TA-50 WM-1

RADIONUCLIDE SUMMARY

JAN, 1997 through DEC, 1997

	RAW Average	Maximum	Minimum	Count	Total (Ci)	FINAL Average	Maximum	Minimum	Count	Total (Ci)
ALPHA	6.2e-8	2.7e-7	5.8e-9	12.0	1.011	3.27e-10	6.2e-10	1.6e-10	12.0	0.006
Am-241	1.584e-8	6.7e-8	9.9e-10	12.0	0.258	1.309e-10	2.3e-10	5.8e-11	12.0	0.002
BETA	2.828e-9	7.6e-9	3.2e-11	12.0	0.046	4.927e-10	1.4e-9	7.0e-11	12.0	0.009
Cs-137	1.262e-10	7.0e-10	3.0e-10	12.0	0.002	1.52e-10	8.0e-10	3.0e-10	12.0	0.003
GAMMA	1.491e-9	1.0e-8	3.0e-9	12.0	0.024	6.516e-10	4.0e-9	3.0e-9	12.0	0.011
Na-22	No Data			0.0		7.24e-11	8.0e-10	8.0e-10	1.0	0.001
Pu-238	1.263e-8	2.4e-8	2.9e-10	12.0	0.206	7.663e-11	1.3e-10	2.1e-11	12.0	0.001
Pu-239	2.135e-8	9.0e-8	3.7e-10	12.0	0.348	4.576e-11	1.2e-10	2.0e-11	12.0	7.994e-4
Sr-89	1.316e-10	9.0e-10	1.0e-11	12.0	0.002	5.34e-11	3.0e-10	1.0e-11	12.0	9.33e-4
Sr-90	4.796e-11	1.4e-10	4.0e-12	12.0	7.817e-4	2.712e-11	6.0e-11	2.0e-12	12.0	4.739e-4
TOTAL_PLUTONIUM	3.398e-8	1.14e-7	6.6e-10	12.0	0.554	1.224e-10	2.5e-10	6.0e-11	12.0	0.002
TRITIUM	No Data			0.0		8.103e-8	2.4e-7	1.1e-10	12.0	1.416
U-234	4.094e-10	2.1e-9	4.7e-12	12.0	0.007	3.524e-12	1.2e-11	2.5e-12	12.0	6.157e-5
U-235	9.104e-11	2.0e-10	2.6e-11	12.0	0.001	3.64e-13	1.6e-12	2.0e-13	12.0	6.359e-6

Volume of Flow: Influent = 16,298,612.0 liters Final = 17,471,848.0 liters

Preston

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT

1/31 P 065 271 080

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Susan Diane	
Street & Number P.O. Box 9855	
Post Office, State, & ZIP Code Santa Fe, NM 87504	
Postage	$

January 30, 1997

Susan Diane
P.O. Box 9855
Santa Fe, New Mexico 87504

RE: Discharge Plan (DP-1132) for Los Alamos National Laboratory, Radio Active Liquid Waste Treatment Facility

Dear Ms. Diane:

This is in response to your letter of December 14, 1996 requesting a public hearing for the discharge plan referenced above. The public comment period ended on December 17, 1996.

The NM Environment Department will be making a decision on holding a public hearing within the next several weeks. Your request is being given due consideration, and you will receive written notification of the Department's decision.

Please call the Ground Water Section at 827-2900 if you have any questions.

Sincerely,

Dale M Doremus

Dale M. Doremus, Program Manager
Ground Water Quality Bureau
Pollution Prevention Section

DMD/PAB/pab

cc: James Bearzi, District Manager, NMED District II

Phyllis

1

RECEIVED
DEC 16 1996
GROUND WATER BUREAU

December 14, 1996

Ms. Marcie Levitt, Bureau Chief
Ground Water Quality B.
fax 827-2965

Dear Ms. Levitt,

I am requesting a hearing on Discharge Plan 1132 since the comment period is nearly over and the public has not had substantial public comment time.

Among many reasons for the hearing are:

- Does the plan eliminate the discharge of radionuclides and bring the release of nitrates within acceptable levels?
- Does the plan address the extent of _past_ contamination & possible remediation efforts?
- What volumes of radioactive sludge are being projected for future burial at TA-54?

In addition I want to be informed by the GWQB whether a hearing is scheduled.

Sincerely,
Susan Diane
POB 9855, SF, NM 87504

(505-699-0195)

Phyllis

1912

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT

1/31

P 065 271 082

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to: Joey Natseway
Street & Number: Tewa Women United
Post Office, State & ZIP Code: Rt 5 Box 298 Santa Fe, NM 87501
Postage: $

January 30, 1997

Joey Natseway
Tewa Women United
Rt. 5 Box 298
Santa Fe, New Mexico 87501

RE: Discharge Plan (DP-1132) for Los Alamos National Laboratory, Radio Active Liquid Waste Treatment Facility

Dear Ms. Natseway:

This is in response to your letter of December 17, 1996 requesting a public hearing for the discharge plan referenced above. The public comment period ended on December 17, 1996.

The NM Environment Department will be making a decision on holding a public hearing within the next several weeks. Your request is being given due consideration, and you will receive written notification of the Department's decision.

Please call the Ground Water Section at 827-2900 if you have any questions.

Sincerely,

Dale M. Doremus

Dale M. Doremus, Program Manager
Ground Water Quality Bureau
Pollution Prevention Section

DMD/PAB/pab

cc: James Bearzi, District Manager, NMED District II

phmllo

3

RECEIVED
DEC 17 1996
GROUND WATER BUREAU

Rte. 5 Box 298
Santa Fe, New Mexico 87501
(505) 753-6277

Fax page 1 of 1

Dec. 17,1996

From: Joey Natseway
Tewa Women United

To: Ms. Marcie Levitt, Bureau Chief
Ground Water Quality Bureaul,NMED

Subject: LANL'S RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

The new discharge plan-1132 has taken us by surprise. We definitely feel a need to have a public hearing. Here are some of the questions which we would like to have discussed.

Does the plan eliminate the discharge of radionuclides and bring the release of nitrates to within acceptable levels?

Does the plan address the extent of past contamination and possible remediation efforts?

Have adequate waste stream characterizations been performed for liquid volumes coming into RLWTF?

