

September 11, 2000
Project 077.41991.068

0002

Mr. Robert Weimer
Alaska Department of Environmental Conservation (ADEC)
555 Cordova Street
Anchorage, AK 99501

Re: **Waste Oil UST Removal**
Chevron Service Station 9-7324
4417 Lake Otis Parkway
Anchorage, Alaska

RECEIVED
SEP 15 2000

Dept. of Environmental Conservation
Underground Storage Tanks — FAP

Dear Mr. Weimer:

SECOR International Incorporated (SECOR) has prepared this letter on behalf of Chevron Products Company (Chevron) to present the results of recent waste oil underground storage tank (UST) removal activities at the site referenced above (Figures 1 and 2). The purpose of this work was to evaluate the presence and extent of petroleum hydrocarbon impact below the waste oil tank and piping.

SITE BACKGROUND AND PREVIOUS INVESTIGATIONS

This site is currently an operating service station located at 4417 Lake Otis Parkway in Anchorage Alaska (Figure 1). The site has two pump islands with three gasoline dispensers on each island. Three gasoline USTs are located to the south of the station building, including one 10,000-gallon regular, one 10,000-gallon supreme and one 5,000-gallon plus. The station building houses a convenience store. The building's northern bay, formerly a service bay, is now used for storage of food and dry goods. Locations of site facilities are shown on Figure 2.

Initial site investigation began in September of 1990, when a used oil sump in the northeast corner of the station building was discovered to be leaking. Soils were excavated from the site to maximum extent possible without undermining the building foundation.

To assess potential impact to groundwater, five groundwater monitoring wells were installed at the site in December of 1990. In May of 1991, nine additional groundwater-monitoring wells were installed to further assess impact to groundwater beneath the site.

In 1991, Hart Crowser installed a bioenhancement system at the site near the northeast corner of the station building to remediate waste oil hydrocarbons in soil beneath the station building. The system consists of approximately 25 injection points. No data was available to document the operation of this system or initial concentration of waste oil hydrocarbons in soil in this area.

In 1992, a groundwater extraction (GWE) system and soil vapor extraction/bioventing (SVE) system were installed at the site. From November of 1992, through October of 1996, the GWE system extracted and treated approximately 261,000 gallons of groundwater from beneath the site. In October of 1996, the GWE system was shut off. From August of 1993 through June of 1997, the SVE system removed approximately 6,660 pounds of gasoline from beneath the site. The SVE system was shut off in June of 1997 due to declining influent concentrations. In May of 1998, Pinnacle Construction (Pinnacle), of Anchorage Alaska, upgraded the UST fill ports and cathodic protection.

Currently, nine groundwater monitoring wells both onsite and offsite are sampled semi-annually at the site.

WASTE OIL UST REMOVAL ACTIVITIES

On August 10, 2000, David Thomas of RRM observed Pinnacle remove both asphalt and concrete paving between the waste oil tank and the station building with a jackhammer and backhoe. The fill and vent piping was exposed for a length of approximately 18 feet between the north edge of the building and the center of the tank. Fill piping was 2-inch diameter fiberglass bedded in 3/8-inch pea gravel at a depth of approximately 9 inches sloping towards the west end of the tank. The fill pipe originated 5 feet within the old service bay (northern fifth of the building) and had reportedly been filled with grout from inside the building (according to Pinnacle personnel). According to the station manager, the last use of the waste oil tank was when it was pumped out on January 10, 2000. Vent piping was 2-inch diameter schedule 40 galvanized steel pipe run from the east end of the tank to the northeast corner of the building. No obvious staining or odor was reported by RRM in the line backfill or in soil beneath the gravel backfill. Two soil samples were collected from beneath the gravel backfill near a pipe joint and at a 10-foot interval. A cathodic-protection-type electrical cable, previously connected to the tank, was removed when the fill pipe was removed.

Pinnacle personnel used a backhoe to remove the concrete pad from above the tank and excavate soils from the south side of the waste oil tank. RRM reported that while excavating these soils, a tooth on the backhoe bucket snagged the southern side of the tank and created a 2-inch puncture at the midline of the tank. Sticking the fill (west) end of the tank indicated a depth of 4-inches of liquid remaining in the tank, estimated at about 50-gallons. An explosimeter detected 0% L.E.L in the tank pit and 0% L.E.L in

the tank. Once the overburden soils were removed, the tank was bumped several inches to allow RRM to observe the UST. RRM reported no obvious defects, holes, or corrosion on the UST, with the exception of the backhoe-caused puncture noted above. Fill (4-inch) and vent (2-inch and 4-inch, plugged) fittings appeared tight with no staining.

RRM reported no obvious petroleum staining or odor in the exposed sidewalls and bottom of the tank pit. Soil samples were collected from beneath area the fill (west) and vent (east) ends of the tank. Tank dimensions were approximately 46-inches outside diameter and 12-foot length (1,000-gallon capacity UST). The tank and piping was loaded onto a trailer for transport to Pinnacle Construction's yard to be cut apart there. All soil samples were analyzed by North Creek Analytical, Inc. (NCA) of Soldotna, Alaska. Soil analytical data is presented in Table 1. Field and laboratory procedures are presented as Attachment A. Certified analytical reports and chain-of-custody documentation are presented as Attachment B.

Stockpiled Soil Removal

Approximately 20 to 30 cubic yards of soil generated during the removal of the UST was temporarily stockpiled on-site and two soil samples were collected from the pile by digging 18 inches into the pile in two different locations. After characterization of the stockpiled soil by NCA, Mr. Steve Bainbridge of the Alaskan Department of Environmental Conservation (ADEC) approved the transport and disposal of the stockpile, which was performed by Alaska Soil Recycling of Anchorage. Stockpiled soil analytical data is presented in Table 2. The approval letter, dated August 25, 2000, for the transportation of and disposal of stockpiled soil is presented as Attachment C.

SUMMARY AND CONCLUSIONS

A summary of the results of soil sampling performed during site UST removal operations, and conclusions based on these results are listed below:

- GRO was reported as below detection limits in all soil samples collected at the site during UST removal.
- RRO was reported in all four of the soil samples at a maximum concentration of 168 mg/kg (Tankpit #2). The Method 2 Cleanup Standard for RRO is 11,000 mg/kg (for potential migration to groundwater in a precipitation zone of less than 40 inches per year). All samples collected in the area of the waste oil UST were below Method 2 Cleanup Standards.
- DRO was reported in the all four of the soil samples from the waste oil UST and pipeline excavation at a maximum concentration of 59.9 mg/kg (Piperun #1). The Method 2 Cleanup Standard for DRO is 250

mg/kg (for potential migration to groundwater in a precipitation zone of less than 40 inches per year). All samples collected in the area of the waste oil UST were below Method 2 Cleanup Standards.

