ATTACHMENT 1

IET-09

ESTIMATION OF VOLUME OF CONTAMINATED SOIL FROM A FUEL OIL SPILL

A. S. Rood

AUGUST 7, 1991

PROBLEM: What is the volume of contaminated soil which would result from a surface fuel oil spill of a known or estimated quantity?

ASSUMPTIONS:

- N GALLON FUEL SPILL
- SOIL POROSITY = 0.33 (p) (Case at al., pg A-62)
- THE RESIDUAL SATURATION CAPACITY (RS) = 0.10, 0.15, 0.20

The residual saturation for fuel oils is approximately 33% of the water holding capacity of the soil. Dragun (1988) reports maximum RS values for different fuel oils.

Table 1. Residual Saturation (RS) values for different fuels.

Fuel	RS
light oil and gasoline	0.10
diesel and light fuel oil	0.15
lube and heavy fuel oil	0.20

The volume of soil in cubic yards contaminated by a soil is given by (Dragun, 1988)

$$V_s = \frac{0.2 \times V_{HC}}{p \times (RS)} \qquad (1)$$

where V_s = Volume of contaminated soil at residual saturation (yd^3)
V_{HC} = volume of discharged hydrocarbons in barrels
= (N gallons of spilled fuel) x (1 barrel per 44 gallons)
p = soil porosity
RS = residual saturation from Table 1

The estimated volume in cubic yards contaminated by a light oil or gasoline spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.33 \times 0.10}$$

The estimated volume in cubic yards contaminated by a diesel or light fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.33 \times 0.15}$$

The estimated volume in cubic yards contaminated by a lube or heavy fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.33 \times 0.20}$$

Calculate a volume:

N = 25 gallons

RS = .20 (from Table 1)

Therefore:

$$V_s = \frac{0.2 \times 25/44}{0.35 \times .20} = 1.6 \text{ cubic yards of contaminated soil}$$

References:

Case, M. J., Maheras, S. J., at al., Radioactive Waste Management Complex Performance Assessment, EG&G Idaho Informal Report, EGG-WM-8773, June, 1990, Page A-62.

Dragun, James, Soil Chemistry of Hazardous Materials, Hazardous Materials Control Research Institute, Chapter 2, 1988.

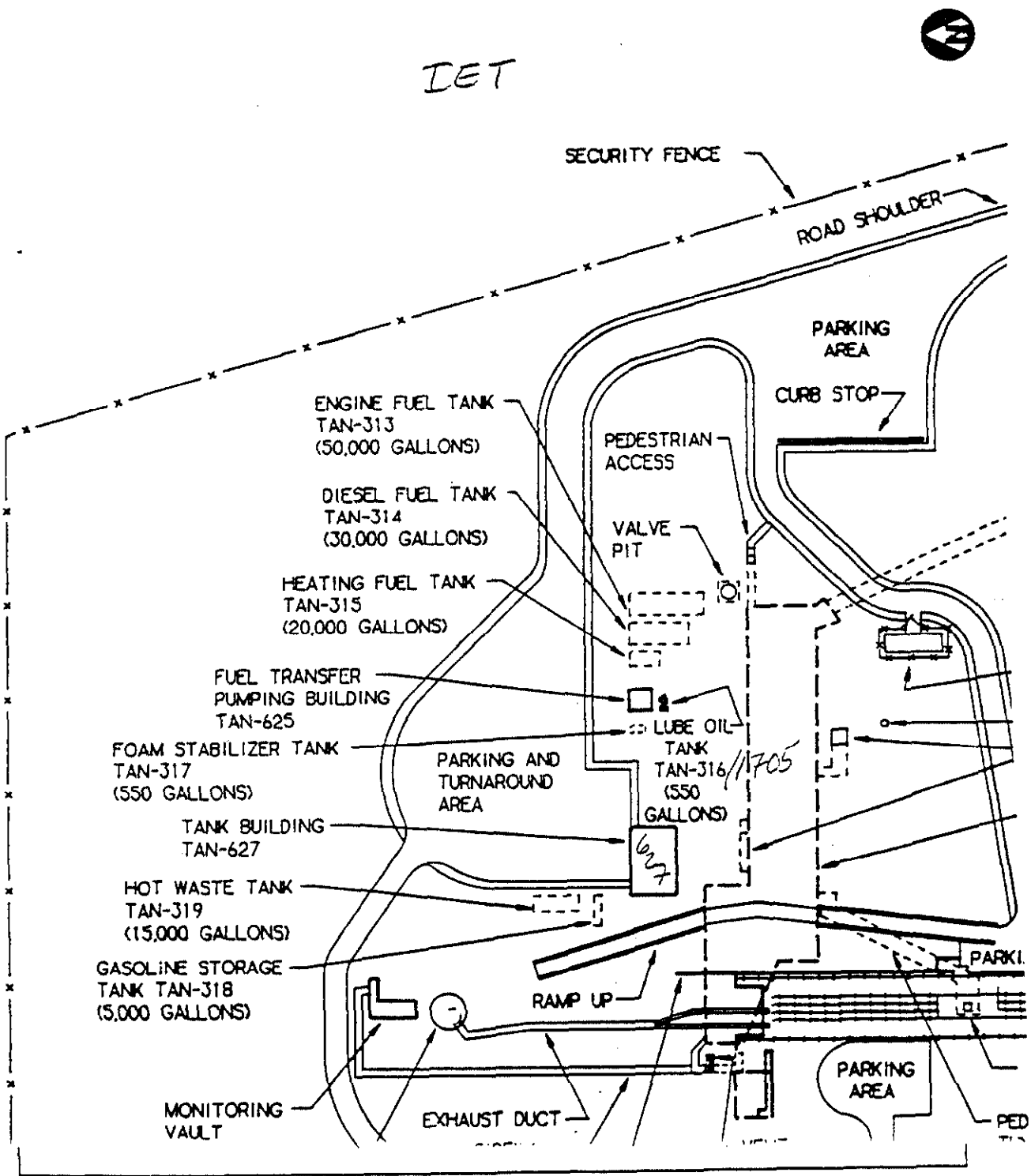
ATTACHMENT 2

TANK CONTENT

SAMPLING AND LOCATION MAP

FIELD SKETCH OF TANK LOCATION

Include North Arrow and Scale or Dimensions



Recorded by: R. Perman Checked By: _____

EG&G Idaho Inc
FORM EG&G 669
(Rev. 06-87)

GENERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code: [ ]
Facility:

A. General Information

Generator Name: Department of Energy (DOE)
Charge No.
Facility Address: Idaho
Organization No.
P.O. Box 1625
Idaho Falls, Idaho 83415
Technical Contact: Connie Nash
Title: Project Manager
Phone: 526-8059
Name of Waste: Oil phase from Tank TW 176
Process Generating Waste: Tank Closure Program

B. Physical Characteristics of Waste

Color

Physical state @ 70°F: ☐ Solid ☐ Liquid ☐ Semi-solid ☐ Powder

Layers: ☒ Multilayered ☐ Bi-layered ☐ Single phased

Free Liquids: ☐ Yes ☐ No Volume ____ %

pH: ☐ <2 ☐ 2—4 ☐ 4.1—6.9 ☐ 7 ☒ 7.1—10 ☐ 10.1—12.5 ☐ >12.5 ☐ Exact ____ ☐ N/A

Specific Gravity: ☐ 0.8 ☐ 0.8—1.0 ☐ 1.1—1.2 ☐ Exact 0.9 g/ml ☐ 1.3—1.4 ☐ 1.5—1.7 ☐ >1.7

