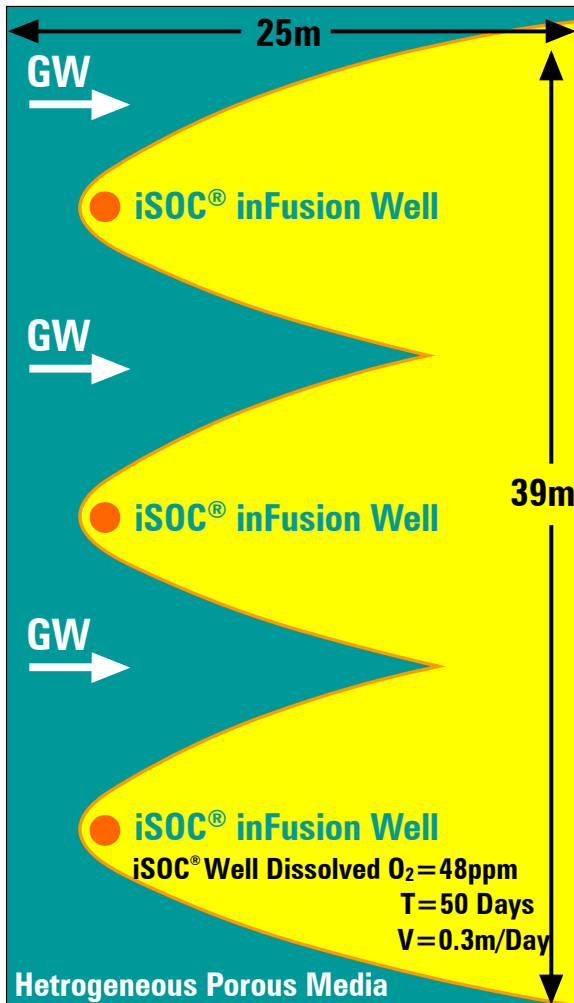


iSOC® CONES OF INFLUENCE BASED ON FEMLAB MODEL



iSOC® RADIUS OF INFLUENCE

Case studies and field measurements have shown the typical iSOC® radius of influence to be 10 feet (3 m) to 20 feet (6 m) laterally from the infusion well and spreading many more feet in the direction of groundwater flow. Flowing groundwater and molecular diffusion transport the dissolved gas (e.g. oxygen, alkane, hydrogen) to the saturated porous media. The higher the concentration gradient in the infusion well, the further the transport of the gas and the greater the influence. The influence is best measured by biological parameters because the measure of dissolved gases at a distance from the infusion well is often inconclusive.

iSOC® REMEDIATION APPROACH

- Create an oxygen barrier at the leading edge of the contaminant plume to avoid boundary litigation and to protect off-site receptors.
- Reduce contamination levels by source treatment with supersaturated oxygen at the heart of the plume.
- Achieve rapid, localized remediation of low-level contamination and hot spots in existing monitoring wells.
- Accelerate site closure through natural attenuation as a primary remediation strategy or as a polisher.
- Lowest annual O&M cost of any passive enhancement technology.

HYDROCARBONS AND iSOC®

The use of dissolved oxygen in hydrocarbon-contaminated groundwater to enhance natural attenuation of hydrocarbons such as MTBE and BTEX has been growing as a remediation technology since the mid-1990s. Conventional sparging technologies typically waste most of their delivered oxygen. Sparging bubbles make preferential flow paths and rise to the top of the groundwater table, escaping before they have a chance to dissolve and be utilized by naturally occurring hydrocarbon-degrading micro-organisms. Other in-situ technologies generate oxygen for a short period of time but are inadequate in aquifers with high ferrous iron, moderate BOD, and/or high concentrations of hydrocarbon constituents. iSOC® is a proven bioremediation technology that delivers high concentrations of dissolved oxygen into the aquifer. Very low O&M costs allow the iSOC® technology to be deployed in all types of remediation projects and site conditions.

TYPICAL GAS CONCENTRATIONS (ppm)

GAS TYPE	WATER COLUMN DEPTH (ft/m)				
	5'/1.5	10'/3	15'/4.6	20'/6.1	50'/15.2
Oxygen	42	55	62	69	111
Methane	22	30	33	37	59
Propane	66	88	99	110	175
Hydrogen	2	2	3	3	5
Ethane	57	75	85	95	150

USING OTHER GASES WITH iSOC®

Consultants may need to use gases other than oxygen in their remediation approach. For example, hydrogen, methane, or propane may be used for remediation of chlorinated solvents and perchlorate. iSOC® will transfer these gases into the groundwater as effectively as it transfers oxygen (see above table).



iSOC[®] YOUR ULTIMATE MANAGED ATTENUATION TOOL



iSOC[®] DISTRIBUTION HEADER

Each order is supplied with a distribution header. Multiple port distribution headers are available. The size ordered is determined by the number of iSOC[®] units being run from each regulator. The distribution header can be directly mounted onto the gas regulator. The header is supplied with an on/off valve for each iSOC[®] unit such that the gas bottles can be changed without pulling the iSOC[®] from the well. For further detail go to www.isocinfo.com - Installation and Design - Installation Procedures.

iSOC[®] QUALITY CONSTRUCTION

iSOC[®] is constructed of high quality SS316 stainless steel using the latest manufacturing equipment and a proprietary structured polymer mass transfer device. iSOC[®] is 1.62" (41 mm) in diameter and 12.65" (321 mm) long with a barb connector for 0.17" (4 mm) ID polyurethane tubing. The housings for the pressure and flow control unit and the drain plug are made from nylon. iSOC[®] has a lifting ring for connecting to a suspension line for insertion in 2" (50 mm) or larger treatment wells.

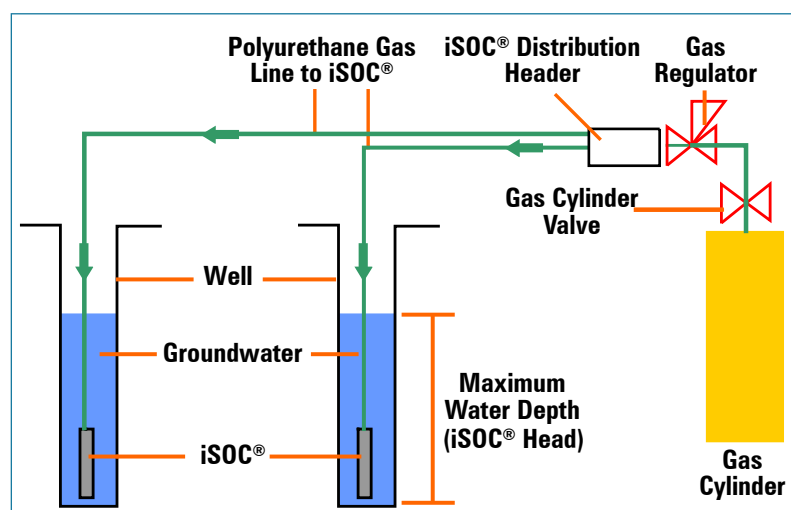
iSOC[®] COSTS

The iSOC[®] groundwater remediation technology is the leading and most cost effective solution in the marketplace today. Speak with your local iSOC[®] Sales Representative for system pricing. Your nearest Sales Representative can be found at www.isocinfo.com

CHLORINATED SOLVENTS AND iSOC[®]

The iSOC[®] gas infusion system is used to effectively remediate chlorinated solvent contaminated groundwater. Where tetrachloroethene (PCE) is the main contaminant of concern, a two-stage sequential bioremediation approach is used to first degrade PCE to trichloroethene (TCE) by reductive dechlorination, followed by aerobic cometabolic oxidation of TCE and other daughter products such as DCE and vinyl chloride. Alkane gas delivered by iSOC[®] stimulates the anaerobic process. iSOC[®]s are used to deliver oxygen and additional alkane gas to achieve aerobic cometabolic treatment of the daughter products. The aerobic process can be applied independently to TCE, DCE and VC sites and is not subject to stall due to competing electron acceptors or limited availability of necessary anaerobic microorganisms. Several alternative bioremediation approaches can also be implemented with iSOC[®]s including direct aerobic treatment of vinyl chloride and reductive dechlorination of chlorinated solvents by direct hydrogen delivery.

