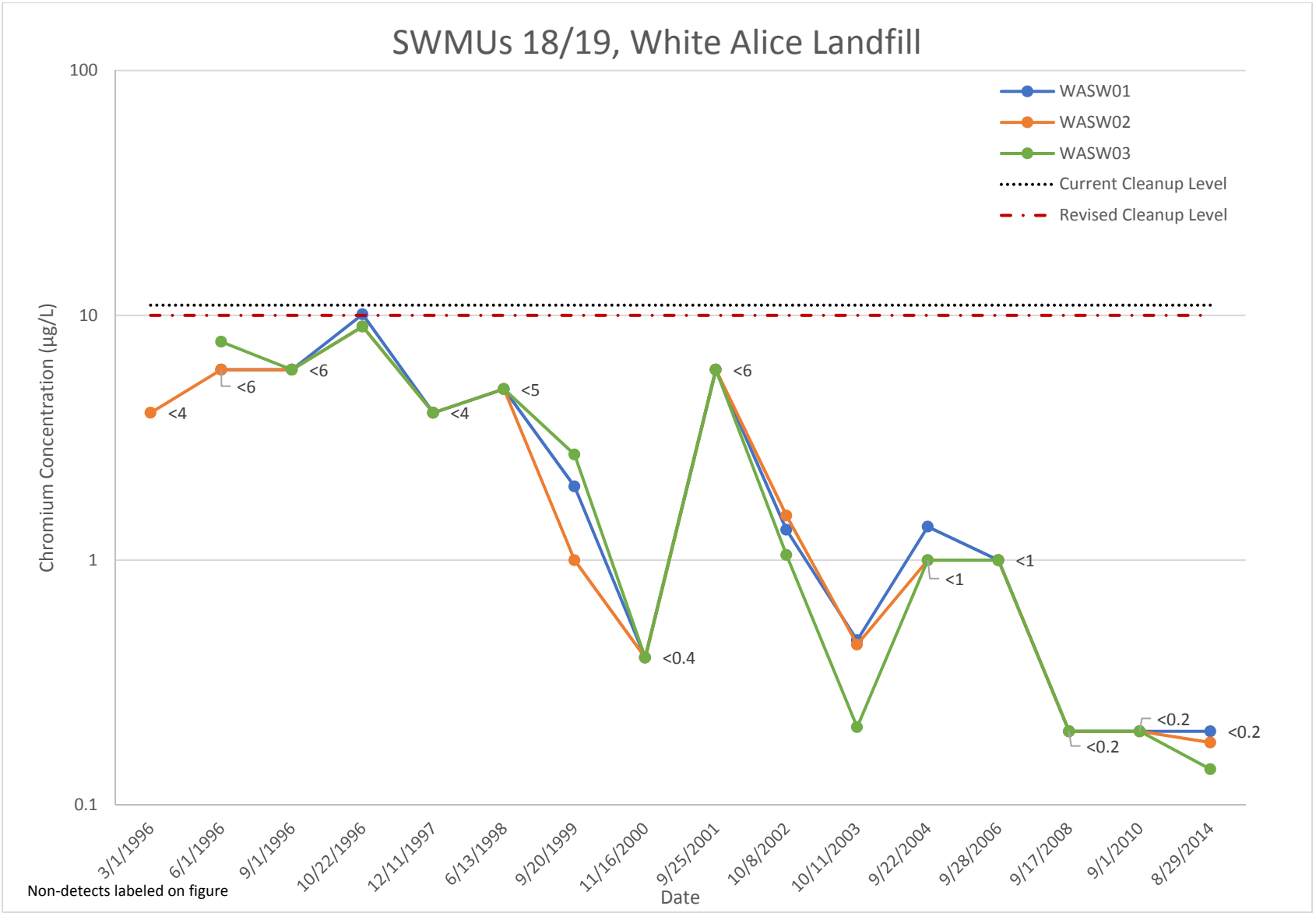


Figure A2-4: Chromium Concentrations in SW at SWMUs 18/19 from 1996 to 2014

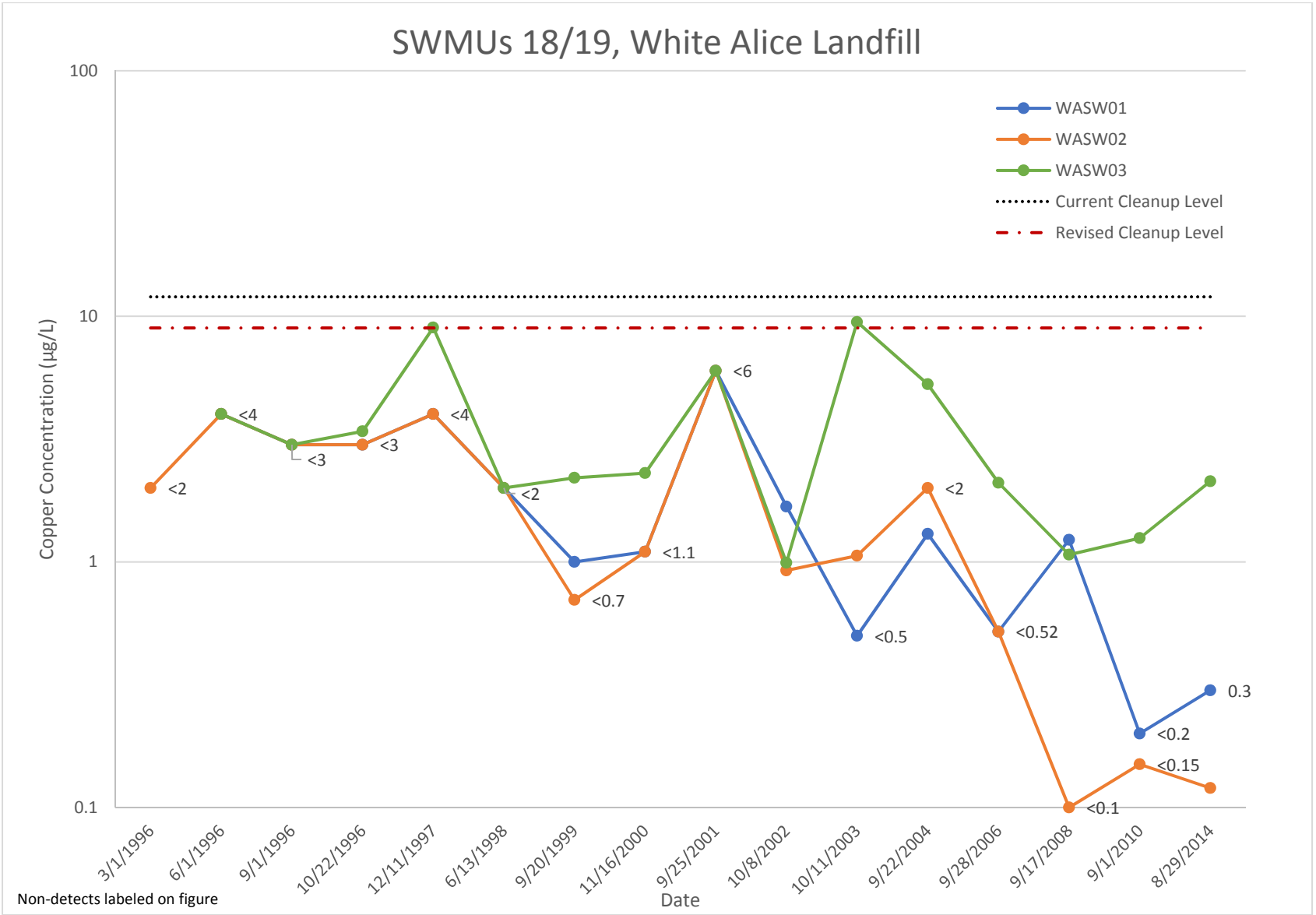
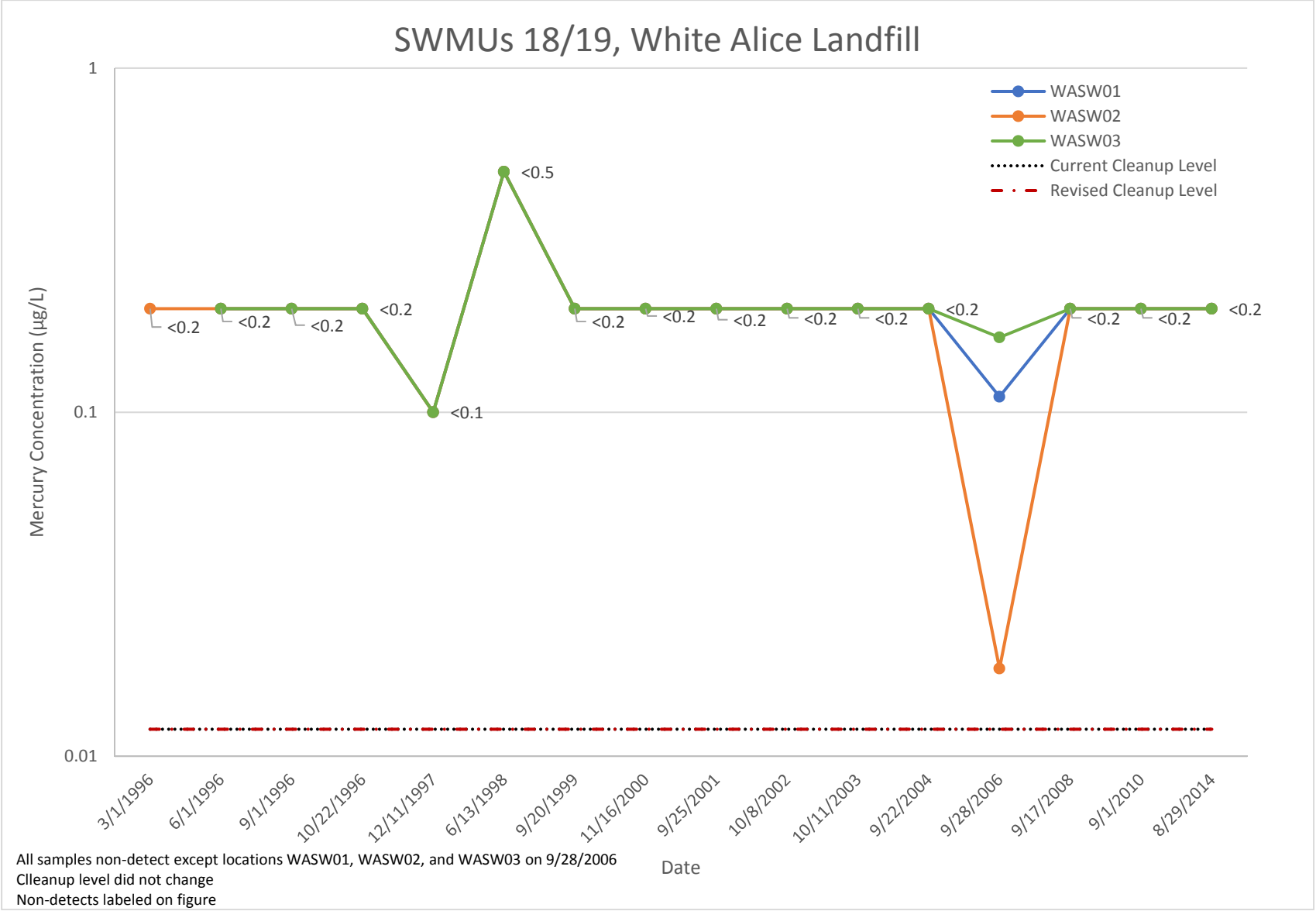