What volumes of radioactive sludge are being projected for future burial at TA-54,Area G ?

There are many more such questions areas of concern for us.

Please do keep us informed as to whether a hearing is scheduled.

Thank you.

Ch. files

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

1/31

P 065 271 083

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Kathy Sanchez President
Street & Number Pi'ee Quiyo Inc.
Rt 5 Box 442-B
Post Office, State, & ZIP Code San Ildefonso Pueblo
Espanola, NM 87532
Postage $

CERTIFIED MAIL - RETURN RECEIPT

January 30, 1997

Kathy Sanchez, President
Pi'ee Quiyo Inc.
Rt. 5 Box 442-B
San Ildefonso Pueblo
Espanola, New Mexico 87532

RE: Discharge Plan (DP-1132) for Los Alamos National Laboratory, Radio Active Liquid Waste Treatment Facility

Dear Ms. Sanchez:

This is in response to your letter of December 17, 1996 requesting a public hearing for the discharge plan referenced above. The public comment period ended on December 17, 1996.

The NM Environment Department will be making a decision on holding a public hearing within the next several weeks. Your request is being given due consideration, and you will receive written notification of the Department's decision.

Please call the Ground Water Section at 827-2900 if you have any questions.

Sincerely,

Dale M Doremus

Dale M. Doremus, Program Manager
Ground Water Quality Bureau
Pollution Prevention Section

DMD/PAB/pab

cc: James Bearzi, District Manager, NMED District II

Pi'ee Quiyo Inc.
Rt. 5 Box 442-B
San Ildefonso Pueblo
Española, New Mexico 87532

p/ky/113 2

RECEIVED
DEC 17 1996
GROUND WATER BUREAU

Fax page 1 of 1

Dec. 17,1996

From: Kathy Sanchez KS
President

To: Ms. Marcie Levitt, Bureau Chief
Ground Water Quality Bureaul,NMED

Subject: LANL'S RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

The new discharge plan-1132 needs more public input and time is needed for us to tell our side of the impact. We definitely feel a need to have a public hearing. Here are some of the questions which we would like to have discussed.

Does the plan eliminate the discharge of radionuclides and bring the release of nitrates to within acceptable levels?

Does the plan address the extent of past contamination and possible remediation efforts?

Have adequate waste stream characterizations been performed for liquid volumes coming into RLWTF?

What volumes of radioactive sludge are being projected for future burial at TA-54,Area G ?

There are many more such questions or areas of concern for us as community Pueblo people who live below Los Alamos. Our safety should not be put at risk.

Please do keep us informed as to whether a hearing is scheduled.

