Table 2-1
Monthly Groundwater Recovery

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

Date	Monthly Total (gallons)	Monthly Average (gallons / day)	Monthly Average (gallons / minute)	Highest Daily Flow (gallons)	Lowest Daily Flow (gallons)
January 2009	5,637,292	181,848	126	223,719	160,077
February 2009	4,965,414	177,336	123	193,239	156,219
March 2009	5,673,504	183,016	127	197,544	161,158
April 2009	5,845,823	194,861	135	211,585	165,629
May 2009	6,430,915	207,449	144	213,643	195,151
June 2009	6,229,883	207,663	144	232,475	191,543
July 2009	6,316,965	203,773	142	243,049	176,412
August 2009	6,243,319	201,397	140	358,591	24,712
September 2009	10,634,423	354,481	246	376,819	291,904
October 2009	5,114,811	164,994	115	374,175	0
November 2009	0	0	0	0	0
December 2009	6,153,173	198,489	138	285,246	0
January 2010	8,676,601	279,890	194	310,005	238,342
February 2010	9,185,582	328,057	228	349,341	280,463
March 2010	9,424,363	304,012	211	338,199	241,764
April 2010	9,914,262	330,475	229	375,313	283,315
May 2010	9,812,735	316,540	220	352,672	277,754
June 2010	9,282,464	309,415	215	380,474	223,718
July 2010	9,325,475	300,822	209	351,204	93,133
August 2010	9,872,250	318,460	221	356,560	212,790
September 2010	9,122,386	304,080	211	348,426	276,194
October 2010	7,700,526	248,404	173	322,996	731
November 2010	7,489,601	249,653	173	322,261	203,597
December 2010	7,279,463	234,821	163	290,275	206,455
January 2011	8,605,402	277,594	193	321,282	234,410
February 2011	7,409,928	264,640	184	291,111	196,712
March 2011	7,144,062	230,454	160	275,500	68,270
April 2011	8,034,008	267,800	186	286,026	227,154
May 2011	8,076,367	260,528	181	346,116	0
June 2011	9,735,245	324,508	225	405,251	223,585
July 2011	11,838,286	381,880	265	419,943	323,687
August 2011	12,119,042	390,937	271	553,937	0
September 2011	15,458,620	515,287	358	616,457	449,816
October 2011	15,492,362	499,754	347	575,331	406,852
November 2011	16,279,722	542,657	377	609,830	497,588
December 2011	16,711,381	539,077	374	566,868	515,920
January 2012	15,645,486	504,381	350	537,854	468,103
February 2012	15,936,577	515,987	358	551,895	486,254
March 2012	16,390,112	530,180	368	553,633	498,110
April 2012	16,010,934	514,711	357	538,278	477,932
May 2012	14,639,653	472,247	328	500,690	418,914
June 2012	14,109,044	451,769	314	527,289	409,056
July 2012	16,721,808	540,994	376	567,123	494,073
August 2012	16,256,379	523,831	364	560,732	476,469
September 2012	15,402,121	515,527	358	558,100	438,897
October 2012	16,377,507	527,101	366	558,528	502,787
November 2012	15,069,768	503,018	349	537,145	348,636

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Monthly Groundwater Recovery

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

Date	Monthly Total (gallons)	Monthly Average (gallons / day)	Monthly Average (gallons / minute)	Highest Daily Flow (gallons)	Lowest Daily Flow (gallons)
December 2012	15,740,566	507,135	352	539,894	470,343
January 2013	15,663,097	505,261	357	780,314	0
February 2013	14,380,130	513,576	323	557,487	370,088
March 2013	14,398,601	464,471	352	529,499	230,633

Table 2-2
2013 LNAPL Recovery

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

All units in gallons

2013	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
MW-138	0	0	0										0
MW-176-A	2	0	2										4
MW-186-A	0	0	0										0
MW-334-15	0	0	9										9
O-wells	0.1	0	2										2.1
S-wells	0	0	2										2
R-14A	0	0	1										1
R-18	1	0	0										1
R-20-R	0	0	6										6
R-21	10	0	16										26
R-22	0	0	0										0
R-32	3	0	23										26
R-33	0	0	0										0
R-34	0	0	0										0
R-35-R	0	0	0										0
R-39	0	0	0										0
R-40	8	0	17										25
Coalescer	0	0	0										0
TOTAL	25	0	77	0	0	0	0	0	0	0	0	0	102

Note: This summary includes only product that has been recovered for recycling. Product that has been recovered but has not yet been removed from the storage tank for recycling is not included in the table.