SYSTEM SET-UP



Appendix F

Agency Comments, Comment Responses, and Comment Resolution

Alaska Department of Environmental Conservation
Comments on the Draft Site Characterization and Risk Assessment, Focused Feasibility Study Report, South of Runway 18-36
FORMER NAVAL AIR FACILITY, ADAK
February 2005

Comments Developed February 25, 2005

Cmt. No.	Pg. & Line	Sec.	Comment/Recommendation	Response
1		General Comment	Please include a figure similar to 2-5 with the boundaries of the former canal and remediated areas plotted in relationship to the various sampling sites.	The former sections of the West Canal and the Cross-over Canal will be added to Figure 2-4 that shows the Airport Ditch System. The area surrounding the canals where aesthetic corrective actions occurred is shown on Figure 3-5 that presents DRO, GRO, and BTEX concentrations in sediment and surface water samples.
2		General Comment	Some petroleum hydrocarbons, particularly PAHs can be bioaccumulated by shellfish such as mussels. What receptors are present at the mouth of the creek? This question may be important for to both the human and ecological risk assessment.	Blue mussels could attach themselves to submerged rocks and other solid surfaces found near the mouth of South Sweeper Creek and along the shoreline of Sweeper Cove. The conceptual site model constructed for the ecological risk assessment identifies potentially complete exposure pathways for benthic and epibenthic invertebrates (which include Blue Mussels) in sediment and surface water of South Sweeper Creek and Sweeper Cove. Because these exposure pathways are considered potentially complete, they are included in the ecological risk assessment evaluation.
3	2-2 Line 36	2.2	The report lists Dolly Varden as a trout. While this was technically correct at the time the USGS report was written, Dolly Varden have been reclassified as a char (Genus <i>Salvelinus</i>), not trout (Genera <i>Oncorhynchus</i> or <i>Salmo</i>). Please revise text accordingly.	The term "trout" will be removed from the sentence.
4	2-3 Line 3	2.2	Verb tense: used vs. use. All of the animals listed in this section still use the nearshore marine habitat, so the correct usage of the verb is 'use'. Please revise.	The term "used" will be replaced with "use".
5	2-3 Lines 16-17	2.3	We are not sure why the sentence 'However, no analytical data are available for 6 of the test pits, 9 of the borings, and 5 of the hand auger locations' has been placed in parenthesis in the paragraph. Recommend	The second and third sentences in this paragraph will be replaced with the following: During site investigations at the South of Runway Area site, 62 borings were drilled, 24 of these were completed as groundwater monitoring wells, 20 hand auger borings were advanced, and 15 test pits were

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			removing the parenthesis to clarify the paragraph.	excavated (Figure 2-5). Analytical data are not available for 6 of the test pits, 9 of the drilled soil borings, and 5 of the hand auger locations.
6	Figure 2-5		We recommend placing the cross-section location diagram or another copy of this figure closer to the actual cross sections of the site. It is somewhat confusing to have the diagram a section before the cross sections and very awkward to flip back and forth between different sections of the report to compare the two illustrations.	The cross-section lines will be removed from Figure 2-5 and added to Figures 3-3 and 3-4 that present the locations where petroleum-related chemicals exceed soil and groundwater cleanup levels. In addition, the last sentence of the first paragraph in Section 3.5.4 will be changed to the following: The locations of these cross sections are shown on Figures 3-3 and 3-4.
7	3-4 Line 30	3.3.2	The moving averages are shown on Figure 3-1, not Figure 3-3. Please revise.	The sentence will be changed to refer to Figure 3-1 not Figure 3-3.
8	3-11 and 3-12	3.5.1 and 3.5.2	The two sections listed reference Plates 1 and 2. We recommend adding wording after the initial introduction of the plates to tell the reader where to find them (located in the back of the document.)	The last sentence in the first paragraph in Section 3.5.1 will be replaced with the following: Results of chemical analyses for DRO, GRO, and BTEX in soil at each of the sampling locations for the South of Runway Area are shown on Plate 1, included at the end of this document. The last sentence in the first paragraph in Section 3.5.2 will be replaced with the following: Results of chemical analyses for DRO, GRO, and BTEX in groundwater at each of the sampling locations for the South of Runway Area are shown on Plate 2, included at the end of this document.
9	3-14 Line 28-33	3.5.3	This paragraph discusses prior remedial actions and the use and disposition of sediment samples in the remedy development and evaluation process. The highlighted sentences discuss that sediment is now considered soil because it has been covered in place. However, these sampling locations are not represented in the soils data	Locations 761, 762, 763, 764, 765, 766, 801, 805, and 809 will be added to Figure 3-3 and Plate 1 and designated as buried sediments. Results of analyses for GRO, DRO, and BTEX compounds in sediment samples collected from these 9 locations will be added to Plate 1.

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			on Figure 3-3 or on Plate 1. We request the addition of these samples to the figures along with a specific symbol identifying them as buried sediments.	
10	3-15 Lines 5-8	3.5.3	This paragraph discusses the volume of remaining contaminated sediments in Sweeper Creek. Figure 3-5 illustrates where sediments were removed in 1999. Please add a new figure or append Figure 3-5 to show the location of the remaining petroleum contaminated sediments discussed in this section.	Figure 3-5 will be modified to show the area in South Sweeper Creek estimated to contain contaminated sediments. In addition, the subject paragraph will be replaced with the following: The volume of petroleum contaminated sediments remaining in South Sweeper Creek is estimated to be approximately 6,400 cubic yards. This volume is based on an estimated area of contaminated sediments within the creek of 86,900 square feet, shown on Figure 3-5, and a presumed thickness of two feet. Because sediment moves dynamically through this section of South Sweeper Creek, and because petroleum hydrocarbons continue to enter the creek from the South of Runway Area site, the area estimated to contain petroleum-affected sediments includes portions of the creek where sediment was removed during 1999.
11	3-18 Lines 7-8	3.6.1	This sentence reads 'Cleanup levels specified for soil are based on Alaska DEC Method Four criteria...' The wording of this sentence is misleading. Because the cleanup levels for groundwater are presented in a general manner prior to specifying the levels to be used, it makes Method 4 appear to be the main soil clean-up criteria. We recommend rewording the sentence to clarify that the soil cleanup levels for the report were determined using Method 4, and that 18 AAC 60.340 lists the various methods that can be used to determine cleanup levels.	The second sentence in the first paragraph of Section 3.6.1 will be replaced with the following: Cleanup levels may be determined for soil using one of four methods described under Alaska regulation 18 AAC 75.340. Cleanup levels specified for soil at the South of Runway Area site are based on Alaska DEC Method Four criteria [18 AAC 75.340(f)].