Flash Point: ☐ 70°F ☐ 70°F—100°F ☐ 101°F—139°F ☐ 140°F—200°F ☐ Exact ____ ☒ No Flash ☐ >200°F ☒ Closed Cup ☐ Open Cup

C. Incineration Information

Not Analyzed

____ Btus Heat of Combustion

____ % Ash Content

____ % Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet)

Hydrocarbons	67%
Aqueous	19%
Solvent	7%
	%
	%
	%
	%
	%
	%
	%

E. Metals ☐ Total (ppm) ☒ EPA Extraction Procedure (mg/L)

Arsenic (As)	BPQL	Selenium (Se)	BPQL
Barium (Ba)	BPQL	Silver (Ag)	7.320
Cadmium (Cd)	BPQL	Copper (Cu)	BPQL
Chromium (Cr)	BPQL	Nickel (Ni)	BPQL
Mercury (Hg)	0.0126	Zinc (Zn)	178.500
Lead (Pb)	BPQL	Thallium (Tl)	BPQL
Chromium-Hex (Cr+6)	N/A		

F. PCB Not Analyzed ppm
☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None Not Analyzed
☐ Pyrophoric ☐ Shock-sensitive ☐ Water-reactive
☐ Explosive ☐ Chemically unstable ☐ Cyanide or sulfides

H. ☐ New waste stream
If new stream, provide representative sample in one-liter (quart) glass or plastic container.
☐ Sample sent.

I. Present volume to be shipped to HWSF
____ Drums
____ Gallons
____ Pounds

J. ____ Anticipated volume per year.
☐ Drums ☐ Cu. feet
☐ Gallons ☐ Cu. yards
☐ Pounds ☐ Tons

K. ☐ Radioactive
☒ Nonradioactive
If radioactive, attach spectral analysis.
☐ Spectral analysis attached.

Principal Nuclide(s): Not Analyzed
Activity (Ci):
Total Activity: ____ Ci
Specific Activity: Lead and Selenium Ci/g

L. Special handling, procedures, comments: The oil phase is EP Toxic for silver. The aqueous phase was EP Toxic for Barium and may not be easily separated from the oil phase. The Laboratory Simulation Limits exceeded the Regulatory Action Limit for Arsenic Cadmium,

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

Authorized Signature	Title	Date
[signature]	[illegible]	6-23-90

Copies 1 & 2 — Waste Management Copy 3 — Generator Retain

EG&G Idaho Inc
FORM EG&G 669
(Rev. 06-87)

GENERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code

Facility:

A. General Information

Generator Name: Department of Energy (DOE-Id) Charge No.

Address: TAGC Organization No.
P O Box 1625
Idaho Falls Id 83415

Technical Contact: W A Rhoades Title: Project Manager Phone: X-8066

Name of Waste: Aqueous phase from tank TAU-1705

Process Generating Waste:

B. Physical Characteristics of Waste

Color

Physical state @ 70°F: ☐ Solid ☒ Liquid ☐ Semi-solid ☐ Powder

Layers: ☐ Multilayered ☐ Bi-layered ☐ Single phased

Free Liquids: ☐ Yes ☐ No Volume ____ %

pH: ☐ <2 ☐ 2—4 ☒ 4.1—6.9 ☐ 7 ☐ 7.1—10 ☐ N/A ☐ 10.1—12.5 ☐ >12.5 ☐ Exact ____

Specific Gravity: Not Analyzed ☐ 0.8 ☐ 0.8—1.0 ☐ 1.1—1.2 ☐ Exact ____ ☐ 1.3—1.4 ☐ 1.5—1.7 ☐ >1.7

Flash Point: ☐ 70°F ☐ 70°F—100°F ☐ 101°F—139°F ☐ 140°F—200°F ☐ No Flash ☐ >200°F ☒ Exact >140°F ☒ Closed Cup ☐ Open Cup

C. Incineration Information

Not Analyzed

____ Btus Heat of Combustion

____ % Ash Content

____ % Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet) See Attachment

	%
	%
	%
	%
	%
	%
	%
	%
	%
	%

E. Metals ☒ Total (ppm) ☐ EPA Extraction Procedure (mg/L)

Arsenic (As)	BPQL	Selenium (Se)	BPQL
Barium (Ba)	1600	Silver (Ag)	BPQL
Cadmium (Cd)	BPQL	Copper (Cu)	BPQL
Chromium (Cr)	0.070	Nickel (Ni)	0.076
Mercury (Hg)	0.00056	Zinc (Zn)	797
Lead (Pb)	BPQL	Thallium (Tl)	BPQL
Chromium-Hex (Cr+6)	NA		

F. PCB Not Analyzed ppm

☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None Not Analyzed

☐ Pyrophoric ☐ Shock-sensitive ☐ Water-reactive

☐ Explosive ☐ Chemically unstable ☐ Cyanide or sulfides

H. ☐ New waste stream

If new stream, provide representative sample in one-liter (quart) glass or plastic container.

☐ Sample sent.

I. Present volume to be shipped to HWSF

____ Drums
____ Gallons
____ Pounds

J. ____ Anticipated volume per year.

☐ Drums ☐ Cu. feet
☐ Gallons ☐ Cu. yards
☐ Pounds ☐ Tons

K. ☐ Radioactive

☒ Nonradioactive

If radioactive, attach spectral analysis.

☐ Spectral analysis attached.

Principal Nuclide(s):	Activity (Ci):

Total Activity: ____ Ci

Specific Activity: ____ Ci/g

L. Special handling, procedures, comments: The sample exhibits EP Toxicity for Barium

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

Authorized Signature	Title	Date
Matthew Hall	Engineer	1-2-90

Copies 1 & 2 — Waste Management Copy 3 — Generator Retain

EG&G Idaho Inc
FORM EG&G 669
(Rev. 06-87)

NERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code
Facility:

A. General Information

Generator Name: Department of Energy (DOE-Id) Charge No.
Address: INEL Organization No.
P.O. Box 1625
Idaho Falls, Id 83415
Technical Contact: W A Wheeler Title: Project Manager Phone: X-8066
Name of Waste: Oil Phase from Tank TAN 1705
Process Generating Waste: Tank Closure Program

B. Physical Characteristics of Waste

Color
Physical state @ 70°F: ☐ Solid ☒ Liquid ☐ Semi-solid ☐ Powder
Layers: ☐ Multilayered ☐ Bi-layered ☐ Single phased
Free Liquids: ☐ Yes ☐ No Volume ____ %
pH: ☐ <2 ☐ 2—4 ☐ 4.1—6.9 ☐ 7 ☐ 7.1—10 ☒ N/A ☐ 10.1—12.5 ☐ >12.5 ☐ Exact ____
Specific Gravity: Not Analyzed ☐ 0.8 ☐ 0.8—1.0 ☐ 1.1—1.2 ☐ Exact ____ ☐ 1.3—1.4 ☐ 1.5—1.7 ☐ >1.7
Flash Point: ☐ 70°F ☐ 70°F—100°F ☐ 101°F—139°F ☐ 140°F—200°F ☐ No Flash ☐ >200°F ☒ Exact >140 °F ☐ Closed Cup ☐ Open Cup

