

6.0 ANTENNA FIELD, USTS ANT-1, ANT-2, ANT-3, AND ANT-4

This section presents the results of groundwater sampling performed at the Antenna Field (USTs ANT-1, ANT-2, ANT-3, and ANT-4) site during September 2005. MNA is the remedy selected for this site (U.S. Navy, Alaska DEC, and USEPA 2000). To comply with requirements specified for this remedy, the Navy conducts periodic groundwater monitoring at one location (ANT-601) at the site. Groundwater samples are collected from this well to evaluate groundwater quality relative to Alaska groundwater cleanup levels (18 AAC 75.345) and to verify that natural attenuation is occurring. On September 12, 2005, one groundwater sample was collected from well ANT-601 and analyzed for DRO.

Based on data collected prior to the 2005 sampling event, natural attenuation of dissolved petroleum hydrocarbons has been demonstrated at this site and is not discussed further. The CMP, Revision 2 (U.S. Navy 2005a) requires collection of NAP data once every 5 years, with the next NAP sampling scheduled for 2009.

Figure 6-1 shows the location of monitoring well ANT-601, relative to potential source areas at the Antenna Field site and the downgradient surface water body, Palisades Lake. The monitored well is located within the dissolved petroleum plume, approximately 75 feet downgradient from the former petroleum-release area at this site.

The following sections present field and laboratory data resulting from monitoring activities conducted at this site, a comparison of target analyte concentration data to endpoint criteria specified in Section 4, trend evaluation analyses for target analyte concentration data obtained since 1999, conclusions based on these analyses, and recommendations for future monitoring activities at the site.

6.1 FIELD MEASUREMENTS

Field measurements were recorded in the field logbooks during monitoring well purging activities. These field measurements include depth to groundwater, free-product thickness, and physical groundwater parameters. The physical groundwater parameters consisted of pH, specific conductance, turbidity, DO, temperature, salinity and ORP. Table 6-1 lists the final field measurements recorded at each monitoring well prior to sample collection. Appendix A provides copies of the field logbooks containing field measurements recorded during well purging activities at this site. A review of the field measurement data reported for this site indicates that, with the exception of ORP, groundwater parameters stabilized to within the criteria specified by the CMP, Revision 2 (U.S. Navy 2005a) prior to sample collection.

6.2 NATURAL ATTENUATION MONITORING

Based on data collected prior to the 2005 sampling event and summarized in the 2004 report (U.S. Navy 2005b), natural attenuation of dissolved petroleum hydrocarbons has been demonstrated at this site and NAPs were not monitored during the 2005 event. The CMP, Revision 2, requires collection of NAP data once every 5 years, with the next NAP sampling scheduled for 2009.

6.3 TARGET ANALYTE RESULTS

The groundwater sample collected from location ANT-601 was analyzed for DRO content. Table 6-2 presents results of these analyses conducted from 1999 through 2005. DRO was reported in this sample at a concentration of 2,410 µg/L, which is greater than the Alaska DEC groundwater cleanup level of 1,500 µg/L. DRO concentrations in groundwater samples from ANT-601 decreased from 3,200 µg/L in 2001 to 1,700 µg/L in 2002. DRO concentrations have increased to 2,410 µg/L in the 2005 sample from this well.

The analytical results obtained for this location from 1999 through 2005 are summarized in Appendix D. Laboratory forms presenting the 2005 results are provided in Appendix E.

6.4 TREND EVALUATION

The purpose of this evaluation is to determine whether increasing or decreasing concentration trends could be statistically verified for site-specific target analytes. The trend evaluation uses DRO concentration data obtained during six sampling periods from 1999 through 2005. Results of this trend evaluation are summarized in Table 6-3. A groundwater sample could not be obtained from ANT-601 during 2003, because groundwater recharge produced an insufficient volume of water within the well for sample collection during that period. Concentrations of DRO in historical groundwater samples obtained from ANT-601 between 1999 and 2005 that are used for this trend evaluation are presented in Appendix D and Table 6-2.

The nonparametric Mann-Kendall test was used to determine whether DRO concentrations were decreasing, increasing, or remaining constant over time. For this test, all chemical concentration trends are assumed to equal zero, signifying that no trend was present. The calculated Mann-Kendall statistic (s) is a measure of relative concentration change over time. A positive value represents more increasing concentrations than decreasing concentrations during the trend evaluation period. A negative value represents more decreasing concentrations than increasing concentrations during the trend evaluation period. A zero value represents an equal number of

increasing and decreasing concentrations during the trend evaluation period (no concentration change). However, the Mann-Kendall statistic (s) is considered to be statistically significant only if the Mann-Kendall probability (p) is less than the critical value of 0.05. If the (p) value is less than 0.05, the null hypothesis of no trend is rejected and the alternative hypothesis that the concentration trend is significantly different from zero is accepted.

As shown in Table 6-3, a Mann-Kendall statistic (s) of 9 was calculated for DRO concentration data from well ANT-601. This indicates a potentially upward concentration trend. However, a Mann-Kendall probability (p) estimated for the DRO data (0.068) is greater than 0.05 and indicates that the null hypothesis (no statistically significant trend) is accepted. Because the Mann-Kendall probability (p) indicated no statistically significant DRO concentration trend, the slope of the concentration was not calculated, and the evaluation was terminated at this point.

In summary, DRO concentrations reported in groundwater samples from monitoring location ANT-601 appear to be increasing over time. However, this cannot be demonstrated with a statistical significance. Additional DRO data are required to produce a statistically significant estimate of the DRO concentration trend.

6.5 CONCLUSIONS

This section presents the conclusions based on a review of analytical results obtained for groundwater samples collected at the Antenna Field (USTs ANT-1, ANT-2, ANT-3, and ANT-4) site between 1999 and 2005. The conclusions are as follows:




- Field measurements recorded during well purging indicate that groundwater parameters, with the exception of ORP, stabilized to within the specified criteria prior to sample collection.
- MNA is the remedy selected for this site. Natural attenuation parameter monitoring, conducted between 1999 and 2004, suggest that aerobic digestion may have already occurred consuming the available DO in groundwater and that methanogenesis may be the predominant biodegradation reaction occurring at the Antenna Field site (U.S. Navy 2005b).
- Analytical results reported for the groundwater sample collected during 2005 indicate that DRO in groundwater remains above the Alaska DEC groundwater cleanup level established for DRO in groundwater used as a drinking water source (1,500 $\mu\text{g/L}$).

- The trend evaluation performed on DRO data collected between 1999 and 2005 indicates that DRO concentrations appear to be increasing over time. However, this cannot be demonstrated with a statistical significance, and additional DRO data are required to produce a statistically significant trend.