Figure A2-5: Copper Concentrations in SW at SWMUs 18/19 from 1996 to 2014



All samples non-detect except locations WASW01, WASW02, and WASW03 on 9/28/2006
Clleanup level did not change
Non-detects labeled on figure

Figure A2-6: Mercury Concentrations in SW at SWMUs 18/19 from 1996 to 2014

Appendix A-3: Metals Concentrations in Surface Water over Time at

SWMU 25, Roberts Landfill

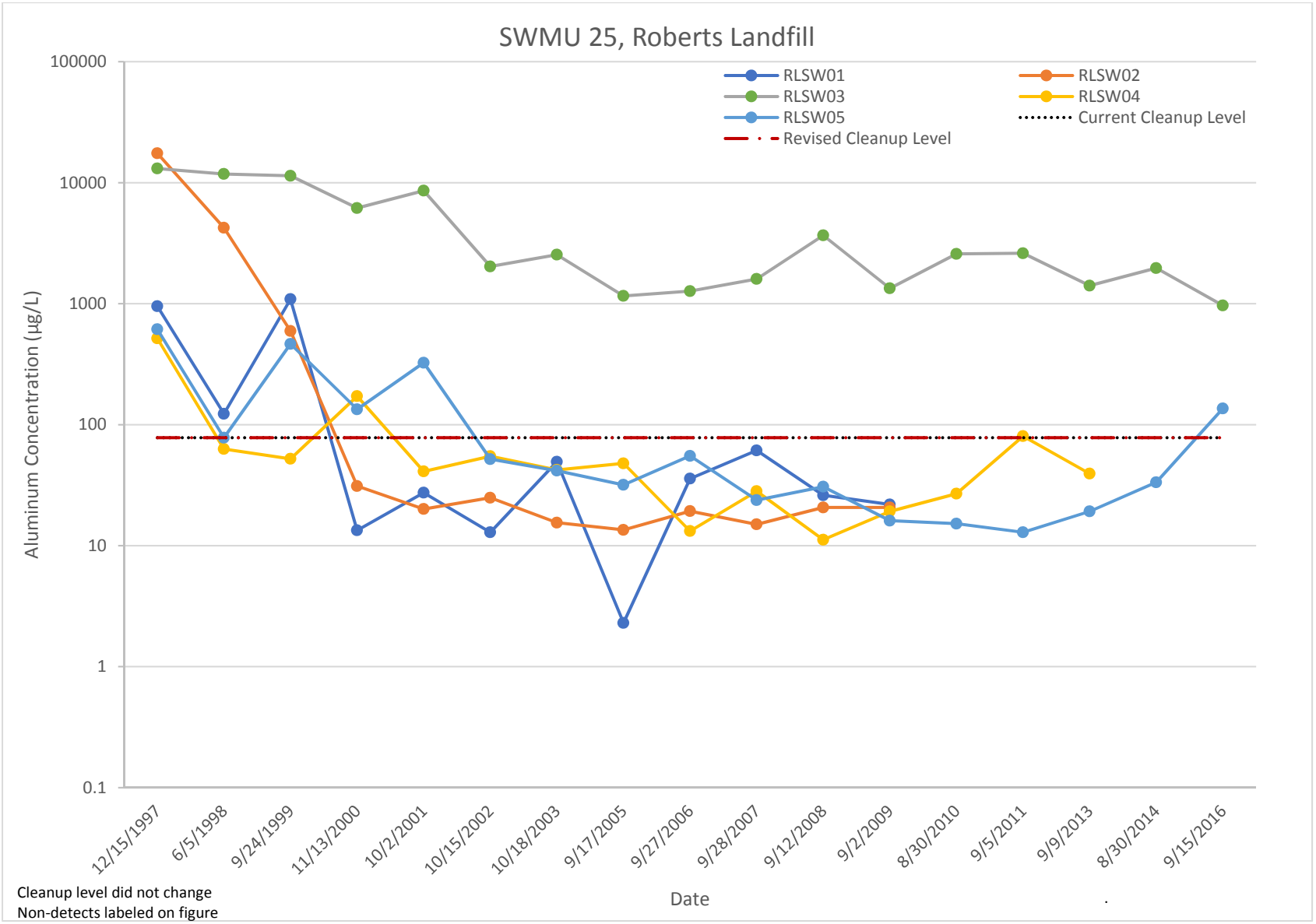
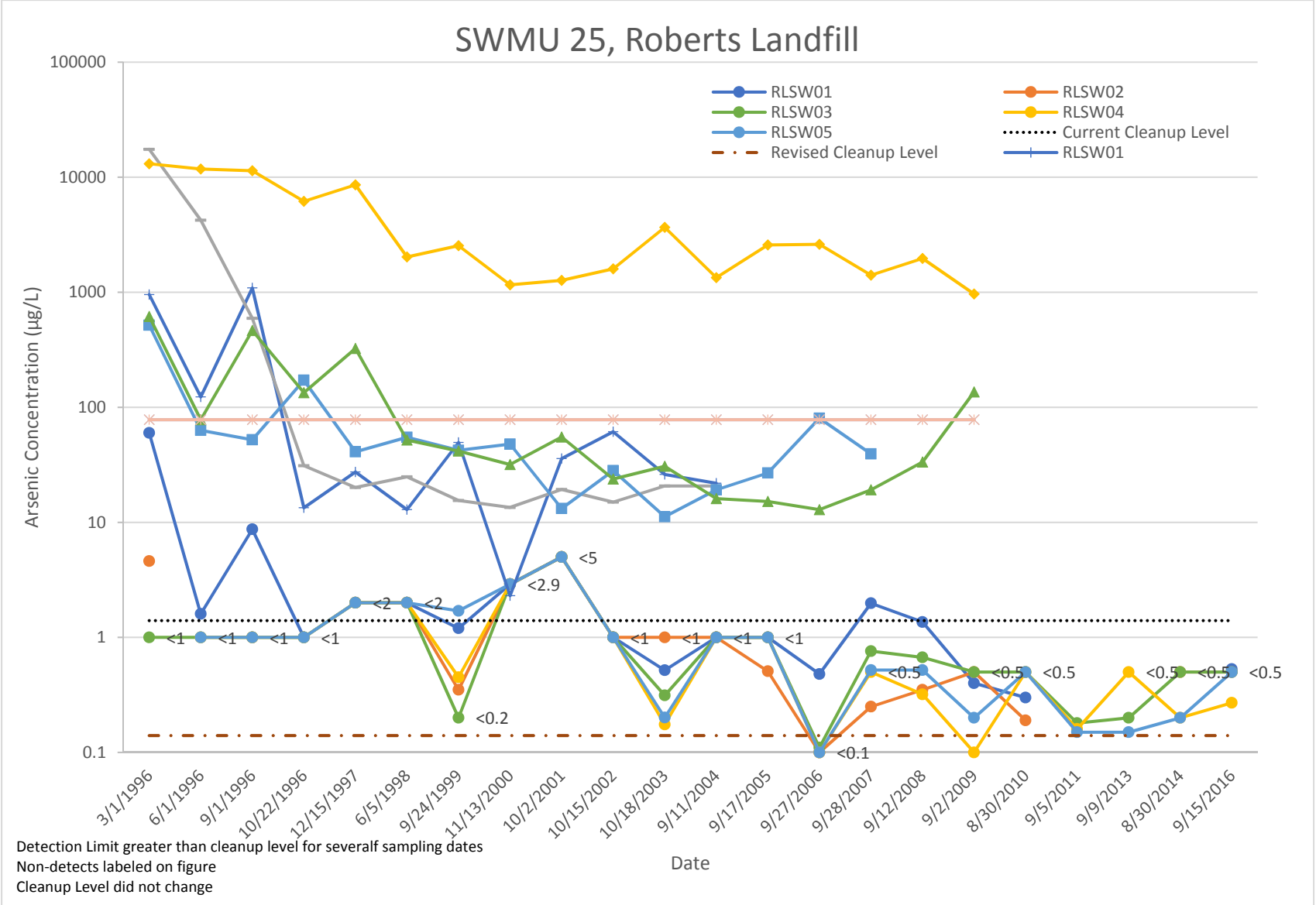
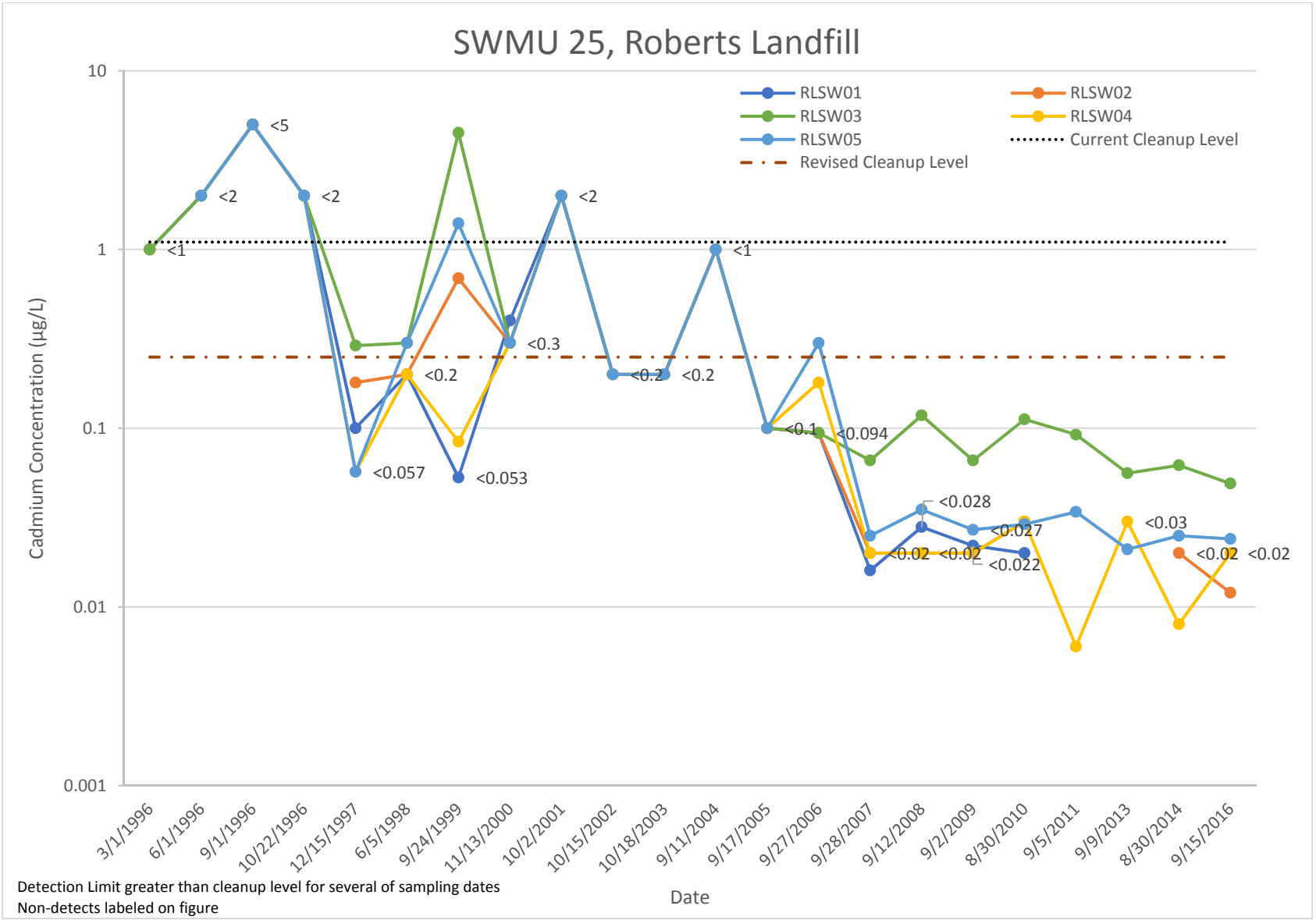