- BTEX was reported as below detection limits in all soil samples collected at the site during waste oil UST removal operations.
- Arsenic (As), barium (Ba), chromium (Cr), nickel (Ni), lead (Pb), and vanadium (V) were reported in all the soil samples from the waste oil UST at maximum concentrations of 6.12 mg/kg, 109 mg/kg, 42.4 mg/kg, 43.6 mg/kg, 16.4 mg/kg, 66.3 mg/kg respectively. The Method 2 Cleanup Standards for As, Ba, Cr, Ni, Pb, and V are 2 mg/kg, 1,100 mg/kg, 26 mg/kg, 87 mg/kg, 1,000 mg/kg, and 3,400 mg/kg, respectively (for potential migration to groundwater in a precipitation zone of less than 40 inches per year). Ba, Ni, Cd, Pb, and V were below Method 2 Cleanup Standards in the area of the waste oil UST. The Method 2 Cleanup Standards for As and Cr were exceeded in all of the samples. However, the reported concentrations of As and Cr concentrations are comparable to concentrations found at other sites in Anchorage where RRO was reported as below detection limits.
- A total of 20 to 30 cubic yards of soil was excavated during removal activities. Soil generated during the waste oil UST removal was removed to Alaska Soil Recycling for disposal.

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If you have any questions or comments regarding this letter, please feel free to call us at (916) 861-0400.

Sincerely,

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SECOR International Incorporated

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Roger Hoffmore
Project Geologist



Greg Barclay
Senior Geologist

Attachments: Table 1 - Soil Analytical Data
Table 2 - Soil Analytical Data – Stockpile Soil Analytical Data
Figure 1 - Site Location Map
Figure 2 - Site Map
Attachment A - Field and Laboratory Procedures
Attachment B - Certified Analytical Reports and Chain-of-Custody Documentation
Attachment C - ADEC Approval Letter for Transport and Disposal

cc: Mr. Bob Cochran, Chevron Products Company, San Ramon, CA

Table 1
Soil Analytical Data

Chevron Service Station 9-7324
4417 Lake Otis Parkway
Anchorage, Alaska

Sample ID	Date Sampled	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Vanadium (mg/kg)
Tank Pit #1**	8/10/00	<5.00	48.3	141	<0.0500	<0.0500	<0.0500	<0.100	5.77	91.3	<0.413	37.8	41.6	16.4	63.1
Tank Pit #2**	8/10/00	<5.00	56.7	168	<0.0500	<0.0500	<0.0500	<0.100	5.21	90.3	<0.314	33.8	38.0	16.3	59.1
Piperun #1 S**	8/10/00	<5.00	59.9	149	<0.0500	<0.0500	<0.0500	<0.100	2.95	55.4	<0.397	30.8	20.7	5.59	56.8
Piperun #2 N**	8/10/00	<5.00	28.3	82.7	<0.0500	<0.0500	<0.0500	<0.100	6.12	109	<0.342	42.4	43.6	12.7	66.3
Proposed Method 2 Cleanup Levels*		300	250	11,000	0.02	5.4	5.5	78	2	1,000	5	26	87	300	3,400
GRO = Gasoline Range Organics DRO = Diesel Range Organics RRO = Residual Range Organics mg/kg = milligrams per kilogram * = Strictest Levels (migration to groundwater) in under 40" of precipitation per year zone ** = Samples were analyzed for Polynuclear Aromatic Hydrocarbons. Results were below detection limits.															

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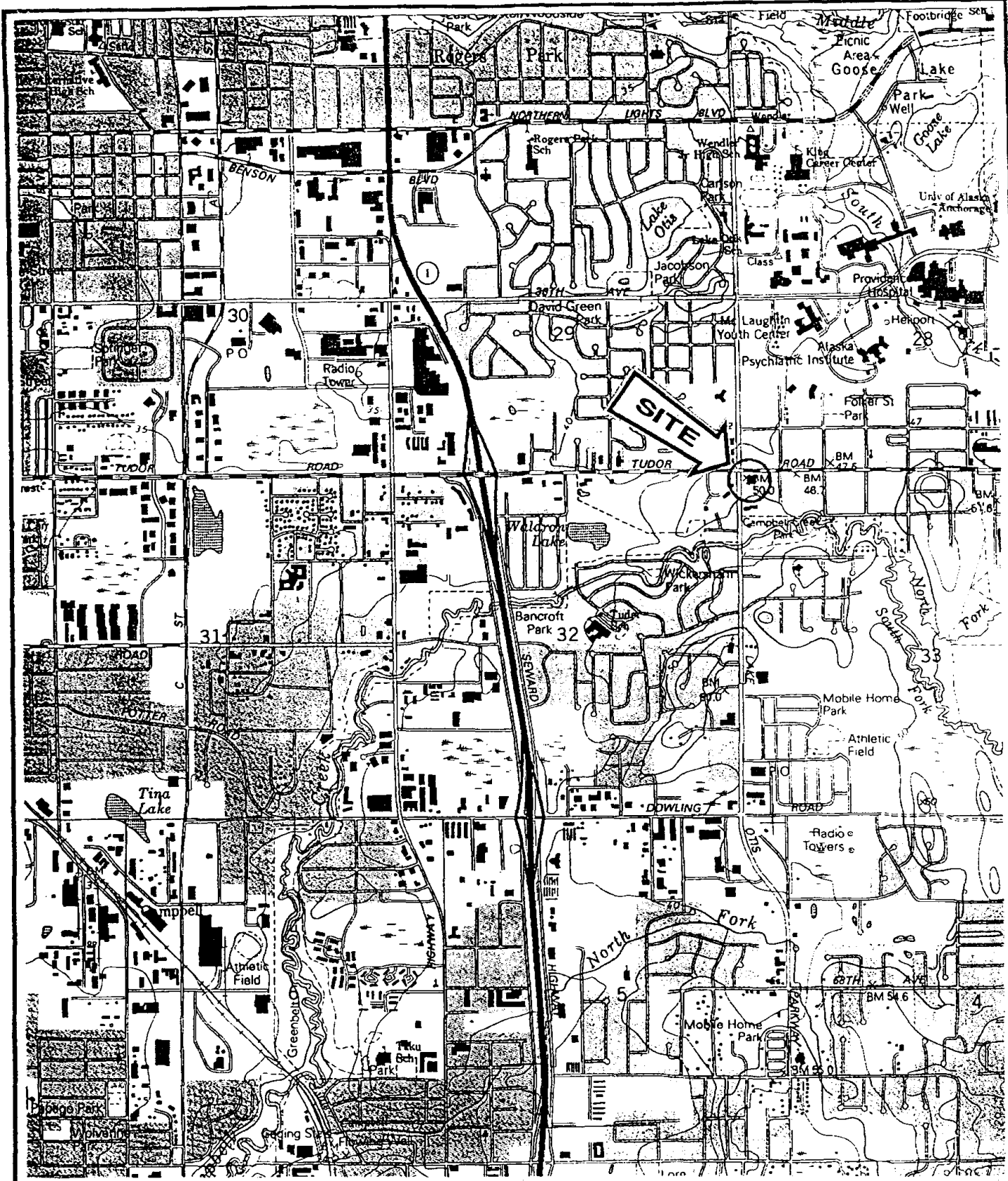
Table 2
Soil Analytical Data

Chevron Service Station 9-7324
4417 Lake Otis Parkway
Anchorage, Alaska

Sample ID	Date Sampled	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Vanadium (mg/kg)
Stockpile #1*	8/10/00	<5.00	221	485	<0.0500	<0.0500	<0.0500	<0.100	5.19	87.6	<0.299	34.5	36.2	15.3	60.5
Stockpile #2*	8/10/00	<5.00	110	252	<0.0500	<0.0500	<0.0500	<0.100	5.65	108	<0.289	39.4	39.6	15.7	65.5

GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/kg = milligrams per kilogram
* = Samples were analyzed for Polynuclear Aromatic Hydrocarbons. Results were below detection limits with the exception of benzo (ghi) perylene (Stockpile #1 and Stockpile #2) at concentrations of 0.0397 mg/kg and 0.0308 mg/kg, respectively. See Attachment B for analytical results.