6.6 RECOMMENDATIONS

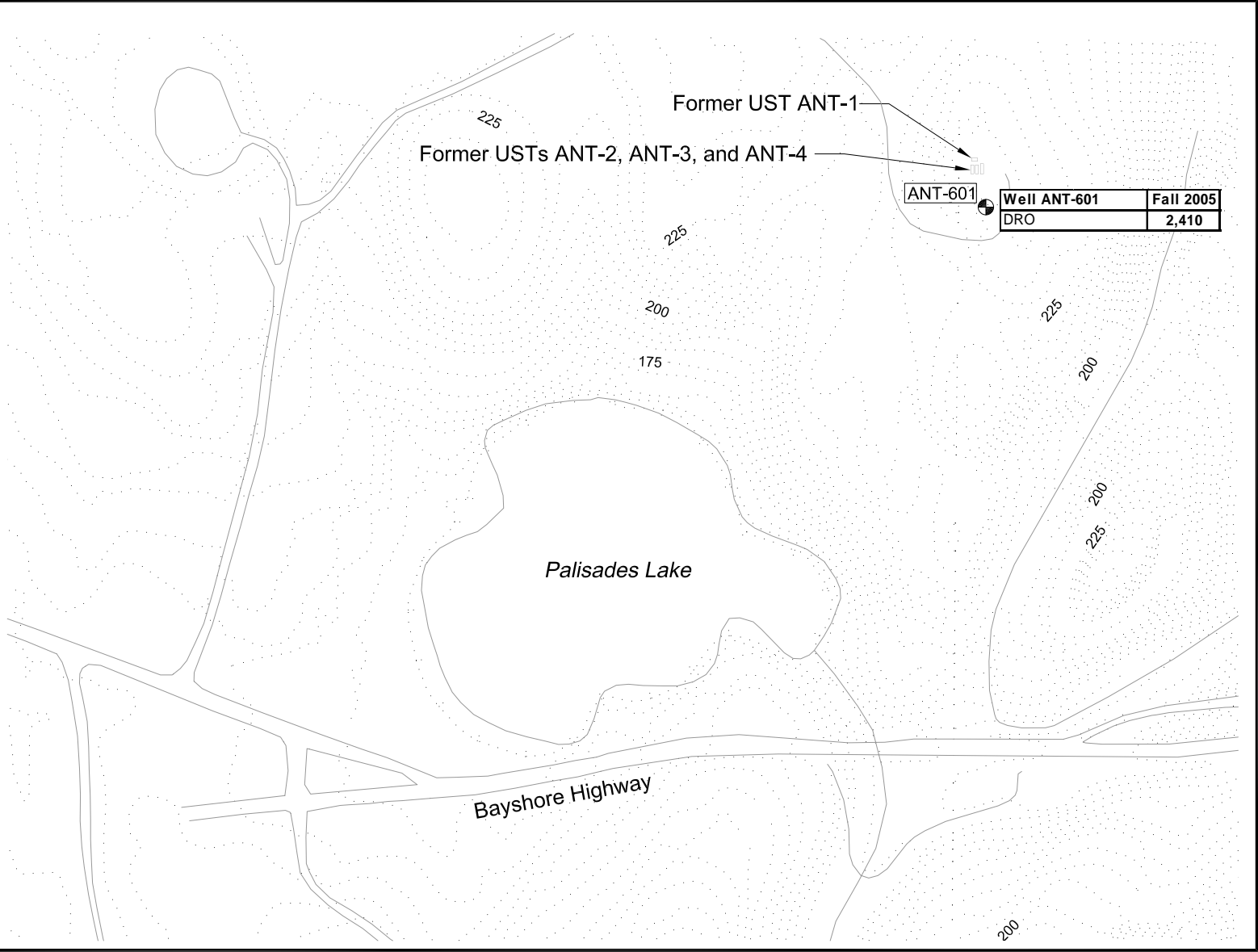
Because DRO concentrations during the four most recent monitoring periods (2001, 2002, 2004, and 2005) are above the endpoint criteria established for monitoring activities and no statistically significant concentration trend could be demonstrated, it is recommended that sampling for DRO continue at location ANT-601 as prescribed in the CMP, Revision 2 (U.S. Navy 2005a).

Legend

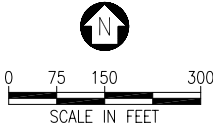
-  25 Elevation Contour (ft Above MLLW)
-  Monitoring Well
-  Well to be Sampled Annually

- Notes:**
1. Concentrations in micrograms per liter (ug/L).
 2. **Bolded Value** is Exceedance of Endpoint Criterion.

Endpoint Criteria	
GRO	1,300 ug/L
RRO	1,100 ug/L
DRO	1,500 ug/L
Benzene	5 ug/L
Toluene	1,000 ug/L
Ethylbenzene	700 ug/L
Xylenes	10,000 ug/L
Lead-Dissolved	15 ug/L
Lead-Total	15 ug/L
Methylene Chloride	5 ug/L
Tetrachloroethene	5 ug/L
bis(2-Ethylhexyl)phthalate	6 ug/L



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**Figure 6-1
Antenna Field
USTs ANT-1, ANT-2, ANT-3, and ANT-4**

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**Table 6-1
 2005 Field Measurements for
 Antenna Field, USTs ANT-1, ANT-2, ANT-3, and ANT-4**

Well Location	Physical Measurements				Groundwater Parameters						
	Casing Elevation (foot MLLW)	Depth to Water (foot BTOC)	Groundwater Surface Elevation (foot MLLW)	Measured Product Thickness (foot)	pH (SU)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Salinity (%)	ORP (mV)
ANT-601	NM	7.07	NM	0	5.88	0.220	0	10.3	8.58	0	-2

Notes:

The reported casing elevation is the surveyed elevation resident within the Navy Installation Restoration Information Management System (IRIMS) database.

The last groundwater parameter measurement prior to sample collection is reported.

BTOC - below top of casing

°C - degree Celsius

mg/L - milligram per liter

mS/cm - milliSiemens per centimeter

MLLW - mean lower low water

mV - millivolt

NM - not measured

ORP - oxidation-reduction potential

NTU - nephelometric turbidity unit

SU - standard unit

Table 6-2
Analytical Results for Petroleum-Related Chemicals for
Antenna Field, USTs ANT-1, ANT-2, ANT-3, and ANT-4

Well Location	Date	DRO (µg/L)
ANT-601	1999	210 U
	2000	310 J
	2001	3,200
	2002	1,700
	2003	NS
	2004	2,020 J
	2005	2,410
Alaska DEC Cleanup Level		1,500

Notes:

Bold indicates reported concentration is greater than Alaska Department of Environmental Conservation (DEC) groundwater cleanup level for groundwater used as a drinking water source.

DRO - diesel-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

NS - not sampled, well dry

U - analyte not detected at specified practical quantitation limit

**Table 6-3
 Concentration Trend Evaluation for
 Antenna Field, USTs ANT-1, ANT-2, ANT-3, and ANT-4**

Well ID	Target Analyte	Exceeds Endpoint Criteria^a	Highest Concentration Last Two Sampling Periods (µg/L)	Endpoint Criteria^a (µg/L)	Sampling Periods (n)	Mann-Kendall Statistic (s)	Mann-Kendall Probability (p)	Statistically Significant Trend	Sen Median Slope	Lower Limit Slope (80% Confidence)	Upper Limit Slope (80% Confidence)
ANT-601	DRO	Yes	2,410	1,500	6	9	0.068	No	NC	NC	NC

^aEndpoint criteria are the Alaska Department of Environmental Conservation (DEC) groundwater cleanup levels established for groundwater used as a drinking water source.

Notes:

Mann-Kendall probability (p) greater than 0.05; Sen slopes were not calculated.

DRO - diesel-range organics

µg/L - microgram per liter (parts per billion)

NC - not calculated

7.0 FORMER POWER PLANT, BUILDING T-1451

This section presents the results of groundwater sampling performed at the Former Power Plant, Building T-1451 site during September 2005. MNA is the remedy selected for this site (U.S. Navy, Alaska DEC, and USEPA 2000). To comply with requirements specified for this remedy, the Navy conducts periodic groundwater monitoring at four locations (01-118, 01-150, 01-151, and E-701) at the site. Groundwater samples are collected from these wells to evaluate groundwater quality relative to Alaska groundwater cleanup levels (18 AAC 75.345) and to verify that natural attenuation is occurring. Background monitoring for DRO, GRO, BTEX, and MNA parameters was initiated at well E-701 during 2003. Well 01-118 was sampled on September 16, 2005 and wells 01-150 and 01-151 were sampled on September 18, 2005. One groundwater sample was collected from each of these wells for DRO analyses. The sample from well 01-118 was also analyzed for RRO.

Figure 7-1 shows the location of these monitoring wells, relative to potential source areas at the Former Power Plant site and the downgradient surface water body, East Canal of the airport ditch system. Apparent groundwater flow across the site is to the south-west. Monitoring wells 01-118, 01-150, and 01-151 are located within the dissolved petroleum plume downgradient of the former petroleum-release area at this site, but upgradient from the East Canal.

The following sections present field and laboratory data resulting from monitoring activities conducted at this site, a comparison of target analyte concentration data to endpoint criteria specified in Section 4, trend evaluation analyses for target analyte concentration data obtained since 1999, conclusions based on these analyses, and recommendations for future monitoring activities at the site.

7.1 FIELD MEASUREMENTS

Field measurements were recorded in the field logbooks during monitoring well purging activities. These field measurements include depth to groundwater, free-product thickness, and physical groundwater parameters. The physical groundwater parameters consisted of pH, specific conductance, turbidity, DO, temperature, salinity, and ORP. Table 7-1 lists the final field measurements recorded at each monitoring well prior to sample collection. Appendix A provides copies of the field logbooks containing field measurements recorded during well purging activities at this site. A review of the field measurement data reported for this site indicates that groundwater parameters stabilized to within the criteria specified by the CMP, Revision 2 (U.S. Navy 2005a) prior to sample collection. Free product was not observed on the groundwater surface in the four wells monitored in 2005.