Thank you,
Kathy Sanchez

HSWA PRSs (Potential Release Sites)
see TA-50 sites, pages 25 ÷ 26

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
0-001		4/14/95	1995						
0-003		10/16/92	1/6/93						
0-005		10/16/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
0-011(a)		10/16/92	1/6/93	3/1/94				Proposed in report/work plan	
0-011(c)		10/16/92	1/6/93	3/1/94				Proposed in report/work plan	
0-011(d)		10/16/92	1/6/93	3/1/94				Proposed in report/work plan	
0-011(e)		10/16/92	1/6/93	3/1/94				Proposed in report/work plan	
0-012		10/16/92	1/6/93						
0-016		10/16/92	1/6/93						
0-017		10/16/92	1/6/93						
0-018(a)		10/16/92	1/6/93						
0-019		10/16/92	1/6/93						
0-028(a)		10/16/92	1/6/93	7/22/96				Proposed in report/work plan	
0-028(b)		10/16/92	1/6/93	7/22/96				Proposed in report/work plan	
0-030(a)		10/16/92	1/6/93				9/30/96	Cleanup report Submitted	
0-030(b)		10/16/92	1/6/93	5/22/96			9/30/96	Cleanup report Submitted	
0-030(g)		10/16/92	1/6/93	11/13/95				Proposed in work plan or RFI report that received an NOD or disapproval	
0-030(l)		10/16/92	1/6/93				9/30/96	Cleanup report Submitted	
0-030(m)		10/16/92	1/6/93				9/30/96	Cleanup report Submitted	
0-033(a)		10/16/92	1/6/93				9/30/96	Cleanup report Submitted	
0-039		10/16/92	1/6/93	10/16/95		2/28/96		Proposed in report/work plan	
1-001(a)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-001(b)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-001(c)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-001(d)		5/20/92	1/6/93	8/14/95				Reviewed for RCRA and DOE NFA; Mercury must be addressed for surfac	
1-001(e)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-001(f)		5/20/92	1/6/93	3/18/96			9/30/95	Cleanup report Submitted	
1-001(g)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-001(h)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(i)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(j)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(k)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(l)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(m)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-001(n)		5/20/92	1/6/93					Final AA Approval of Permit Mod 12/10/96	
1-001(o)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-001(s)		5/20/92	1/6/93						
1-001(t)		5/20/92	1/6/93	4/12/96				Proposed in report/work plan	
1-001(u)		5/20/92	1/6/93						
1-002		5/1/92	5/1/93	6/22/95		4/12/96		Proposed in report/work plan	
1-003(a)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
1-003(d)		5/20/92	1/6/93	3/5/96			9/30/96	Cleanup report Submitted	
1-003(e)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-006(a)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-006(b)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-006(c)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-006(d)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-006(h)		5/20/92	1/6/93	8/14/95				Proposed in report/work plan	
1-006(n)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-006(o)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-007(a)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-007(b)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-007(c)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-007(d)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-007(e)		5/20/92	1/6/93	3/5/96				Proposed in report/work plan	
1-007(j)		5/20/92	1/6/93	3/18/96				Proposed in report/work plan	
1-007(l)		5/20/92	1/6/93	3/5/96					
2-005		6/4/93	11/16/93						
2-006(a)		6/4/93	11/16/93						
2-006(b)		6/4/93	11/16/93						
2-007		6/4/93	11/16/93						
2-008(a)		6/4/93	11/16/93						
2-008(b)		6/4/93	11/16/93	9/27/96				Proposed in report/work plan	
2-009(a)		6/4/93	11/16/93						
2-009(b)		6/4/93	11/16/93						
2-009(c)		6/4/93	11/16/93						
3-001(a)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-001(b)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-001(c)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-001(k)		7/7/93	1/7/94					Proposed in Permit Mod 9/95	
3-002(a)		7/18/95						Proposed in Permit Mod 9/96	
3-002(b)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-002(c)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-002(d)		7/18/95						Proposed in Permit Mod 9/96	
3-003(a)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-003(b)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-003(c)		7/7/93	1/7/94					Proposed in Permit Mod 9/95	
3-009(a)		7/7/93	1/7/94					Proposed in Permit Mod 9/95	
3-009(b)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-009(c)		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
3-009(d)		7/7/93	1/7/94					Proposed in Permit Mod 9/95	
3-009(e)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
3-009(f)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-009(g)		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
3-009(h)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-009(i)		7/18/95						Proposed in Permit Mod 9/96	
3-009(j)		7/18/95						Proposed in Permit Mod 9/96	
3-010(a)	4/28/95	7/7/93	1/7/94	4/28/95				Proposed in report/work plan	
3-011		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-012(a)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-012(b)		7/7/93	1/7/94	2/29/96					
3-013(a)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(a)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(b)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(c)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(d)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(e)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(f)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(g)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(h)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(i)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(j)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(k)		7/7/93	1/7/94	2/29/96					
3-014(l)		7/7/93	1/7/94	2/29/96					
3-014(m)		7/7/93	1/7/94	2/29/96					
3-014(n)		7/7/93	1/7/94	2/29/96					
3-014(o)		7/7/93	1/7/94	2/29/96					
3-014(p)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(q)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(r)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(s)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(t)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-014(u)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-015		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-018		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-019		7/18/95						Proposed in Permit Mod 9/96	
3-020(a)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-021		7/18/95							
3-024		7/18/95						Proposed in Permit Mod 9/96	
3-025(a)		7/18/95						Proposed in Permit Mod 9/96	
3-025(b)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-026(b)		7/18/95						Proposed in Permit Mod 9/96	
3-026(c)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
3-026(d)		7/7/93	1/7/94					AA concurrence for deferral	
3-028		7/7/93	1/7/94					AA concurrence for deferral	
3-029		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-031		7/18/95						Proposed in Permit Mod 9/96	
3-032		7/18/95						Proposed in Permit Mod 9/96	
3-033		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
3-034(a)		7/18/95							
3-034(b)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-035(a)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-035(b)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-036(a)		7/18/95						AA concurrence for deferral	
3-036(c)		7/18/95						AA concurrence for deferral	
3-036(d)		7/18/95						AA concurrence for deferral	
3-037		7/7/93	1/7/94					Proposed for Deferral	
3-038(a)		7/7/93	1/7/94						
3-038(b)		7/7/93	1/7/94						
3-039(a)		7/7/93	1/7/94					Final AA Approval of Permit Mod 12/10/96	
3-043(c)		7/18/95						Proposed in Permit Mod 9/96	
3-043(e)		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
3-044(a)		7/18/95						Proposed in Permit Mod 9/96	
3-045(a)		7/18/95						Proposed in Permit Mod 9/96	
3-045(b)		7/7/93	1/7/94	2/29/96					
3-045(c)		7/7/93	1/7/94	2/29/96					
3-045(d)		7/18/95						Proposed in Permit Mod 9/96	
3-045(e)		7/18/95						Proposed in Permit Mod 9/96	
3-045(f)		7/18/95						Proposed in Permit Mod 9/96	
3-045(g)		7/18/95							
3-045(h)		7/18/95						Proposed in Permit Mod 9/96	
3-045(i)		7/18/95						Proposed in Permit Mod 9/96	
3-046		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-049(a)		7/18/95							
3-049(b)		7/18/95							
3-049(c)		7/18/95						Proposed in Permit Mod 9/96	
3-049(d)		7/18/95						Proposed in Permit Mod 9/96	
3-049(e)		7/18/95						Proposed in Permit Mod 9/96	
3-050(a)		7/18/95						Proposed in Permit Mod 9/96	
3-050(d)		7/18/95						Proposed in Permit Mod 9/96	
3-050(e)		7/18/95						Proposed in Permit Mod 9/96	
3-050(f)		7/18/95						Proposed in Permit Mod 9/96	
3-050(g)		7/18/95						Proposed in Permit Mod 9/96	
3-052(a)		7/18/95							