C. Incineration Information

Not Analyzed
____ Btus Heat of Combustion
____ % Ash Content
____ % Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet) See Attachments

	%
	%
	%
	%
	%
	%
	%
	%
	%
	%

E. Metals ☒ Total (ppm) ☐ EPA Extraction Procedure (mg/L) N/C

Arsenic (As)	2 PCL	Selenium (Se)	BPCL
Barium (Ba)	BPCL	Silver (Ag)	0.0074
Cadmium (Cd)	2PCL	Copper (Cu)	2PCL
Chromium (Cr)	BPCL	Nickel (Ni)	BPCL
Mercury (Hg)	0.000013	Zinc (Zn)	7.780
Lead (Pb)	BPCL	Thallium (Tl)	BPCL
Chromium-Hex (Cr+6)	N/A		

F. PCB Not Analyzed ppm
☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None Not Analyzed
☐ Pyrophoric ☐ Shock-sensitive ☐ Water-reactive
☐ Explosive ☐ Chemically unstable ☐ Cyanide or sulfides

H. ☐ New waste stream
If new stream, provide representative sample in one-liter (quart) glass or plastic container.
☐ Sample sent.

I. Present volume to be shipped to HWSF
____ Drums
____ Gallons
____ Pounds

J. ____ Anticipated volume per year.
☐ Drums ☐ Cu. feet
☐ Gallons ☐ Cu. yards
☐ Pounds ☐ Tons

K. ☐ Radioactive
☒ Nonradioactive
If radioactive, attach spectral analysis.
☐ Spectral analysis attached.

Principal Nuclide(s): Activity (Ci):
Total Activity: ____ Ci
Specific Activity: ____ Ci/g

L. Special handling, procedures, comments: Examination of laboratory data indicates that the sample does not exhibit any anomalous hazardous characteristics

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

Authorized Signature	Title	Date
[signature]	Engineer	12-14-87

Copies 1 & 2 — Waste Managemen Copy 3 — Generator Retain

TAN 1705

DATA CHEM LABORATORIES

ANALYTICAL REPORT

Form ARF-AL

Date 12/22/89
Agency Identification Number S89-0813
Account No. 03018

EG&G Idaho - INEL
P.O. Box 1625
Idaho Falls, ID 83415-2109
Attention: Charles W. Ariss

Telephone (208) 526-9055

Sampling Collection and Shipment

Sampling Site _____ Date of Collection December 04, 1989

Date Samples Received at DataChem December 06, 1989

Analysis

Method of Analysis _____

Date(s) of Analysis _____

Analytical Results

Field Sample Number	DataChem Lab Number	Sample Type	Arsenic PPM	Barium PPM	Cadmium PPM	Chromium PPM	Copper PPM	Lead PPM	Nickel PPM	Selenium PPM
TAN-1705-1	EI 3617	OIL	ND*	1400.	ND*	1.0	7.0	60.	ND*	ND*
TAN-1705-2	EI 3618	OIL	ND*	1200.	ND*	1.0	5.0	80.	ND*	ND*
* Limit of Detection			1.	0.5	0.2	0.5	1.	1.	0.5	1.

* See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
** Parameter not analyzed(See comment on last page).
( ) Parameter between LOD and LOQ.

Reference Laboratory
Analyst: Reference Laboratory

Reviewer:

Rand Potter
Laboratory Supervisor:

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700

DATA CHEM LABORATORIES

ANALYTICAL REPORT

Form ARF-AL

Date 12/22/89
Agency Identification Number S89-0813
Account No. 03018

EG&G Idaho - INEL
P.O. Box 1625
Idaho Falls, ID 83415-2109
Attention: Charles W. Ariss

Telephone (208) 526-9055

Sampling Collection and Shipment

Sampling Site _____ Date of Collection December 04, 1989

Date Samples Received at DataChem December 06, 1989

Analysis

Method of Analysis _____

Date(s) of Analysis _____

Analytical Results

Field Sample Number	DataChem Lab Number	Sample Type	Silver PPM	Thallium PPM	Zinc PPM	Mercury PPB				
TAN-1705-1	EI 3617	OIL	ND*	1.8	250.	70.				
TAN-1705-2	EI 3618	OIL	ND*	2.4	190.	120.				
* Limit of Detection			0.5	0.5	1.	0.5				

† See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
** Parameter not analyzed(See comment on last page).
( ) Parameter between LOD and LOQ.

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700

EG&G Idaho, Environmental Chemistry, ROA

Customer Sample ID:	LAB BLANK	TAN1705L L02	LAB BLANK	TAN1705L L02		
Sample Type:		Liquid		Liquid		
Date Sampled:	/ /	06/06/89	/ /	06/06/89		
Date Received:	/ /	06/06/89	/ /	06/06/89		
Lab Sample ID:	VBLK1048	9MIA10538	VBLK1053	9MIA1053T		
Date Extracted:	10/23/89	10/23/89	10/23/89	10/23/89		
Date Analyzed:	10/23/89	10/23/89	10/23/89	10/23/89		
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Volatile Organic Compounds EPA Method 8240						
1,1,1-Trichloroethane	< 2500	< 1838	< 25000	< 22523		
1,1,2,2-Tetrachloroethane	< 2500	< 1838	< 25000	< 22523		
1,1,2-Trichloroethane	< 2500	< 1838	< 25000	< 22523		
1,1-Dichloroethane	< 2500	< 1838	< 25000	< 22523		
1,1-Dichloroethene	< 2500	< 1838	< 25000	< 22523		
1,2,3-Trichloropropane	< 2500	< 1838	< 25000	< 22523		
1,2-Dichlorobenzene	< 5000	< 3676	< 50000	< 45045		
1,2-Dichloroethane	< 2500	< 1838	< 25000	< 22523		
1,2-Dichloroethene (total)	< 2500	< 1838	< 25000	< 22523		
1,2-Dichloropropane	< 2500	< 1838	< 25000	< 22523		
1,3-Dichlorobenzene	< 5000	< 3676	< 50000	< 45045		
1,4-Dichloro-2-butene	< 50000	< 36765	< 500000	< 450450		
1,4-Dichlorobenzene	< 5000	< 3676	< 50000	< 45045		
2- ne	3775 J	5636 J	37750 J	< 450450		
2- ethyl vinyl ether	< 5000	< 3676	< 50000	< 45045		
2-Hexanone	< 25000	< 18382	< 250000	< 225225		
4-Methyl-2-Pentanone	< 25000	< 18382	< 250000	< 225225		
Acetone	< 50000	5004 J	< 500000	86847 J		
Acrolein	< 25000	< 18382	< 250000	< 225225		
Acrylonitrile	< 50000	< 36765	< 500000	< 450450		
Benzene	< 2500	< 1838	< 25000	< 22523		
Bromodichloromethane	< 2500	< 1838	< 25000	< 22523		
Bromoform	< 2500	< 1838	< 25000	< 22523		
Bromomethane	< 5000	< 3676	< 50000	< 45045		
Carbon Disulfide	< 2500	< 1838	< 25000	< 22523		
Carbon Tetrachloride	< 2500	< 1838	< 25000	< 22523		
Chlorobenzene	< 2500	< 1838	< 25000	< 22523		
Chloroethane	< 5000	< 3676	< 50000	< 45045		
Chloroform	< 2500	< 1838	< 25000	< 22523		
Chloromethane	< 5000	< 3676	< 50000	< 45045		
Cis-1,3-Dichloropropene	< 2500	< 1838	< 25000	< 22523		
Dibromochloromethane	< 2500	< 1838	< 25000	< 22523		
Dibromomethane	< 10000	< 7353	< 100000	< 90090		
Dichlorodifluoromethane	< 10000	< 7353	< 100000	< 90090		
Ethyl Methacrylate	< 2500	< 1838	< 25000	< 22523		
Ethylbenzene	< 2500	< 1838	< 25000	< 22523		
Iodomethane	< 10000	< 7353	< 100000	< 90090		
Methylene Chloride	1445 J	1908	14450 J	23198		
Styrene	< 2500	< 1838	< 25000	< 22523		
Tetrachloroethene	2095 J	1419 J	20950 J	9459 J		