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REFERENCE: U.S. GEOLOGICAL SURVEY, 7.5 MINUTE SERIES ANCHORAGE (A-8) NW, ALASKA QUADRANGLE. PHOTOREVISED 1994.



SECOR
INTERNATIONAL
INCORPORATED

DRAWN	CCR
APPR	RB
DATE	11SEP98
JOB NO.	7G007-031-03

FIGURE 1
CHEVRON SERVICE STATION #9-7324
4417 LAKE OTS PARKWAY
ANCHORAGE, ALASKA
SITE LOCATION MAP

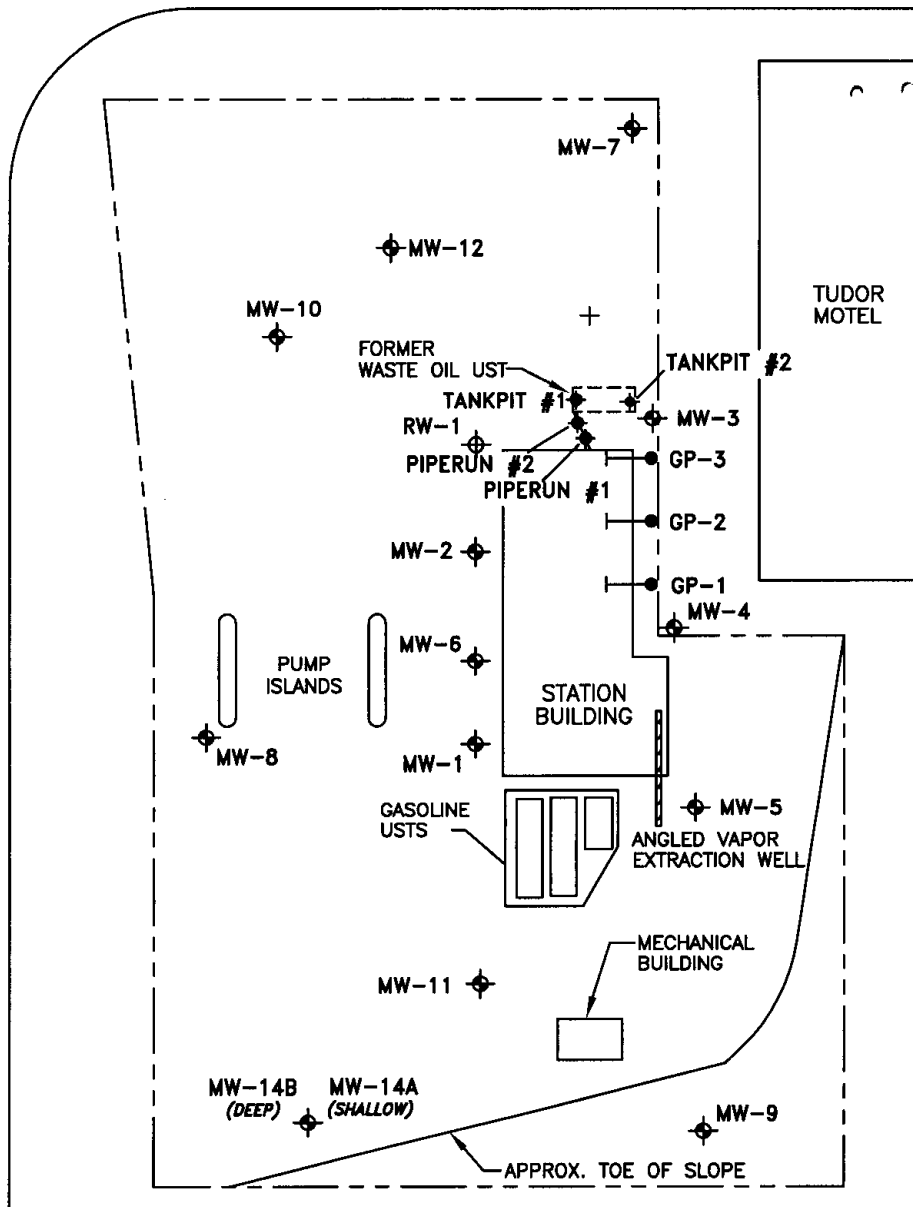
199808.250817 C:\SITE-LOC

TUDOR ROAD

0010

LAKE OTIS PARKWAY

TUDOR MOTEL



LEGEND:

- ◆ #1 SOIL SAMPLE LOCATION
- GP-1 ANGLED GEOPROBE BORING LOCATION
- ◆ MW-1 GROUNDWATER MONITORING WELL LOCATION
- APPROXIMATE PROPERTY BOUNDARY



REFERENCE: THIS FIGURE IS BASED ON A "SITE PLAN" PROVIDED BY HARTCROWSER, DATED AUGUST 1997, AND IS INTENDED FOR ILLUSTRATION ONLY.

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DATE	31AUGUST00
JOB NO.	077.41991.068

FIGURE 2
CHEVRON SERVICE STATION #9-7324
4417 LAKE OTIS PARKWAY
ANCHORAGE, ALASKA
SITE PLAN

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ATTACHMENT A
FIELD AND LABORATORY PROCEDURES

ATTACHMENT A

FIELD AND LABORATORY PROCEDURES

Soil Sampling

Soil samples were collected by advancing 2-inch-diameter brass sample liners into undisturbed soil, or soil removed from an excavation by a backhoe bucket. Soil samples for chemical analysis were retained in the brass liners, labeled, and capped with Teflon sheets and plastic end caps. The samples were then sealed in zip-lock bags, placed on ice, and transported to the laboratory accompanied by the appropriate chain-of-custody documentation.

Soil Sampling for Stockpiled Soil

Soil samples were collected by advancing 2-inch diameter brass sample liners into the soil stockpile, after removing approximately 6 to 18 inches of surface material in the sample location. Soil samples for chemical analysis were retained in the brass liners, labeled, and capped with Teflon sheets and plastic end caps. The samples were then sealed in zip-lock bags, placed on ice, and transported to the laboratory accompanied by the appropriate chain-of-custody documentation.