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12	3-19 and 3-20	3.6.2 "Sheen Control"	This paragraph discusses the booms used to control sheen on Sweeper Creek and West Canal. Boom locations are not shown on any illustration. The product interceptor trench is shown on several drawings. We request that a graphic be placed in the document to show where the booms are located in relation to the site and that the graphic be referenced in this paragraph.	A new Figure 3-8 will be prepared showing the current boom locations. In addition the following sentence will be inserted after the second sentence in the " <i>Sheen Control</i> " paragraph. Figure 3-8 shows the current boom locations.
13	3-45 Table 3-5		All screening criteria are footnoted with an (a). Please revise.	The footnotes will be modified to accurately identify the applicable soil cleanup criteria.
14		Section 4 and Appendix CI.3.1	<p>The Human Health Risk Assessment lists construction workers, workers, and trespassers as potential receptors at this site. The Department feels that recreational users should be evaluated as well. People have been observed on numerous occasions fishing at the mouth of South Sweeper Creek. Access to the west and south sides of South Sweeper Creek is not restricted. The airport property boundary coincides with east bank of South Sweeper Creek throughout much of its length. Thus, access to the canals would be trespassing, but access to South Sweeper Creek via the channel, south, or west bank is not. Thus, recreational users should be considered as part of the risk evaluation process.</p> <p>Some consideration should also be given to subsistence users at this area. The tissue-sampling program currently takes samples of blue mussels at the mouth of South Sweeper</p>	<p>Recreational users will be added as a population of potential concern and discussed in both the CSM section and the uncertainty section of the risk assessment. It will be assumed that recreational exposures will be limited to South Sweeper Creek, while trespasser exposures will be limited to the Airport Ditch, since access to the runway area is restricted to airport personnel. Neither recreational exposures to chemicals in South Sweeper Creek nor trespasser exposures to chemicals in the airport ditch will be quantitatively evaluated in the risk assessment. Concentrations of chemicals in surface water and sediment of South Sweeper Creek were reviewed in Section CI.7.2 of the risk assessment and were found to be below Alaska DEC soil and groundwater residential cleanup levels.</p> <p>The tissue-sampling program at the mouth of South Sweeper Creek is part of the on-going monitoring and remedial action for Sweeper Cove, not South of Runway 18-36 Area. Part of the remedial action at Sweeper Cove is the issuance of a fish advisory which limits the amount of shellfish ingested from Sweeper Cove (U.S. Navy 2004). While the South Runway 18-36 Area does not have any restrictions on shellfish consumption, shellfish are not expected to be present in the South Runway 18-36 Area in great numbers. The fish advisory in place for Sweeper Cove is expected to be protective of potential shellfish</p>

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			<p>Creek. Harvesting of mussels is not restricted at this site, so it is possible that some recreational users of the Sweeper Creek area are exposed through eating shellfish.</p> <p>Both pathways should be addressed in the CSM and discussed in the uncertainty section. The potential contribution to risk is of greater importance if shellfish are harvested near the mouth of the creek. (See also comment 2)</p>	<p>contamination at the mouth of South Sweeper Creek. Text will be added to the CSM discussion and the uncertainty section which discusses the remediation goals of Sweeper Cove, as the downgradient water body of the South Runway 18-36 Area.</p> <p>Reference: U.S. Navy. 2004. Final Institutional Control Management Plan Revision 1, Former Adak Naval Complex, Adak Island, Alaska. Prepared by Engineering Field Activity, Northwest. Poulsbo, Washington. April 2004.</p>
15	CI.2-3 Lines 12-15	CI.2.1	The punctuation of this sentence is confusing, please revise.	<p>This sentence will be revised as follows:</p> <p>“Note that surface water and sediment data were not included in the human health evaluation because human exposures to surface water and sediment at the South of Runway 18-36 Area are expected to be infrequent, thus insignificant (see further discussion in Section CI.3.1).”</p>
16	CI.2-3 Lines 21-23	CI.2.1	<p>Two sentences discuss soil sample 850, the area around which was supposedly removed and backfilled. According to the BEESC report (page 2, section 3), only soils on the south side of the canal were removed. Sampling location 850 appears to be located on the northern side of the channel. Thus, the soils at this site may have been left in place, which may have some impact on the conclusions drawn for the risk assessment. Please review and revise as appropriate.</p>	<p>The Navy agrees that it is not clear from the BEESC report whether the material from location 850 was removed during the airport ditch culvert installation. However, based on review of photographs taken before, during and after the airport ditch culvert installation, the area from which this surface soil sample (location 850) was collected has been completely re-worked. Even if the material was not removed from the site, it has been covered with clean fill material and is no longer representative of surface conditions at the South Runway 18-36 Area. Because there is uncertainty as to whether soil has been removed from this location, data from this location will be included in the risk assessment. However, these data will be evaluated as subsurface soil, not as surface soil.</p>
17	CI.7-6	CI.7.2 Exposure to Free Product	If migration of free product still has the potential to occur, it could increase exposure. Currently human exposure to sediment along the creek is not considered a significant pathway but if free product	Exposures to surface water and sediment along the creek were considered an insignificant pathway based on infrequent exposures and exposures of only short duration. This assumption would still apply if sediment concentrations increased due to the potential presence of free

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			<p>continues to migrate to surface water, sediment concentrations could be affected. Also, additional PAHs could bioaccumulate in shellfish which may be used for human consumption.</p> <p>Under ADEC Surface Water guidelines, no contamination which could cause sheen on surface water is permitted. Free product in soil should be dealt with in a manner that takes all these factors, not just construction workers, into consideration.</p>	<p>product in surface water. Therefore, the presence of free product in surface water is not likely to present a health concern for recreational or trespasser exposures in South Sweeper Creek and the airport ditch. However, additional text will be provided in the uncertainty discussion to discuss potential exposures to free product by recreational and trespasser populations. In addition, text will be added regarding Alaska DEC surface water guidelines which state that no contamination which could cause sheen on surface water is permitted</p>
18	Figure CII.1-1		<p>It is not certain that the exposure of terrestrial receptors to the creek through ingestion can be discounted. It seems likely that the creek could be a major source of water to receptors with a small home range. Please assess surface water exposure to terrestrial receptors.</p>	<p>The following new section will be added to the uncertainty section of the ecological risk assessment:</p> <p><i>CII.7.3.7 Minor or Insignificant Exposure Pathways for Terrestrial Receptors</i></p> <p>Exposure of terrestrial receptors to the creek through ingestion was considered a minor or insignificant pathway, as depicted on the CSM Figure CII.1-1. However, this pathway was evaluated in this uncertainty discussion. Surface water ingestion generally represents a small portion of the total dose for ecological receptors, particularly when the water concentrations are low as evidenced in Table CII.7-3. Using the rat as our receptor of concern, the exposure from surface water ingestion was quantitatively evaluated assuming the animal drank exclusively from the stream.</p> <p>The mammalian water ingestion rate was estimated based on Calder and Braun (1983) equation of $0.99 (BW)^{0.9}$ kg, yielding a water ingestion rate of 0.438 L/day. The mammalian TRVs were taken from Table CII.5-9 and were the same values used to generate soil RBSCs for soil and food ingestion. As noted in Table CII.7-3, the hazard quotients for this exposure route are very low, indicating this route of exposure is insignificant relative to soil driven pathways. Therefore, exclusion of this pathway from quantitative evaluation is not likely to affect the conclusions reached in the ecological risk assessment.</p>