Continued

EG&G Idaho, Environmental Chemistry, RCA

Customer Sample ID:	LAB BLANK	TAN1705L L02	LAB BLANK	TAN1705L L02		
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Volatile Organic Compounds EPA Method 8240						
Toluene	< 2500	< 1838	< 25000	< 22523		
Trans-1,3-Dichloropropene	< 2500	< 1838	< 25000	< 22523		
Trichloroethene	< 2500	< 1838	< 25000	< 22523		
Trichlorofluoromethane	< 5000	< 3676	< 50000	< 45045		
Vinyl Acetate	< 25000	< 18382	< 250000	< 225225		
Vinyl Chloride	< 5000	< 3676	< 50000	< 45045		
Xylene (meta & para)	< 2500	897 J	< 25000	29505		
Xylene (ortho)	< 2500	< 1838	< 25000	5676 J		

Customer Sample ID:	LAB BLANK	TAN170SL L02	TAN170SL L02			
Sample Type:		Liquid	Liquid			
Date Sampled:	/ /	06/06/89	06/06/89			
Date Received:	/ /	06/06/89	06/06/89			
Lab Sample ID:	SBLK1048	9MIA1053T	9MIA1053B			
Date Extracted:	10/18/89	10/18/89	10/18/89			
Date Analyzed:	10/26/89	11/13/89	11/13/89			
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
1,2,4,5-Tetrachlorobenzene	< 9900	< 9405	< 9405			
1,2,4-Trichlorobenzene	< 9900	< 9405	< 9405			
1,2-Dichlorobenzene	< 9900	< 9405	< 9405			
1,3-Dichlorobenzene	< 9900	< 9405	< 9405			
1,4-Dichlorobenzene	< 9900	< 9405	< 9405			
1-Chloronaphthalene	< 9900	< 9405	< 9405			
1-Naphthylamine	< 9900	< 9405	< 9405			
2,3,4,6-Tetrachlorophenol	< 9900	< 9405	< 9405			
2,4,5-Trichlorophenol	< 9900	< 9405	< 9405			
2,4,6-Trichlorophenol	< 9900	< 9405	< 9405			
2,4-Dichlorophenol	< 9900	< 9405	< 9405			
2,4-Dimethylphenol	< 9900	< 9405	< 9405			
2,4-Dinitrophenol	< 49500	< 47025	< 47025			
2,[illegible] trotoluene	< 9900	< 9405	< 9405			
2,[illegible] trotoluene	< 9900	< 9405	< 9405			
2-Chloronaphthalene	< 9900	< 9405	< 9405			
2-Chlorophenol	< 9900	< 9405	< 9405			
2-Methylnaphthalene	< 9900	10537	< 9405			
2-Methylphenol	< 9900	< 9405	< 9405			
2-Naphthylamine	< 9900	< 9405	< 9405			
2-Nitroaniline	< 49500	< 47025	< 47025			
2-Nitrophenol	< 9900	< 9405	< 9405			
2-Picoline	< 49500	< 47025	< 47025			
3,3'-Dichlorobenzidine	< 19500	< 18525	< 18525			
3-Methylcholanthrene	< 9900	< 9405	< 9405			
3-Nitroaniline	< 49500	< 47025	< 47025			
4,6-Dinitro-2-methyl phenol	< 49500	< 47025	< 47025			
4-Aminobiphenyl	< 19500	< 18525	< 18525			
4-Bromophenyl phenyl ether	< 9900	< 9405	< 9405			
4-Chloro-3-methylphenol	< 19500	< 18525	< 18525			
4-Chloroaniline	< 19500	< 18525	< 18525			
4-Chlorophenyl phenyl ether	< 9900	< 9405	< 9405			
4-Methylphenol	< 9900	< 9405	< 9405			
4-Nitroaniline	< 49500	< 47025	< 47025			
4-Nitrophenol	< 49500	< 47025	< 47025			
7,12-Dimethylbenz(A)anthracene	< 9900	< 9405	< 9405			
A,A-Dimethylphenethylamine	< 19500	< 18525	< 18525			
Acenaphthene	< 9900	< 9405	< 9405			
Acenaphthylene	< 9900	< 9405	< 9405			
Acetophenone	< 9900	< 9405	< 9405			

Continued

EG&G Idaho, Environmental Chemistry, ROA

Customer Sample ID:	LAB BLANK	TAN170SL L02	TAN170SL L02			
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
Aldrin	< 19500	< 18525	< 18525			
Alpha-BHC	< 19500	< 18525	< 18525			
Alpha-endosulfan	< 19500	< 18525	< 18525			
Aniline	< 9900	< 9405	< 9405			
Anthracene	< 9900	< 9405	< 9405			
BIS(2-Chloroethoxy)methane	< 9900	< 9405	< 9405			
BIS(2-Chloroethyl) Ether	< 9900	< 9405	< 9405			
BIS(2-Chloroisopropyl)ether	< 9900	< 9405	< 9405			
BIS(2-ethylhexyl)phthalate	< 9900	< 9405	< 9405			
Benzidine	< 49500	< 47025	< 47025			
Benzo(G,H,I)perylene	< 9900	< 9405	< 9405			
Benzo(a)anthracene	< 9900	< 9405	< 9405			
Benzo(a)pyrene	< 9900	< 9405	< 9405			
Benzo(b)fluoranthene	< 9900	< 9405	< 9405			
Benzo(k)fluoranthene	< 9900	< 9405	< 9405			
Benzoic Acid	< 49500	< 47025	< 47025			
Benzyl Alcohol	< 19500	< 18525	< 18525			
Beta-BHC	< 19500	< 18525	< 18525			
Beta-endosulfan	< 19500	< 18525	< 18525			
Bu[illegible]nzylphthalate	< 9900	< 9405	< 9405			
Ch[illegible]	< 9900	< 9405	< 9405			
Delta-BHC	< 19500	< 18525	< 18525			
Di-n-butyl phthalate	< 9900	< 9405	< 9405			
Di-n-octylphthalate	< 9900	< 9405	< 9405			
Dibenzo(A,H)anthracene	< 9900	< 9405	< 9405			
Dibenzofuran	< 9900	< 9405	< 9405			
Dieldrin	< 19500	< 18525	< 18525			
Diethyl Phthalate	< 9900	< 9405	< 9405			
Dimethyl Phthalate	< 9900	< 9405	< 9405			
Dimethylaminoazobenzene	< 9900	< 9405	< 9405			
Diphenylamine	< 9900	< 9405	< 9405			
Endosulfan sulfate	< 19500	< 18525	< 18525			
Endrin	< 19500	< 18525	< 18525			
Endrin ketone	< 19500	< 18525	< 18525			
Ethylmethanesulfonate	< 19500	< 18525	< 18525			
Fluoranthene	< 9900	< 9405	< 9405			
Fluorene	< 9900	< 9405	< 9405			
Gamma-BHC	< 19500	< 18525	< 18525			
Heptachlor	< 19500	< 18525	< 18525			
Heptachlor epoxide	< 19500	< 18525	< 18525			
Hexachlorobenzene	< 9900	< 9405	< 9405			
Hexachlorobutadiene	< 9900	< 9405	< 9405			
Hexachlorocyclopentadiene	< 9900	< 9405	< 9405			
Hexachloroethane	< 9900	< 9405	< 9405			
Indeno(1,2,3-CD)pyrene	< 9900	< 9405	< 9405			
Isophorone	< 9900	< 9405	< 9405			