Figure A3-1: Aluminum Concentrations in SW at SWMU 25 from 1997 to 2016



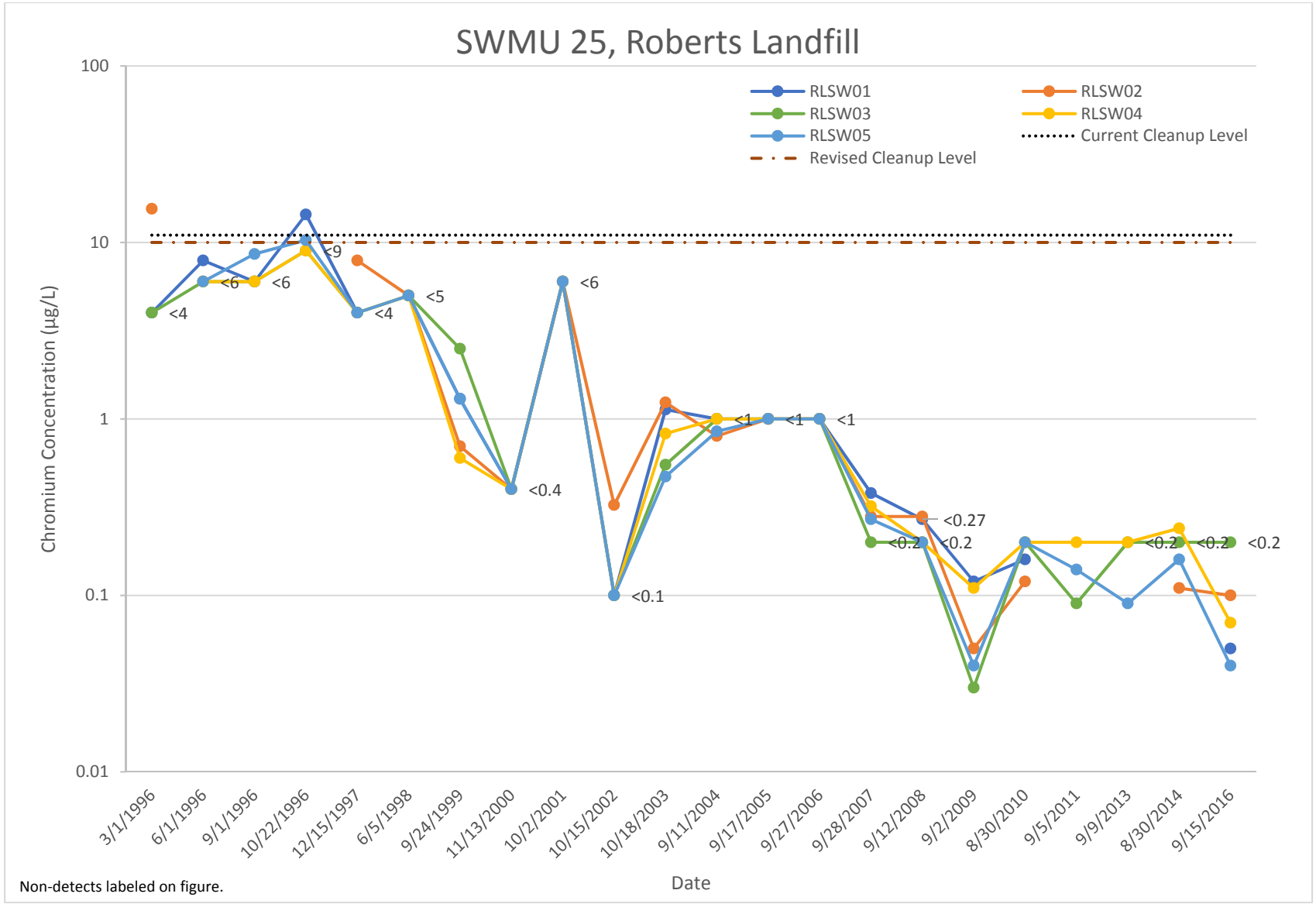
Detection Limit greater than cleanup level for severalf sampling dates
Non-detects labeled on figure
Cleanup Level did not change

Figure A3-2: Arsenic Concentrations in SW at SWMU 25 from 1996 to 2016



Detection Limit greater than cleanup level for several of sampling dates
Non-detects labeled on figure

Figure A3-3: Cadmium Concentrations in SW at SWMU 25 from 1996 to 2016



Non-detects labeled on figure.