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
3-052(c)		7/18/95						Proposed in Permit Mod 9/96	
3-052(e)		7/18/95							
3-052(f)		7/18/95		2/29/96				Proposed in work plan or RFI report that received an NOD or disapproval	
3-054(a)		7/18/95						Proposed in Permit Mod 9/96	
3-054(b)		7/18/95							
3-054(c)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-054(d)		7/18/95						Proposed in Permit Mod 9/96	
3-054(e)		7/18/95							
3-055(a)		7/18/95						Proposed in Permit Mod 9/96	
3-055(c)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-055(d)		7/18/95						Proposed in Permit Mod 9/96	
3-056(a)		7/7/93	1/7/94					Proposed in Permit Mod 9/96	
3-056(c)		7/18/95						EC Permit Mod Submitted	
3-056(d)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-056(l)		7/18/95						Proposed in work plan or RFI report that received an NOD or disapproval	
3-056(m)		7/18/95						Proposed in Permit Mod 9/96	
3-056(n)		7/18/95						Proposed in Permit Mod 9/96	
3-059		7/18/95							
4-001		5/20/92	11/3/93						
4-002		5/20/92	11/3/93						
4-003(a)		6/13/94	5/22/95						
4-003(b)		6/13/94	5/22/95						
5-001(a)		5/20/92	11/3/93						
5-001(b)		5/20/92	11/3/93						
5-002		5/20/92	11/3/93						
5-003		5/20/92	11/3/93						
5-004		5/20/92	11/3/93						
5-005(a)		5/20/92	11/3/93						
5-005(b)		6/13/94	5/22/95						
5-006(b)		6/13/94	5/22/95						
5-006(c)		6/13/94	5/22/95						
5-006(e)		6/13/94	5/22/95						
5-006(h)		6/13/94	5/22/95						
6-001(a)	6/30/95	8/30/93	10/19/94						
6-001(b)	6/30/95	8/30/93	10/19/94						
6-002	5/1/96	8/30/93	10/19/94						
6-003(a)	6/30/95	8/30/93	10/19/94						
6-003(c)	6/30/95	8/30/93	10/19/94						
6-003(d)	6/30/95	8/30/93	10/19/94						
6-003(e)	6/30/95	8/30/93	10/19/94						
6-003(f)	6/30/95	8/30/93	10/19/94						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
6-003(g)	6/30/95	8/30/93	10/19/94						
6-003(h)		8/30/93	10/19/94						
6-005	10/4/97	8/30/93	10/19/94						
6-006	6/30/95	8/30/93	10/19/94						
6-007(a)	10/4/97	8/30/93	10/19/94						
6-007(b)	10/4/97	8/30/93	10/19/94						
6-007(c)	10/4/97	8/30/93	10/19/94						
6-007(d)	10/4/97	8/30/93	10/19/94						
6-007(e)	10/4/97	8/30/93	10/19/94						
6-007(f)	3/29/95	8/30/93	10/19/94				9/30/95	Cleanup report Submitted	
6-007(g)	3/29/95	8/30/93	10/19/94						
7-001(a)	3/29/95	8/30/93	10/19/94						
7-001(b)	3/29/95	8/30/93	10/19/94						
7-001(c)	3/29/95	8/30/93	10/19/94						
7-001(d)	3/29/95	8/30/93	10/19/94						
7-003(c)								Proposed in Permit Mod 9/96	
7-003(d)								Proposed in Permit Mod 9/96	
8-002	5/30/95	7/23/93	10/7/94						
8-003(a)	4/30/96	7/23/93	10/7/94				9/30/95	EC Report Submitted	
8-003(b)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
8-003(c)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
8-004(a)	5/30/95	7/23/93	10/7/94						
8-004(b)	5/30/95	7/23/93	10/7/94						
8-004(c)	5/30/95	7/23/93	10/7/94						
8-004(d)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
8-005	5/30/95	7/23/93	10/7/94			yes	9/30/95	Cleanup report Submitted	
8-006(a)	5/30/95	7/23/93	10/7/94						
8-006(b)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
8-007	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
8-009(a)	5/30/95	7/23/93	10/7/94						
8-009(d)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
8-009(e)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
C-8-010	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-001(a)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-001(b)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-001(c)	4/30/96	7/23/93	10/7/94						
9-001(d)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-002	5/30/95	7/23/93	10/7/94						
9-003(a)	4/30/96	7/23/93	10/7/94						
9-003(b)	4/30/96	7/23/93	10/7/94						
9-003(c)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
9-003(d)	4/30/96	7/23/93	10/7/94						
9-003(e)	4/30/96	7/23/93	10/7/94						
9-003(f)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-003(g)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-003(h)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-003(i)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-004(a)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(b)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(c)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(d)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(e)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(f)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(g)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(h)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(i)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(j)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(k)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(l)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(m)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(n)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-004(o)	5/30/95	7/23/93	10/7/94					Proposed for Deferral	
9-005(a)	4/30/96	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-005(b)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-005(c)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-005(d)	4/30/96	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-005(e)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-005(f)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-005(g)	5/30/95	7/23/93	10/7/94					Proposed in Permit Mod 3/95	
9-005(h)	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-006	4/30/96	7/23/93	10/7/94						
9-007	5/30/95	7/23/93	10/7/94					Final AA Approval of Permit Mod 12/10/96	
9-008(b)	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-009	5/30/95	7/23/93	10/7/94	3/15/96				Proposed in report/work plan	
9-013	5/30/95	7/23/93	10/7/94				9/30/96	EC Report Submitted	
C-9-001	5/30/95	7/23/93	10/7/94				9/30/95	Cleanup report Submitted	
10-001(a)		5/1/92	5/1/93	9/8/95				Proposed in report/work plan	
10-001(b)		5/1/92	5/1/93	9/8/95				Proposed in report/work plan	
10-001(c)		5/1/92	5/1/93	9/8/95				Proposed in report/work plan	
10-001(d)		5/1/92	5/1/93	9/8/95				Proposed in report/work plan	
10-002(a)		5/1/92	5/1/93	4/18/96		6/3/96		Proposed in report/work plan	
10-002(b)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
10-003(a)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(b)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(c)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(d)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(e)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(f)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(g)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(h)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(i)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(j)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(k)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(l)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(m)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(n)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-003(o)		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
10-004(a)		5/1/92	5/1/93	4/18/96		6/3/96		Proposed in report/work plan	
10-004(b)		5/1/92	5/1/93	4/18/96		6/3/96		Proposed in report/work plan	
10-005		5/1/92	5/1/93	4/18/96		6/3/96		Proposed in report/work plan	
10-006		5/1/92	5/1/93					Proposed in Permit Mod 3/95	
10-007		5/1/92	5/1/93	4/18/96		6/3/96		Reviewed for RCRA NFA; Rad/other Component must be addressed.	
11-001(a)	9/30/96	7/16/93	12/22/94						
11-001(b)	9/30/96	7/16/93	12/22/94						
11-001(c)	9/30/96	7/16/93	12/22/94				9/30/96	Cleanup report Submitted	
11-002	9/30/96	7/16/93	12/22/94						
11-004(a)	9/30/96	7/16/93	12/22/94						
11-004(b)	9/30/96	7/16/93	12/22/94						
11-004(c)	9/30/96	7/16/93	12/22/94						
11-004(d)	9/30/96	7/16/93	12/22/94						
11-004(e)	9/30/96	7/16/93	12/22/94						
11-005(a)	9/30/96	7/16/93	12/22/94						
11-005(b)	9/30/96	7/16/93	12/22/94						
11-005(c)	9/30/96	7/16/93	12/22/94						
11-006(a)	9/30/96	7/16/93	12/22/94						
11-006(b)	9/30/96	7/16/93	12/22/94						
11-006(c)	9/30/96	7/16/93	12/22/94						
11-006(d)	9/30/96	7/16/93	12/22/94						
11-007		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
11-009		7/16/93	12/22/94					AA concurrence for deferral	
11-011(a)	9/30/96	7/16/93	12/22/94						
11-011(b)	9/30/96	7/16/93	12/22/94						
11-011(c)		7/6/94	1/18/95					Proposed in Permit Mod 3/95	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
11-011(d)	9/30/96	7/16/93	12/22/94						
12-001(a)	2/19/96	5/23/94	12/22/94	2/15/96			9/30/96	Cleanup report Submitted	
12-001(b)	2/19/96	5/23/94	12/22/94	2/15/96					
12-002	2/19/96	5/23/94	12/22/94					Proposed in Permit Mod 3/95	
13-001	9/30/97	7/16/93	12/22/94						
13-002	9/30/97	7/16/93	12/22/94						
13-003(a)	9/30/96	7/16/93	12/22/94						
13-004	9/30/97	7/16/93	12/22/94						
14-002(a)	2/19/96	5/23/94	12/22/94	2/15/96					
14-002(b)	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan	
14-002(c)	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan, reviewed by AA	
14-002(d)	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan, reviewed by AA	
14-002(e)	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan, reviewed by AA	
14-002(f)	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan, reviewed by AA	
14-003	2/19/96	5/23/94	12/22/94	2/15/96					
14-004(b)	2/19/96	5/23/94	12/22/94	2/15/96				Final AA Approval of Permit Mod 12/10/96	
14-005	2/19/96	5/23/94	12/22/94	2/15/96				AA concurrence for deferral	
14-006	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan	
14-007	2/19/96	5/23/94	12/22/94	2/15/96				Proposed in report/work plan, reviewed by AA	
14-009	2/19/96	5/23/94	12/22/94	2/15/96					
14-010	2/19/96	5/23/94	12/22/94	2/15/96					
15-002		7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-003		7/1/93	1/9/95						
15-004(a)	8/30/95	7/1/93	1/9/95	11/1/95				Proposed in report/work plan	
15-004(b)	8/30/95	7/1/93	1/9/95	11/1/95			9/30/96	Cleanup report Submitted	
15-004(c)	8/30/95	7/1/93	1/9/95	11/1/95				Proposed in report/work plan	
15-004(f)	8/30/95	7/1/93	1/9/95	11/1/95					
15-004(g)	7/30/96	7/1/93	1/9/95	5/20/96					
15-004(i)		7/1/93	1/9/95					Proposed in Permit Mod 3/95	
15-006(a)		7/1/93	1/9/95						
15-006(b)		7/1/93	1/9/95						
15-006(c)	7/30/97	7/1/93	1/9/95	5/20/96					
15-006(d)	7/30/97	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-007(a)	7/30/96	7/1/93	1/9/95	5/20/96					
15-007(b)	8/30/95	7/1/93	1/9/95	11/1/95					
15-007(c)		7/1/93	1/9/95						
15-007(d)		7/1/93	1/9/95					Proposed in Permit Mod 9/95	
15-008(a)	8/30/95	7/1/93	1/9/95	11/1/95					
15-008(b)	8/30/95	7/1/93	1/9/95	11/1/95					
15-008(c)	7/30/96	7/1/93	1/9/95	5/20/96					
15-008(d)		7/1/93	1/9/95						