Laboratory Analysis of Soil Samples

Soil sample analyses were done using the following methods: GRO by Alaska Method 101, DRO by Alaska Method 102, RRO by Alaska Method 103, BTEX compounds by EPA Method 8020, volatile organic compounds (VOCs) and halogenated organic compounds (HVOCs) by EPA Method 8260B, semi-volatile organic compounds (SVOCs) by EPA Method 8270C, polychlorinated biphenyls (PCBs) by EPA Method 8082, trace metals (cadmium, chromium, lead, nickel, zinc) by EPA Method 6010B, and total metals by EPA Method 6020.

0000013

ATTACHMENT B
CERTIFIED ANALYTICAL REPORTS AND
CHAIN-OF-CUSTODY DOCUMENTATION



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 541.383.9310 fax 541.382.7588

000014

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK. 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tank Pit #1 (fill)	B0H0240-01	Soil	08/10/00 12:00	08/11/00 09:00
Tank Pit #2 (vent)	B0H0240-02	Soil	08/10/00 12:00	08/11/00 09:00
Stockpile #1	B0H0240-03	Soil	08/10/00 12:10	08/11/00 09:00
Stockpile #2	B0H0240-04	Soil	08/10/00 12:10	08/11/00 09:00
Piperun #1 (South)	B0H0240-05	Soil	08/10/00 10:30	08/11/00 09:00
Piperun #2 (north)	B0H0240-06	Soil	08/10/00 10:30	08/11/00 09:00

AUG 21 2000

North Creek Analytical - Bothell

Steve Davis, Project Manager

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 503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
 541.383.9310 fax 541.382.7588

RRM, Inc. (Soldotna, AK)
 247 N. Fireweed, Suite A
 Soldotna AK, 99669

Project: Chevron #9-7324
 Project Number: not provided
 Project Manager: David Thomas

0000015

Reported:
 08/15/00 09:33

Gasoline Hydrocarbons (2-Methylpentane to 1,2,4-Trimethylbenzene) and BTEX by EPA 8015M and 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								

Tank Pit #1 (fill) (B0H0240-01) Soil **Sampled: 08/10/00 12:00** **Received: 08/11/00 09:00**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	84.7 %	50-150							
Surrogate: 4-BFB (PID)	85.8 %	50-150							

Tank Pit #2 (vent) (B0H0240-02) Soil **Sampled: 08/10/00 12:00** **Received: 08/11/00 09:00**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	85.4 %	50-150							
Surrogate: 4-BFB (PID)	84.7 %	50-150							

Stockpile #1 (B0H0240-03) Soil **Sampled: 08/10/00 12:10** **Received: 08/11/00 09:00**

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	ND	0.0500	"	"	"	"	"	"	
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	89.5 %	50-150							
Surrogate: 4-BFB (PID)	88.9 %	50-150							

North Creek Analytical - Bothell

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 Steve Davis, Project Manager



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08/15/00 0016

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Gasoline Hydrocarbons (2-Methylpentane to 1,2,4-Trimethylbenzene) and BTEX by EPA 8015M and 8021B
North Creek Analytical - Bothell

Analyte	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Result	Limit							

Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	"
Toluene	ND	0.0500	"	"	"	"	"	"	"
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	"
Xylenes (total)	ND	0.100	"	"	"	"	"	"	"
Surrogate: 4-BFB (FID)	93.6 %	50-150			"	"	"	"	"
Surrogate: 4-BFB (PID)	89.6 %	50-150			"	"	"	"	"

Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	"
Toluene	ND	0.0500	"	"	"	"	"	"	"
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	"
Xylenes (total)	ND	0.100	"	"	"	"	"	"	"
Surrogate: 4-BFB (FID)	96.4 %	50-150			"	"	"	"	"
Surrogate: 4-BFB (PID)	92.5 %	50-150			"	"	"	"	"

Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	0H14005	08/14/00	08/14/00	EPA8015BM 8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	"
Toluene	ND	0.0500	"	"	"	"	"	"	"
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	"
Xylenes (total)	ND	0.100	"	"	"	"	"	"	"
Surrogate: 4-BFB (FID)	92.3 %	50-150			"	"	"	"	"
Surrogate: 4-BFB (PID)	90.0 %	50-150			"	"	"	"	"

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Environmental Laboratory Network

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000017

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103
North Creek Analytical - Bothell

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								

Tank Pit #1 (fill) (B0H0240-01) Soil **Sampled: 08/10/00 12:00** **Received: 08/11/00 09:00**

Diesel Range Hydrocarbons	48.3	4.00	mg/kg dry	1	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	141	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	92.4 %	50-150							
Surrogate: Octacosane	87.9 %	50-150							

Tank Pit #2 (vent) (B0H0240-02) Soil **Sampled: 08/10/00 12:00** **Received: 08/11/00 09:00**

Diesel Range Hydrocarbons	56.7	4.00	mg/kg dry	1	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	168	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	83.5 %	50-150							
Surrogate: Octacosane	86.9 %	50-150							

Stockpile #1 (B0H0240-03) Soil **Sampled: 08/10/00 12:10** **Received: 08/11/00 09:00**

Diesel Range Hydrocarbons	221	12.0	mg/kg dry	3	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	485	75.0	"	"	"	"	"	"	
Surrogate: 2-FBP	90.5 %	50-150							
Surrogate: Octacosane	114 %	50-150							

Stockpile #2 (B0H0240-04) Soil **Sampled: 08/10/00 12:10** **Received: 08/11/00 09:00**

Diesel Range Hydrocarbons	110	4.00	mg/kg dry	1	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	252	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	88.6 %	50-150							
Surrogate: Octacosane	84.7 %	50-150							

Piperun #1 (South) (B0H0240-05) Soil **Sampled: 08/10/00 10:30** **Received: 08/11/00 09:00**

Diesel Range Hydrocarbons	59.9	4.00	mg/kg dry	1	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	149	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	87.5 %	50-150							
Surrogate: Octacosane	80.3 %	50-150							

North Creek Analytical - Bothell

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000018

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Diesel Range Hydrocarbons	28.3	4.00	mg/kg dry	1	0H11026	08/11/00	08/13/00	AK102/103	
Residual Range Organics	82.7	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	83.9 %	50-150			"	"	"	"	
Surrogate: Octacosane	75.2 %	50-150			"	"	"	"	