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				Reference: Calder, W.A. and Braun, E.J. 1983. Scaling of osmotic regulation in mammals and birds. <i>Am. J. Physiol.</i> 244:R601-R606.
19	CII.2-2 Line 11 and line 19	CII.2.1	The publications for the USFWS 1999 and U.S. Navy 2001a citations are not located in the references section of the Ecological Risk Assessment. Please review and revise as appropriate.	The following citations will be added to the reference section of Appendix CII. Note, the (U.S. Navy 2001a) citation in the text will be changed to (BEESC 2001a). U.S. Fish and Wildlife Service (USFWS). 1995. <i>Ecological Survey of Potentially Contaminated Sites Identified in the Federal Facility Agreement, Naval Air Facility, Adak Island, Alaska.</i> March 6, 1995. Bristol Environmental and Engineering Services Corporation (BEESC). 2001a. <i>Completion Report, Airport Ditch Culvert Installation, Naval Air Facility, Adak Island, Alaska.</i> Prepared for U.S. Navy by BEESC, Anchorage, Alaska. October 30, 2001.
20	CII.3-2 Line 25	CII.3.0	The publication for the U.S. Navy 1996b citation is not located in the references section of the Ecological Risk Assessment. Please review and revise as appropriate.	The citation in the referenced section should be (URS 1996). The following citation will be added to the reference section of Appendix CII. Note, the citations in the ecological risk assessment will be reviewed for accuracy. URS Consultants, Inc. 1996. <i>Baseline Ecological Survey Report, Adak Island, Alaska.</i> Prepared for Engineering Field Activity, Northwest, Southwest Division, Naval Facilities Engineering Command, Poulso, WA by URS Consultants, Seattle, Washington. CTO-197.
21	CII.6-4	CII.6.4	How was the ACL for GRO selected? As mentioned in this RA, total aromatic hydrocarbons should not exceed 10 µg/l in surface water, yet the ACL is given as 114 µg/l for GRO. Is there evidence to suggest the GRO is less than 10% aromatic?	For this project, a site-specific risk-based criterion was developed. The ACL for GRO that was derived for this project is based on a No Effects Tissue Residue concentration for petroleum alkanes as described in Section CII.5.2.1. This value would also be expected to be protective of the aromatic fraction. Because the carbon range of GRO is typically C6-C10, n-heptane (C5- C8) is typically used as a chemical surrogate to evaluate toxicity (MADEP, 1996). As noted in Table CII.5-4, the value of 114 ug/L used as the RBSC for GRO based on tissue residue is lower than direct measures of toxicity using n-heptane. Since none of the adverse effect concentrations for n-heptane for a variety of fresh and

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				<p>saltwater species are lower than the alkane RBSCs derived using the no effects tissue concentrations, this site-specific ACL would, therefore, be expected to be protective of both narcotic effects and direct toxicity.</p> <p>The relative concentrations of constituents in petroleum vary considerably depending on the source of crude oil, refinery process, and product specifications. For automotive gasoline, the typical hydrocarbon distribution consists of 4-8% alkanes, 2-5% alkenes, 25-40% isoalkanes, 3-7% cycloalkanes, 1-4% cycloalkenes, and 20-50% aromatics (IARC 1989a as cited http://www.atsdr.cdc.gov/toxprofiles/tp123-c3.pdf). However, it would be expected for weathered gasoline and particularly gasoline released to surface water that the aromatic content of GRO would be much less. As noted in Table CII.4-3, the TEX concentrations in surface water are lower than 10 ug/L.</p>
22	CII.7-6	CII.7.3.5	<p>In addition to the toxicological uncertainty regarding using a mammal as a surrogate species for avian there is also uncertainty regarding the exposure estimate. It is likely that avian invertevores would have higher exposure due to consuming a greater amount of soil and possibly a contaminated food source. Please mention this in the uncertainty assessment</p>	<p>We concur. The following statements will be added to the last paragraph:</p> <p>In addition, diet and foraging habitat can also influence exposure. For instance, avian invertevores would likely ingest a higher quantity of soil and, depending on uptake rates in insects, could possibly have a higher exposure via contaminated prey.</p>

To: "Oresik Wendy \ (E-mail\)" <Wendy_LS_Oresik@URSCorp.com>
From: "Wicklein, Mark A CIV \ (EFANW\)" <mark.wicklein@navy.mil>
Date: 05/09/2005 06:40AM
Subject: FW: South Runway 18-36 response

Wendy, please finalize the South of Runway 18-36 SC\RA.

Thank you.

-----Original Message-----

From: Weigle, Jason [<mailto:Jason.Weigle@dec.state.ak.us>]
Sent: Friday, May 06, 2005 12:06
To: Wicklein, Mark A CIV (EFANW)
Subject: RE: South Runway 18-36 response

Lindsay approves - you're good to go.

-----Original Message-----

From: Wicklein, Mark A CIV (EFANW) [<mailto:mark.wicklein@navy.mil>]
Sent: Wednesday, April 20, 2005 10:25 AM
To: Weigle, Jason
Subject: FW: South Runway 18-36 response

Jason, attached is our response to your comment on the South Runway Site Characterization\Risk Assessment report.

Please let me know if our response is acceptable to you.

Thank you.

-----Original Message-----

From: Wendy_LS_Oresik@URSCorp.com [mailto:Wendy_LS_Oresik@URSCorp.com]
Sent: Tuesday, April 19, 2005 22:55
To: Wicklein, Mark A CIV (EFANW)
Cc: Debbie_Rodenhizer@URSCorp.com; Laura_Scheffler@URSCorp.com; Bill_Rohrer@URSCorp.com
Subject: Re: South Runway 18-36 response

Mark:

As discussed, I believe that the terminology used confused the intent of the text. Terminology that was used in Section CII.6.4 and Section 5.4 will be modified to clarify the cleanup levels and the application of the cleanup levels at the South of Runway 18-36 Area site. Risk-based cleanup levels were derived for TPH-GRO in surface water, as well as for indeno(1,2,3-cd)pyrene and TPH-DRO. However, the use of the terms "Alternative Cleanup Levels" or "ACLs" was imprecise and therefore confusing. These terms were used for surface water and sediment in an effort to be consistent with the terminology used for soil and sediment. However, the use of this term for surface water implied that the cleanup levels developed based on the risk assessment (RBSCs) would take the place of established surface water quality criteria. This was not the Navy's intent. The water quality standards established

by Alaska regulation 18 AAC 70, including the Total Aqueous Hydrocarbon (TAqH) and the Total Aromatic Hydrocarbon (TAH) criteria, are applicable to the South of Runway 18-36 Area. Since Alaska regulations do not establish cleanup levels or individual chemicals, TPH-GRO, and TPH-DRO in surface water, the results of the ecological risk assessment were used to establish additional risk-based cleanup levels for chemicals with surface water concentrations that result in a potential risk to ecological receptors above target health goals. Because concentrations of indeno(1,2,3-cd)pyrene, TPH-DRO, and TPH-GRO in surface water result in a potential risk to ecological receptors, risk-based cleanup levels were established for these chemicals in order to protect ecological receptors. Again, these are additional cleanup levels

for surface water, and were not meant to replace the TAqH and TAH criteria. Both the risk-based cleanup levels and the surface water quality criteria established by Alaska regulation 18 AAC 70 apply to the surface water (South Sweeper Creek) at the site. In order to clarify the text, any reference to ACLs for sediment or surface water will be eliminated and will be replaced by the terminology "risk-based cleanup levels" or "cleanup levels", whichever is most appropriate (see below for specific changes to be made).

For clarification, the following specific changes is proposed for Section CII.6.4 of the document:

- 1) The word "alternative" will be replaced with "risk-based" in the sentence beginning on line 6 of page CII.6-4: "Therefore, the RBSCs derived for sediment were selected as the risk-based cleanup levels for chemicals identified as COCs in sediment...".
- 2) The last sentence of the second paragraph of Section CII.6.4 (on lines 18 and 19 of page CII.6-4) will be replaced with the following: "These water quality criteria are the cleanup levels for the surface water of South Sweeper Creek in the vicinity of the South Runway 18-36 Area."
- 3) The following sentence will be added to the last paragraph of Section CII.6.4 (at the beginning of line 21): "Alaska State Regulations do not establish cleanup levels for individual chemicals, TPH-DRO, and TPH-GRO in surface water."
- 4) The existing first sentence of the last paragraph of Section CII.6.4 (on lines 21 through 23) will be replaced with the following: "Therefore, the RBSCs derived for surface water were selected as the risk-based cleanup levels for individual chemicals that were identified as COCs in surface water of South Sweeper Creek: 0.28 ug/l for indeno(1,2,3-cd)pyrene, 0.014 ug/l for TPH-DRO, and 114 ug/l for TPH-GRO. These are additional cleanup levels and do not replace the surface water quality criteria applicable to the site, as described in the previous paragraph."
- 5) "ACL" will be replaced with "risk-based cleanup level" in the remainder of the last paragraph of Section CII.6.4.
- 6) Identical changes will be made to Section 5.4. In addition, any reference to ACLs for surface water or sediment will be changed to risk-based cleanup levels throughout the remainder of the document.