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PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
15-009(a)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed for Deferral	
15-009(b)	7/30/97	7/1/93	1/9/95					Proposed in Permit Mod 9/95	
15-009(c)	7/30/97	7/1/93	1/9/95					Proposed in Permit Mod 9/95	
15-009(e)	8/30/95	7/1/93	1/9/95	11/1/95					
15-009(f)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-009(g)		7/1/93	1/9/95						
15-009(h)		7/1/93	1/9/95					Proposed in Permit Mod 9/95	
15-009(i)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed for Deferral	
15-009(j)	8/30/95	7/1/93	1/9/95	11/1/95					
15-009(k)		7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-010(a)	7/30/96	7/1/93	1/9/95	5/20/96					
15-010(b)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-010(c)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-011(a)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-011(b)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-011(c)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-012(a)		7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-012(b)	8/30/95	7/1/93	1/9/95	11/1/95					
15-014(a)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(b)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(i)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(j)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(k)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(l)	7/30/96	7/1/93	1/9/95	5/20/96				Proposed in report/work plan	
15-014(m)		7/1/93	1/9/95					Final AA Approval of Permit Mod 12/10/96	
16-001(a)	9/30/97	7/16/93	12/22/94						
16-001(b)	9/30/97	7/16/93	12/22/94						
16-001(c)	9/30/97	7/16/93	12/22/94						
16-001(d)	9/30/97	7/16/93	12/22/94						
16-001(e)	9/30/97	7/16/93	12/22/94						
16-003(a)	9/30/96	7/16/93	12/22/94						
16-003(b)	9/30/96	7/16/93	12/22/94						
16-003(c)	9/30/96	7/16/93	12/22/94						
16-003(d)	9/30/96	7/16/93	12/22/94						
16-003(e)	9/30/96	7/16/93	12/22/94						
16-003(f)	9/30/96	7/16/93	12/22/94						
16-003(g)	9/30/96	7/16/93	12/22/94						
16-003(h)	9/30/96	7/16/93	12/22/94						
16-003(i)	9/30/96	7/16/93	12/22/94						
16-003(j)	9/30/96	7/16/93	12/22/94						
16-003(k)	9/30/96	7/16/93	12/22/94	9/23/96					