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000019

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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**Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank Pit #1 (fill) (B0H0240-01) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Arsenic	5.77	0.413	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	91.3	4.13	"	"	"	"	"	"	
Calcium	7820	8.47	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	37.8	0.413	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	41.6	0.413	"	"	"	"	"	"	
Lead	16.4	0.413	"	"	"	"	"	"	
Vanadium	63.1	0.413	"	"	"	"	"	"	
Tank Pit #2 (vent) (B0H0240-02) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Arsenic	5.21	0.314	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	90.3	3.14	"	"	"	"	"	"	
Calcium	8070	8.77	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	33.8	0.314	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	38.0	0.314	"	"	"	"	"	"	
Lead	16.3	0.314	"	"	"	"	"	"	
Vanadium	59.1	0.314	"	"	"	"	"	"	
Stockpile #1 (B0H0240-03) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00									
Arsenic	5.19	0.299	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	87.6	2.99	"	"	"	"	"	"	
Calcium	8970	12.1	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	34.5	0.299	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	36.2	0.299	"	"	"	"	"	"	
Lead	15.3	0.299	"	"	"	"	"	"	
Vanadium	60.5	0.299	"	"	"	"	"	"	

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RRM, Inc. (Soldotna, AK)
 247 N. Fireweed, Suite A
 Soldotna AK, 99669

Project: Chevron #9-7324
 Project Number: not provided
 Project Manager: David Thomas

Reported:
 08/15/00 09:33

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Result	Limit							

Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00

Arsenic	5.65	0.289	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	108	2.89	"	"	"	"	"	"	
Calcium	8020	10.5	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	39.4	0.289	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	39.6	0.289	"	"	"	"	"	"	
Lead	15.7	0.289	"	"	"	"	"	"	
Vanadium	65.5	0.289	"	"	"	"	"	"	

Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Arsenic	2.95	0.397	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	55.4	3.97	"	"	"	"	"	"	
Calcium	14100	11.2	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	30.8	0.397	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	20.7	0.397	"	"	"	"	"	"	
Lead	5.59	0.397	"	"	"	"	"	"	
Vanadium	56.8	0.397	"	"	"	"	"	"	

Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Arsenic	6.12	0.342	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Barium	109	3.42	"	"	"	"	"	"	
Calcium	9600	11.4	"	"	0H11023	08/11/00	08/14/00	EPA 6010B	
Chromium	42.4	0.342	"	"	0H11021	08/11/00	08/13/00	EPA 6020	
Nickel	43.6	0.342	"	"	"	"	"	"	
Lead	12.7	0.342	"	"	"	"	"	"	
Vanadium	66.3	0.342	"	"	"	"	"	"	

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0021

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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**Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Tank Pit #1 (fill) (B0H0240-01) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00										
Dry Weight	86.2	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Tank Pit #2 (vent) (B0H0240-02) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00										
Dry Weight	83.6	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Stockpile #1 (B0H0240-03) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00										
Dry Weight	87.4	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00										
Dry Weight	88.7	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00										
Dry Weight	96.7	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00										
Dry Weight	91.0	1.00		%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	

North Creek Analytical - Bothell

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0027

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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**Gasoline Hydrocarbons (2-Methylpentane to 1,2,4-Trimethylbenzene) and BTEX by EPA 8015M and 8021B
 - Quality Control
 North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H14005: Prepared 08/14/00 Using EPA 5030B (MeOH)

Blank (0H14005-BLK1)

Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	3.94		"	4.00		98.5	50-150			
Surrogate: 4-BFB (PID)	3.73		"	4.00		93.3	50-150			

LCS (0H14005-BS1)

Gasoline Range Hydrocarbons	25.7	5.00	mg/kg wet	25.0		103	70-130			
Surrogate: 4-BFB (FID)	4.05		"	4.00		101	50-150			

Duplicate (0H14005-DUP1)

Source: B0H0240-02

Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry		ND			21.3	50	
Surrogate: 4-BFB (FID)	4.02		"	4.78		84.1	50-150			

Matrix Spike (0H14005-MS1)

Source: B0H0240-06

Benzene	0.458	0.0500	mg/kg dry	0.549	ND	82.7	60-140			
Toluene	0.475	0.0500	"	0.549	ND	84.9	60-140			
Ethylbenzene	0.484	0.0500	"	0.549	ND	87.2	60-140			
Xylenes (total)	1.53	0.100	"	1.65	ND	91.2	60-140			
Surrogate: 4-BFB (PID)	3.95		"	4.40		89.8	50-150			

Matrix Spike Dup (0H14005-MSD1)

Source: B0H0240-06

Benzene	0.471	0.0500	mg/kg dry	0.549	ND	85.0	60-140	2.80	20	
Toluene	0.484	0.0500	"	0.549	ND	86.5	60-140	1.88	20	
Ethylbenzene	0.502	0.0500	"	0.549	ND	90.4	60-140	3.65	20	
Xylenes (total)	1.57	0.100	"	1.65	ND	93.6	60-140	2.58	20	
Surrogate: 4-BFB (PID)	3.87		"	4.40		88.0	50-150			

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0023

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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**Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 - Quality Control
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H11026: Prepared 08/11/00 Using EPA 3550B

Blank (0H11026-BLK1)

Diesel Range Hydrocarbons	ND	4.00	mg/kg wet							
Residual Range Organics	ND	25.0	"							
Surrogate: 2-FBP	11.8		"	14.6		80.8	50-150			
Surrogate: Octacosane	9.06		"	12.7		71.3	50-150			

LCS (0H11026-BS1)

Diesel Range Hydrocarbons	74.0	4.00	mg/kg wet	79.7		92.8	60-120			
Surrogate: 2-FBP	12.0		"	14.6		82.2	50-150			

LCS (0H11026-BS2)

Residual Range Organics	78.1	25.0	mg/kg wet	80.0		97.6	60-100			
Surrogate: Octacosane	11.5		"	12.8		89.8	50-150			

LCS Dup (0H11026-BSD1)

Diesel Range Hydrocarbons	76.1	4.00	mg/kg wet	80.0		95.1	60-120	2.80	20	
Surrogate: 2-FBP	11.6		"	14.7		78.9	50-150			

LCS Dup (0H11026-BSD2)

Residual Range Organics	79.7	25.0	mg/kg wet	79.7		100	60-100	2.03	20	
Surrogate: Octacosane	10.7		"	12.7		84.3	50-150			

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0024

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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**Total Metals by EPA 6000/7000 Series Methods - Quality Control
 North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H11021: Prepared 08/11/00 Using EPA 3050B

Blank (0H11021-BLK1)

Arsenic	ND	0.500	mg/kg wet							
Barium	ND	5.00	"							
Chromium	ND	0.500	"							
Lead	ND	0.500	"							
Nickel	ND	0.500	"							
Vanadium	ND	0.500	"							

LCS (0H11021-BS1)

Arsenic	26.4	0.500	mg/kg wet	25.0		106	70-130			
Barium	26.4	5.00	"	25.0		106	80-120			
Chromium	27.8	0.500	"	25.0		111	80-120			
Lead	27.1	0.500	"	25.0		108	80-120			
Nickel	27.5	0.500	"	25.0		110	80-120			
Vanadium	27.7	0.500	"	25.0		111	80-120			

Matrix Spike (0H11021-MS1)