Should you wish to discuss this further, please do not hesitate to call

Regards-

Wendy O.

Wendy L.S. Oresik, P.E.
Century Square
1501 Fourth Avenue, Suite 1400
Seattle, WA 98101-1616
Direct: 206.438.2262
Fax: 866.495.5290

-----Original Message-----

From: Weigle, Jason [<mailto:Jason.Weigle@dec.state.ak.us>]
Sent: 04/14/2005 09:58
To: Wicklein, Mark A CIV (EFANW), Wendy_LS_Oresik@urscorp.com
CC:
Subject: South Runway 18-36 response

Mark and Wendy,

Finally got an answer for you on the South Runway responses.

In response to comment 21, we are concerned about the application of the ACLs derived in the document. ACLs cannot be applied to surface water quality levels. Under 18 AAC 75.345 ACLs can only be derived and applied to groundwater and soils. The wording of the response makes it seem that ACLs were derived for TPH-GRO in surface water. We believe that the intent of the ACL derived for GRO was in fact meant for sediment and sub-stream bottom soils in South Sweeper Creek, and that by treating the sediment, the surface water quality standard would in fact be met. Another way that the ACL could be taken is that the standard was for the soil/sediment pore water (groundwater interface) and that by treating the sediment, the pore water would be treated, preventing an exceedance. The document isn't clear as to how this would be applied. It may be wise to emphasize this in both the response to the comment and in the applicable sections of the SC/RA what the exact use of the ACL will be. We tried to find a good, concise description but couldn't, so if this is in there, please direct us to it.

Please call if you have any questions.

Jason

Jason L. Weigle

Project Manager - Adak
Federal Facilities Oversight Section
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova St.

Anchorage, AK 99501
jason_weigle@dec.state.ak.us
Ph: 907-269-7528
Fax: 907-269-7649

E-Mail Record

From: Weigle, Jason [mailto:Jason_Weigle@dec.state.ak.us]	To: Wicklein, Mark A CIV (EFANW)
Date: Tuesday, July 19, 2005	CC:
Time: 10:22	Subject: Revised Draft SR 18-36 FFS Comments

Mark,

Please find attached the comment table for the South of Runway 18-36 FFS. The text of the cover letter is included below. Hardcopies are in the mail.

Call if you have questions,

Jason

July 19, 2005

Naval Facilities Engineering Command, Northwest
Attn: Mark Wicklein, Remedial Project Manager
19917 - 7th Avenue, NE
Poulsbo, WA 98370-7570

RE: Revised Draft Focused Feasibility Study
South of Runway 18-36 Area
July 2005

Dear Mr. Wicklein:

The Department has completed its review of the Revised Draft Focused Feasibility Study (FFS) for the South of Runway 18-36 Area. The revised draft contains revised candidate remedial alternatives based on the Department's comments of June 8, 2005 and a teleconference between the Department and the Navy on June 14, 2005. The revision adequately addresses the comments made in both meetings.

The Department has three comments on the revised draft document. The first is an acknowledgement; the second a minor editorial comment on a unit listed in the index of the document. The third comment, as discussed below, bears a major impact on Section 9.

Section 9 of the document discusses the candidate remedial alternatives for the site. The four remedial actions presented for the site are:

1. No Action
2. Institutional Controls, Passive Free-Product Recovery and Containment, Monitored Natural Attenuation (MNA) for Groundwater, and Natural Recovery for Surface Water and Sediment
3. Institutional Controls, Passive Free-Product Recovery and Containment, Creek Bank Soil Excavation, iSOC and MNA for Groundwater, and Natural Recovery for Surface Water and Sediment
4. Institutional Controls, Passive Free-Product Recovery and Containment, Creek Bank/Hot Spot Soil Excavation, iSOC and MNA for Groundwater, Sediment Removal, and Natural Recovery for Surface Water

E-Mail Record

Alternative 1, No Action, is presented in the FFS as with no institutional controls (ICs) as part of the remedy. Lines 17 and 18 on Page 9-1 specifically state that ICs are not included as part of Alternative 1. ICs are by default part of any remedy at this site due to the restrictions placed on the property by the equitable servitude in the Interim Conveyance Document.

At a minimum, a discussion of the ICs and restrictions on the property should be added to Section 9.1 and Table 9-1 altered to show that equitable servitude restrictions and access restrictions are part of this remedy. However, it may be in the best interest of the Navy to revise this section to discuss the base level of ICs applicable to all remedial actions, and then discuss in each alternative the additional restrictions that the remedy would add. It may be advisable to issue a revised Section 9 for the NMCB FFS. The South of Runway 18-36 and SWMU 17 FFS can be edited at the time they are finalized.

Additionally, there may be other restrictions placed on this parcel beyond those listed in the FFS. As the site lies in the safety zone at the end of the runway, additional land use restrictions may be in place beyond those required by the Interim Conveyance. We suggest that the Navy work with the Alaska Department of Transportation and Public Facilities to determine any other restrictions that may be part of the baseline restrictions at the site.

Please feel free to contact me if you have any questions or concerns at 907-269-7528 or through email at jason_weigle@dec.state.ak.us.

Sincerely,

Jason L. Weigle
Project Manager
Federal Facilities Environmental Restoration Program
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
555 Cordova St.
Anchorage, AK 99501
jason_weigle@dec.state.ak.us
Ph: 907-269-7528
Fax: 907-269-7649



ADEC Comments on Revised FFS for SR 18-36 Comment Table 18July2005.doc

Alaska Department of Environmental Conservation
Comments on the Revised Draft Focused Feasibility Study Report for South of Runway 18-36 Area
FORMER NAVAL AIR FACILITY, ADAK
July 2005

Comments Developed July 18, 2005

Cmt. No.	Pg. & Line	Sec.	Comment/Recommendation	Response
1		General	All previous comments on the first draft version have been addressed.	Comment acknowledged.
2	xxx Line 30	Units of Measure	The Unit of measure for kilogram day per milligram is abbreviated kg-day/ms. Please revise.	Change will be made to kg-day/mg.
3	9-2 to 9-3 and 9-27	Section 9.1 and Table 9-1	The No Action alternative must include Equitable Servitude Restrictions and Access Restrictions as part of the remedy. The Interim Conveyance document included these restrictions as part of the land transfer process. Therefore, they ride with the property and cannot be separated from the land. No Action, Equitable Servitude Restrictions, and Access restrictions must be included as the baseline "No Action" remedy.	<p>The description of alternative 1 will be modified to include equitable servitude restrictions. Access restrictions, as has been defined in the document, include temporary fences and signs used to prevent access to contaminated materials during remedial activities. Since no remedial activities are planned in Alternative 1, no access restrictions would be implemented. The Navy will contact the Alaska Department of Transportation and Public Facilities to determine any other restrictions related to the runway and incorporate these restrictions in the discussion, as necessary.</p> <p>The following are the specific changes to be implemented based on including equitable servitude restrictions in alternative 1:</p> <p>The following language will be added on line 3 of page 9-2 after "implemented.": "However, institutional controls, specifically equitable servitude restrictions, are currently in place in accordance with the Interim Conveyance document and the OU A ROD. Equitable servitude restrictions applicable to this site would include restrictions on land development (i.e., residential land development would be prohibited), the downtown groundwater use prohibition, and soil excavation notification requirements. The Navy has an established institutional controls program that was developed to ensure that institutional controls selected in the OU A ROD remain effective and reliable. The Navy has prepared an Institutional Control Management Plan (ICMP) (U.S. Navy 2004) documenting the approach the Navy will use to ensure that the controls remain protective. The ICMP provides details of the institutional controls management program, and therefore, a detailed description of the equitable servitude restrictions to be implemented at the South of Runway 18-36 Area is not included here. Site inspections would be used to evaluate compliance with equitable servitude restrictions."</p> <p>The last sentence of the first paragraph of Section 9.1 on lines 7 and 8 will be deleted and replaced with: "Costs associated with the implementation of institutional controls at this site were not estimated because existing island-wide institutional controls would cover site-specific restrictions. There are no</p>