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-003(l)	9/30/96	7/16/93	12/22/94						
16-003(m)	9/30/96	7/16/93	12/22/94						
16-003(n)	9/30/96	7/16/93	12/22/94						
16-003(o)	9/30/96	7/16/93	12/22/94						
16-004(a)	9/30/96	7/16/93	12/22/94						
16-004(b)	9/30/96	7/16/93	12/22/94						
16-004(c)	9/30/96	7/16/93	12/22/94						
16-004(d)	9/30/96	7/16/93	12/22/94						
16-004(e)	9/30/96	7/16/93	12/22/94						
16-004(f)	9/30/96	7/16/93	12/22/94						
16-005(a)	6/30/98	7/6/94	1/18/95						
16-005(b)		7/6/94	1/18/95					Proposed in Permit Mod 9/95	
16-005(c)	9/30/97	7/6/94	1/18/95						
16-005(d)	9/30/97	7/6/94	1/18/95						
16-005(e)	6/30/98	7/6/94	1/18/95						
16-005(f)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-005(g)	9/30/97	7/16/93	12/22/94						
16-005(h)	6/30/98	7/6/94	1/18/95						
16-005(i)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-005(j)	9/30/97	7/6/94	1/18/95						
16-005(k)	6/30/98	7/6/94	1/18/95						
16-005(l)	6/30/98	7/6/94	1/18/95						
16-005(m)	9/30/97	7/6/94	1/18/95						
16-005(n)	9/30/96	7/16/93	12/22/94						
16-005(o)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-006(a)	9/30/96	7/16/93	12/22/94						
16-006(b)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-006(c)	9/30/96	7/16/93	12/22/94						
16-006(d)	9/30/96	7/16/93	12/22/94						
16-006(e)	9/30/96	7/16/93	12/22/94						
16-006(f)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-006(g)	6/30/98	7/6/94	1/18/95						
16-006(h)		7/6/94	1/18/95						
16-006(i)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-007(a)	9/30/96	7/16/93	12/22/94						
16-008(a)	9/30/97	7/16/93	12/22/94						
16-009(a)	9/30/96	7/16/93	12/22/94						
16-010(a)	9/30/96	7/16/93	12/22/94						
16-010(b)		7/16/93	12/22/94						
16-010(c)		7/16/93	12/22/94						
16-010(d)		7/16/93	12/22/94						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-010(e)		7/16/93	12/22/94						
16-010(f)		7/16/93	12/22/94						
16-010(g)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-010(h)	9/30/96	7/16/93	12/22/94						
16-010(i)	9/30/96	7/16/93	12/22/94						
16-010(j)		7/16/93	12/22/94						
16-010(k)	9/30/96	7/16/93	12/22/94						
16-010(l)	9/30/96	7/16/93	12/22/94						
16-010(m)	9/30/96	7/16/93	12/22/94						
16-010(n)	9/30/96	7/16/93	12/22/94						
16-012(a)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(b)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(c)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(d)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(e)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(f)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(g)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(h)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(i)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(j)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(k)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(l)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(m)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(n)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(o)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(p)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(q)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(r)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(s)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(t)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(u)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(v)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(w)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(x)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-012(y)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-012(z)		7/16/93	12/22/94					Final AA Approval of Permit Mod 12/10/96	
16-013	9/30/96	7/16/93	12/22/94						
16-015(a)	6/30/98	7/5/95							
16-015(b)	6/30/98	7/6/94	1/18/95						
16-016(a)	9/30/96	7/16/93	12/22/94						
16-016(b)	9/30/96	7/16/93	12/22/94				9/15/95	Cleanup report Submitted	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-016(c)	9/30/96	7/16/93	12/22/94						
16-016(d)		7/5/95						Proposed in report/work plan	
16-016(e)		7/5/95						Proposed in report/work plan	
16-016(g)		7/5/95						Proposed in report/work plan	
16-017	6/30/98	7/6/94	1/18/95						
16-018		7/16/93	12/22/94						
16-019	9/30/97	7/16/93	12/22/94						
16-020	9/30/96	7/16/93	12/22/94						
16-021(a)	9/30/96	7/16/93	12/22/94						
16-021(c)	9/30/96	7/16/93	12/22/94	9/23/96					
16-024(e)	9/30/97	7/6/94	1/18/95						
16-025(a)	9/30/97	7/6/94	1/18/95						
16-025(a2)	9/30/97	7/5/95	1/18/95						
16-025(b)	9/30/97	7/6/94	1/18/95						
16-025(b2)	9/30/98	7/6/94	1/18/95						
16-025(c)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-025(c2)	9/30/98	7/6/94	1/18/95						
16-025(d)	9/30/97	7/6/94	1/18/95						
16-025(d2)	9/30/97	7/5/95							
16-025(e)	9/30/97	7/6/94	1/18/95						
16-025(e2)	9/30/97	7/5/95						Proposed in report/work plan	
16-025(f)	9/30/97	7/6/94	1/18/95						
16-025(f2)		7/5/95						Proposed in report/work plan	
16-025(g)	9/30/97	7/6/94	1/18/95						
16-025(g2)	9/30/97	7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-025(h)	9/30/97	7/6/94	1/18/95						
16-025(h2)	9/30/97	7/5/95						Proposed in report/work plan	
16-025(i)	9/30/97	7/6/94	1/18/95						
16-025(j)	9/30/97	7/6/94	1/18/95						
16-025(k)	9/30/97	7/6/94	1/18/95						
16-025(l)	9/30/97	7/6/94	1/18/95						
16-025(m)	9/30/97	7/6/94	1/18/95						
16-025(n)	9/30/97	7/6/94	1/18/95						
16-025(o)	9/30/97	7/6/94	1/18/95						
16-025(p)	9/30/97	7/6/94	1/18/95						
16-025(q)	9/30/97	7/6/94	1/18/95						
16-025(r)	9/30/97	7/6/94	1/18/95						
16-025(s)	9/30/97	7/6/94	1/18/95						