7.2 NATURAL ATTENUATION MONITORING

Based on data collected prior to the 2005 sampling event and summarized in the 2004 report (U.S. Navy 2005b), natural attenuation of dissolved petroleum hydrocarbons has been demonstrated at this site and NAPs were not monitored during the 2005 event. The CMP, Revision 2, requires collection of NAP data once every 5 years, with the next NAP sampling scheduled for 2009.

7.3 TARGET ANALYTE RESULTS

The groundwater samples collected from locations 01-118, 01-150, and 01-151 were submitted to an analytical laboratory for DRO analysis according AK 102.0. These wells are positioned within the dissolved plume. The sample from well 01-118 was also analyzed for RRO according to AK 103.0. Table 7-2 presents results of these analyses for the 2004 and 2005 events. DRO was reported in the 2005 samples from wells 01-118, 01-150, and 01-151 at estimated concentrations of 11,200, 927, and 2,840 $\mu\text{g/L}$, respectively. The DRO concentrations in samples from these three wells increased from 2004 to 2005 (Table 7-2) and the 2004 and 2005 concentrations for wells 01-118 and 01-151 were greater than the Alaska DEC cleanup level of 1,500 $\mu\text{g/L}$.

RRO was reported in the sample from well 01-118 at an estimated concentration of 1,130 $\mu\text{g/L}$, which is greater than the Alaska DEC cleanup level of 1,100 $\mu\text{g/L}$, but less than the 2004 result for this location.

The analytical results obtained for these locations from 1999 through 2005 are summarized in Appendix D. Laboratory forms presenting the 2005 results are provided in Appendix E.

7.4 TREND EVALUATION

The purpose of this evaluation is to determine whether increasing or decreasing concentration trends could be statistically verified for site-specific target analytes. The trend evaluation was limited to the target analytes for which laboratory-reported concentrations exceeded endpoint criteria during either of the last two sampling events and where there were at least four data points.

The trend evaluation conducted for target analytes at the Former Power Plant site utilizes concentration data obtained during previous sampling periods. These sampling periods are 2001 through 2005 for location 01-118 and 2003 through 2005 for locations 01-150 and 01-151.

Concentrations of target analytes in historical groundwater samples obtained from this site that are used for trend evaluations are presented in Appendix D.

Trend evaluations are conducted for DRO and RRO at 01-118, because analyses of groundwater samples collected from this location during the last two periods identified DRO and RRO at concentrations above the respective Alaska DEC groundwater cleanup levels for groundwater used as a drinking water source (endpoint criteria) and data are available from four sampling periods at this location.

Trend evaluations are not conducted for DRO and RRO at 01-150, because analyses of groundwater samples collected from this location during the last two periods identified DRO and RRO at concentrations that meet endpoint criteria (below Alaska DEC groundwater cleanup levels for groundwater used as a drinking water source).

Trend evaluation is not conducted for DRO at 01-151, because an insufficient number of DRO data points (three) are available at this location to conduct trend evaluation.

Results of trend evaluations performed for this site are summarized in Table 7-3.

The nonparametric Mann-Kendall test was used to determine whether target analyte concentrations are decreasing, increasing, or remaining constant over time. For this test, all chemical concentration trends are assumed to equal zero, signifying that no statistically significant trend is present. The calculated Mann-Kendall statistic (s) is a measure of relative concentration change over time. A positive value represents more increasing concentrations than decreasing concentrations during the trend evaluation period. A negative value represents more decreasing concentrations than increasing concentrations during the trend evaluation period. A zero value represents an equal number of increasing and decreasing concentrations during the trend evaluation period (no concentration change). However, the Mann-Kendall statistic (s) is considered to be statistically significant only if the Mann-Kendall probability (p) is less than the critical value of 0.05. If the (p) value is less than 0.05, the null hypothesis of no trend is rejected and the alternative hypothesis that the concentration trend is significantly different from zero is accepted.

A Mann-Kendall statistic (s) of 0 was calculated for DRO concentration data from well 01-118 (Table 7-3). This indicates no concentration trend is apparent for DRO in groundwater at this location. The Mann-Kendall probability (p) estimated for the DRO data (0.592) is greater than 0.05 and indicates that the null hypothesis (no statistically significant trend) is accepted. Because the Mann-Kendall probability (p) indicates no statistically significant DRO concentration trend, the slope of the concentration was not calculated and the evaluation was terminated at this point.

A Mann-Kendall statistic (s) of -4 was calculated for RRO concentration data from well 01-118 (Table 7-3). This indicates a potentially decreasing concentration trend. However, a Mann-Kendall probability (p) estimated for the RRO data (0.242) is greater than 0.05 and indicates that the null hypothesis (no statistically significant trend) is accepted. Because the Mann-Kendall probability (p) indicates no statistically significant RRO concentration trend, the slope of the concentration was not calculated and the evaluation was terminated at this point.

In summary, DRO concentrations reported in groundwater samples from monitoring location 01-118 appear to be essentially unchanged over time while RRO concentrations appear to be decreasing. However, these trends cannot be demonstrated with a statistical significance. In addition, an insufficient number of data points are available to conduct a trend evaluation for DRO data from monitoring location 01-151. Further monitoring and sample analyses are required to produce a statistically significant estimate of DRO and RRO concentration trends at these locations.

7.5 CONCLUSIONS

This section presents the conclusions based on a review of analytical results obtained for groundwater samples collected at the Former Power Plant, Building T-1451 site between 1999 and 2005. The conclusions are as follows:

- Field measurements recorded during 2005 well purging indicate that groundwater parameters stabilized to within the specified criteria prior to sample collection.
- Free product was not observed on the groundwater in the wells monitored at this site in 2005.
- Analytical results reported for the groundwater samples collected during 2005 indicate that the DRO concentrations remain above the Alaska DEC groundwater cleanup level established for DRO in groundwater used as a drinking water source (1,500 $\mu\text{g/L}$) at locations 01-118 (11,200 $\mu\text{g/L}$) and 01-151 (2,840 $\mu\text{g/L}$).
- Analytical results reported for the groundwater sample collected during 2005 indicate that the RRO concentration remains above the Alaska DEC groundwater cleanup level established for RRO in groundwater used as a drinking water source (1,100 $\mu\text{g/L}$) at location 01-118 (1,130 $\mu\text{g/L}$).
- Analytical results reported for the groundwater sample from location 01-150 collected during 2005 indicate that DRO concentrations remain below the Alaska




DEC groundwater cleanup levels for groundwater used as a drinking water source (1,500 µg/L). However, concentrations have increased from 2004 to 2005.