Alaska Department of Environmental Conservation
Comments on the Revised Draft Focused Feasibility Study Report for Soth of Runway 18-36 Area
FORMER NAVAL AIR FACILITY, ADAK
July 2005

Comments Developed July 18, 2005

Cmt. No.	Pg. & Line	Sec.	Comment/Recommendation	Response
				<p>other costs associated with this alternative.”</p> <p>The language on page 9-4 discussing institutional controls will be modified. The first full paragraph on page 9-4 (lines 4 to 22) will be modified to read: “The institutional controls that would be implemented include equitable servitude restrictions, access restrictions, site inspections, and environmental monitoring. Equitable servitude restrictions applicable to this site would include restrictions on land development (i.e., residential land development would be prohibited), downtown groundwater use prohibition, and soil excavation notification requirements, as discussed in Section 9.1. Access restrictions include fences and signs used to prevent access to contaminated materials during free-product collection/containment trench installation, wake and propeller use restrictions to minimize transport of contaminated sediments, and a fishing advisory for consumption of fish in South Sweeper Creek. Site inspections would be used to evaluate compliance with equitable servitude restrictions and access restrictions. Monitoring of groundwater, surface water, and sediment would continue until groundwater cleanup goals are achieved and petroleum concentrations in surface water and sediment are below ecological RBSCs and Alaska DEC water quality standards (TAqH and TAH).”</p> <p>The following language will be added to the “protectiveness” discussion after “OU A ROD” on Table 10-1 and in the last paragraph of Section 11.1 on page 11-2: “and by the Interim Conveyance document.”</p>

E-Mail Record

From: Weigle, Jason [mailto:Jason_Weigle@dec.state.ak.us]	To: Wicklein, Mark A CIV (EFANW)
Date: Wednesday, July 20, 2005	CC:
Time: 10:29	Subject: RE: Response to Comments

Mark,

The only comment I have is on the definition of Access Restrictions in the SR 18-36 FFS responses. Section 9.2, Page 9-4, Lines 14-18 of the revised draft states that access restrictions 'include fences and signs used to prevent access to contaminated materials during free-product collection/containment trench installation, wake and propeller use restrictions to minimize transport of contaminated sediments, and a fishing advisory to prevent consumption of fish in South Sweeper Creek.' The seafood consumption advisory for Sweeper Cove applies to this site and based on this definition, there is an access restriction. I'm not aware of wake restrictions in place anymore in Sweeper Cove, so this may not be applicable. In either case, the text needs to be adjusted for this or the definition needs to be redefined in section 9.2.

Other than that, you're good to go.

Jason

-----Original Message-----

From: Wicklein, Mark A CIV (EFANW) [mailto:mark.wicklein@navy.mil]

Sent: Wednesday, July 20, 2005 5:54 AM

To: Weigle, Jason

Subject: Response to Comments

Jason, attached are Navy response to ADEC comments on both the SWMU 62 FFS and the South of Runway 18-36 FFS. Concerning Comment 3 on SWMU 62. I'll make sure the design incorporates the wells you specified.

Please let me know if you agree with the responses. URS is working the response to NMCB PP comments now.

Thank you.

<<Response to ADEC Comments on Revised SR 18-36 FFS.doc>> <<Response to ADEC Comments SWMU 62 FFS.doc>>

Mark A. Wicklein, P.E.
(360) 396-0226 ph; 744-0226 DSN
(360) 396-0857 fax
mark.wicklein@navy.mil

Environmental Operations Team, Code 05ER
Naval Facilities Engineering Command, Northwest
19917 7th Avenue N.E.
Poulsbo, WA 98370-7570

To learn more about NAVFAC, visit www.navfac.navy.mil

E-Mail Record

From: Weigle, Jason [mailto:Jason_Weigle@dec.state.ak.us]	To: Wicklein, Mark A CIV (EFANW)
Date: Thursday, July 21, 2005	CC:
Time: 9:25	Subject: RE: FW: Response to Comments

Works for me.

-----Original Message-----

From: Wicklein, Mark A CIV (EFANW) [mailto:mark.wicklein@navy.mil]
Sent: Thursday, July 21, 2005 7:53 AM
To: Weigle, Jason
Subject: FW: FW: Response to Comments

Jason, below is the Navy response to the ADEC comment on the South of Runway FFS. Let me know what you think.

Thank you.

The terminology "access restrictions" is confusing because it is used as a technology type and a process option (see Tables 8-2 through 8-5 of the FFS). Access restrictions, as a technology type, includes the following process options: equitable servitude restrictions, access restrictions, wake and propeller use restrictions (for sediment only), and access restrictions and fishing advisory (for sediment only). Access restrictions, as a process option, includes fences and signs. After carefully reviewing the paragraph discussing institutional controls in Section 9.2 of the South of Runway FFS, we determined that the "access restrictions" terminology was not clearly and consistently used. As a result, the response to ADEC Comment #3 on the South of Runway FFS was modified as follows:

The following language will be added on line 3 of page 9-2 after "implemented.":

"However, institutional controls, specifically equitable servitude restrictions and a fishing advisory, are currently in place in accordance with the Interim Conveyance document and the OU A ROD. Equitable servitude restrictions applicable to this site would include restrictions on land development (i.e., residential land development would be prohibited), the downtown groundwater use prohibition, and soil excavation notification requirements. The Navy has an established institutional controls program that was developed to ensure that institutional controls selected in the OU A ROD remain effective and reliable. The Navy has prepared an Institutional Control Management Plan (ICMP) (U.S. Navy 2004) documenting the approach the Navy will use to ensure that the controls remain protective. The ICMP provides details of the institutional controls management program, and therefore, a detailed description of the equitable servitude restrictions and the fishing advisory is not included here. Site inspections would be used to evaluate compliance with equitable servitude restrictions and the fishing advisory."

The language on page 9-4 discussing institutional controls will be modified. The first full paragraph on page 9-4 (lines 4 to 22) will be modified to read:

"The institutional controls that would be implemented include equitable servitude restrictions, access restrictions, site inspections, environmental monitoring, access restrictions/fishing advisory, and wake and propeller use restrictions. Equitable servitude restrictions applicable to this site would include restrictions on land development (i.e., residential land development would be prohibited), downtown groundwater use prohibition, and soil excavation notification requirements, as discussed in Section 9.1. Access restrictions include fences and signs used to prevent access to contaminated materials during free-product collection/containment trench installation. Access restrictions/fishing advisory would include a fishing

E-Mail Record

advisory for consumption of fish in South Sweeper Creek. Wake and propeller use restrictions would be used to minimize transport of contaminated sediments. Site inspections would be used to evaluate compliance with equitable servitude restrictions, access restrictions(fences and signs), access restrictions/fishing advisory, and wake and propeller use restrictions. Monitoring of groundwater, surface water, and sediment would continue until groundwater cleanup goals are achieved and petroleum concentrations in surface water and sediment are below ecological RBSCs and Alaska DEC water quality standards (TAqH and TAH)."