Figure A3-4: Chromium Concentrations in SW at SWMU 25 from 1996 to 2016

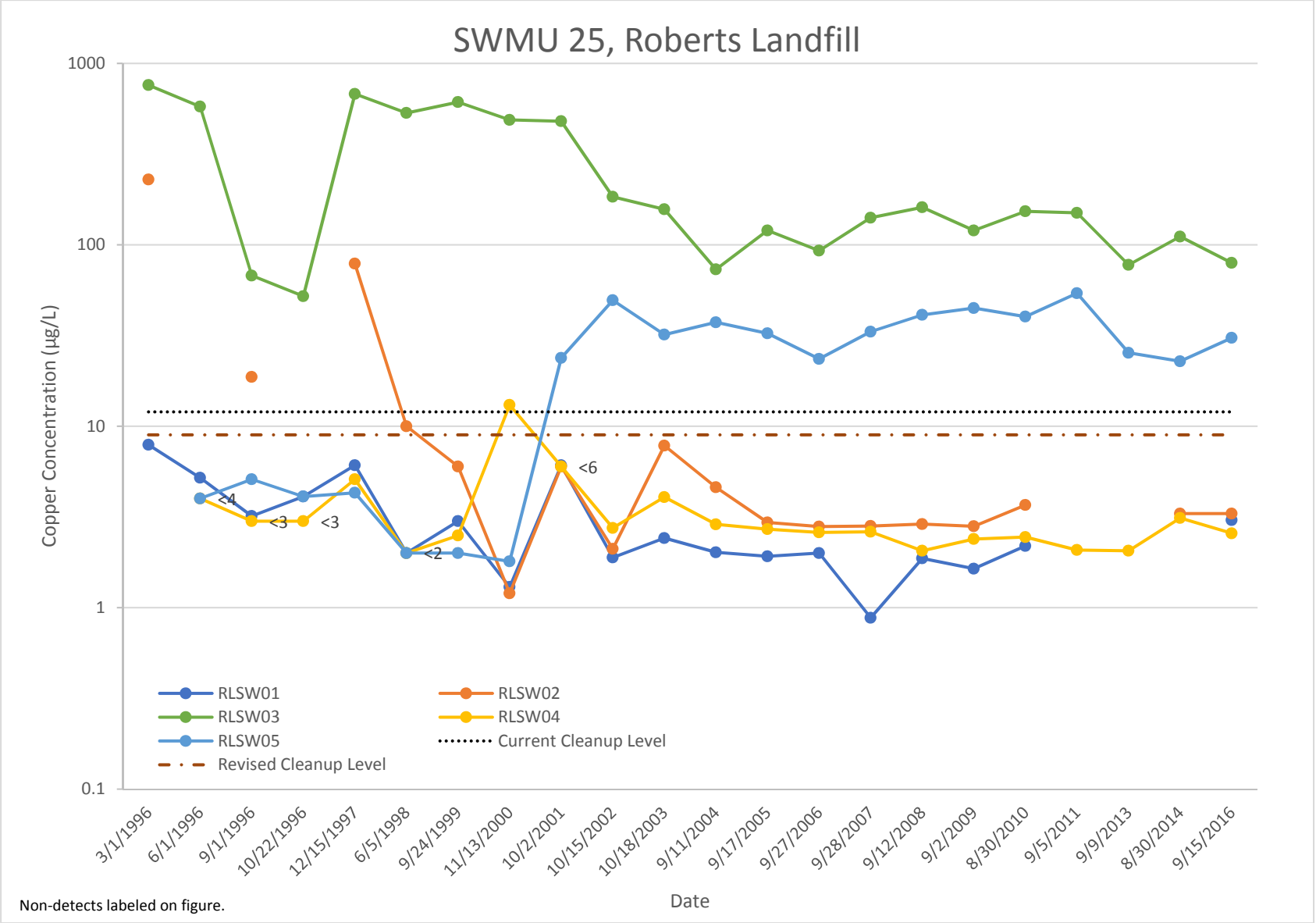
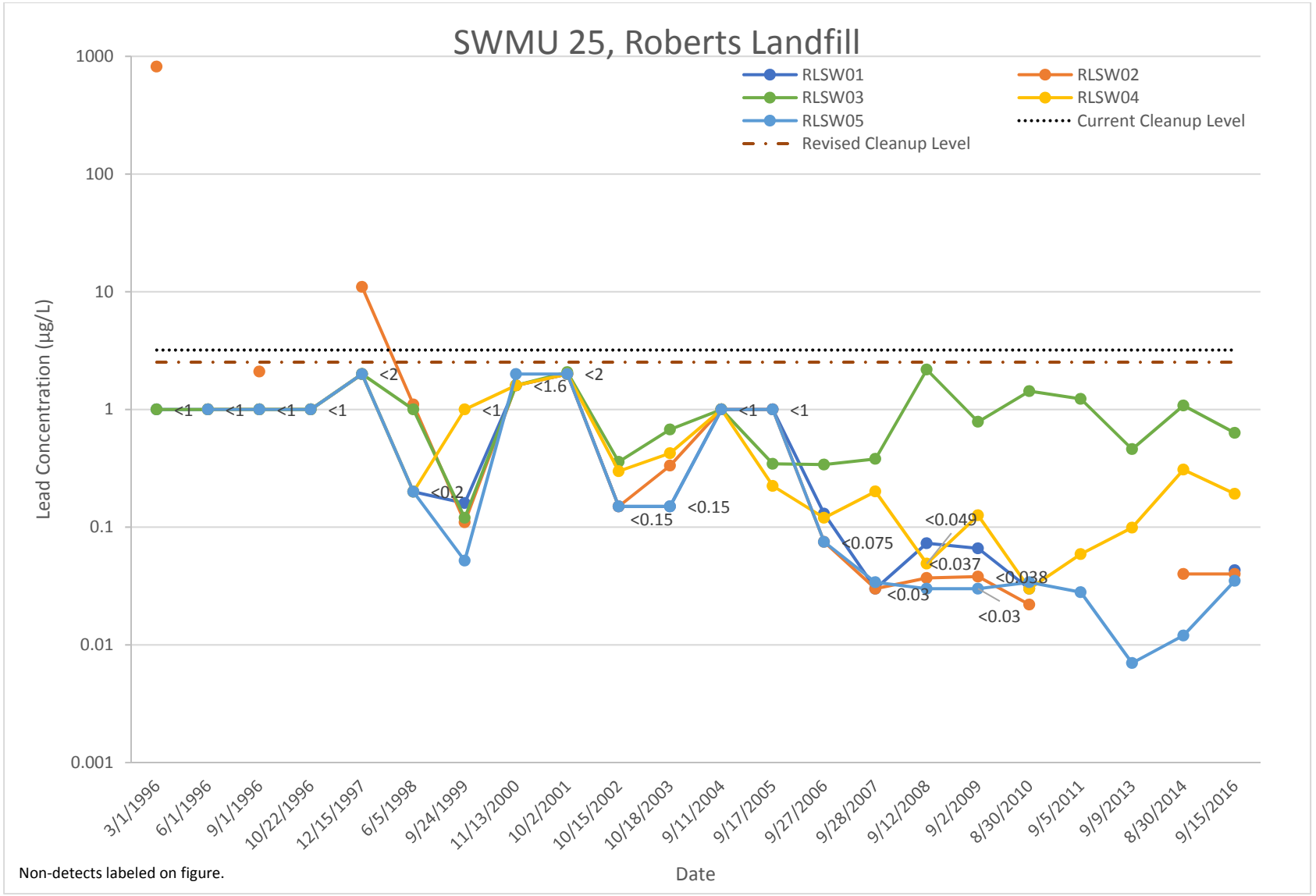
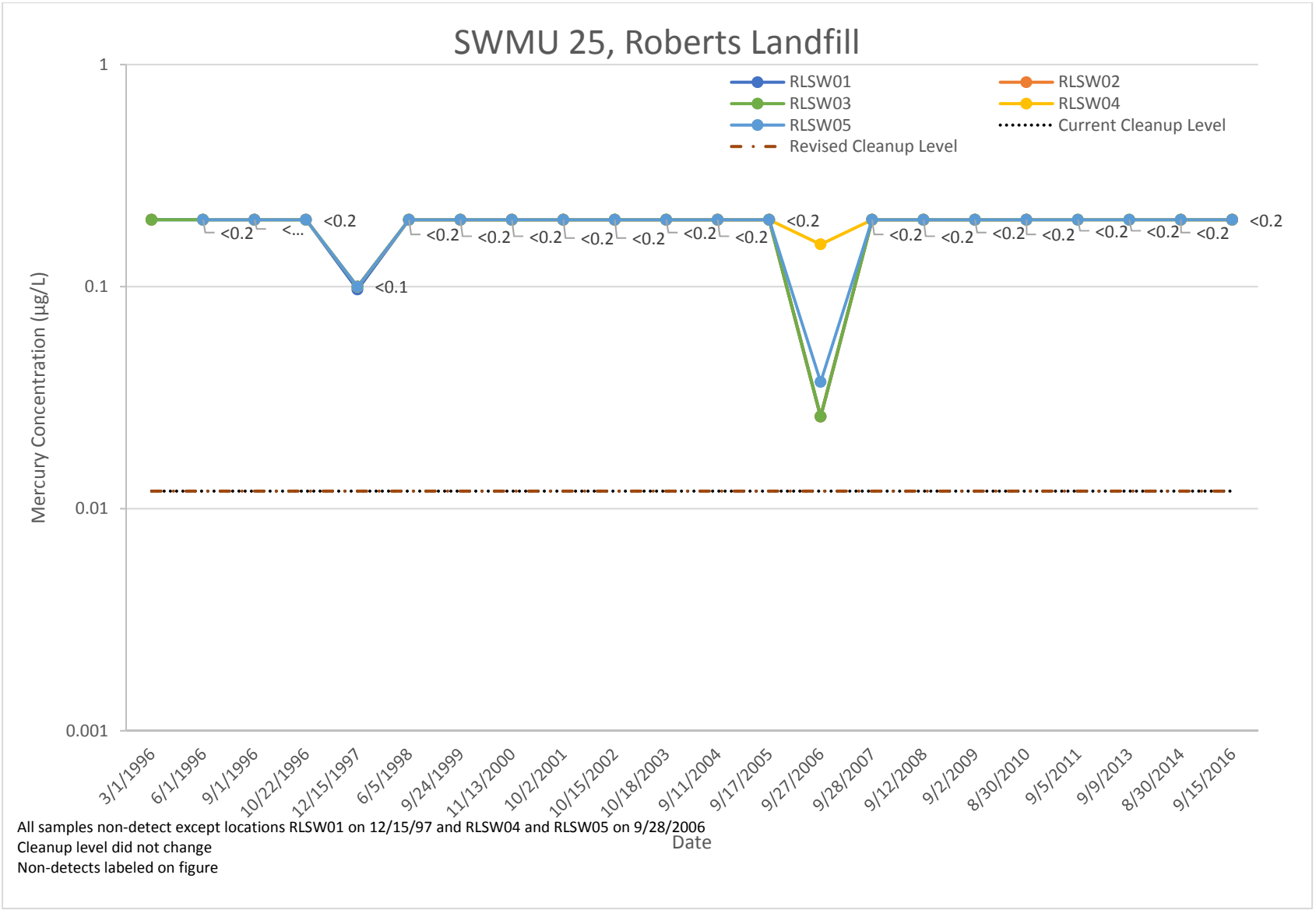