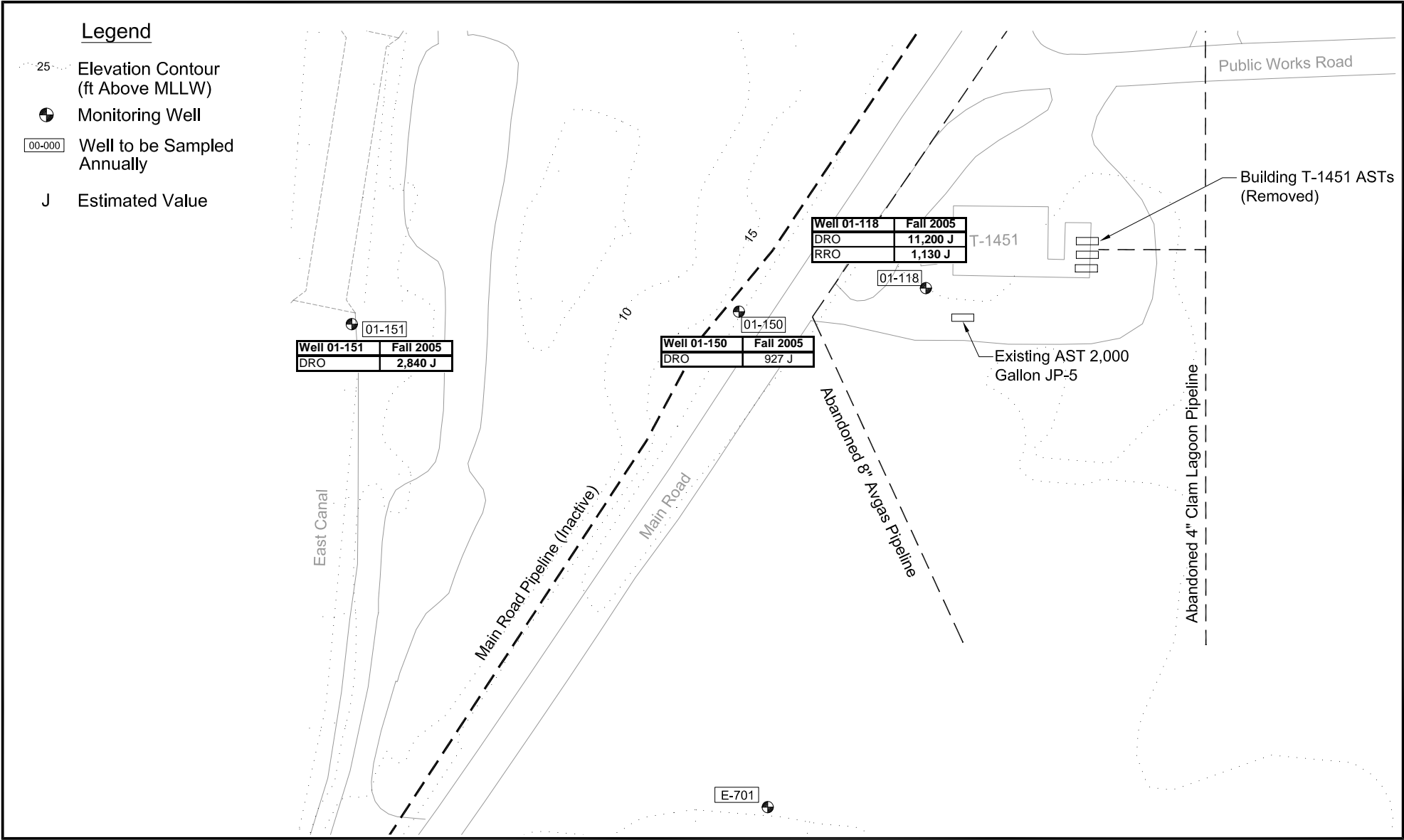
- The trend evaluation performed on DRO and RRO data collected between 1999 and 2005 at location 01-118 indicates that DRO concentrations appear to be essentially unchanged over time, while RRO concentrations appear to be decreasing. However, these trends cannot be demonstrated with a statistical significance, and additional DRO and RRO data are required to demonstrate statistically significant trends.

7.6 RECOMMENDATIONS

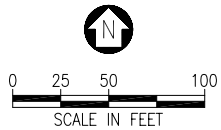
Since DRO concentrations remain above the Alaska DEC cleanup level in groundwater samples collected from wells 01-118 and 01-151 and RRO concentrations remain above the Alaska cleanup level in groundwater samples from well 01-118, monitoring should continue at this site as prescribed by the CMP, Revision 2 (U.S Navy 2005a).

Legend

-  25 Elevation Contour (ft Above MLLW)
-  Monitoring Well
-  Well to be Sampled Annually
- J** Estimated Value



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**Figure 7-1
Former Power Plant
Building T-1451**

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**Table 7-1
 2005 Field Measurements for Former Power Plant, Building T-1451**

Well Location	Physical Measurements				Groundwater Parameters						
	Casing Elevation (foot MLLW)	Depth to Water (foot BTOC)	Groundwater Surface Elevation (foot MLLW)	Measured Product Thickness (foot)	pH (SU)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Salinity (%)	ORP (mV)
01-118	19.68	16.51	3.17	0	6.29	0.604	58	0	8.00	0	-115
01-150	22.68	20.33	2.35	0	5.88	0.284	85	0	8.19	0	34
01-151	8.67	7.75	0.92	0	6.46	0.353	43	0	8.47	0	-151
E-701	21.26	18.53	2.73	0	6.25	0.168	6	11.57	5.82	0	277

Notes:

The reported casing elevation is the surveyed elevation resident within the Navy Installation Restoration Information Management System (IRIMS) database.

The last groundwater parameter measurement prior to sample collection is reported.

BTOC - below top of casing

°C - degree Celsius

mg/L - milligram per liter

mS/cm - milliSiemens per centimeter

MLLW- mean lower low water

mV - millivolt

NTU - nephelometric turbidity unit

ORP - oxidation-reduction potential

SU - standard unit

**Table 7-2
 Analytical Results for Petroleum-Related Chemicals for
 Former Power Plant, Building T-1451**

Well Location	Date	DRO (µg/L)	RRO (µg/L)
01-118	2004	7,080	1,310
	2005	11,200 J	1,130 J
01-150	2004	394	500 U
	2005	927 J	NP
01-151	2004	1,590	500 U
	2005	2,840 J	NP
E-701	2004	250 U	NP
	2005	NP	NP
Alaska DEC Cleanup Level		1,500	1,100

Notes:

Bold indicates reported concentration is greater than Alaska Department of Environmental Conservation (DEC) groundwater cleanup level for groundwater used as a drinking water source.

DRO - diesel-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

NP - not planned

RRO - residual-range organics

U - analyte not detected at specified practical quantitation limit

**Table 7-3
 Concentration Trend Evaluation for Former Power Plant, Building T-1451**

Well ID	Target Analyte	Exceeds Endpoint Criteria ^a	Highest Concentration Last Two Sampling Periods (µg/L)	Endpoint Criteria ^a (µg/L)	Sampling Periods (n)	Mann-Kendall Statistic (s)	Mann-Kendall Probability (p)	Statistically Significant Trend	Sen Median Slope	Lower Limit Slope (80% Confidence)	Upper Limit Slope (80% Confidence)
01-118	DRO	Yes	11,200 J	1,500	5	0	0.592	No	NC	NC	NC
	RRO	Yes	1,310	1,100	5	-4	0.242	No	NC	NC	NC
01-150	DRO	No	927 J	1,500	3	Meets endpoint criterion; 2 consecutive results below groundwater cleanup level					
01-151	DRO	Yes	2,840 J	1,500	3	Insufficient number of data points to complete trend evaluation					

^a Endpoint criteria are the Alaska Department of Environmental Conservation (DEC) groundwater cleanup levels established for groundwater used as a drinking water source.

Notes:

Mann-Kendall probability (p) greater than 0.05; Sen slopes were not calculated.

DRO - diesel-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

NC - not calculated

RRO - residual-range organics

8.0 GCI COMPOUND, UST GCI-1

This section presents the results of groundwater sampling performed at the GCI Compound, UST GCI-1 site during September 2005. The remedy specified for this site in the OU A ROD is free-product recovery (U.S. Navy, Alaska DEC, and USEPA 2000). MNA with institutional controls was selected by the Navy and Alaska DEC as the post-free-product recovery remedy for this site (U.S. Navy and Alaska DEC 2005). To comply with requirements specified for the MNA remedy, the Navy conducts annual groundwater monitoring at four locations (04-100, 04-202, 04-210, and 04-701) at the site. The 2005 event is the first year that monitoring has been conducted at wells 04-202 and 04-210 as part of the annual monitoring program under the CMP, Revision 2 (U.S. Navy 2005a). Groundwater samples are collected from these wells to evaluate groundwater quality relative to Alaska groundwater cleanup levels (18 AAC 75.345), to evaluate NAPs, and to monitor for surface water protection. On September 20, 2005, one groundwater sample was collected from each of wells 04-100, 04-210, and 04-701 for GRO and BTEX analysis. The groundwater sample collected from well 04-100 was also analyzed for DRO. Free product was observed on the groundwater surface in well 04-202 and was not sampled. NAPs will be monitored at this site every five years, with the next sampling scheduled for 2009.

Figure 8-1 shows the location of these monitoring wells, relative to potential source areas at the GCI Compound site. Apparent groundwater flow across the site is to the west. Well 04-202 is the most upgradient well and, given the presence of free product, is assumed to be closest to the inferred source area. Well 04-100 is approximately 140 feet south-southwest of 04-202, while well 04-210 is approximately 180 feet southwest of 04-202. Well 04-701 is the most downgradient well monitored at the site and is located approximately 380 feet west-southwest of 04-202. The Navy is planning additional investigation of this area during the 2006 field season.

The following sections present field and laboratory data resulting from monitoring activities conducted at this site, a comparison of target analyte concentration data to endpoint criteria specified in Section 4, trend evaluation analyses for target analyte concentration data obtained since 1999, conclusions based on these analyses, and recommendations for future monitoring activities at the site.