Table 2-3
Historical LNAPL Recovery

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

Well ID	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 (through First Quarter)	Well Total (gallons)
R-1	3,243	1,165	340	218	60	35	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Removed July 2008						**5,086**
R-2	1,538	1,546	175	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3,299**
R-3	39	313	0	42	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**419**
R-4	412	430	110	148	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1,140**
R-5&5A	4,170	3,606	978	1,464	1,115	447	316	209	141	321	175	236	222	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**13,425**
R-6	25	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Removed October 2009						**80**
R-7 & 8	14,216	17,108	67	809	1,438	575	1,793	1,693	385	250	0	Removed																	**38,334**
R-9	11,011	22,378	744	479	385	510	1,036	565	106	71	23	25	29	12	0	0	0	0	0	0	0	0	0	5	2	0	0	0	**37,381**
R-10&10A	2,558	5,271	200	352	280	127	0	20	0	0	0	0	0	0	0	0	0	0	0	Removed May 2005									**8,808**
R-11	15,796	14,920	724	241	190	5	0	317	444	117	0	0	0	11	0	0	0	0	0	Removed May 2005									**32,765**
R-12	4,099	0	80	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4,230**
R-13	1,044	3,563	79	177	55	0	27	15	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**5,022**
R-14&14A	4,664	773	125	341	344	48	116	182	96	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	**6,813**
R-18	0	1,955	5,128	13	0	10	17	0	151	30	0	25	0	0	1	2	0	0	0	0	0	0	0	7	29	5	101	1	**7,474**
R-19	0	6,106	1,623	106	90	30	138	496	205	9	0	0	0	0	2	0	0	0	0	0	0	0	0	12	14	Removed August 2010			**8,831**
R-20/R-20R	0	5,165	28,603	46	281	2,443	2,193	1,131	296	69	123	112	88	115	33	56	16	0	94	46	100	87	49	50	48	34	144	6	**41,422**
R-21	0	4,859	46,028	767	422	175	370	5,993	6,621	1,441	2,154	1,118	3,364	737	314	207	112	303	786	1,225	157	6,489	2,799	92	2,403	2,254	629	26	**91,844**
R-22	0	0	411	136	45	101	775	34	0	64	26	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0	**1,598**
R-23	0	210	147	0	0	15	7	183	71	33	12	5	0	0	0	0	0	0	0	Removed May 2005									**683**
R-24	0	1,070	109	30	0	30	18	254	156	5	40	0	0	0	0	0	0	0	0	Removed May 2005									**1,712**
R-25	0	435	44	20	30	70	91	227	177	62	40	62	5	0	21	0	0	0	0	Removed May 2005									**1,284**
R-26	0	0	26	73	157	149	79	57	47	13	12	2	0	0	0	0	0	0	0	Removed May 2005									**615**
R-27	0	460	477	120	305	124	68	25	55	26	0	9	54	11	3	0	0	0	0	Removed May 2005									**1,737**
R-28	0	35	14	10	78	0	48	40	0	7	0	0	0	0	0	0	0	0	0	Removed May 2005									**232**
R-29	0	0	6	0	0	0	0	40	21	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	**75**
R-30	0	0	10	0	0	0	0	0	26	21	0	14	5	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	**82**
R-31	0	2,255	3,452	269	110	350	316	340	343	20	52	85	110	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	**7,708**
R-32	0	7,360	5,498	394	543	1,089	1,242	1,074	1,642	555	118	315	602	141	18	56	0	0	0	0	0	0	0	55	318	25	453	26	**21,498**
R-33	0	0	162	47	290	685	19	112	50	0	25	22	0	0	0	0	0	0	0	0	0	0	0	12	0	10	0	0	**1,434**
R-34	0	0	201	1,216	4,922	2,734	4,208	3,177	5,923	3,077	508	193	200	407	190	5	155	110	502	327	913	201	0	11	43	4	46	0	**29,271**
R-35/R-35R	0	0	22	37	1,042	2,659	740	468	26	0	0	0	0	0	4	5	0	0	13	0	0	0	0	18	234	201	358	0	**5,827**
R-36	0	0	20	23	0	0	191	261	491	0	26	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1,016**
R-37	0	0	8	15	65	1,147	297	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1,532**
R-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
R-39	0	0	0	0	50	336	40	68	27	0	0	1,261	1,090	6	61	7	4	9	1	4	21	0	58	2	33	46	17	0	**3,141**
R-40	0	0	0	0	0	141	128	27	0	0	0	0	0	0	28	173	85	85	106	27	211	58	253	46	19	350	512	25	**2,248**
MW-138													Installed April 2001			0	0	76	352	469	365	367	187	321	216	144	286	0	**2,783**
MW-176-A																							Installed October 2010		0	0	4	4	**8**
MW-186-A																							Installed October 2010		0	0	1	0	**1**
MW-334-15																									Installed August 2012		11	9	**11**
S-22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
S-27	0	0	0	0	0	0	0	0	0	0	340	0	0	2	1	0	4	0	0	Removed May 2005									**347**
S-28	0	0	0	0	0	0	0	0	0	0	44	0	0	0	1	3	1	0	0	Removed May 2005									**49**
S-33	0	0	0	0	0	4	0	0	0	28	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	**37**
S-34	0	0	0	0	0	0	0	0	0	0	38	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**43**
S-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	0	0	**53**
S-42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	**6**
S-43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
S-44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	**4**
S-45	0	0	0	0	0	0	0	0	0	0	0	Removed 1997																	**0**
S-46	0	0	0	0	0	0	0	0	0	0	50	21	0	Removed May 1999															**71**
S-47	0	0	0	0	0	0	0	0	0	0	92	9	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	**104**
S-48	0	0	0	0	0	0	0	0	0	0	225	44	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	**272**
S-49	0	0	0	0	0	0	0	0	0	0	450	401	181	38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1,071**
S-50	0	0	0	0	0	0	0	0	0	0	0	9	0	0	3	4	4	0	0	0	0	0	0	1	4	0	3	3	**27**
S-51	0	0	0	0	0	0	0	0	0	0	0	65	0	0	0	1	4	0	0	0	0	0	0	1	0	0	1	0	**72**
S-52	0	0	0	0	0	0	0	0	0	0	0	70	22	0	3	6	6	0	0	0	0	0	0	0	1	0	0	0	**108**
O-2																							Installed September 2010			176	0.1	0	**176**
O-10																								Installed September 2011			12	4	**12**
O-11																								Installed September 2011			0.6	0.1	**1**
O-13																								Installed September 2011			2	0	**2**
O-19																								Installed October 2011			0.3	0	**0**
O-27																								Installed November 2011			0.2	0.1	**0**
Coalescer																						Installed December 2009			264	355	38	0	**657**
Annual Total	**62,815**	**101,038**	**95,611**	**7,684**	**12,342**	**14,059**	**14,298**	**17,008**	**17,562**	**6,342**	**4,573**	**4,111**	**5,972**	**1,505**	**703**	**537**	**393**	**583**	**1,854**	**2,150**	**1,767**	**7,201**	**3,345**	**635**	**3,634**	**3,603**	**2,625**	**105**	**393,980**