Source: B0H0240-06

Arsenic	23.4	0.342	mg/kg dry	18.8	6.12	91.9	70-130			
Barium	116	3.42	"	18.8	109	37.2	70-130			Q-15
Chromium	58.0	0.342	"	18.8	42.4	83.0	70-130			
Lead	34.7	0.342	"	18.8	12.7	117	70-130			
Nickel	61.8	0.342	"	18.8	43.6	96.8	70-130			
Vanadium	85.8	0.342	"	18.8	66.3	104	70-130			

Matrix Spike Dup (0H11021-MSD1)

Source: B0H0240-06

Arsenic	22.3	0.338	mg/kg dry	18.6	6.12	87.0	70-130	4.81	20	
Barium	119	3.38	"	18.6	109	53.8	70-130	2.55	20	Q-15
Chromium	58.5	0.338	"	18.6	42.4	86.6	70-130	0.858	20	
Lead	33.4	0.338	"	18.6	12.7	111	70-130	3.82	20	
Nickel	59.3	0.338	"	18.6	43.6	84.4	70-130	4.13	20	
Vanadium	83.5	0.338	"	18.6	66.3	92.5	70-130	2.72	20	

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000025

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Total Metals by EPA 6000/7000 Series Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H11023: Prepared 08/11/00 Using EPA 3050B

Blank (0H11023-BLK1)

Calcium	ND	15.0	mg/kg wet							
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LCS (0H11023-BS1)

Calcium	258	15.0	mg/kg wet	250		103	70-130			
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Matrix Spike (0H11023-MS1)

Source: B0H0240-06

Calcium	8390	11.4	mg/kg dry	208	9600	-582	70-130			Q-15
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Matrix Spike Dup (0H11023-MSD1)

Source: B0H0240-06

Calcium	9630	11.5	mg/kg dry	211	9600	14.2	70-130	13.8	20	Q-15
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North Creek Analytical - Bothell

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0026

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H11039: Prepared 08/11/00 Using Dry Weight

Blank (0H11039-BLK1)

Dry Weight	100	1.00	%							
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Steve Davis, Project Manager



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8223
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

000027

RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/15/00 09:33
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Notes and Definitions

- Q-15 Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

North Creek Analytical - Bothell

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Steve Davis, Project Manager



CHEVRON U.S.A., Inc. CHAIN OF CUSTODY REPORT BOHO240

CHEVRON INFORMATION

Facility Number: **9-7324**
 Site Address: **4417 Lake Otis Parkway**
 City, State, ZIP: **Anchorage, AK**
 Service Code: Site Assessment
 Service Order: Remediation
 Cost Element: 75100100 O & M
 Chevron Project Manager: **Bob Cochran** GWM

CONSULTANT INFORMATION

Name: **RRM** Project# **9-7324**
 Address: **247 North Firweed, Suite A**
Soldotna, AK 99669
 Phone: **907-283-4109** Fax:
SECOR: 916-861-0400 X230 Fax to SECOR at:
916-861-0430
 Project Manager: **David Thomas** Airbill#: **82 123 498920**
 Sample Collection by: **David Thomas**

Laboratory Turnaround Time

- 1 Business Day
 3 Business Days
 5 Business Days
 10 Business Days
 3 Day Air Samples
 (Please Select One)

AK OR WA NW Series

SAMPLE IDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W.S.O)	# OF CONTAINERS
Tank Pit #1 (fill)	12:00 pm 8-10-00	S	2
Tank Pit #2 (vent)	12:00 8-10-00	S	2
Stockpile #1	12:10 8-10-00	S	2
stock pile #2	12:20 8-10-00	S	2
Pipe run #1 (South)	10:30 8-10-00	S	2
Pipe run #2 (North)	10:30 8-10-00	S	2

TPH-HCID	TPH-Gas	BTEX Only EPA 8021 Mod.	TPH-Gas + BTEX GLO	TPH-Diesel D20	TPH-Diesel Extended Res	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS Semi-Vols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	Metals (As, Ba, Ca, Cr, Pb, Ni, V)
			X	X	X								X	
			X	X	X								X	
			X	X	X								X	
			X	X	X								X	
			X	X	X								X	

NCA SAMPLE NUMBER
BOHO240-01
-02
-03
-04
-05
-06
SAMPLES WERE NOT @ 2-6G UPON RECEIPT

Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1. David G Thomas	RRM	8-10-00 11:30am	FedEx		8-10-00 11:30
2.			Cathy Heeb	NCT	8/11/00 9:00
3.					

Additional Comments:
 Please see: **Roger Hoffmore** 9.20
 Report to: **SECOR International** w/o
3017 Kilgore Rd, Ste 100
Rancho Cordova, CA 95670

0028

000029

RRM. Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tank Pit #1 (fill)	B0H0240-01	Soil	08/10/00 12:00	08/11/00 09:00
Tank Pit #2 (vent)	B0H0240-02	Soil	08/10/00 12:00	08/11/00 09:00
Stockpile #1	B0H0240-03	Soil	08/10/00 12:10	08/11/00 09:00
Stockpile #2	B0H0240-04	Soil	08/10/00 12:10	08/11/00 09:00
Piperun #1 (South)	B0H0240-05	Soil	08/10/00 10:30	08/11/00 09:00
Piperun #2 (north)	B0H0240-06	Soil	08/10/00 10:30	08/11/00 09:00

0000030

RRM. Inc. (Soldotna, AK)
247 N. Fireweed, Suite A
Soldotna AK, 99669

Project: Chevron #9-7324
Project Number: not provided
Project Manager: David Thomas

Reported:
08/18/00 16:18

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank Pit #1 (fill) (B0H0240-01) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Cadmium	ND	0.413	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Tank Pit #2 (vent) (B0H0240-02) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Cadmium	ND	0.314	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Stockpile #1 (B0H0240-03) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00									
Cadmium	ND	0.299	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00									
Cadmium	ND	0.289	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Cadmium	ND	0.397	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	
Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Cadmium	ND	0.342	mg/kg dry	1	0H11021	08/11/00	08/13/00	EPA 6020	

00031

RRM, Inc. (Soldotna, AK)
247 N. Fireweed, Suite A
Soldotna AK, 99669

Project: Chevron #9-7324
Project Number: not provided
Project Manager: David Thomas

Reported:
08/18/00 16:18

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank Pit #1 (fill) (BOH0240-01) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	"
Anthracene	ND	0.0100	"	"	"	"	"	"	"
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	"
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	"
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Benzo (ghi) perylene	ND	0.0100	"	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Chrysene	ND	0.0100	"	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	"
Fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Fluorene	ND	0.0100	"	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	"
Naphthalene	ND	0.0100	"	"	"	"	"	"	"
Phenanthrene	ND	0.0100	"	"	"	"	"	"	"
Pyrene	ND	0.0100	"	"	"	"	"	"	"
Surrogate: 2-FBP	85.5 %	30-150			"	"	"	"	"
Surrogate: Nitrobenzene-d5	72.0 %	30-150			"	"	"	"	"
Surrogate: p-Terphenyl-d14	90.2 %	30-150			"	"	"	"	"