8.1 FIELD MEASUREMENTS

Field measurements were recorded in the field logbooks during monitoring well purging activities. These field measurements include depth to groundwater, free-product thickness, and physical groundwater parameters. The physical groundwater parameters consisted of pH, specific conductance, turbidity, DO, temperature, salinity, and ORP. Table 8-1 lists the final

field measurements recorded at each monitoring well prior to sample collection. Appendix A provides copies of the field logbooks containing field measurements recorded during well purging activities at this site. A review of the field measurement data reported for this site indicates that groundwater parameters stabilized to within the criteria specified by the CMP, Revision 2 (U.S. Navy 2005a) prior to sample collection.

Depth to groundwater was measured in 11 wells during the 2005 monitoring. Depth-to-water measurements are summarized in Appendix F. Depth to groundwater ranged from 15.07 to 28.64 feet below top-of-casing (BTOC). Free product was measured in well 04-202 at a thickness of 0.02 foot. Groundwater flow is generally to the west-southwest, with a hydraulic gradient of approximately 0.004.

8.2 NATURAL ATTENUATION MONITORING

Based on data collected prior to the 2005 sampling event and summarized in the 2004 report (U.S. Navy 2005b), natural attenuation of dissolved petroleum hydrocarbons has been demonstrated at this site, and NAPs were not monitored during the 2005 event. The CMP, Revision 2 requires collection of NAP data once every 5 years, with the next NAP sampling scheduled for 2009.

8.3 TARGET ANALYTE RESULTS

The groundwater samples collected from locations 04-100, 04-210, and 04-701 were submitted to an analytical laboratory for GRO and BTEX analyses. The groundwater sample collected from location 04-100 was also analyzed for DRO. Well 04-202 is assumed to be positioned near a source area at the site, and free product was observed in this well during the 2005 monitoring event. As a result, a groundwater sample was not collected from this well. Wells 04-210 and 04-100 are situated within and near the margin of the dissolved plume, respectively. Well 04-701 is positioned near the leading edge of the dissolved plume.

Table 8-2 summarizes the analytical results. GRO was reported in the 2005 sample from well 04-100 at an estimated (J qualified) concentration of 4,420 µg/L. GRO was measured in the 2005 sample from well 04-210 at an estimated concentration of 4,580 µg/L. Both of these concentrations are greater than the Alaska DEC groundwater cleanup level of 1,300 µg/L. The GRO concentrations at these two locations have decreased since they were last sampled (Table 8-2). Benzene was measured in the 2005 samples from well 04-100 and 04-210 at concentrations of 0.95 µg/L and 5.66 µg/L (estimated), respectively. The benzene concentration in the 2005 sample from well 04-210 is greater than the cleanup level of 5 µg/L. Toluene,

ethylbenzene, and total xylenes were not measured at concentrations greater than their respective cleanup levels in the 2005 samples from wells 04-100 and 04-210. DRO was not measured in the sample from well 04-100 at a concentration greater than the cleanup level. GRO and BTEX concentrations were below the cleanup levels in the sample from downgradient well 04-701. A free-product thickness of 0.02 foot was measured in well 04-202 (Table 8-2) and was not sampled in 2005.

The analytical results obtained for these locations from 1999 through 2005 are summarized in Appendix D. Laboratory forms presenting the 2005 results are provided in Appendix E.

8.4 TREND EVALUATION

The purpose of the trend evaluation is to determine whether increasing or decreasing concentration trends can be statistically verified for site-specific target analytes. The trend evaluation is limited to the target analytes for which laboratory-reported concentrations exceeded endpoint criteria during either of the last two sampling events and where there were at least four data points.

Trend evaluations were not conducted on DRO, GRO, and BTEX concentration data from well 04-100, because this well has not been sampled at least four times since 1999. Well 04-100 was sampled in 2003, 2004, and 2005. Trend evaluations were not conducted on GRO and BTEX concentration data from wells 04-202 and 04-210, because these wells have not been sampled at least four times since 1999. Well 04-202 was sampled in 2002 and was not sampled in 2005, because of the presence of free-product. Well 04-210 was sampled in 2002 and 2005. A trend evaluation was not conducted on DRO, GRO, and BTEX concentration data for well 04-701, because these analytes have not been measured in groundwater samples from this well at concentrations greater than endpoint criteria.

A summary of the data to be used in future trend analyses is provided in Table 8-3.

8.5 CONCLUSIONS

This section presents conclusions based on a review of analytical results obtained for groundwater samples collected at the GCI Compound, UST GCI-1 site between 1999 and 2005. The conclusions are as follows:

- Field measurements recorded during 2005 well purging indicate that groundwater parameters stabilized to within the specified criteria prior to sample collection.

- GRO concentrations remain above the Alaska DEC groundwater cleanup level established for GRO in groundwater used as a drinking water source (1,300 µg/L) at locations 04-100 (4,420 µg/L) and 04-210 (4,580 µg/L).
- Benzene concentrations remain above the Alaska DEC groundwater cleanup level established for groundwater used as a drinking water source (5 µg/L) at location 04-210 (5.66 µg/L).
- Analytical results reported for the groundwater samples collected during 2005 indicate that the remaining target analytes were detected at concentrations below the respective Alaska DEC groundwater cleanup levels for groundwater used as a drinking water source.
- Free-product was measured at a thickness of 0.02 foot in well 04-202 during the 2005 monitoring event.
- Dissolved GRO and BTEX have not migrated in groundwater to the downgradient monitoring point 04-701 at concentrations greater than endpoint criteria.
- Trend evaluations were not conducted for concentration data from any of the locations monitored in 2005, because there were less than four data points available, or concentrations were below endpoint criteria.

8.6 RECOMMENDATIONS

Since GRO and benzene concentrations remain above the Alaska DEC cleanup levels in groundwater samples collected from wells 04-100 and 04-210 and product was measured in well 04-202 (0.02 feet), monitoring should continue at this site as prescribed by the CMP, Revision 2 (U.S Navy 2005a).

It is also recommended that well 04-204 be added to the 2006 monitoring program to assess the presence or absence of an upgradient source.