-----Original Message-----

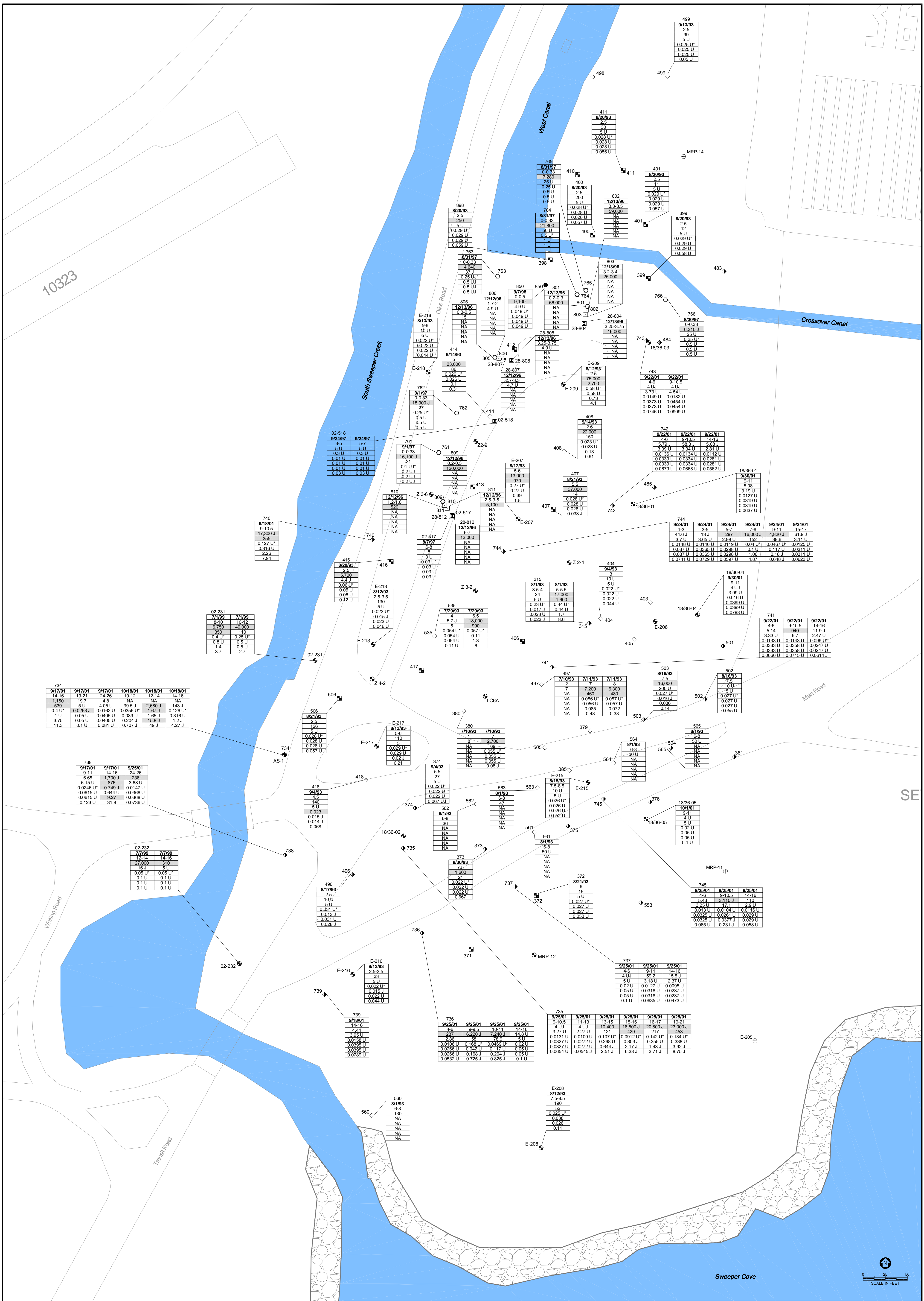
From: Weigle, Jason [mailto:Jason_Weigle@dec.state.ak.us]
Sent: Wednesday, July 20, 2005 10:29
To: Wicklein, Mark A CIV (EFANW)
Subject: RE: Response to Comments

Mark,

The only comment I have is on the definition of Access Restrictions in the SR 18-36 FFS responses. Section 9.2, Page 9-4, Lines 14-18 of the revised draft states that access restrictions 'include fences and signs used to prevent access to contaminated materials during free-product collection/containment trench installation, wake and propeller use restrictions to minimize transport of contaminated sediments, and a fishing advisory to prevent consumption of fish in South Sweeper Creek.' The seafood consumption advisory for Sweeper Cove applies to this site and based on this definition, there is an access restriction. I'm not aware of wake restrictions in place anymore in Sweeper Cove, so this may not be applicable. In either case, the text needs to be adjusted for this or the definition needs to be redefined in section 9.2.

Other than that, you're good to go.

Jason



734	9/17/01	9/17/01	9/17/01	10/18/01	10/18/01	10/18/01
14-16	19-21	24-26	10-12	12-14	14-16	NA
1.150	19.7	4.8	NA	NA	NA	NA
5.98	5 U	4.05 U	39.5 J	2.680 J	143 J	NA
0.4 U*	0.0263 J	0.0162 U	0.0356 U*	1.67 J	0.126 U*	NA
1 U	0.05 U	0.0405 U	0.0889 U	1.65 J	0.318 U	NA
3.75	0.05 U	0.0405 U	0.234 J	15.8 J	1.2 J	NA
11.3	0.1 U	0.081 U	0.707 J	49 J	4.27 J	NA

738	9/17/01	9/17/01	9/25/01
8-11	14-16	24-26	NA
6.65	1.700 J	2.36	NA
6.15 U	876	3.88 U	NA
0.0246 U*	0.749 J	0.0147 U	NA
0.0615 U	0.644 U	0.0368 U	NA
0.0615 U	3.27	0.0368 U	NA
0.123 U	31.8	0.0736 U	NA

02-232	7/7/99	7/7/99
12-14	14-16	NA
27,000	310	NA
19.4	5 U	NA
0.05 U*	0.05 U*	NA
0.1 U	0.1 U	NA
0.1 U	0.1 U	NA

Alaska DEC Method 2 Soil Criteria Over 40-Inch Rainfall Zone		
	Ingestion	Inhalation
DRO	8,250 mg/kg	12,500 mg/kg
GRO	1,400 mg/kg	1,400 mg/kg
Benzene	120 mg/kg	6.4 mg/kg
Toluene	17,000 mg/kg	180 mg/kg
Ethylbenzene	8,300 mg/kg	89 mg/kg
Total xylenes	166,000 mg/kg	81 mg/kg

Note: These criteria levels are specified for petroleum release sites at Adak in the Record of Decision for Operable Unit A.

Chemical Concentrations in Soil (mg/kg)

04-211 Location Number
10/10/96 Sample Date
15-17 Sample Depth Interval (ft bgs)
12 DRO
12 GRO
0.06 Benzene
0.08 Toluene
0.38 Ethylbenzene
1.4 Total Xylenes

LEGEND

- Monitoring Well
- Abandoned Monitoring Well
- Lost Monitoring Well
- Recovery Well
- Geoprobe Well
- Geoprobe Boring
- Bore Hole
- Hand Auger
- Ground Surface
- Test Pit
- Buried Sediment
- Approximate Extent of Riprap

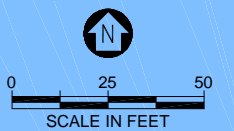
U Chemical Not Detected at Concentration Shown
J Estimated Concentration
bgs Below Ground Surface
NA Not Analyzed