Tank Pit #2 (vent) (BOH0240-02) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	"
Anthracene	ND	0.0100	"	"	"	"	"	"	"
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	"
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	"
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Benzo (ghi) perylene	ND	0.0100	"	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Chrysene	ND	0.0100	"	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	"
Fluoranthene	ND	0.0100	"	"	"	"	"	"	"
Fluorene	ND	0.0100	"	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	"
Naphthalene	ND	0.0100	"	"	"	"	"	"	"
Phenanthrene	ND	0.0100	"	"	"	"	"	"	"

North Creek Analytical - Bothell

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RRM, Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Tank Pit #2 (vent) (B0H0240-02) Soil **Sampled: 08/10/00 12:00** **Received: 08/11/00 09:00**

Pyrene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
<i>Surrogate: 2-FBP</i>	86.9 %	30-150			"	"	"	"	
<i>Surrogate: Nitrobenzene-d5</i>	72.9 %	30-150			"	"	"	"	
<i>Surrogate: p-Terphenyl-d14</i>	85.4 %	30-150			"	"	"	"	

Stockpile #1 (B0H0240-03) Soil **Sampled: 08/10/00 12:10** **Received: 08/11/00 09:00**

Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	
Anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (ghi) perylene	0.0397	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Fluoranthene	ND	0.0100	"	"	"	"	"	"	
Fluorene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Naphthalene	ND	0.0100	"	"	"	"	"	"	
Phenanthrene	ND	0.0100	"	"	"	"	"	"	
Pyrene	ND	0.0100	"	"	"	"	"	"	
<i>Surrogate: 2-FBP</i>	84.3 %	30-150			"	"	"	"	
<i>Surrogate: Nitrobenzene-d5</i>	72.8 %	30-150			"	"	"	"	
<i>Surrogate: p-Terphenyl-d14</i>	79.1 %	30-150			"	"	"	"	

RRM, Inc. (Soldotna, AK)
247 N. Fireweed, Suite A
Soldotna AK, 99669

Project: Chevron #9-7324
Project Number: not provided
Project Manager: David Thomas

Reported:
08/18/00 16:18

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00

Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	
Anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (ghi) perylene	0.0308	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Fluoranthene	ND	0.0100	"	"	"	"	"	"	
Fluorene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Naphthalene	ND	0.0100	"	"	"	"	"	"	
Phenanthrene	ND	0.0100	"	"	"	"	"	"	
Pyrene	ND	0.0100	"	"	"	"	"	"	
<i>Surrogate: 2-FBP</i>	85.1 %	30-150			"	"	"	"	
<i>Surrogate: Nitrobenzene-d5</i>	73.4 %	30-150			"	"	"	"	
<i>Surrogate: p-Terphenyl-d14</i>	81.9 %	30-150			"	"	"	"	

Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00

Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	
Anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Fluoranthene	ND	0.0100	"	"	"	"	"	"	
Fluorene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Naphthalene	ND	0.0100	"	"	"	"	"	"	
Phenanthrene	ND	0.0100	"	"	"	"	"	"	

North Creek Analytical - Bothell

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RRM, Inc. (Soldotna, AK)
247 N. Fireweed, Suite A
Soldotna AK, 99669

Project: Chevron #9-7324
Project Number: not provided
Project Manager: David Thomas

Reported:
08/18/00 16:18

Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Pyrene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Surrogate: 2-FBP	83.7 %	30-150			"	"	"	"	
Surrogate: Nitrobenzene-d5	73.8 %	30-150			"	"	"	"	
Surrogate: p-Terphenyl-d14	80.8 %	30-150			"	"	"	"	
Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Acenaphthene	ND	0.0100	mg/kg dry	1	0H16022	08/16/00	08/17/00	GCMS-SIM	
Acenaphthylene	ND	0.0100	"	"	"	"	"	"	
Anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.0100	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.0100	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	0.0100	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.0100	"	"	"	"	"	"	
Chrysene	ND	0.0100	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.0100	"	"	"	"	"	"	
Fluoranthene	ND	0.0100	"	"	"	"	"	"	
Fluorene	ND	0.0100	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.0100	"	"	"	"	"	"	
Naphthalene	ND	0.0100	"	"	"	"	"	"	
Phenanthrene	ND	0.0100	"	"	"	"	"	"	
Pyrene	ND	0.0100	"	"	"	"	"	"	
Surrogate: 2-FBP	88.0 %	30-150			"	"	"	"	
Surrogate: Nitrobenzene-d5	77.6 %	30-150			"	"	"	"	
Surrogate: p-Terphenyl-d14	85.2 %	30-150			"	"	"	"	

0000035

RRM. Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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**Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Tank Pit #1 (fill) (B0H0240-01) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Dry Weight	86.2	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Tank Pit #2 (vent) (B0H0240-02) Soil Sampled: 08/10/00 12:00 Received: 08/11/00 09:00									
Dry Weight	83.6	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Stockpile #1 (B0H0240-03) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00									
Dry Weight	87.4	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Stockpile #2 (B0H0240-04) Soil Sampled: 08/10/00 12:10 Received: 08/11/00 09:00									
Dry Weight	88.7	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Piperun #1 (South) (B0H0240-05) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Dry Weight	96.7	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	
Piperun #2 (north) (B0H0240-06) Soil Sampled: 08/10/00 10:30 Received: 08/11/00 09:00									
Dry Weight	91.0	1.00	%	1	0H11039	08/11/00	08/14/00	BSOPSPL003R07	

0000036

RRM. Inc. (Soldotna. AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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**Total Metals by EPA 6000/7000 Series Methods - Quality Control
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0H11021: Prepared 08/11/00 Using EPA 3050B										
Blank (0H11021-BLK1)										
Cadmium	ND	0.500	mg/kg wet							
LCS (0H11021-BS1)										
Cadmium	26.4	0.500	mg/kg wet	25.0		106	70-130			
Matrix Spike (0H11021-MS1) Source: B0H0240-06										
Cadmium	19.0	0.342	mg/kg dry	18.8	ND	100	70-130			
Matrix Spike Dup (0H11021-MSD1) Source: B0H0240-06										
Cadmium	18.8	0.338	mg/kg dry	18.6	ND	100	70-130	1.06	20	

RRM. Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H16022: Prepared 08/16/00 Using EPA 3550B

Blank (0H16022-BLK1)

Acenaphthene	ND	0.0100	mg/kg wet							
Acenaphthylene	ND	0.0100	"							
Anthracene	ND	0.0100	"							
Benzo (a) anthracene	ND	0.0100	"							
Benzo (a) pyrene	ND	0.0100	"							
Benzo (b) fluoranthene	ND	0.0100	"							
Benzo (ghi) perylene	ND	0.0100	"							
Benzo (k) fluoranthene	ND	0.0100	"							
Chrysene	ND	0.0100	"							
Dibenz (a,h) anthracene	ND	0.0100	"							
Fluoranthene	ND	0.0100	"							
Fluorene	ND	0.0100	"							
Indeno (1,2,3-cd) pyrene	ND	0.0100	"							
Naphthalene	ND	0.0100	"							
Phenanthrene	ND	0.0100	"							
Pyrene	ND	0.0100	"							
<i>Surrogate: 2-FBP</i>	<i>1.46</i>		<i>"</i>	<i>1.67</i>		<i>87.4</i>	<i>30-150</i>			
<i>Surrogate: Nitrobenzene-d5</i>	<i>1.27</i>		<i>"</i>	<i>1.67</i>		<i>76.0</i>	<i>30-150</i>			
<i>Surrogate: p-Terphenyl-d14</i>	<i>1.56</i>		<i>"</i>	<i>1.67</i>		<i>93.4</i>	<i>30-150</i>			