Continued

EG&G Idaho, Environmental Chemistry, ROA

Customer Sample ID:	LAB BLANK	TAN170SL LO2	TAN170SL LO2			
Parameter	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg	Results ug/Kg
Semi-volatile Organic Compounds EPA Method 8270						
Methoxychlor	< 19500	< 18525	< 18525			
Methylmethanesulfonate	< 9900	< 9405	< 9405			
N-Nitrosodibutylamine	< 9900	< 9405	< 9405			
N-nitroso-di-propylamine	< 9900	< 9405	< 9405			
N-nitrosodimethylamine	< 9900	< 9405	< 9405			
N-nitrosodiphenylamine	< 9900	< 9405	< 9405			
Naphthalene	< 9900	5633 J	< 9405			
Nitrobenzene	< 9900	< 9405	< 9405			
P,P'-DDD	< 19500	< 18525	< 18525			
P,P'-DDE	< 19500	< 18525	< 18525			
P,P'-DDT	< 19500	< 18525	< 18525			
Pentachlorobenzene	< 9900	< 9405	< 9405			
Pentachloronitrobenzene	< 19500	< 18525	< 18525			
Pentachlorophenol	< 49500	< 47025	< 47025			
Phenacetin	< 19500	< 18525	< 18525			
Phenanthrene	< 9900	< 9405	< 9405			
Phenol	< 9900	< 9405	< 9405			
Pronamide	< 9900	< 9405	< 9405			
Pyrene	< 9900	< 9405	< 9405			

L..d:

PQL = Practical quantitation level. This is the lowest concentration reliably measurable (i.e., 33% maximum uncertainty in precision and accuracy at the one standard deviation confidence level) for normal samples during routine laboratory operations.

< = Less than. The value reported immediately following the less than symbol is the practical quantitation level (PQL) for the analyte. See the PQL definition for further explanation of the PQL. The reported PQL is adjusted for differences in sample weight, sample volume, sample moisture content, and analysis dilutions whenever those parameters differ from that specified for the standard analytical procedure.

Comments:

J Indicates an estimated value for target compounds (i.e., specific compounds for which the procedure was calibrated). The concentration is below the PQL, but the compound was detected in the sample. In the case of compounds which are not target compounds (i.e., tentatively identified compounds), the method is not calibrated to quantitatively measure their abundances. An estimated calibration factor is assumed to quantify these compounds, therefore the reported concentrations are estimated.

M16 Due to the sample matrix (a liquid with numerous particles), the aliquot analyzed for Volatile Organic Compounds was measured gravimetrically rather than volumetrically. For this reason, the concentration is reported in ug/kg, rather than ug/L. The concentration in terms of ug/L would be slightly higher than the ug/kg reported.

M17 Due to the sample matrix (a liquid with numerous particles), the aliquot analyzed for Semivolatile Organic Compounds was measured gravimetrically rather than volumetrically. For this reason, the concentration is reported in ug/kg, rather than ug/L. The concentration in terms of ug/L would be slightly higher than the ug/kg reported.

Technical and Quality Review:

Not required

Shelly J. Sailer
Inorganic Technical Leader

Technical and Quality Review:

for

Michael J. Connolly, Ph.D.
Organic Technical Leader

Quality Assurance Review:

Nancy Roberts
Quality Assurance Officer

Release Authorization:

Joseph T. Bennett, Ph.D.
Laboratory Manager

EG&G Idaho, Inc.
Environmental Chemistry
P.O. Box 1625, MS 4123
Idaho Falls, ID 83415

This report of analysis (ROA) presents the analytical results for the analyses you requested. Sample identification, sampling information, and laboratory analysis information are listed in a column for each sample. Analytical results are listed by analytical parameter below the sample identification information. Acronyms and abbreviations used are defined at the end of the report. A letter and/or letter number flag immediately to the right of a parameter, method, PQL and units, result, or any other entry indicates an amplifying comment also provided at the end of the report.

REPORT OF ANALYSIS
INEL Tank Closure Program

Prepared for:

W.A. Rhoades
Tank Closure Program Manager
Environmental Restoration Program
EG&G Idaho, Inc.
P.O. Box 1625, MS 8101
Idaho Falls, ID 83415

Report Identification:

ROA Number:	218
Date:	11/03/89
Charge No.:	3RIF08400
Page:	1

Analysis Results Summary for Tank TAN 1705

This report provides results for the following:

- Ignitability
- Total metals
- Toxicity Extraction Procedure (EP) and metal analyses of the extract

Summary: Aqueous phase - The samples do exhibit the characteristics of EP Toxicity for metals for this phase.

Oil phase - The samples do not exhibit the characteristics of EP Toxicity for metals for this phase.

Under method 1310, oil samples may be treated as either liquids or solids, depending upon their densities, (e.g., heavy oils and greases are treated as solids and require the EP extraction procedure; lighter oils may be treated as a liquid and are digested for total metals). Insufficient sample volume of the oil phases existed to determine whether they should be treated as liquids or solids; therefore, based on visual examination, the oil phases were treated as liquids and digested for total metals. Total metals results are normally reported in units of mg/kg, so total concentrations were multiplied by the oil phase density to convert to units of ug/L for comparison to the EP Toxicity regulatory limits.

Ignitability - The samples do not exhibit the hazardous characteristic of Ignitibility.