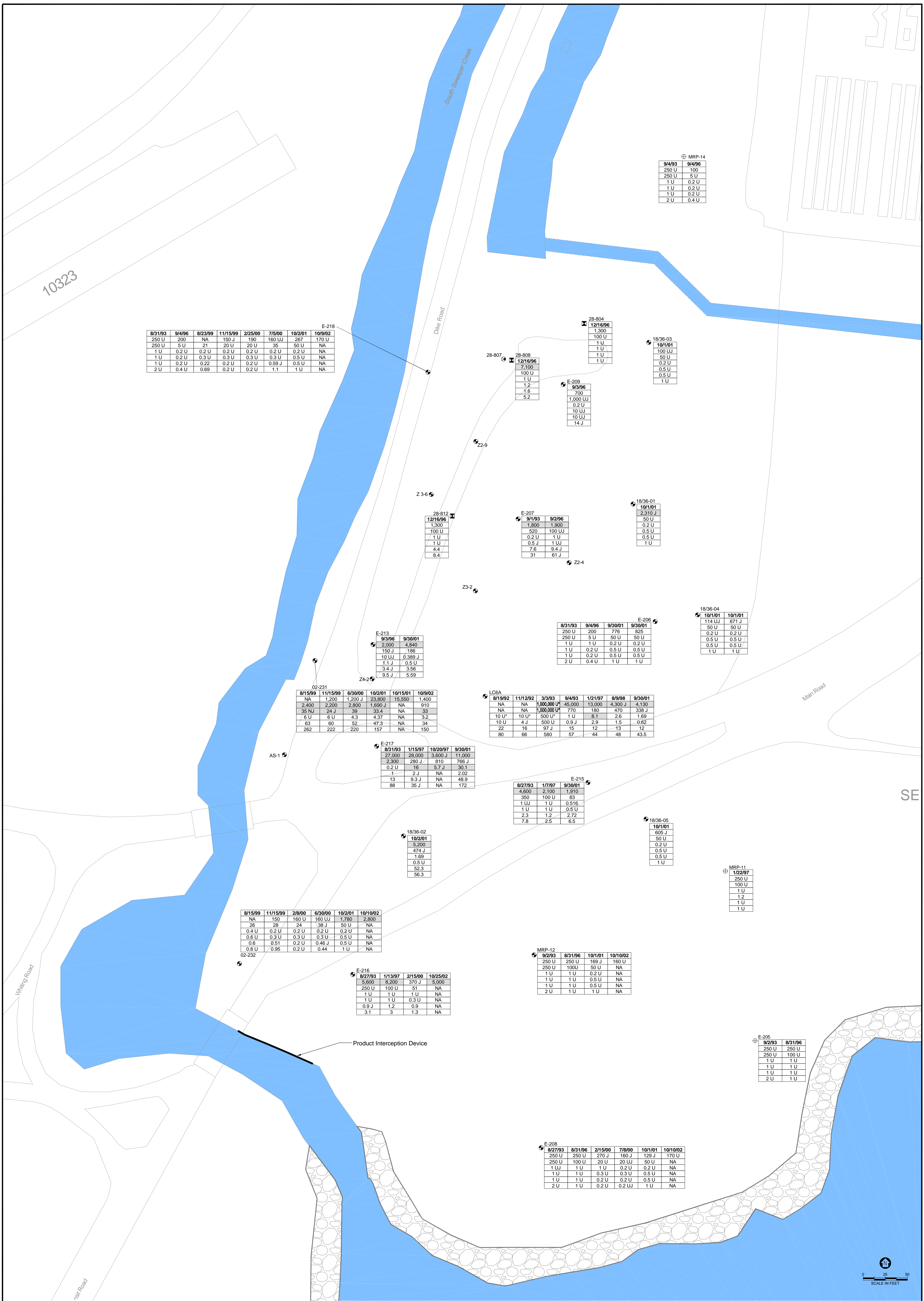
Exceeds Cleanup Criteria
Detection Limit Exceeds Most Stringent Screening Criteria

**Plate 1
DRO, GRO, and BTEX Concentrations in Soil
South of Runway 18-36 Area**

Delivery Order 0037
Adak Island, AK
FOCUSED FEASIBILITY
STUDY

U.S. NAVY





8/31/93	9/4/96	8/23/99	11/15/99	2/25/00	7/5/00	10/2/01	10/9/02
250 U	200	NA	150 J	190	160 UJ	267	170 U
250 U	5 U	21	20 U	20 U	35	50 U	NA
1 U	0.2 U	0.3 U	0.3 U	0.3 U	0.3 U	0.2 U	NA
1 U	0.2 U	0.22	0.2 U	0.2 U	0.59 J	0.5 U	NA
2 U	0.4 U	0.69	0.2 U	0.2 U	1.1	1 U	NA

8/15/99	11/15/99	6/30/00	10/2/01	10/15/01	10/9/02
NA	1,200	1,200 J	23,800	15,550	1,400
2,400	2,200	2,800	1,690 J	NA	910
35 NJ	24 J	39	33.4	NA	33
6 U	6 U	4.3	4.37	NA	3.2
63	60	52	47.3	NA	34
262	222	220	157	NA	150

8/15/99	11/15/99	2/8/00	6/30/00	10/2/01	10/10/02
NA	150	160 U	160 UJ	1,780	2,800
26	28	24	38 J	50 U	NA
0.4 U	0.2 U	0.2 U	0.2 U	0.2 U	NA
0.6 U	0.3 U	0.3 U	0.3 U	0.5 U	NA
0.6	0.51	0.2 U	0.46 J	0.5 U	NA
0.8 U	0.95	0.2 U	0.44	1 U	NA

8/27/93	1/13/97	2/15/00	10/25/02
5,600	8,200	370 J	5,000
250 U	100 U	51	NA
1 U	1 U	1 U	NA
1 U	1 U	0.3 U	NA
0.9 J	1.2	0.9	NA
3.1	3	1.3	NA

12/16/96	9/1/93	9/2/96
100 U	1,800	1,900
1 U	520	100 UJ
1.2	0.2 U	1 U
1.6	0.5 J	1 UJ
5.2	7.6	9.4 J
	31	61 J

8/31/93	9/4/96	9/30/01	9/30/01
250 U	200	776	825
250 U	5 U	50 U	50 U
1 U	1 U	0.2 U	0.2 U
1 U	0.2 U	0.5 U	0.5 U
2 U	0.4 U	1 U	1 U

8/19/92	11/12/92	3/3/93	9/4/93	1/21/97	8/9/96	9/30/01
NA	NA	1,000,000 U*	45,000	13,000	4,300 J	4,130
NA	NA	1,000,000 U*	770	180	470	338 J
10 U*	10 U*	500 U*	1 U	8.1	2.6	1.69
10 U	4 J	500 U	0.9 J	2.9	1.5	0.62
22	16	97 J	15	12	13	12
80	66	580	57	44	48	43.5

8/27/93	1/7/97	9/30/01
4,630	2,100	1,910
350	100 U	83
1 UJ	1 U	0.516
1 U	1 U	0.5 U
2.3	1.2	2.72
7.8	2.5	6.5

9/2/93	8/31/96	10/1/01	10/10/02
250 U	250 U	169 J	160 U
250 U	100 U	50 U	NA
1 U	1 U	0.2 U	NA
1 U	1 U	0.5 U	NA
2 U	1 U	1 U	NA

8/27/93	8/31/96	2/15/00	7/8/00	10/1/01	10/10/02
250 U	250 U	270 J	160 J	129 J	170 U
250 U	100 U	20 U	26 UJ	50 U	NA
1 UJ	1 U	1 U	0.2 U	0.2 U	NA
1 U	1 U	0.3 U	0.3 U	0.5 U	NA
1 U	1 U	0.2 U	0.2 U	0.5 U	NA
2 U	1 U	0.2 U	0.2 U	1 U	NA

LEGEND

Note: Concentrations in ug/L

E-217 Location Number

10/25/98 Sample Date

3,900 GRO

100 U GRO

1 U Benzene

1 U Toluene

13 Ethylbenzene

32 Total Xylenes

U Chemical Not Detected at Concentration Shown

J Estimated Concentration

NA Not Analyzed

Alaska DEC Groundwater Criteria

DRO	1,500 ug/L
GRO	1,300 ug/L
Benzene	5 ug/L
Toluene	1,000 ug/L
Ethylbenzene	700 ug/L
Total Xylenes	10,000 ug/L

Note: These criteria are for groundwater used as a drinking water source (18 AAC 75).

Exceeds Cleanup Criteria

* Detection Limit Exceeds Most Stringent Screening Criteria

Plate 2
DRO, GRO, and BTEX
Concentrations in Groundwater
South of Runway 18-36 Area

U.S. NAVY

Delivery Order 0037
 Adak Island, AK
 FOCUSED FEASIBILITY
 STUDY