16-025(t)	9/30/98	7/6/94	1/18/95						
16-025(u)	9/30/97	7/6/94	1/18/95						
16-025(v)	9/30/97	7/6/94	1/18/95						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-025(w)	6/30/98	7/6/94	1/18/95						
16-025(x)	6/30/98	7/6/94	1/18/95						
16-025(y)	6/30/98	7/6/94	1/18/95						
16-025(z)	6/30/98	7/6/94	1/18/95						
16-026(a)		7/5/95						Proposed in report/work plan	
16-026(a2)		7/5/95						Proposed in report/work plan	
16-026(b)	9/30/96	7/16/93	12/22/94						
16-026(b2)		7/5/95							
16-026(c)	9/30/96	7/16/93	12/22/94						
16-026(c2)		7/5/95							
16-026(d)	9/30/96	7/16/93	12/22/94						
16-026(d2)		7/5/95						Proposed in report/work plan	
16-026(e)	9/30/96	7/16/93	12/22/94						
16-026(e2)		7/5/95						Proposed in report/work plan	
16-026(f)		7/5/95						Proposed in report/work plan	
16-026(f2)		7/5/95						Proposed in report/work plan	
16-026(g)		7/5/95						Proposed in report/work plan	
16-026(g2)		7/5/95						Proposed in report/work plan	
16-026(h)		7/5/95						Proposed in report/work plan	
16-026(h2)	9/30/96	7/16/93	12/22/94						
16-026(i)		7/5/95							
16-026(i2)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-026(j)		7/5/95							
16-026(j2)	9/30/96	7/16/93	12/22/94						
16-026(k)		7/5/95						Proposed in report/work plan	
16-026(k2)		7/5/95							
16-026(l)		7/5/95						Proposed in report/work plan	
16-026(m)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-026(n)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-026(o)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-026(p)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-026(q)	9/30/97	7/6/94	1/18/95						
16-026(r)		7/5/95							
16-026(s)	9/30/98	7/6/94	1/18/95						
16-026(t)		7/5/95						Proposed in report/work plan	
16-026(u)		7/5/95							
16-026(v)	9/30/96	7/16/93	12/22/94						
16-026(w)	9/30/97	7/6/94	1/18/95						
16-026(x)		7/5/95						Proposed in report/work plan	
16-026(y)		7/5/95						Proposed in report/work plan	
16-026(z)		7/5/95						Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-028(a)	6/30/98	7/6/94	1/18/95						
16-028(b)		7/5/95							
16-028(c)		7/5/95							
16-028(d)		7/5/95							
16-028(e)		7/5/95						Proposed in report/work plan	
16-029(a)	9/30/96	7/16/93	12/22/94						
16-029(a2)	6/30/98	7/6/94	1/18/95						
16-029(b)	9/30/96	7/16/93	12/22/94						
16-029(b2)	6/30/98	7/6/94	1/18/95						
16-029(c)	9/30/96	7/16/93	12/22/94						
16-029(c2)	6/30/98	7/6/94	1/18/95						
16-029(d)	9/30/96	7/16/93	12/22/94						
16-029(d2)	6/30/98	7/6/94	1/18/95						
16-029(e)	9/30/96	7/16/93	12/22/94						
16-029(e2)	6/30/98	7/6/94	1/18/95						
16-029(f)	9/30/96	7/16/93	12/22/94						
16-029(f2)	9/30/97	7/6/94	1/18/95						
16-029(g)	9/30/96	7/16/93	12/22/94						
16-029(g2)	9/30/96	7/6/94	1/18/95						
16-029(h)		7/5/95							
16-029(h2)	9/30/97	7/6/94	1/18/95						
16-029(i)		7/5/95						Proposed in report/work plan	
16-029(j)		7/5/95							
16-029(k)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(l)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(m)	9/30/97	7/6/94	1/18/95						
16-029(n)	9/30/97	7/6/94	1/18/95						
16-029(o)	9/30/97	7/6/94	1/18/95						
16-029(p)	9/30/97	7/6/94	1/18/95						
16-029(q)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(r)	9/30/97	7/6/94	1/18/95						
16-029(s)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(t)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(u)	9/30/97	7/6/94	1/18/95				9/30/96	Cleanup report Submitted	
16-029(v)	9/30/98	7/6/94	1/18/95						
16-029(w)	9/30/98	7/6/94	1/18/95						
16-029(x)	9/30/97	7/6/94	1/18/95						
16-029(y)	9/30/97	7/6/94	1/18/95						
16-029(z)	9/30/97	7/6/94	1/18/95						
16-030(a)		7/5/95							
16-030(b)		7/5/95						Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
16-030(c)		7/5/95						Proposed in report/work plan	
16-030(e)		7/5/95						Proposed in report/work plan	
16-030(f)		7/5/95						Proposed in report/work plan	
16-030(h)	9/30/96	7/16/93	12/22/94						
16-031(a)		7/5/95							
16-031(b)		7/5/95							
16-031(c)	9/30/97	7/6/94	1/18/95						
16-031(d)	9/30/97	7/6/94	1/18/95						
16-031(e)		7/5/95						Proposed in report/work plan	
16-031(f)		7/5/95						Proposed in report/work plan	
16-031(g)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-031(h)		7/5/95						Proposed in report/work plan	
16-032(a)	9/30/97	7/6/94	1/18/95						
16-032(c)	9/30/97	7/6/94	1/18/95						
16-032(d)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-032(e)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-034(a)	9/30/97	7/6/94	1/18/95						
16-034(b)	9/30/97	7/6/94	1/18/95						
16-034(c)	9/30/97	7/6/94	1/18/95						
16-034(d)	9/30/97	7/6/94	1/18/95						
16-034(e)	9/30/97	7/6/94	1/18/95						
16-034(f)	9/30/97	7/6/94	1/18/95						
16-034(g)		7/6/94	1/18/95					Final AA Approval of Permit Mod 12/10/96	
16-034(h)		7/5/95							
16-034(i)		7/5/95						Proposed in report/work plan	
16-034(j)		7/5/95							
16-034(k)		7/5/95						Proposed in report/work plan	
16-034(l)	9/30/97	7/6/94	1/18/95						
16-034(m)	6/30/98	7/6/94	1/18/95						
16-034(n)	6/30/98	7/6/94	1/18/95						
16-034(o)	6/30/98	7/6/94	1/18/95						
16-034(p)	9/30/97	7/6/94	1/18/95						
16-035	9/30/97	7/16/93	12/22/94						
16-036	9/30/97	7/16/93	12/22/94						
C-16-025		7/6/94	1/18/95						
C-16-026		7/6/94	1/18/95						
18-001(a)	1/30/95	5/14/93	9/23/94	1/20/95			9/30/95	Cleanup report Submitted	
18-001(b)	1/30/95	5/14/93	9/23/94	1/20/95			9/30/95	EC Report Submitted	
18-001(c)	1/30/95	5/14/93	9/23/94	1/20/95				Proposed in Permit Mod 9/96	
18-002(a)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-002(b)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