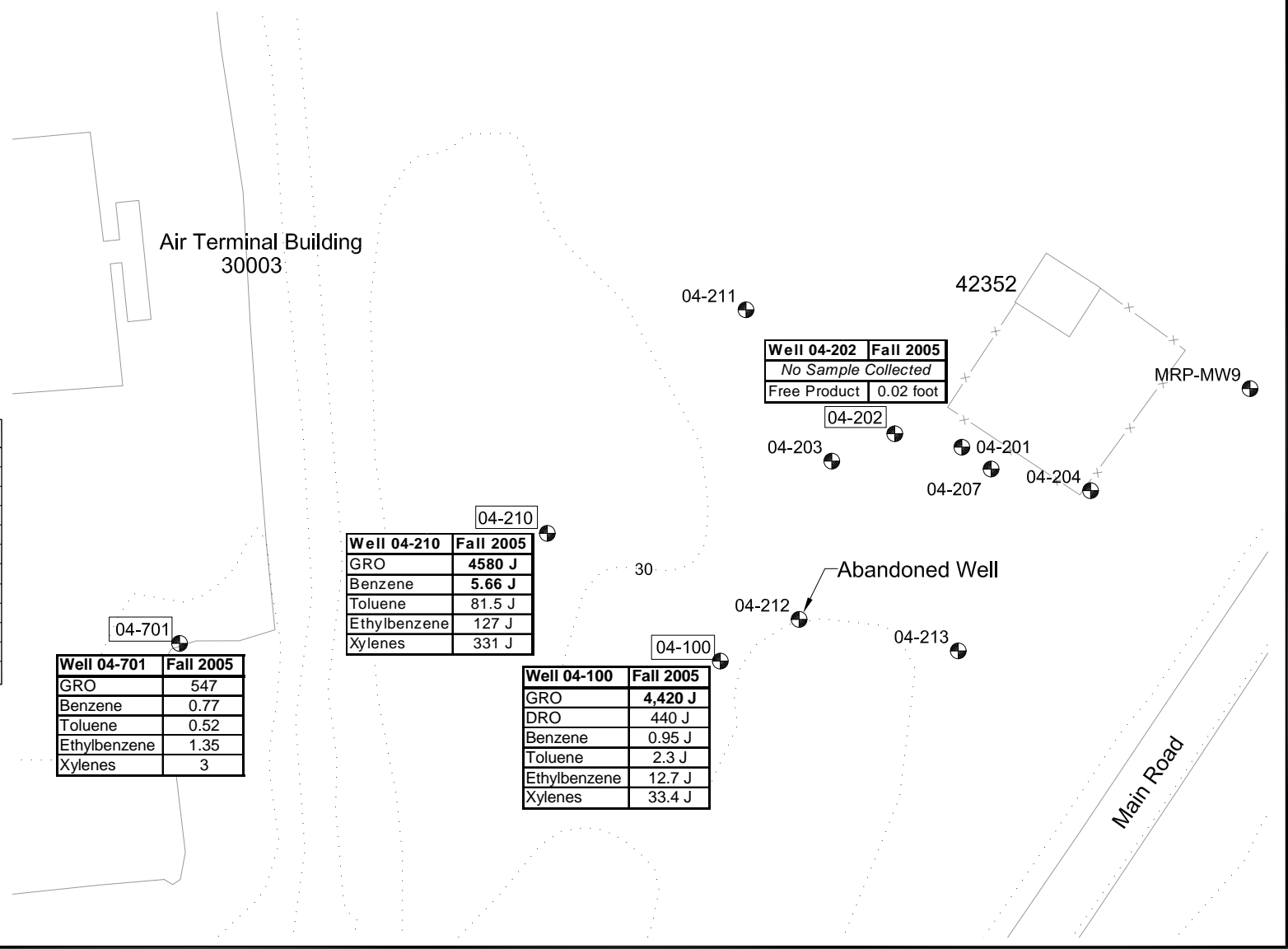
Legend

- 25--- Elevation Contour (ft Above MLLW)
- ⊕ Monitoring Well
- 00-000 Well to be Sampled Annually
- J Estimated Value

Notes:

1. Concentrations in micrograms per liter (ug/L).
2. Bolded Value is Exceedance of Endpoint Criterion.

Endpoint Criteria	
GRO	1,300 ug/L
RRO	1,100 ug/L
DRO	1,500 ug/L
Benzene	5 ug/L
Toluene	1,000 ug/L
Ethylbenzene	700 ug/L
Xylenes	10,000 ug/L
Lead-Dissolved	15 ug/L
Lead-Total	15 ug/L
Methylene Chloride	5 ug/L
Tetrachloroethene	5 ug/L
bis(2-Ethylhexyl)phthalate	6 ug/L



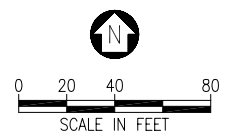
Well 04-701	Fall 2005
GRO	547
Benzene	0.77
Toluene	0.52
Ethylbenzene	1.35
Xylenes	3

Well 04-210	Fall 2005
GRO	4580 J
Benzene	5.66 J
Toluene	81.5 J
Ethylbenzene	127 J
Xylenes	331 J

Well 04-100	Fall 2005
GRO	4,420 J
DRO	440 J
Benzene	0.95 J
Toluene	2.3 J
Ethylbenzene	12.7 J
Xylenes	33.4 J

Well 04-202	Fall 2005
No Sample Collected	
Free Product	0.02 foot

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**Figure 8-1
GCI Compound
UST GCI-1**

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**Table 8-1
 2005 Field Measurements for GCI Compound, UST GCI-1**

Well Location	Physical Measurements				Groundwater Parameters						
	Casing Elevation (foot MLLW)	Depth to Water (foot BTOC)	Groundwater Surface Elevation (foot MLLW)	Measured Product Thickness (foot)	pH (SU)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Salinity (%)	ORP (mV)
04-100	32.80	28.64	4.16	0	6.38	0.295	72	0	7.17	0	-80
04-202	30.90	26.22	4.68	0.02	NM	NM	NM	NM	NM	NM	NM
04-210	29.41	25.10	4.31	0	6.22	0.239	110	0	7.44	0	-52
04-701	18.49	15.07	3.42	0	6.29	0.315	140	0	8.91	0	-72

Notes:

The reported casing elevation is the surveyed elevation resident within the Navy Installation Restoration Information Management System (IRIMS) database.

The last groundwater parameter measurement prior to sample collection is reported.

BTOC - below top of casing

°C - degree Celsius

GCI - General Communications, Inc.

mg/L - milligram per liter

mS/cm - milliSiemens per centimeter

MLLW - mean lower low water

mV - millivolt

NM - not measured

NTU - nephelometric turbidity unit

ORP - oxidation-reduction potential

SU - standard unit

UST - underground storage tank

**Table 8-2
 Analytical Results for Petroleum-Related Chemicals for
 GCI Compound, UST GCI-1**

Well Location	Date	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
04-100	2004	376	5,300J	0.95	2.44	13.1	26.6
	2005	440 J	4,420 J	0.95 J	2.30 J	12.7 J	33.4 J
04-202	2002	660	5,100	8.7	53	90	310
	2004	NP	NP	NP	NP	NP	NP
	2005	FP	FP	FP	FP	FP	FP
04-210	2002	420	5,000	12	29	110	330
	2004	NP	NP	NP	NP	NP	NP
	2005	NP	4,580 J	5.66 J	81.5 J	127 J	331 J
04-701	2004	NP	199	1.72	1.98	10.2	6.51
	2005	NP	547	0.77	0.52	1.35	3.00
Alaska DEC Cleanup Level		1,500	1,300	5	1,000	700	10,000

Notes:

Bold indicates reported concentration is greater than Alaska Department of Environmental Conservation (DEC) groundwater cleanup level for groundwater used as a drinking water source.

DRO - diesel-range organics

FP - not sampled because of the presence of free product

GCI - General Communications, Inc.

GRO - gasoline-range organics

J - estimated value

µg/L - microgram per liter

NP - not planned

UST - underground storage tank

**Table 8-3
 Concentration Trend Evaluation for GCI Compound, UST GCI-1**

Well ID	Target Analyte	Exceeds Endpoint Criteria ^a	Highest Concentration Last Two Sampling Periods (µg/L)	Endpoint Criteria ^a (µg/L)	Sampling Periods (n)	Mann-Kendall Statistic (s)	Mann-Kendall Probability (p)	Statistically Significant Trend	Sen Median Slope	Lower Limit Slope (80% Confidence)	Upper Limit Slope (80% Confidence)
04-100	DRO	No	440	1,500	3	Meets endpoint criterion; 2 consecutive results below endpoint criterion					
	GRO	Yes	5,300 J	1,300	3	Insufficient number of data points to complete trend evaluation					
	Benzene	No	0.95 J	5	3	Meets endpoint criteria; 2 consecutive results below endpoint criteria					
	Ethylbenzene	No	13.1	700	3						
	Toluene	No	2.44	1,000	3						
	Total xylenes	No	33.4 J	10,000	3						
04-202	DRO	No	660	1,500	2	Insufficient number of data points to complete trend evaluation					
	GRO	Yes	5,100	1,300	2						
	Benzene	Yes	8.7	5	2						
	Ethylbenzene	No	90	700	2						
	Toluene	No	53	1,000	2						
	Total xylenes	No	310	10,000	2						
04-210	DRO	No	420	1,500	2	Insufficient number of data points to complete trend evaluation					
	GRO	Yes	5,000	1,300	2						
	Benzene	Yes	12	5	2						
	Ethylbenzene	No	127 J	700	2						
	Toluene	No	81.5 J	1,000	2						
	Total xylenes	No	331 J	10,000	2						
04-701	GRO	No	290	1,300	6	Meets endpoint criteria; 2 consecutive results below endpoint criteria. However, a review of data obtained for this location from 1999 through 2004 suggests an upward concentration trend for these target analytes.					
	Benzene	No	1.72	5	6						
	Ethylbenzene	No	10.2	700	6						
	Toluene	No	1.98	1,000	6						
	Total xylenes	No	12.2	10,000	6						

Table 8-3 (Continued)
Concentration Trend Evaluation for GCI Compound, UST GCI-1

^aEndpoint criteria are the Alaska Department of Environmental Conservation (DEC) groundwater cleanup levels established for groundwater used as a drinking water source.

Notes:

Mann-Kendall probability (p) greater than 0.05; Sen slopes were not calculated.