Additional analyses as originally requested are underway and their results will be submitted in a separate report as soon as available for the following:

- Volatile Organic Compounds
- Semivolatile Organic Compounds

Page				
Sampling Site:		TAN	TAN
Tank ID:		TAN 1712	TAN 1712
Sample Type:	Blank	Multiphase	Multiphase
Customer Sample ID:		TAN1712LL01	TAN1712LL02
Sampling Date:		06/06/89	06/06/89
Date Received:		06/06/89	06/06/89
Lab Sample ID:	PB	9MIA1048	9MIA1049
Date Extracted:	10/23/89	10/23/89	10/23/89
Date Analyzed:	10/27/89	10/27/89	10/27/89
Mercury Date Extracted:	10/26/89	10/26/89	10/26/89
Mercury Date Analyzed:	10/27/89	10/27/89	10/27/89
Remarks:	Lab Blank	Aqueous Phase	Aqueous Phase

Parameter	Method	PQL and Units	Result	Result	Result
Metals AA - ICP					
Arsenic	EPA SW-846 6010	250 ug/L	BPQL	BPQL	BPQL
Barium	EPA SW-846 6010	200 ug/L	BPQL	225	BPQL
Cadmium	EPA SW-846 6010	5 ug/L	BPQL	BPQL	BPQL
Chromium	EPA SW-846 6010	10 ug/L	16	BPQL	BPQL
Copper	EPA SW-846 6010	25 ug/L	BPQL	25	BPQL
Lead	EPA SW-846 6010	150 ug/L	BPQL	BPQL	BPQL
Mercury	EPA SW-846 7470	0.2 ug/L	BPQL	BPQL	BPQL
Nickel	EPA SW-846 6010	40 ug/L	BPQL	BPQL	BPQL
Selenium	EPA SW-846 6010	300 ug/L	BPQL	BPQL	BPQL
Silver	EPA SW-846 6010	10 ug/L	BPQL	BPQL	BPQL
Thallium	EPA SW-846 6010	500 ug/L	BPQL	BPQL	BPQL
Zinc	EPA SW-846 6010	20 ug/L	43	237 B	256 B

Sampling Site:		TAN	TAN
Tank ID:		TAN 1712	TAN 1712
Sample Type:	Blank	Multiphase	Multiphase
Customer Sample ID:		TAN1712LL01	TAN1712LL02
Sampling Date:		06/06/89	06/06/89
Date Received:		06/06/89	06/06/89
Lab Sample ID:	P8	9MIA1048	9MIA1049
Date Extracted:	10/23/89	10/23/89	10/23/89
Date Analyzed:	10/27/89	10/27/89	10/27/89
Mercury Date Extracted:	10/26/89	10/26/89	10/26/89
Mercury Date Analyzed:	10/27/89	10/27/89	10/27/89
Remarks:	Lab Blank	Oil phase	Oil phase

Parameter	Method	PQL and Units	Result	Result	Result
Metals - ICP				Comments D6, M15	Comments D6, M15
Arsenic	EPA SW-846 6010	6.2 mg/kg	BPQL	< 19	< 18
Barium	EPA SW-846 6010	5.0 mg/kg	BPQL	< 15	< 15
Cadmium	EPA SW-846 6010	0.12 mg/kg	BPQL	< 0.38	0.44
Chromium	EPA SW-846 6010	0.25 mg/kg	BPQL	< 0.75	< 0.74
Copper	EPA SW-846 6010	0.62 mg/kg	BPQL	< 1.9	< 1.8
Lead	EPA SW-846 6010	3.8 mg/kg	BPQL	< 11	< 11
[illegible]ry	EPA SW-846 7471	0.0065 mg/kg	0.0065	0.0080 B	0.0074 B
Nickel	EPA SW-846 6010	1.0 mg/kg	BPQL	4.9	< 2.9
Selenium	EPA SW-846 6010	7.5 mg/kg	BPQL	< 22	< 22
Silver	EPA SW-846 6010	0.25 mg/kg	BPQL	< 0.75	3.3
Thallium	EPA SW-846 6010	12.5 mg/kg	BPQL	< 38	< 37
Zinc	EPA SW-846 6010	0.50 mg/kg	BPQL	2.9	7.3

EG&G Idaho, Environmental Chemistry, ROA

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Sampling Site:		TAN	TAN	
Tank ID:		TAN 1712	TAN 1712	
Sample Type:		Multiphase	Multiphase	
Customer Sample ID:		TAN1712LL01	TAN1712LL01	
Sampling Date:		06/06/89	06/06/89	
Date Received:		06/06/89	06/06/89	
Lab Sample ID:		9MIA1048	9MIA1048	
Date Extracted:		10/23/89	10/23/89	
Date Analyzed:		10/27/89	10/27/89	
Mercury Date Extracted:		10/26/89	10/26/89	
Mercury Date Analyzed:		10/27/89	10/27/89	
Remarks:		Aqueous Phase	Oil Phase	
Parameter	Method	Units	Result	Result	Regulatory Definition (comment RD2)
Hazardous Waste Characterization as prescribed by Resource Conservation and Recovery Act (PL 94-580)					
EP Toxicity	EPA SW-846 1310		Comment EP1	Comments EP1,EP7	
Metals AA-ICP					(max. conc.)
Arsenic	EPA SW-846 6010	ug/L	< 250	< 16	5000
Barium	EPA SW-846 6010	ug/L	225	< 13	100000
[illegible]	EPA SW-846 6010	ug/L	< 5	< 0.32	1000
Chromium, Total	EPA SW-846 6010	ug/L	< 10	< 0.64	5000
Lead	EPA SW-846 6010	ug/L	< 150	< 9.6	5000
Mercury	EPA SW-846 7470	ug/L	< 0.2	0.0068	200
Selenium	EPA SW-846 6010	ug/L	< 300	< 19	1000
Silver	EPA SW-846 6010	ug/L	< 10	< 0.64	5000
Organic Compounds in Extract	NA				-
Corrosivity	NA				
					(min. temp.)
Ignitability	EPA SW-846 1010	20 C	above 110	above 110	60
Reactivity	NA				

EG&G ho, Environmental Chemistry, ROA

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		Sampling Site:	TAN	TAN	
		Tank ID:	TAN 1712	TAN 1712	
		Sample Type:	Multiphase	Multiphase	
		Customer Sample ID:	TAN1712LL02	TAN1712LL02	
		Sampling Date:	06/06/89	06/06/89	
		Date Received:	06/06/89	06/06/89	
		Date Extracted:	9MIA1049	9MIA1049	
		Date Analyzed:	10/23/89	10/23/89	
		Mercury Date Extracted:	10/27/89	10/27/89	
		Mercury Date Analyzed:	10/26/89	10/26/89	
		Lab Sample ID:	10/27/89	10/27/89	Regulatory
		Remarks:	Aqueous Phase	Oil Phase	Definition
Parameter	Method	Units	Result	Result	(comment RD2)

Hazardous Waste Characterization as prescribed by Resource Conservation and Recovery Act (PL 94-580)

EP Toxicity	EPA SW-846 1310		Comment EP1	Comments EP1,EP7	
Metals AA - ICP					(max. conc.)
Arsenic	EPA SW-846 6010	ug/L	< 250	< 15	5000
Barium	EPA SW-846 6010	ug/L	< 200	< 12	100000
m	EPA SW-846 6010	ug/L	< 5	0.35	1000
Chromium, Total	EPA SW-846 6010	ug/L	< 10	< 0.59	5000
Lead	EPA SW-846 6010	ug/L	< 150	< 8.8	5000
Mercury	EPA SW-846 7470	ug/L	< 0.2	0.0059	200
Selenium	EPA SW-846 6010	ug/L	< 300	< 18	1000
Silver	EPA SW-846 6010	ug/L	< 10	2.6	5000
Organic Compounds in Extract	NA				
Corrosivity	NA				
					(min. temp.)
Ignitability	EPA SW-846 1010	20 C	above 110	above 110	60
Reactivity	NA				

BDL = Below practical quantitation level. See PQL definition for further explanation of practical quantitation level.