Figure A3-5: Copper Concentrations in SW at SWMU 25 from 1996 to 2016



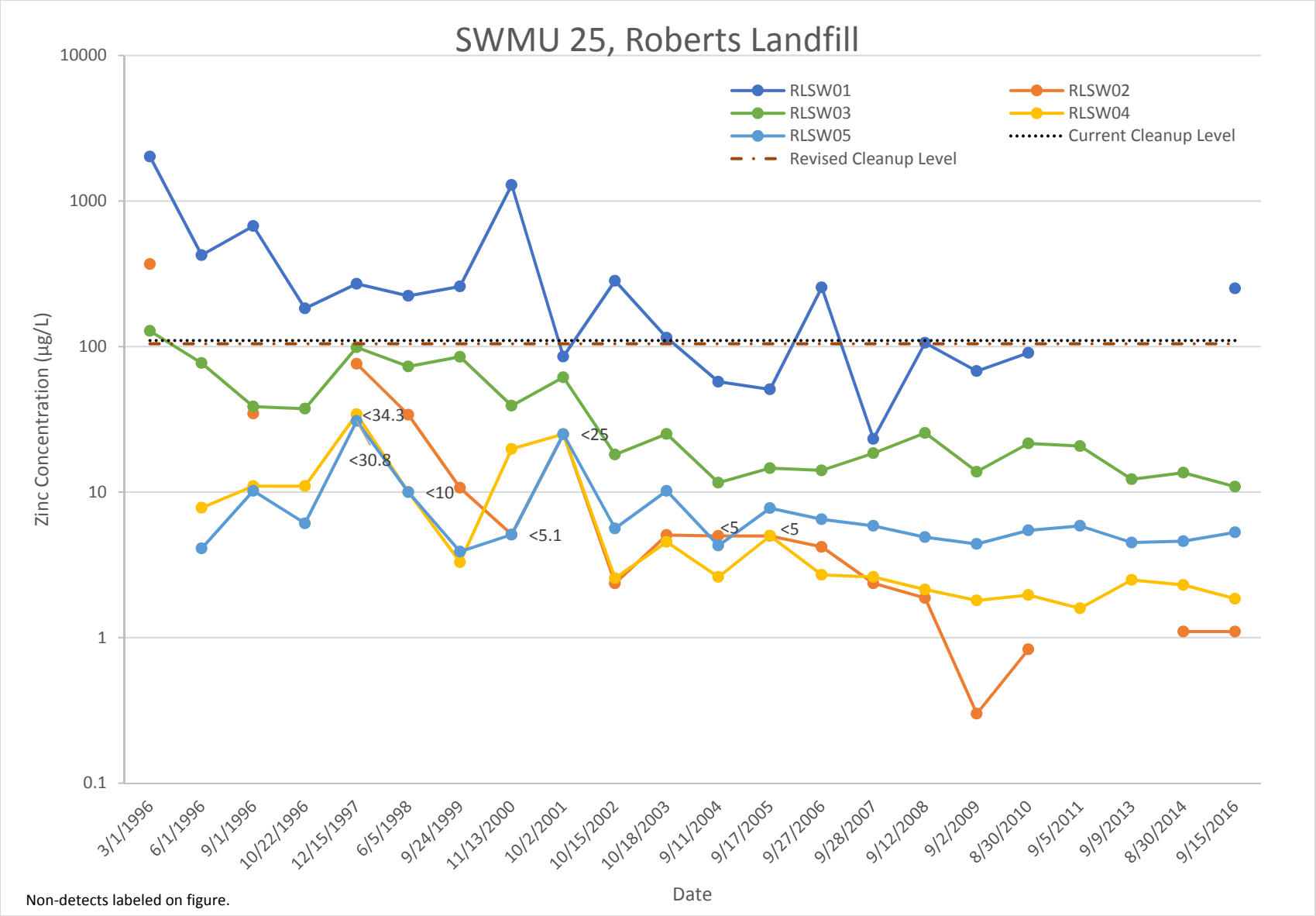
Non-detects labeled on figure.

Figure A3-6: Lead Concentrations in SW at SWMU 25 from 1996 to 2016



All samples non-detect except locations RLSW01 on 12/15/97 and RLSW04 and RLSW05 on 9/28/2006
Cleanup level did not change
Non-detects labeled on figure

Figure A3-7: Mercury Concentrations in SW at SWMU 25 from 1996 to 2016



Non-detects labeled on figure.

Figure A3-8: Zinc Concentrations in SW at SWMU 25 from 1996 to 2016

Appendix B: Metals Data at SWMUs 11, 18/19, and 25

Table B-1: SWMU 11, Palisades Landfill Historical Metals Data

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver[(a)]		Thallium	
		Concentration (µg/L)																			
101-101	5/5/1996	99.1	J	0.7	U	0.1	U	0.42	U	2	U	0.66	U	0.1	U	0.45	J	2.5	U	0.16	U
101-101	8/7/1996	46.4	J	0.7	U	0.22	U	0.43	J	6.2	J	1.6	U	0.1	UJ	0.58	U	3.3	U	0.1	U
101-101	11/7/1996	54.3	J	0.9	U	0.1	U	0.37	U	4.2	U	0.25	U	0.1	UJ	11.5	U	1.8	U	0.1	U
101-101	2/9/1997	331	A	1.3	U	0.22	J	0.6	U	8.4	J	2.8	A	0.1	U	12.5	J	4.1	U	0.1	U
101-101	5/23/1997	252	A	1.3	U	0.1	U	0.34	J	5.9	U	2	A	0.1	UJ	9.3	U	4.1	U	0.1	U
101-101	6/8/1998	116	A	0.88	J	0.047	U	6.4	U	3.3	J	0.019	U	0.1	J	192	A	3	U	0.008	U
101-101	9/19/1999	66.4	J	0.49	J	0.32	J	56.4	N	10.2	A	0.32	J	0.2	U	38.4	A	0.5	U	0.012	U
101-101	11/14/2000	192	J	2.9	U	0.3	U	0.4	U	1.4	J	1.6	U	0.2	U	0.7	U	0.7	U	3.5	U
101-101	10/1/2001	5.32	A	5	U	2	U	2.63	A	6	U	2	U	0.0002	U	2	U	2	U	1	U
101-101	10/8/2002	316	A	0.378	A	0.2	U	1.91	A	1.69	A	0.431	A	0.2	U	1.33	A	0.35	U	0.175	A
101-101	10/5/2003	134	A	0.295	J	0.2	U	1.07	J	1.06	J	0.101	J	0.0002	U	1.01	J	0.368	J	0.066	A
101-101	9/24/2004	-		0.001	U	0.001	U	0.0007	J	0.0053	A	0.0007	J	0.0002	U	0.0037	A	0.001	U	0.001	U
101-101	9/13/2005	-		0.001	U	0.001	U	0.001	U	0.002	U	0.001	U	0.0002	U	0.002	U	0.001	U	0.001	U
101-101	9/19/2006	-		0.27	U	0.094	J	0.12	J	0.67	J	0.075	U	0.018	UJ	50	UJ	0.085	U	0.044	U
101-101	9/12/2008	-		0.61	A	0.023	U	0.35	U	0.4	A	0.03	U	0.2	U	0.71	U	0.03	U	0.02	U
101-102	5/5/1996	65.3	J	0.7	U	0.1	U	0.7	U	2	U	0.64	U	0.1	U	0.43	J	2.5	U	0.1	U
101-102	8/7/1996	27.9	J	0.7	U	0.2	U	0.43	J	4.3	J	1	U	0.1	UJ	0.64	U	3.3	U	0.1	U
101-102	11/7/1996	34.3	J	0.9	U	0.1	U	0.42	U	6.2	U	0.54	U	0.1	UJ	11.5	U	1.8	U	0.1	U
101-102	2/9/1997	335	A	1.3	U	0.13	J	0.58	U	15.9	A	2.1	A	0.1	U	9.3	U	4.1	U	0.1	U
101-102	5/23/1997	258	A	1.3	U	0.1	U	0.38	J	7	J	1.9	J	0.1	UJ	9.3	J	4.1	U	0.1	U
101-102	6/8/1998	27	U	0.89	J	0.047	U	6.4	U	2.1	U	0.019	U	0.1	U	5.6	J	3	U	0.008	U
101-102	9/19/1999	55.1	J	0.63	J	0.64	J	2.3	N	5	A	0.52	J	0.2	U	2.2	U	0.5	U	8.4	A
101-102	11/14/2000	347	A	2.9	U	0.3	U	0.8	J	3.6	J	7	J	0.2	U	0.7	U	0.7	U	3.5	U
101-102	10/1/2001	3.22	A	5	U	2	U	2.4	A	6	U	2	U	0.0002	U	2	A	2	U	1	U
101-102	10/8/2002	16	A	0.199	A	0.2	U	1.25	A	0.665	A	0.326	A	0.2	U	0.986	A	0.35	U	0.25	U
101-102	10/5/2003	25.3	A	0.259	A	0.2	U	0.61	A	1.49	J	0.331	A	0.0002	U	1.16	J	0.466	J	0.25	U

Table B-1: SWMU 11, Palisades Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Nickel		Silver		Thallium	
		Concentration (µg/L)																			
101-102	9/24/2004	-		0.001	U	0.001	U	0.0011	A	0.0048	A	0.0009	J	0.0002	U	0.0008	U	0.001	U	0.001	U
101-102	9/13/2005	-		0.001	U	0.001	U	0.001	U	0.0008	J	0.0003	J	0.0002	U	0.002	UJ	0.001	U	0.001	U
101-102	9/19/2006	-		0.24	U	0.39	J	0.12	U	0.86	J	0.3	J	0.018	UJ	50	A	0.085	UJ	0.044	U
101-102	9/12/2008	-		0.56	A	0.02	U	0.2	U	0.49	A	0.125	A	0.2	U	0.92	U	0.03	U	0.02	U

(a) Exceedances of CMP, Revision 6 values but do not exceed revised cleanup values.

Note: Red font indicates exceedances of current 40 CFR 131.36, 18 AAC 70 values, CWA AWQC, and ADEC Solid Waste regulations.

- Not analyzed.

Qualifiers:

A - Acceptable

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U - The analyte was analyzed for, but not detected above the reported sample quantitation limit.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table B-2: SWMUs 18/19, White Alice Landfill Historical Metals Data

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Mercury	
		Concentration (µg/L)											
WASW01	6/1/1996	-		1	U	2	U	6	U	4	U	0.2	U
WASW01	9/1/1996	-		1	U	5	U	6	U	3	U	0.2	U
WASW01	10/22/1996	-		1	U	2	U	10.1	A	3	U	0.2	U
WASW01	12/11/1997	104	U	2	U	0.057	UJ	4	UJ	4	UJ	0.1	J
WASW01	6/13/1998	50	U	2	U	0.2	U	5	U	2	U	0.5	U
WASW01	9/20/1999	375	A	0.36	J	0.053	U	2	N	1	J	0.2	U
WASW01	11/16/2000	80.6	U	2.9	U	0.3	U	0.4	J	1.1	U	0.2	U
WASW01	9/25/2001	200	U	5	U	2	U	6	U	6	U	0.2	U
WASW01	10/8/2002	336	A	1.08	A	0.2	U	1.33	A	1.68	A	0.2	U
WASW01	10/11/2003	169	A	1	U	0.2	U	0.471	A	0.5	U	0.2	U
WASW01	9/22/2004	-		1	U	1	U	1.37	A	1.3	J	0.2	U
WASW01	9/28/2006	-		0.29	J	0.57	A	1	U	0.52	U	0.111	J
WASW01	9/17/2008	6.8	A	0.84	A	0.02	U	0.2	U	1.23	A	0.2	U
WASW01	9/1/2010	-		0.5		0.03		0.2	U	0.2	U	0.2	U
WASW01	8/29/2014	-		0.3	J	0.02	U	0.2	U	0.3	=	0.2	U
WASW02	3/1/1996	-		1.7	J	1	U	4	U	2	U	0.2	U
WASW02	6/1/1996	-		1	U	2	U	6	U	4	U	0.2	U
WASW02	9/1/1996	-		1	U	5	U	6	U	3	U	0.2	U
WASW02	10/22/1996	-		1	U	2	U	9	U	3	U	0.2	U
WASW02	12/12/1997	299	A	2	U	0.057	UJ	4	UJ	4	UJ	0.1	U
WASW02	6/13/1998	50	U	2	U	0.2	U	5	U	2	U	0.5	U
WASW02	9/20/1999	239	A	0.37	J	1.7	A	1	N	0.7	U	0.2	U
WASW02	11/16/2000	80.6	U	2.9	U	0.3	U	0.4	J	1.1	U	0.2	U
WASW02	9/25/2001	200	U	5	U	2	U	6	U	6	U	0.2	U
WASW02	10/8/2002	34.9	A	1	U	0.2	U	1.52	A	0.923	A	0.2	U
WASW02	10/11/2003	50	A	1	U	0.2	U	0.452	A	1.06	A	0.2	U