Table 3-1
Proposed Phase 8 Monitoring Wells

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

Well Name	Well Location Description	Proposed Depths (feet bgs)	Well Proposed for Permafrost Delineation	Notes
8-A	North Property Boundary	15 (WT), 25, 35, 50, 80, PF	Yes	1,2,3,4
8-B	North Property Boundary	15 (WT), 20, 40, 60, PF	Yes	1,2,3,4
8-C	North Property Boundary	15 (WT), 35, 50, 80, PF	Yes	1,2,3,4
8-D	North Property Boundary	15 (WT), 35, 50, 80, PF	Yes	1,2,3,4
8-E	North Property Boundary	15 (WT), 25, 35, 50, 65, 80, PF	Yes	1,2,3,4
8-F	North Property Boundary	15 (WT), 35, 50, 80, PF	Yes	1,2,3,4

Notes:
1: Current well names are for planning purposes only. Permanent well names will be applied upon installation.
2: Proposed depths may change based on field observations of permafrost.
3: Permafrost will only be delineated at depths up to 150 feet bgs due to limitations of the drilling equipment.
4: If permafrost is not encountered or encountered below 130 feet bgs, and additional well will be installed and screened at 110 feet bgs.

bgs = below ground surface
WT = water table
PF = permafrost

Table 4-1
Proposed Performance Monitoring Networks

Revised Interim Remedial Action Plan Addendum
North Pole Refinery
North Pole, Alaska

Groundwater Extraction System - Sulfolane and BTEX	Groundwater Extraction System - Hydraulic Capture
O-2	O-2
O-3	O-3
O-4	O-4
O-5*	O-5*
O-6	O-6
O-12*	O-12*
O-19*	O-19*
O-24*	O-24*
O-26*	S-32
S-43	S-43
R-39	S-44
R-40	S-50
MW-113	S-51
MW-125	R-14A
MW-127	R-18
MW-129	R-22
MW-130	R-39
MW-139	R-40
MW-142	MW-113
MW-145	MW-125
MW-154A	MW-130
MW-154B	MW-135
MW-175	MW-136
MW-186A	MW-137
MW-186B	MW-175
MW-186E	MW-186A
MW-199*	MW-186B
MW-309-15	MW-186E
MW-309-66	MW-197A
MW-334-15	MW-197B
MW-334-65	MW-199
EGWRT-1	MW-307
EGWRT-2	MW-309-15
EGWRT-3	MW-309-66
EGWRT-4	MW-334-15
EGWRT-5	MW-334-65
EGWRT-6	**EGWRT-1**
	EGWRT-2
	EGWRT-3
	EGWRT-4
	EGWRT-5
	EGWRT-6

Notes:
* A well nest or deeper well is proposed at this location and will be included in performance monitoring
Bold = proposed monitoring well
BTEX = benzene, toluene, ethylbenzene, total xylenes