PQL = Practical quantitation level. This is the lowest concentration reliably measurable (i.e., 33% maximum uncertainty in precision and accuracy at the one standard deviation confidence level) for normal samples during routine laboratory operations.

Comments:

B The presence of this element/compound in the associated laboratory method blank indicates the analyte found in the sample may be partially or completely a result of laboratory contamination.

D6 Analyses of the oil matrix of these samples requires sample dilution, which results in the sample-specific PQLs being 3 to 10 times higher than the values listed.

EP1 The sample does not exhibit the characteristics of EP Toxicity for metals for this phase.

EP3 The sample does exhibit the characteristics of EP toxicity for metals (i.e., metal concentrations exceed the regulatory maximum concentration).

EP7 Under method 1310, oil samples may be treated as either liquids or solids, depending upon their densities (e.g., heavy oils and greases are treated as solids and require the EP extraction procedure; lighter oils may be treated as a liquid and are digested for total metals). Insufficient sample volume of the oil phases existed to determine whether they should be treated as liquids or solids; therefore, based on visual examination, the oil phases were treated as liquids and digested for total metals. Total metals results are normally reported in units of mg/kg, so total concentrations were multiplied by the oil phase density to convert to units of ug/L for comparison to the EP Toxicity regulatory limits.

J The oil phase of the sample was digested using SW-846 Method 3030 (a sulfuric acid reflux). Reported values for barium may be biased low by up to 80%, as indicatd by QC data, due to precipitation as barium sulfate. Mercury analysis was performed on a portion of the Method 3030 digestate.

RD2 Source of the regulatory definitions is the Resource Conservation and Recovery Act.

Technical and Quality Review:

Shelly J. Sailer
Inorganic Technical Leader

Technical and Quality Review:

not required NR
Michael J. Connolly, Ph. D.
Organic Technical Leader

Quality Assurance Review:

Nancy Roberts
Quality Assurance Officer

Release Authorization:

Joseph T. Bennett, Ph. D.
Laboratory Manager

Idaho National Engineering Laboratory

EG&G Idaho, Inc.
Environmental Chemistry
P.O. Box 1625, MS 4123
Idaho Falls, ID 83415

This report of analysis (ROA) presents the analytical results for the analyses you requested. Sample identification, sampling information, and laboratory analysis information are listed in a column for each sample. Analytical results are listed by analytical parameter below the sample identification information. Acronyms and abbreviations used are defined at the end of the report. A letter and/or letter number flag immediately to the right of a parameter, method, PQL and units, result, or any other entry indicates an amplifying comment also provided at the end of the report.

REPORT OF ANALYSIS
INEL Tank Closure Program

Prepared for:
Michael J. Nolan
Tank Closure Program Manager
Environmental Restoration Program
EG&G Idaho, Inc.
P.O. Box 1625, MS 8105
Idaho Falls, ID 83415

Report Identification:
ROA Number: 890087-C
Date: 06/06/90
Charge No.: 3RIF08400

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Analysis Results Summary for Tank TAN 1705

Cancellation:
-ROA 218, 11/03/89

This report provides results for the following:
-Ignitability
-Total metals
-Toxicity Extraction Procedure (EP) and metal analyses of the extract. Results reported in this ROA supercede those reported on 11/03/89, ROA 218. An error in data reduction caused the reported EP Toxicity metals concentrations for the oil phase to be understated by a factor of 1000. (Values reported for ignitability and total metals are unchanged from the previous report.)

Summary:

Aqueous phase - The samples do exhibit the characteristics of EP Toxicity for metals for this phase.

Oil phase - The samples do not exhibit the characteristics of EP Toxicity for metals for this phase.

Under method 1310, oil samples may be treated as either liquids or solids, depending upon their densities, (e.g., heavy oils and greases are treated as solids and require the EP extraction procedure; lighter oils may be treated as a liquid and are digested for total metals). Insufficient sample volume of the oil phases existed to determine whether they should be treated as liquids or solids; therefore, based on visual examination, the oil phases were treated as liquids and digested for total metals. Total metals results are normally reported in units of mg/kg, so total concentrations were multiplied by the oil phase density to convert to units of ug/L for comparison to the EP Toxicity regulatory limits.

Several analytes have a reported < value (the sample specific PQL), which indicates that the analytes were not detected in this sample phase at levels exceeding the PQLs. The listed values are near to or exceed the maximum regulatory limits for the analytes; however, since the analytes were not detected in the total metals analysis, it is unlikely that the actual sample concentrations would exceed the regulatory limits.

Ignitability - The samples do not exhibit the hazardous characteristic of Ignitability.

Sampling Site:		TAN	TAN
Tank ID:		TAN 1705	TAN 1705
Sample Type:	Blank	Multiphase	Multiphase
Customer Sample ID:		TAN1705LL01	TAN1705LL02
Sampling Date:		06/06/89	06/06/89
Date Received:		06/06/89	06/06/89
Lab Sample ID:	PB	9MIA1052	9MIA1053
Date Extracted:	10/23/89	10/23/89	10/23/89
Date Analyzed:	10/27/89	10/27/89	10/27/89
Mercury Date Extracted:	10/26/89	10/26/89	10/26/89
Mercury Date Analyzed:	10/27/89	10/27/89	10/27/89
Remarks:	Lab Blank	Aqueous Phase	Aqueous Phase

Parameter	Method	PQL and Units	Result	Result	Result
Metals AA - ICP					
Arsenic	EPA SW-846 6010	250 ug/L	BPQL	BPQL	BPQL
Barium	EPA SW-846 6010	200 ug/L	BPQL	1600000	1350000
Cadmium	EPA SW-846 6010	5 ug/L	BPQL	BPQL	BPQL
Chromium	EPA SW-846 6010	10 ug/L	16	62 B	70 B
Copper	EPA SW-846 6010	25 ug/L	BPQL	BPQL	BPQL
Lead	EPA SW-846 6010	150 ug/L	BPQL	BPQL	BPQL
Mercury	EPA SW-846 7470	0.2 ug/L	BPQL	0.56	0.54
Nickel	EPA SW-846 6010	40 ug/L	BPQL	76	67
Selenium	EPA SW-846 6010	300 ug/L	BPQL	BPQL	BPQL
Silver	EPA SW-846 6010	10 ug/L	BPQL	BPQL	BPQL
Thallium	EPA SW-846 6010	500 ug/L	BPQL	BPQL	BPQL
Zinc	EPA SW-846 6010	20 ug/L	43	742000	797000

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Sampling Site:		TAN	TAN
Tank ID:		TAN 1705	TAN 1705
Sample Type:	Blank	Multiphase	Multiphase
Customer Sample ID:		TAN1705LL01	TAN1705LL02
Sampling Date:		06/06/89	06/06/89
Date Received:		06/06/89	06/06/89
Lab Sample ID:	PB	9MIA1052	9MIA1053
Date Extracted:	10/23/89	10/23/89	10/23/89
Date Analyzed:	10/27/89	10/27/89	10/27/89
Mercury Date Extracted:	10/26/89	10/26/89	10/26/89
Mercury Date Analyzed:	10/27/89	10/27/89	10/27/89
Remarks:	Lab Blank	Oil phase	Oil phase