Table B-2: SWMUs 18/19, White Alice Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Mercury	
		Concentration (µg/L)											
WASW02	9/22/2004	-		1	UJ	1	U	1	U	2	U	0.2	U
WASW02	9/28/2006	-		0.44	J	0.37	A	1	U	0.52	U	0.018	J
WASW02	9/17/2008	3.2	A	0.75	A	0.02	U	0.2	U	0.1	U	0.2	U
WASW02	9/1/2010	-		0.62		0.03	U	0.2	U	0.15	U	0.2	U
WASW02	8/29/2014	-		0.4	J	0.02	U	0.18	J	0.12	=	0.2	U
WASW03	6/1/1996	-		1	U	2	U	7.8	J	4	U	0.2	U
WASW03	9/1/1996	-		1	U	5	U	6	U	3	U	0.2	U
WASW03	10/22/1996	-		1	U	2	U	9	U	3.4	J	0.2	U
WASW03	12/11/1997	3710	A	2	U	0.057	UJ	4	UJ	9	J	0.1	U
WASW03	6/13/1998	137	A	2	U	0.2	U	5	U	2	U	0.5	U
WASW03	9/20/1999	120	A	0.2	U	0.053	U	2.7	N	2.2	J	0.2	U
WASW03	11/15/2000	732	A	2.9	U	0.3	U	0.4	U	2.3	J	0.2	U
WASW03	9/25/2001	200	U	5	U	2	U	6	U	6	U	0.2	U
WASW03	10/8/2002	80.9	A	1	U	0.2	U	1.05	A	0.992	A	0.2	U
WASW03	10/11/2003	323	A	1	U	0.2	U	0.208	A	9.48	J	0.2	U
WASW03	9/22/2004	-		1	U	1	U	1	U	5.29	A	0.2	U
WASW03	9/28/2006	-		0.13	J	0.094	U	1	U	2.1	A	0.165	J
WASW03	9/17/2008	25.8	A	0.41	J	0.02	U	0.2	U	1.07	A	0.2	U
WASW03	9/1/2010	-		0.5		0.03	U	0.2	U	1.25		0.2	U
WASW03	8/29/2014	-		0.2	J	0.007	J	0.14	J	2.13	=	0.2	U

Note: Red font indicates exceedances of current 40 CFR 131.36, 18 AAC 70 values, CWA AWQC, and ADEC Solid Waste regulations.

- Not analyzed.

Qualifiers:

A -Acceptable

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

U - The analyte was analyzed for, but not detected above the reported sample quantitation limit.

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Zinc	
		Concentration (µg/L)															
NL-11	8/31/2010	6.9		-		-		-		32.4		-		-		-	
NL-11	9/5/2011	16.3	A	0.18	J	0.05	A	0.2	U	48.5	A	0.014	J	0.2	U	10.6	A
NL-11	9/10/2013	21.3	A	0.17	J	0.046	A	0.2	U	31.4	J	0.007	J	0.2	U	11.46	A
NL-11	8/30/2014	77.6	=	0.2	J	0.045	=	0.2	U	80.2	=	0.044	=	0.2	U	10.6	=
NL-11	9/15/2016	16.9		0.5	UJ	0.028		0.03	J	37.3		0.019	J	0.2	U	7.11	
NL-12	8/31/2010	9.2		-		-		-		2.53		-		-		-	
NL-12	9/5/2011	43.1	A	0.18	J	0.011	J	0.14	J	7.69	A	0.08	A	0.2	U	2.32	A
NL-12	9/10/2013	38	A	0.16	J	0.03	U	0.2	U	2.02	A	0.073	A	0.2	U	3.95	A
NL-12	9/5/2014	36.9	=	0.1	J	0.02	=	0.22	=	3.44	=	0.116	=	0.2	U	2.9	=
NL-12	9/15/2016	354		0.13	J	0.023		0.38		9.26		0.851		0.2	U	7.75	
NL-13	8/31/2010	3.5		0.5		0.05		0.2		7.84		0.014		0.2	U	10.1	
NL-14	9/6/2011	32	A	0.46	J	0.064	A	0.2	U	12.2	A	0.015	J	0.2	U	13.6	A
NL-14	9/9/2013	180	A	0.62	A	0.14	A	0.2	J	17.5	J	0.272	A	0.2	U	41.9	A
NL-14	9/5/2014	21200	=	0.3	J	6.11	=	1.16	=	2590	=	0.481	=	0.2	U	1370	=
NL-14	9/15/2016	38.6		0.18	J	0.097		0.05	J	5.68		0.051		0.2	U	18.2	
RLSW01	3/1/1996	-		59.9	A	1	U	4	U	7.9	J	1	U	0.2	U	2020	A
RLSW01	6/1/1996	-		1.6	J	2	U	7.9	J	5.2	J	1	U	0.2	U	425	A
RLSW01	9/1/1996	-		8.7	J	5	U	6	U	3.2	J	1	U	0.2	U	673	A
RLSW01	10/22/1996	-		1	U	2	U	14.4	A	4.1	J	1	U	0.2	U	183	A
RLSW01	12/15/1997	954	A	2	U	0.1	J	4	UJ	6.1	J	2	U	0.097	J	270	A
RLSW01	6/5/1998	-		2	U	0.2	U	5	U	2	A	0.2	U	0.2	U	223	A
RLSW01	9/24/1999	123	A	1.2	J	0.053	U	1.3	J	3	J	0.16	J	0.2	U	259	A
RLSW01	11/15/2000	-		2.9	U	0.4	J	0.4	U	1.3	J	1.6	U	0.2	U	1290	A
RLSW01	10/2/2001	1090	A	5	U	2	U	6	U	6.1	A	2	U	0.2	U	85.4	A
RLSW01	10/15/2002	13.4	A	1	U	0.2	U	0.1	U	1.89	A	0.15	U	0.2	U	283	A
RLSW01	10/22/2003	27.4	A	0.518	A	0.2	U	1.13	A	2.42	A	0.15	U	0.2	U	115	A

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Zinc	
		Concentration (µg/L)															
RLSW01	9/11/2004	-		1	U	1	U	1	U	2.02	A	1	U	0.2	U	57.3	A
RLSW01	9/17/2005	12.9	J	1	U	0.1	U	1	U	1.92	J	1	U	0.2	U	50.8	A
RLSW01	9/27/2006	49.4	J	0.48	J	0.094	U	1	U	2	J	0.13	J	0.026	UJ	255	J
RLSW01	9/28/2007	2.3	A	1.98	A	0.016	J	0.38	J	0.88	J	0.03	U	0.2	U	23.2	A
RLSW01	9/12/2008	35.8	A	1.36	A	0.028	U	0.27	U	1.87	A	0.073	A	0.2	U	106	A
RLSW01	9/2/2009	61.3	A	0.4	J	0.022	U	0.12	J	1.64	A	0.066	A	0.2	U	67.8	A
RLSW01	9/14/2010	26.1		0.3		0.02		0.16		2.19		0.03		0.2	U	90.5	
RLSW01	9/15/2016	21.9		0.53	J	0.132		0.05	J	3.04		0.043		0.2	U	251	
RLSW02	3/1/1996	-		4.6	J	1	U	15.5	A	229	A	818	A	0.2	U	369	A
RLSW02	9/1/1996	-		1	U	5	U	6	U	18.7	J	2.1	J	0.2	U	34.7	A
RLSW02	12/15/1997	17500	A	2	U	0.18	J	7.9	J	78.8	A	11	A	0.1	U	76.2	A
RLSW02	6/5/1998	4240	A	2	U	0.2	A	5	A	10	A	1.1	A	0.2	U	34	A
RLSW02	9/24/1999	595	A	0.35	J	0.69	J	0.7	J	6	A	0.11	J	0.2	U	10.7	A
RLSW02	11/13/2000	-		2.9	U	0.3	U	0.4	U	1.2	J	1.6	U	0.2	U	5.1	U
RLSW02	10/2/2001	-		5	U	2	U	6	U	6	U	2	U	0.2	U	25	U
RLSW02	10/15/2002	31.1	A	1	U	0.2	U	0.325	A	2.11	A	0.15	U	0.2	U	2.36	A
RLSW02	10/18/2003	20.1	A	1	U	0.2	U	1.24	A	7.82	A	0.333	A	0.2	U	5.07	A
RLSW02	9/11/2004	-		1	U	1	U	0.8	J	4.61	A	1	U	0.2	U	5	U
RLSW02	9/17/2005	24.9	J	0.508	J	0.1	U	1	U	2.95	A	1	U	0.2	U	5	U
RLSW02	9/27/2006	-		0.1	U	0.094	U	1	U	2.8	A	0.075	U	0.026	UJ	4.2	J
RLSW02	9/28/2007	15.5	A	0.25	J	0.02	UJ	0.28	J	2.82	J	0.03	U	0.2	U	2.36	J
RLSW02	9/12/2008	13.5	A	0.35	J	0.02	U	0.28	U	2.89	A	0.037	U	0.2	U	1.87	A
RLSW02	9/2/2009	19.3	A	0.5	U	0.02	U	0.05	J	2.81	A	0.038	U	0.2	U	0.3	J
RLSW02	9/7/2010	15		0.19		0.03		0.12		3.68		0.022		0.2	U	0.83	
RLSW02	9/2/2014	20.7	=	0.5	U	0.02	U	0.11	J	3.3	=	0.04	=	0.2	U	1.1	=
RLSW02	9/15/2016	20.7		0.5	U	0.012	J	0.1	J	3.3		0.04		0.2	U	1.1	
RLSW03	3/1/1996	-		1	U	1	U	4	U	759	A	1	U	0.2	U	128	A