DRO - diesel-range organics

GRO - gasoline-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

UST - underground storage tank

9.0 HOUSING AREA (ARCTIC ACRES)

This section presents the results of groundwater sampling performed at the Housing Area (Arctic Acres) site during September 2005. MNA is the remedy selected for this site (U.S. Navy, Alaska DEC, and USEPA 2000). To comply with requirements specified for this remedy, the Navy conducts periodic groundwater monitoring at five locations (03-416, 03-420, 03-421, 03-890, and AA-01) at the site (Figure 9-1). Wells 03-421 and 03-890 were added in 2005, and the monitoring frequency of wells 03-416 and AA-01 was reduced to once every other year as part of CMP, Revision 2 (U.S. Navy 2005a). Wells 03-416 and AA-01 were not monitored in 2005, but will be monitored every other year, with the next sampling scheduled for 2006. Groundwater samples are collected from these wells to evaluate groundwater quality relative to Alaska groundwater cleanup levels (18 AAC 75.345) and to verify that natural attenuation is occurring. On September 22, 2005, a groundwater sample was collected from well 03-420. Groundwater samples were not collected from wells 03-421 and 03-890, because of the presence of free product. The sample from well 03-420 was analyzed for DRO.

The following sections present field and laboratory data resulting from monitoring activities conducted at this site, a comparison of target analyte concentration data to endpoint criteria specified in Section 4, trend evaluation analyses for target analyte concentration data obtained since 1999, conclusions based on these analyses, and recommendations for future monitoring activities at the site.

9.1 FIELD MEASUREMENTS

Field measurements were recorded in the field logbooks during monitoring well purging activities. These field measurements include depth to groundwater, free product thickness, and physical groundwater parameters. The physical groundwater parameters consisted of pH, specific conductance, turbidity, DO, temperature, salinity, and ORP. Table 9-1 lists the final field measurements recorded at each monitoring well prior to sample collection. Appendix A provides copies of the field logbooks containing field measurements recorded during well purging activities at this site. A review of the field measurement data reported for this site indicates that all groundwater parameters stabilized to within the criteria specified by the CMP, Revision 2 (U.S. Navy 2005a) prior to sample collection.

Free product was observed in wells 03-421 and 03-890 at thicknesses of 0.22 and 0.21 foot, respectively.

9.2 NATURAL ATTENUATION MONITORING

Based on data collected prior to the 2005 sampling event and summarized in the 2004 report (U.S. Navy 2005b), natural attenuation of dissolved petroleum hydrocarbons has been demonstrated at this site, and NAPs were not monitored during the 2005 event. The CMP, Revision 2, requires collection of NAP data once every 5 years, with the next NAP sampling scheduled for 2009.

9.3 TARGET ANALYTE RESULTS

The target analyte at Housing Area (Arctic Acres) is DRO. RRO was removed as a target analyte, with the concurrence of Alaska DEC, because RRO monitoring had met endpoint criteria (U.S. Navy 2005b). Groundwater sample collection was planned at wells 03-420, 03-421, and 03-890. However, wells 03-421 and 03-890 were not sampled, because of the presence of free product. The sample from well 03-421 was analyzed for DRO according Alaska Method AK 102.0. Table 9-2 summarizes these results. DRO was measured at an estimated concentration of 5,650 $\mu\text{g/L}$ in the sample from well 03-420, which is greater than the Alaska DEC cleanup level of 1,500 $\mu\text{g/L}$.

DRO concentrations in the 2001, 2003, and 2004 groundwater samples from well 03-416 were 3,450, 790, and 1,160 $\mu\text{g/L}$, respectively. The 2003 and 2004 DRO concentrations in groundwater from this well were below the endpoint criterion of 1,500 $\mu\text{g/L}$. DRO concentrations in samples from well 03-420 have generally decreased from 12,300 $\mu\text{g/L}$ in 2001 to 5,650 $\mu\text{g/L}$ in 2005. DRO concentrations in samples from well 03-421 decreased from 81,300 $\mu\text{g/L}$ in 2001 to 3,500 $\mu\text{g/L}$ in 2002. However, free product was observed in this well in 2005. DRO concentrations also decreased in samples from well 03-890 from 90,600 $\mu\text{g/L}$ in 2001 to 16,000 $\mu\text{g/L}$ in 2002. Free product was also observed in this well during the 2005 monitoring event. DRO concentrations in the 2002, 2003, and 2004 groundwater samples from well AA-01 were 320, 420, and 472 $\mu\text{g/L}$, respectively, which are all below the endpoint criteria of 1,500 $\mu\text{g/L}$.

DRO has been measured at concentrations greater than the endpoint criterion of 1,500 $\mu\text{g/L}$ in groundwater samples collected from wells 03-420, 03-421, and 03-890 since 2001, or free product has been observed.

The analytical results obtained for these locations from 1999 through 2005 are summarized in Appendix D. The 2005 laboratory forms showing these results are provided in Appendix E.

9.4 TREND EVALUATION

The purpose of the trend evaluation is to determine whether increasing or decreasing concentration trends can be statistically verified for site-specific target analytes. The trend evaluation is limited to the target analytes for which laboratory-reported concentrations exceeded endpoint criteria during either of the last two sampling events and where there were at least four data points.

Trend evaluations were not conducted for DRO concentrations from wells 03-421 and 03-890, because an insufficient number of data points are available since 2001. A trend evaluation was also not conducted for well AA-01 because DRO concentrations from this well are below the endpoint criteria. A trend evaluation was not conducted for DRO concentrations at well 03-416, because DRO concentrations have been below the cleanup level for the last two sampling events.

The nonparametric Mann-Kendall test was used to determine whether DRO concentrations were decreasing, increasing, or remaining constant over time. For this test all chemical concentration trends are assumed to equal zero, signifying that no trend was present. The calculated Mann-Kendall statistic (s) is a measure of relative concentration change over time. A positive value represents more increasing concentrations than decreasing concentrations during the trend evaluation period. A negative value represents more decreasing concentrations than increasing concentrations during the trend evaluation period. A zero value represents an equal number of increasing and decreasing concentrations during the trend evaluation period (no concentration change). However, the Mann-Kendall statistic (s) is considered to be statistically significant only if the Mann-Kendall probability (p) is less than the critical value of 0.05. If the (p) value is less than 0.05, the null hypothesis of no trend is rejected and the alternative hypothesis that the concentration trend is significantly different from zero is accepted.

As shown in Table 9-3, a Mann-Kendall statistic (s) of 11 was calculated for DRO concentration data from well 03-420. This indicates a potentially upward concentration trend. However, a Mann-Kendall probability (p) estimated for the DRO data (0.068) is greater than 0.05 and indicates that the null hypothesis (no statistically significant trend) is accepted. Because the Mann-Kendall probability (p) indicated no statistically significant DRO concentration trend, the slope of the concentration was not calculated, and the evaluation was terminated at this point.

In summary, DRO concentrations reported in groundwater samples from monitoring location 03-420 appear to be increasing over time. However, this cannot be demonstrated with statistical significance. Additional DRO data are required to produce a statistically significant estimate of the DRO concentration trend.

9.5 CONCLUSIONS

This section presents the conclusions based on a review of analytical results obtained for groundwater samples collected at the Housing Area (Arctic Acres) site between 1999 and 2005. The conclusions are as follows:

- Field measurements recorded during well purging indicate that groundwater parameters stabilized to within the specified criteria prior to sample collection.
- Analytical results reported for the groundwater sample collected during 2004 and 2005 from well 03-420 indicate that the DRO concentrations have not met the endpoint criteria and continue to be above the groundwater cleanup levels with an upward trend. However, this upward trend cannot be demonstrated with statistical significance, and additional DRO data are required to produce a statistically significant trend.
- The trend evaluation performed on DRO data collected between 1999 and 2005 indicated that DRO concentrations appear to be increasing over time. However, this cannot be demonstrated with statistical significance, and additional DRO data are required to produce a statistically significant trend.