Parameter	Method	PQL and Units	Result	Result	Result
Metals - ICP				Comments D6, M15	Comments D6, M15
Arsenic	EPA SW-846 6010	6.2 mg/kg	BPQL	< 62	< 120
Barium	EPA SW-846 6010	5.0 mg/kg	BPQL	< 50	< 98
Cadmium	EPA SW-846 6010	0.12 mg/kg	BPQL	< 1.2	< 2.4
Chromium	EPA SW-846 6010	0.25 mg/kg	BPQL	< 2.5	< 4.9
Copper	EPA SW-846 6010	0.62 mg/kg	BPQL	< 6.2	< 12
Lead	EPA SW-846 6010	3.8 mg/kg	BPQL	< 37	< 73
Mercury	EPA SW-846 7471	0.0065 mg/kg	BPQL	0.014	< 0.021
Nickel	EPA SW-846 6010	1.0 mg/kg	BPQL	< 9.9	< 20
Selenium	EPA SW-846 6010	7.5 mg/kg	BPQL	< 74	< 150
Silver	EPA SW-846 6010	0.25 mg/kg	BPQL	8.2	< 4.9
Thallium	EPA SW-846 6010	12.5 mg/kg	BPQL	< 120	< 240
Zinc	EPA SW-846 6010	0.50 mg/kg	BPQL	532	522

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		Sampling Site:	TAN	TAN	
		Tank ID:	TAN 1705	TAN 1705	
		Sample Type:	Multiphase	Multiphase	
		Customer Sample ID:	TAN1705LL01	TAN1705LL01	
		Sampling Date:	06/06/89	06/06/89	
		Date Received:	06/06/89	06/06/89	
		Lab Sample ID:	9MIA1052	9MIA1052	
		Date Extracted:	10/23/89	10/23/89	
		Date Analyzed:	10/27/89	10/27/89	
		Mercury Date Extracted:	10/26/89	10/26/89	
		Mercury Date Analyzed:	10/27/89	10/27/89	
		Remarks:	Aqueous Phase	Oil Phase	Regulatory Definition
Parameter	Method	Units	Result	Result	(comment RD2)
Hazardous Waste Characterization as prescribed by Resource Conservation and Recovery Act					
EP Toxicity	EPA SW-846 1310		Comment EP3	Comments EP7,EP8	
Metals AA-ICP					
					(max. conc.)
Arsenic	EPA SW-846 6010	ug/L	< 250	< 56000	5000
Barium	EPA SW-846 6010	ug/L	1600000 EP3	< 45000	100000
Cadmium	EPA SW-846 6010	ug/L	< 5	< 1100	1000
Chromium, Total	EPA SW-846 6010	ug/L	62 B	< 2300	5000
Lead	EPA SW-846 6010	ug/L	< 150	< 34000	5000
Mercury	EPA SW-846 7470	ug/L	0.56	13.0	200
Selenium	EPA SW-846 6010	ug/L	< 300	< 68000	1000
Silver	EPA SW-846 6010	ug/L	< 10	7400	5000
Organic Compounds in Extract	NA				
Corrosivity	NA				
					(min. temp.)
Ignitability	EPA SW-846 1010	20 C	above 110	above 110	60
Reactivity	NA				

EG&G Idaho, Environmental Chemistry, ROA 890087-C

Pa					
		Sampling Site:	TAN	TAN	
		Tank ID:	TAN 1705	TAN 1705	
		Sample Type:	Multiphase	Multiphase	
		Customer Sample ID:	TAN1705LL02	TAN1705LL02	
		Sampling Date:	06/06/89	06/06/89	
		Date Received:	06/06/89	06/06/89	
		Date Extracted:	9MIA1053	9MIA1053	
		Date Analyzed:	10/23/89	10/23/89	
		Mercury Date Extracted:	10/27/89	10/27/89	
		Mercury Date Analyzed:	10/26/89	10/26/89	
		Lab Sample ID:	10/27/89	10/27/89	Regulatory
		Remarks:	Aqueous Phase	Oil Phase	Definition
Parameter	Method	Units	Result	Result	(comment RD2)

Hazardous Waste Characterization as prescribed by Resource Conservation and Recovery Act (PL 94-580)

EP Toxicity	EPA SW-846 1310		Comment EP3	Comments EP7,EP8	
Metals AA - ICP					(max. conc.)
Arsenic	EPA SW-846 6010	ug/L	< 250	< 110000	5000
Barium	EPA SW-846 6010	ug/L	1350000 EP3	< 88000	100000
Cadmium	EPA SW-846 6010	ug/L	< 5	< 2200	1000
Chromium, Total	EPA SW-846 6010	ug/L	70 B	< 4400	5000
Lead	EPA SW-846 6010	ug/L	< 150	< 66000	5000
Mercury	EPA SW-846 7470	ug/L	0.54	< 19.0	200
Selenium	EPA SW-846 6010	ug/L	< 300	< 131000	1000
Silver	EPA SW-846 6010	ug/L	< 10	< 4400	5000
Organic Compounds in Extract	NA				
Corrosivity	NA				
					(min. temp.)
Ignitability	EPA SW-846 1010	20 C	above 110	above 110	60
Reactivity	NA				

Pa

Legend:

BPQL = Below practical quantitation level. See PQL definition for further explanation of practical quantitation level.

PQL = Practical quantitation level. This is the lowest concentration reliably measurable (i.e., 33% maximum uncertainty in precision and accuracy at the one standard deviation confidence level) for normal samples during routine laboratory operations.

Comments:

B The presence of this element/compound in the associated laboratory method blank indicates the analyte found in the sample may be partially or completely a result of laboratory contamination.

D6 Analyses of the oil matrix of these samples requires sample dilution, which results in the sample-specific PQLs being 3 to 10 times higher than the values listed.

EP3 The sample does exhibit the characteristics of EP toxicity for metals (i.e., metal concentrations exceed the regulatory maximum concentration).

EP7 Under method 1310, oil samples may be treated as either liquids or solids, depending upon their densities (e.g., heavy oils and greases are treated as solids and require the EP extraction procedure; lighter oils may be treated as a liquid and are digested for total metals). Insufficient sample volume of the oil phases existed to determine whether they should be treated as liquids or solids; therefore, based on visual examination, the oil phases were treated as liquids and digested for total metals. Total metals results are normally reported in units of mg/kg, so total concentrations were multiplied by the oil phase density to convert to units of ug/L for comparison to the EP Toxicity regulatory limits.

The reported < value (the sample specific PQL) indicates that the analyte was not detected in this sample phase at levels exceeding the PQL. The listed value is near to or exceeds the maximum regulatory limit; however, since the analyte was not detected in the total metals analysis, it is unlikely that the actual sample concentration would exceed the regulatory limit.

M15 The oil phase of the sample was digested using SW-846 Method 3030 (a sulfuric acid reflux). Reported values for barium may be biased low by up to 80%, as indicatd by QC data, due to precipitation as barium sulfate. Mercury analysis was performed on a portion of the Method 3030 digestate.

R02 Source of the regulatory definitions is the Resource Conservation and Recovery Act.

Technical and Quality Review:

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Inorganic Technical Leader

Technical and Quality Review:

not required
Michael J. Connolly, Ph. D.
Organic Technical Leader

Quality Assurance Review:

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Quality Assurance Officer

Release Authorization:

Joseph T. Bennett, Ph. D.
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