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Zinc	
		Concentration (µg/L)															
RLSW03	6/1/1996	-		1	U	2	U	6	U	578	A	1	U	0.2	U	77	A
RLSW03	9/1/1996	-		1	U	5	U	6	U	67.7	A	1	U	0.2	U	38.7	A
RLSW03	10/22/1996	-		1	U	2	U	9	U	52.1	A	1	U	0.2	U	37.4	A
RLSW03	12/15/1997	13100	A	2	U	0.29	J	4	UJ	679	A	2	U	0.1	U	98.8	A
RLSW03	6/5/1998	11800	A	2	U	0.3	A	5	U	533	A	1	A	0.2	U	73	A
RLSW03	9/24/1999	11400	A	0.2	U	4.5	A	2.5	J	612	A	0.12	J	0.2	U	85	A
RLSW03	11/13/2000	6170	A	2.9	U	0.3	U	0.4	U	488	A	1.6	U	0.2	U	39.2	A
RLSW03	10/2/2001	8590	A	5	U	2	U	6	U	480	A	2.07	A	0.2	U	61.5	A
RLSW03	10/15/2002	2030	A	1	U	0.2	U	0.1	U	184	A	0.359	A	0.2	U	18.1	A
RLSW03	10/18/2003	2540	A	0.313	A	0.2	U	0.55	A	157	A	0.676	A	0.2	U	25.1	A
RLSW03	9/11/2004	-		1	U	1	U	1	U	73.2	A	1	U	0.2	U	11.6	A
RLSW03	9/17/2005	1160	A	1	U	0.1	U	1	U	120	A	0.345	J	0.2	U	14.6	A
RLSW03	9/27/2006	1270	A	0.11	J	0.094	U	1	U	92.9	A	0.34	J	0.026	UJ	14.1	J
RLSW03	9/28/2007	1600	A	0.76	A	0.066	A	0.2	U	141	J	0.38	A	0.2	U	18.5	A
RLSW03	9/12/2008	3670	A	0.67	A	0.118	A	0.2	U	161	J	2.18	A	0.2	U	25.5	A
RLSW03	9/2/2009	1340	A	0.5	U	0.066	A	0.03	J	120	A	0.785	A	0.2	U	13.8	A
RLSW03	8/30/2010	2580		0.5		0.112		0.2		153		1.43		0.2	U	21.6	
RLSW03	9/5/2011	2610	A	0.18	J	0.092	A	0.09	J	150	A	1.23	A	0.2	U	20.7	A
RLSW03	9/9/2013	1410	A	0.2	J	0.056	A	0.2	U	77.5	A	0.46	A	0.2	U	12.25	A
RLSW03	8/30/2014	1970	=	0.5	U	0.062	=	0.2	U	111	=	1.08	=	0.2	U	13.6	=
RLSW03	9/15/2016	967		0.5	UJ	0.049		0.2	U	79.5		0.633		0.2	U	10.9	
RLSW04	6/1/1996	-		1	U	2	U	6	U	4	U	1	U	0.2	U	7.8	J
RLSW04	9/1/1996	-		1	U	5	U	6	U	3	U	1	U	0.2	U	11	J
RLSW04	10/22/1996	-		1	U	2	U	9	U	3	U	1	U	0.2	U	11	J
RLSW04	12/15/1997	517	A	2	U	0.057	UJ	4	UJ	5.1	J	2	U	0.1	U	34.3	U
RLSW04	6/5/1998	63	A	2	U	0.2	U	5	U	2	U	0.2	U	0.2	U	10	U
RLSW04	9/24/1999	52.2	J	0.45	J	0.084	J	0.6	U	2.5	J	1	J	0.2	U	3.3	J

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Zinc	
		Concentration (µg/L)															
RLSW04	11/13/2000	172	J	2.9	U	0.3	U	0.4	U	13.1	J	1.6	J	0.2	U	19.8	J
RLSW04	10/2/2001	-		5	U	2	U	6	U	6	U	2	U	0.2	U	25	U
RLSW04	10/15/2002	41.1	A	1	U	0.2	U	0.1	U	2.75	A	0.299	A	0.2	U	2.56	A
RLSW04	10/18/2003	54.9	A	0.175	A	0.2	U	0.825	A	4.07	A	0.425	A	0.2	U	4.55	A
RLSW04	9/11/2004	-		1	U	1	U	1	U	2.88	A	1	UJ	0.2	U	2.61	J
RLSW04	9/17/2005	42.3	J	1	U	0.1	U	1	U	2.71	A	0.224	J	0.2	U	5	U
RLSW04	9/28/2006	-		0.1	U	0.18	A	1	U	2.6	A	0.12	J	0.155	J	2.7	J
RLSW04	9/27/2007	47.9	A	0.5	U	0.02	UJ	0.32	J	2.62	A	0.201	A	0.2	U	2.61	A
RLSW04	9/12/2008	13.2	A	0.32	J	0.02	U	0.2	U	2.06	J	0.049	U	0.2	U	2.14	A
RLSW04	9/2/2009	28.2	A	0.1	J	0.02	U	0.11	J	2.39	A	0.126	A	0.2	U	1.8	A
RLSW04	8/31/2010	11.2		0.5		0.03		0.2		2.45		0.03		0.2	U	1.96	
RLSW04	9/5/2011	19.2	A	0.16	J	0.006	J	0.2	A	2.08	A	0.059	A	0.2	U	1.59	A
RLSW04	9/9/2013	26.9	A	0.5	U	0.03	U	0.2	U	2.06	A	0.099	A	0.2	U	2.49	A
RLSW04	8/30/2014	80.4	=	0.2	J	0.008	J	0.24	=	3.12	=	0.308	=	0.2	U	2.3	=
RLSW04	9/15/2016	39.4		0.27		0.02	U	0.07	J	2.57		0.192		0.2	U	1.85	
RLSW05	6/1/1996	-		1	U	2	U	6	U	4	U	1	U	0.2	U	4.1	J
RLSW05	9/1/1996	-		1	U	5	U	8.6	J	5.1	J	1	U	0.2	U	10.2	J
RLSW05	10/22/1996	-		1	U	2	U	10.3	A	4.1	J	1	U	0.2	U	6.1	J
RLSW05	12/15/1997	615	A	2	U	0.057	UJ	4	UJ	4.3	J	2	U	0.1	U	30.8	U
RLSW05	6/5/1998	78	A	2	U	0.3	A	5	U	2	U	0.2	U	0.2	U	10	U
RLSW05	9/24/1999	465	A	1.7	J	1.4	J	1.3	J	2	J	0.052	J	0.2	U	3.9	J
RLSW05	11/13/2000	134	J	2.9	U	0.3	U	0.4	U	1.8	J	2	J	0.2	U	5.1	U
RLSW05	10/2/2001	325	A	5	U	2	U	6	U	23.8	A	2	U	0.2	U	25	U
RLSW05	10/15/2002	51.9	A	1	U	0.2	U	0.1	U	49.5	A	0.15	U	0.2	U	5.63	A
RLSW05	10/18/2003	41.7	A	0.201	A	0.2	U	0.471	A	32	A	0.15	U	0.2	U	10.2	A
RLSW05	9/11/2004	-		1	UJ	1	U	0.85	J	37.4	A	1	U	0.2	U	4.29	J
RLSW05	9/17/2005	31.8	J	1	U	0.1	U	1	U	32.5	A	1	U	0.2	U	7.76	J

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data (continued)

Location ID	Collection Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Lead		Mercury		Zinc	
		Concentration (µg/L)															
RLSW05	9/28/2006	-		0.1	U	0.3	A	1	U	23.5	A	0.075	U	0.0372	J	6.5	A
RLSW05	9/27/2007	55.2	A	0.52	A	0.025	J	0.27	J	33.2	A	0.034	A	0.2	U	5.86	A
RLSW05	9/12/2008	23.8	A	0.52	A	0.035	A	0.2	U	41.1	J	0.03	U	0.2	U	4.9	A
RLSW05	9/2/2009	30.7	A	0.2	J	0.027	U	0.04	J	44.8	A	0.03	U	0.2	U	4.4	A
RLSW05	8/31/2010	16.1		0.5		0.029		0.2		40.2		0.034		0.2	U	5.46	
RLSW05	9/5/2011	15.2	A	0.15	J	0.034	A	0.14	J	54.1	A	0.028	J	0.2	U	5.86	A
RLSW05	9/9/2013	12.9	A	0.15	J	0.021	J	0.09	J	25.4	A	0.007	J	0.2	U	4.5	A
RLSW05	8/30/2014	19.2	=	0.2	J	0.025	=	0.16	J	22.8	=	0.012	J	0.2	U	4.6	=
RLSW05	9/15/2016	33.4		0.5	UJ	0.024		0.04	J	30.7		0.035		0.2	U	5.29	
RLSW06	9/12/2009	136	A	-		-		-		112	A	-		-		-	
RV-008	10/20/1993	98.4	J	2	U	5	U	10	U	6.1	J	2	U	0.2	U	10.3	J
RV-009	10/19/1993	134	J	2	U	5	U	10	U	7.6	J	2	U	0.2	U	13.1	J
RV-010	10/20/1993	1460	A	2	U	5	U	10	U	205	A	2	U	0.2	U	39.1	A
SP-001	10/20/1993	2390	A	2	U	5	U	10	U	88.5	A	3.2	A	0.2	U	17.5	J
SP-002	10/20/1993	1250	A	2	U	5	U	10	U	152	A	2	U	0.2	U	18.4	J
SP-003	10/20/1993	160	J	2	U	5	U	10	U	170	A	2	U	0.2	U	44.4	A
SP-004	10/20/1993	9540	A	2	U	5	U	10	U	522	A	2	U	0.2	U	57.1	A
SP-005	10/20/1993	156	J	2	U	5	U	10	U	9	J	2	U	0.2	U	19	J
SP-006	10/20/1993	74.2	J	2	U	5	U	10	U	6.7	J	2	U	0.2	U	11.8	J
SP-007	10/20/1993	1890	A	2	U	5	U	10	U	167	A	2	U	0.2	U	79.3	A

Note: Red font indicates exceedances of current 40 CFR 131.36, 18 AAC 70 values, CWA AWQC, and ADEC Solid Waste regulations.