9.6 RECOMMENDATIONS

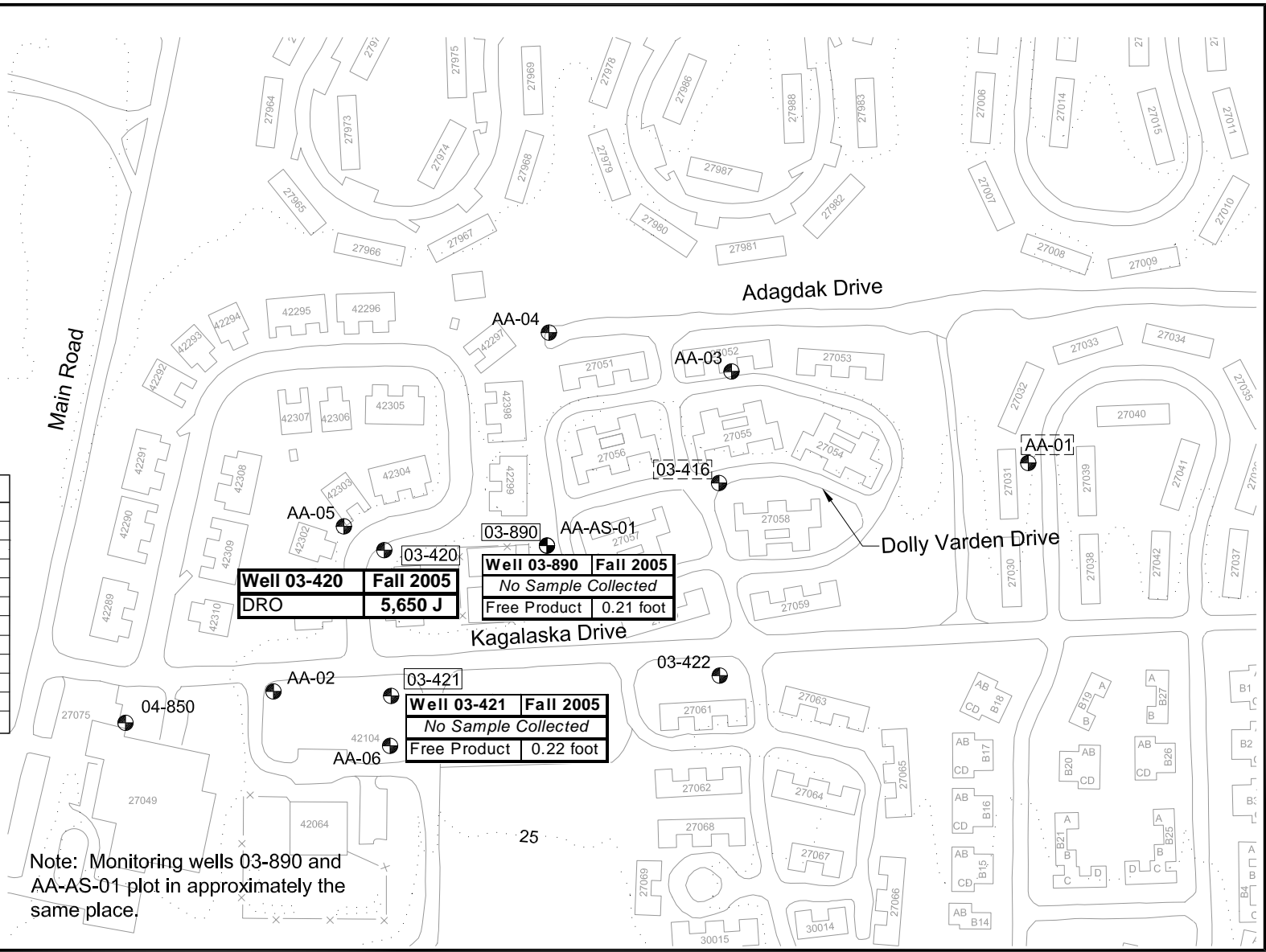
Since DRO concentrations remain above the Alaska DEC cleanup level in groundwater samples collected from well 03-420 and free product was measured in wells 03-421 and 03-890, monitoring should continue at this site as prescribed by the CMP, Revision 2 (U.S Navy 2005a).

Legend

- 25 Elevation Contour (ft Above MLLW)
- Monitoring Well
- Well to be Sampled Annually
- Well to be Sampled Every Other Year
- J Estimated Value

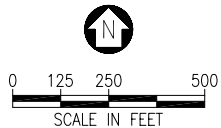
- Notes:**
- Concentrations in micrograms per liter (ug/L).
 - Bolded Value is Exceedance of Endpoint Criterion.**

Endpoint Criteria	
GRO	1,300 ug/L
RRO	1,100 ug/L
DRO	1,500 ug/L
Benzene	5 ug/L
Toluene	1,000 ug/L
Ethylbenzene	700 ug/L
Xylenes	10,000 ug/L
Lead-Dissolved	15 ug/L
Lead-Total	15 ug/L
Methylene Chloride	5 ug/L
Tetrachloroethene	5 ug/L
bis(2-Ethylhexyl)phthalate	6 ug/L



Note: Monitoring wells 03-890 and AA-AS-01 plot in approximately the same place.

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**Figure 9-1
 Housing Area (Arctic Acres)**

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**Table 9-1
 2005 Field Measurements for Housing Area (Arctic Acres)**

Well Location	Physical Measurements				Groundwater Parameters						
	Casing Elevation (foot MLLW)	Depth to Water (foot BTOC)	Groundwater Surface Elevation (foot MLLW)	Measured Product Thickness (foot)	pH (SU)	Specific Conductance (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Salinity (%)	ORP (mV)
03-420	29.76	22.74	7.02	0	6.13	0.300	31	0	7.53	0	-16
03-421	29.81	22.86	6.95	0.22	NM	NM	NM	NM	NM	NM	NM
03-890	30.54	23.48	7.06	0.21	NM	NM	NM	NM	NM	NM	NM

Notes:

The reported casing elevation is the surveyed elevation resident within the Navy Installation Restoration Information Management System (IRIMS) database.

The last groundwater parameter measurement prior to sample collection is reported.

BTOC - below top of casing

°C - degree Celsius

mg/L - milligram per liter

mS/cm - milliSiemens per centimeter

MLLW - above mean lower low water

mV - millivolt

NTU - nephelometric turbidity unit

ORP - oxidization-reduction potential

SU - standard unit

**Table 9-2
 Analytical Results for Petroleum-Related Chemicals for
 Housing Area (Arctic Acres)**

Well Location	Date	DRO (µg/L)
03-416	2001	3,450
	2003	790
	2004	1,160
	2005	NP
03-420	2001	12,300
	2002	4,900
	2003	4,900
	2004	5,450
	2005	5,650 J
03-421	2001	81,300 J
	2002	3,500
	2004	NP
	2005	NS
03-890	2001	90,600 J
	2002	16,000
	2004	NP
	2005	NS
AA-01	2001	1,190 J
	2002	320
	2003	420
	2004	472
	2005	NP
Alaska DEC Cleanup Level		1,500

Notes:

Bold indicates reported concentration is greater than Alaska Department of Environmental Conservation (DEC) groundwater cleanup level for groundwater used as a drinking water source.

DRO - gasoline-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

NP - not planned

NS - not sampled due to the presence of free-product

**Table 9-3
 Concentration Trend Evaluation for Housing Area (Arctic Acres)**

Well ID	Target Analyte	Exceeds Endpoint Criteria ^a	Highest Concentration Last Two Sampling Periods (µg/L)	Endpoint Criteria ^a (µg/L)	Sampling Periods (n)	Mann-Kendall Statistic (s)	Mann-Kendall Probability (p)	Statistically Significant Trend	Sen Median Slope	Lower Limit Slope (80% Confidence)	Upper Limit Slope (80% Confidence)
03-416	DRO	No	1,160	1,500	3	Meets endpoint criterion; 2 consecutive results below endpoint criterion					
03-420	DRO	Yes	5,650 J	1,500	7	11	0.068	No	NC	NC	NC
03-421	DRO	Yes	81,300 J	1,500	3	Insufficient number of data points to complete trend evaluation					
03-890	DRO	Yes	90,600 J	1,500	3						
AA-01	DRO	No	472	1,500	4	Meets endpoint criterion; 2 consecutive results below endpoint criterion					

^aEndpoint criteria are the Alaska Department of Environmental Conservation (DEC) groundwater cleanup levels established for groundwater used as a drinking water source.

Notes:

Mann-Kendall probability (p) greater than 0.05, Sen slopes were not calculated.

DRO - diesel-range organics

J - estimated value

µg/L - microgram per liter (parts per billion)

NC - not calculated

NS - not sampled because of presence of free product