LCS (0H16022-BS1)

Chrysene	0.262	0.0100	mg/kg wet	0.333		78.7	10-125			
Fluorene	0.239	0.0100	"	0.333		71.8	11-116			
Indeno (1,2,3-cd) pyrene	0.239	0.0100	"	0.333		71.8	10-147			
<i>Surrogate: 2-FBP</i>	<i>1.50</i>		<i>"</i>	<i>1.67</i>		<i>89.8</i>	<i>30-150</i>			
<i>Surrogate: Nitrobenzene-d5</i>	<i>1.30</i>		<i>"</i>	<i>1.67</i>		<i>77.8</i>	<i>30-150</i>			
<i>Surrogate: p-Terphenyl-d14</i>	<i>1.41</i>		<i>"</i>	<i>1.67</i>		<i>84.4</i>	<i>30-150</i>			

RRM. Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring - Quality Control
North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0H16022: Prepared 08/16/00 Using EPA 3550B

Matrix Spike (0H16022-MS1)

Source: B0H0195-01

Chrysene	0.353	0.100	mg/kg dry	0.353	ND	90.0	10-125			
Fluorene	3.54	0.100	"	0.353	3.06	136	10-154			
Indeno (1,2,3-cd) pyrene	0.325	0.100	"	0.353	ND	92.1	10-144			
Surrogate: 2-FBP	1.60		"	1.76		90.9	30-150			
Surrogate: Nitrobenzene-d5	1.67		"	1.76		94.9	30-150			
Surrogate: p-Terphenyl-d14	1.71		"	1.76		97.2	30-150			

Matrix Spike Dup (0H16022-MSD1)

Source: B0H0195-01

Chrysene	0.332	0.100	mg/kg dry	0.353	ND	84.1	10-125	6.13	28	
Fluorene	2.37	0.100	"	0.353	3.06	-195	10-154	39.6	32	Q-01
Indeno (1,2,3-cd) pyrene	0.254	0.100	"	0.353	ND	72.0	10-144	24.5	47	
Surrogate: 2-FBP	1.66		"	1.76		94.3	30-150			
Surrogate: Nitrobenzene-d5	1.47		"	1.76		83.5	30-150			
Surrogate: p-Terphenyl-d14	1.54		"	1.76		87.5	30-150			

RRM. Inc. (Soldotna, AK) 247 N. Fireweed, Suite A Soldotna AK, 99669	Project: Chevron #9-7324 Project Number: not provided Project Manager: David Thomas	Reported: 08/18/00 16:18
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Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 0H11039: Prepared 08/11/00 Using Dry Weight									
Blank (0H11039-BLK1)									
Dry Weight	100	1.00	%						

RRM. Inc. (Soldotna, AK)
247 N. Fireweed, Suite A
Soldotna AK, 99669

Project: Chevron #9-7324
Project Number: not provided
Project Manager: David Thomas

Reported:
08/18/00 16:18

Notes and Definitions

- Q-01 The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

00041

**ATTACHMENT C
ADEC APPROVAL LETTER FOR TRANSPORT AND DISPOSAL**

Roger Hoffmore

From: Weimer, Robert [Robert_Weimer@envircon.state.ak.us]
Sent: Friday, August 25, 2000 9:55 AM
To: 'rhoffmore@secor.com'
Cc: Bainbridge, Steve; Weimer, Robert; 'Ron Johnson (E-mail)'
Subject: RE: Chevron # 9-7324, Approval of 30 cy Used Oil Stockpile to ASR

000042

Thank you for the lab data. The 30 cy yard stockpile of used oil (BTEX, GRO, DRO, RRO) contaminated soils at Chevron #9-7324, is approved for transport to and treatment at ASR's Anchorage treatment facility in accordance with their approved facility operation plan.

Robert Weimer - ADEC Site Project Manager

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

From: Roger Hoffmore [mailto:rhoffmore@secor.com]
Sent: Friday, August 18, 2000 4:50 PM
To: Steve Bainbridge (E-mail); Ron Johnson (E-mail)
Cc: Robert Weimer (E-mail); Bob Cochran (E-mail)
Subject: RE: Chevron # 9-7324 sampled: 8/10/00
Importance: High

Gentlemen-

Please find attached the second and last portion of the analytical results for used oil tank removal at 4417 Lake Otis Parkway, Anchorage. The PAH's in the stockpile samples were ND with the exception of the reported detections of "benzo (ghi) perylene" (up to a concentration of 0.0397 mg/kg). No PAH's reported in the in-situ samples. Cadmium was reported in low levels (background?). Please approve for transport and disposal of this material to ASR as soon as you can. Call or email with any questions.

Thank you!

-Roger Hoffmore
mailto:rhoffmore@secor.com
SECOR International, Inc.
916-861-0400

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

From: Roger Hoffmore [SMTP:rhoffmore@secor.com]
Sent: Wednesday, August 16, 2000 11:19 AM
To: Steve Bainbridge (E-mail); Ron Johnson (E-mail)
Cc: Robert Weimer (E-mail); Bob Cochran (E-mail)
Subject: FW: Chevron # 9-7324 sampled: 8/10/00

Gentlemen-

Please find attached analytical results associated with the recent (8/10/00) used oil tank pull at Chevron 9-7324 in Anchorage (4417 Lake Otis Parkway). The soil samples "Stockpile #1" and "Stockpile #2" together characterize approximately 20 to 30 cubic yards of material excavated during the removal of the used oil tank. Cadmium still needs to be run (Calcium was run instead by accident) - and PAHs have been requested. The lab estimates that the results for each of these should be available within three days - these additional results will be forwarded as soon as they become available. You will note that the levels of DRO and RRO are below cleanup levels and that GRO and BTEX are ND (GRO was performed by 8015M). Metals are assumed to be representative of background levels. Please approve for transport and disposal of this material to ASR as soon as you can. Call or email with any questions.

Thank you!
-Roger Hoffmore
mailto:rhoffmore@secor.com
SECOR International, Inc.
916-861-0400

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

From: Steve Davis [SMTP:SDavis@ncalabs.com]
Sent: Tuesday, August 15, 2000 9:40 AM
To: 'rhoffmore@secor.com'
Cc: 'dthomas@alaska.net'
Subject: Chevron # 9-7324 sampled: 8/10/00

0043

<< File: B0H0240.PDF >>