- Not analyzed.

Qualifiers:

A - Acceptable

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U - The analyte was analyzed for, but not detected above the reported sample quantitation limit.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Table B-3: SWMU 25, Roberts Landfill Historical Metals Data (continued)

= - indicate positive concentrations that have not been assigned any qualifiers by the laboratory or during the validation process

Appendix C-1: Mean PCB Concentrations in Rock Sole and Blue Mussels in Sweeper Cove and Kuluk Bay

Table C1-1: Mean PCB Concentrations in Rock Sole in Sweeper Cove and Kuluk Bay

Location	Species	Collection Year	Mean PCB Concentration (µg/kg)
Sweeper Cove	Rock Sole	1996	186
		1999	52.9
		2000	56.2
		2001	62
		2002	87.5
		2003	96
		2005	19.5
		2007	59.1
		2009	44.5
		2011	69.9
		2013	51.6
		2015	53.5
Kuluk Bay	Rock Sole	1996	32.4
		1999	10.6
		2000	5.01
		2001	7.75
		2002	4.94
		2003	13.5
		2005	7.69
		2007	12.1
		2009	6.4
		2011	12.9
		2013	1.73
		2015	4.96

Red font indicates exceedance of the updated RBAL for Rock Sole.

Table C1-2: Mean PCB Concentrations in Blue Mussels in Sweeper Cove and Kuluk Bay

Location	Species	Collection Year	Mean PCB Concentration (µg/kg)
Sweeper Cove	Blue Mussels	1996	34.3
		1999	43.5
		2000	60.9
		2001	24.4
		2002	25.7
		2003	33.3
		2005	133
		2007	47.9
		2009	42.5
		2011	54.1
		2013	32.3
		2015	19.3
Kuluk Bay	Blue Mussels	1996	16.5
		1999	4.07
		2000	4.31
		2001	16.5
		2002	8.1
		2003	12.4
		2005	32
		2007	15
		2009	18.1
		2011	18.3
		2013	9.97
		2015	7.08

Red font indicates exceedance of the updated RBAL for Blue Mussels.

Appendix C-2: PCB Concentrations in Rock Sole and Blue Mussels over Time in Sweeper Cove and Kuluk Bay

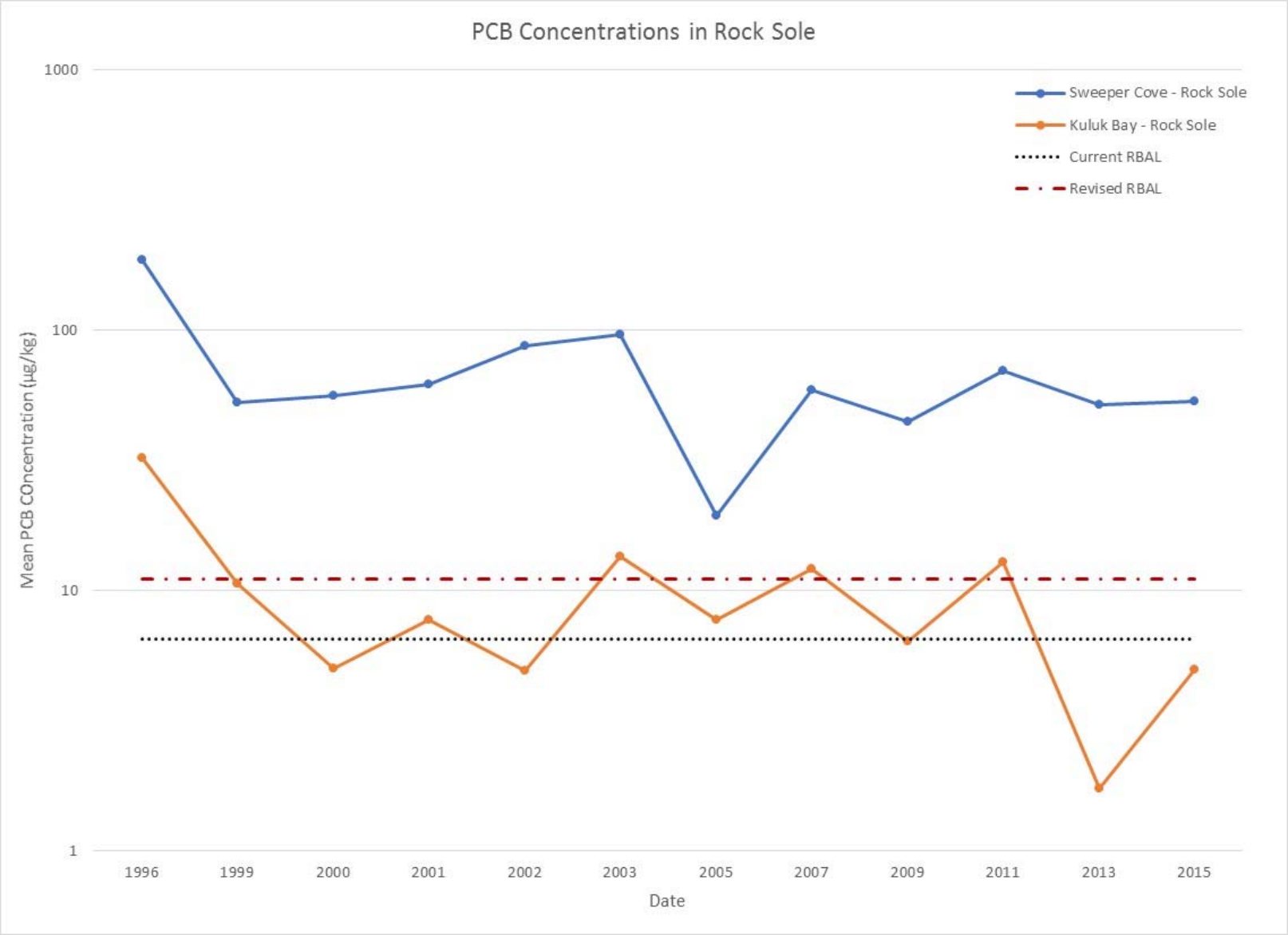


Figure C2-1. Mean PCB Concentrations in Rock Sole in Sweeper Cove and Kuluk Bay from 1996 to 2015

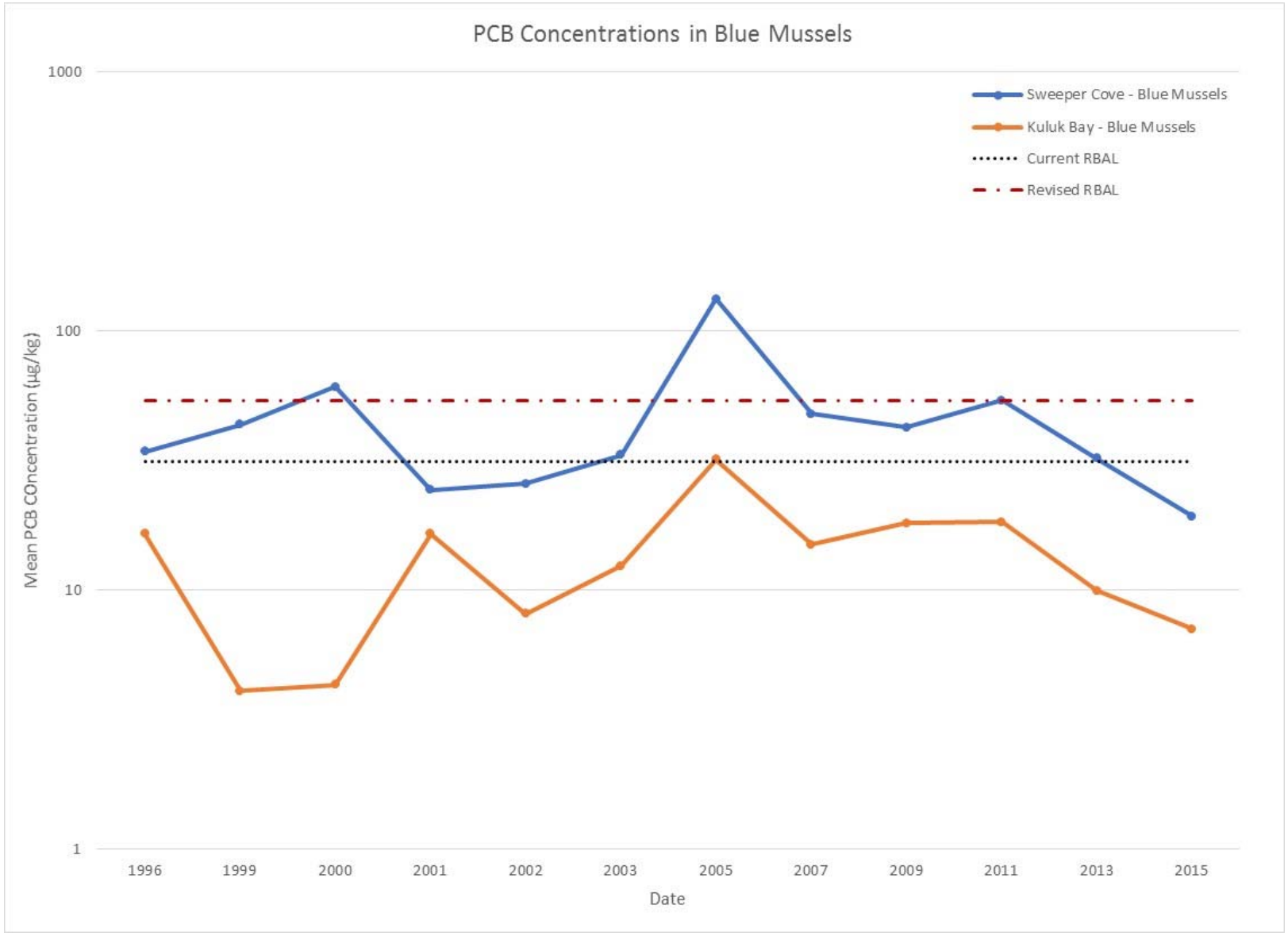


Figure C2-2. Mean PCB Concentrations in Blue Mussels in Sweeper Cove and Kuluk Bay from 1996 to 2015