18-003(a)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96			
18-003(b)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96			
18-003(c)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96			
18-003(d)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96			
18-003(e)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96	9/30/95	EC Report Submitted	
18-003(f)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-003(g)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96			
18-003(h)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-004(a)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-004(b)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-005(a)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-007	1/30/95	5/14/93	9/23/94	1/20/95				Proposed in Permit Mod 9/96	
18-012(a)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
18-012(b)	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
19-001		10/16/92	1/6/93						
19-002		10/16/92	1/6/93				9/30/95	Cleanup report Submitted	
19-003		10/16/92	1/6/93						
20-001(a)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
20-001(b)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
20-001(c)		5/25/94	12/28/94	3/18/96					
20-002(a)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
20-002(b)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
20-002(c)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
20-002(d)		5/25/94	12/28/94	3/18/96					
20-003(a)		5/25/94	12/28/94					Proposed in report/work plan	
20-005		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
21-002(a)		5/23/91	1/9/92						
21-003		5/23/91	1/9/92						
21-004(b)		5/23/91	1/9/92	6/14/96				Proposed in report/work plan	
21-004(c)		5/23/91	1/9/92	6/14/96				Proposed in report/work plan	
21-005		5/23/91	1/9/92						
21-006(a)		5/23/91	1/9/92						
21-006(b)		5/23/91	1/9/92	2/28/94					
21-006(c)		5/23/91	1/9/92						
21-006(d)		5/23/91	1/9/92						
21-006(e)		5/23/91	1/9/92						
21-007		5/23/91	1/9/92	1/28/94				Proposed in report/work plan	
21-010(a)		5/23/91	1/9/92						
21-010(b)		5/23/91	1/9/92						
21-010(c)		5/23/91	1/9/92						
21-010(d)		5/23/91	1/9/92						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
21-010(e)		5/23/91	1/9/92						
21-010(f)		5/23/91	1/9/92						
21-010(g)		5/23/91	1/9/92						
21-010(h)		5/23/91	1/9/92						
21-011(a)		5/23/91	1/9/92						
21-011(b)		5/23/91	1/9/92						
21-011(c)		5/23/91	1/9/92						
21-011(d)		5/23/91	1/9/92						
21-011(e)		5/23/91	1/9/92						
21-011(f)		5/23/91	1/9/92						
21-011(g)		5/23/91	1/9/92						
21-011(i)		5/23/91	1/9/92						
21-011(j)		5/23/91	1/9/92						
21-011(k)		5/23/91	1/9/92	2/28/94					
21-012(a)		5/23/91	1/9/92					Final AA Approval of Permit Mod 12/10/96	
21-012(b)		5/23/91	1/9/92						
21-013(a)		5/23/91	1/9/92						
21-013(b)		5/23/91	1/9/92						
21-013(c)		5/23/91	1/9/92				9/30/95	Cleanup report Submitted	
21-013(d)		5/23/91	1/9/92				9/30/95	Cleanup report Submitted	
21-013(e)		5/23/91	1/9/92				9/30/95	Cleanup report Submitted	
21-014		5/23/91	1/9/92						
21-015		5/23/91	1/9/92						
21-016(a)		5/23/91	1/9/92	3/1/96					
21-016(b)		5/23/91	1/9/92	3/1/96					
21-016(c)		5/23/91	1/9/92	3/1/96					
21-017(a)		5/23/91	1/9/92						
21-017(b)		5/23/91	1/9/92						
21-017(c)		5/23/91	1/9/92						
21-018(a)		5/23/91	1/9/92	8/9/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
21-018(b)		5/23/91	1/9/92	2/28/96					
21-021		5/23/91	1/9/92	1/28/94				Proposed in report/work plan	
21-022(a)		5/23/91	1/9/92						
21-022(b)		5/23/91	1/9/92						
21-022(c)		5/23/91	1/9/92						
21-022(d)		5/23/91	1/9/92						
21-022(e)		5/23/91	1/9/92						
21-022(f)		5/23/91	1/9/92						
21-022(g)		5/23/91	1/9/92						
21-022(h)		5/23/91	1/9/92	2/28/94					
21-022(i)		5/23/91	1/9/92						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
21-022(j)		5/23/91	1/9/92				9/30/95	Cleanup report Submitted	
21-023(a)		5/23/91	1/9/92						
21-023(b)		5/23/91	1/9/92						
21-023(c)		5/23/91	1/9/92	2/28/94					
21-023(d)		5/23/91	1/9/92						
21-024(a)		5/23/91	1/9/92	2/28/94					
21-024(b)		5/23/91	1/9/92	2/28/94				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
21-024(c)		5/23/91	1/9/92	2/28/94					
21-024(d)		5/23/91	1/9/92	2/28/94			9/30/95	Cleanup report Submitted	
21-024(e)		5/23/91	1/9/92	2/28/94			9/30/95	Cleanup report Submitted	
21-024(f)		5/23/91	1/9/92	2/28/94				Proposed in report/work plan	
21-024(g)		5/23/91	1/9/92	2/28/94				Proposed in report/work plan	
21-024(h)		5/23/91	1/9/92	2/28/94			9/30/95	Cleanup report Submitted	
21-024(i)		5/23/91	1/9/92	2/28/94					
21-024(j)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-024(k)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-024(l)		5/23/91	1/9/92	2/28/94				Proposed in report/work plan	
21-024(m)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-024(n)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-024(o)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-026(a)		5/23/91	1/9/92						
21-026(b)		5/23/91	1/9/92						
21-027(a)		5/23/91	1/9/92	2/28/94					
21-027(b)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-027(c)		5/23/91	1/9/92	2/28/94					
21-027(d)		5/23/91	1/9/92	2/28/94				Final AA Approval of Permit Mod 12/10/96	
21-029		5/23/91	1/9/92	1/22/96			8/12/96	Cleanup report Submitted	
22-010(a)	6/30/95	8/30/93	10/19/94						
22-010(b)	6/30/95	8/30/93	10/19/94						
22-011		8/30/93	10/19/94					Proposed in Permit Mod 3/95	
22-012		8/30/93	10/19/94						
22-014(a)		8/30/93	10/19/94						
22-014(b)		8/30/93	10/19/94						
22-015(a)		8/30/93	10/19/94						
22-015(b)		8/30/93	10/19/94						
22-015(c)	4/24/95	8/30/93	10/19/94				9/30/95	EC Report Submitted	
22-015(d)		8/30/93	10/19/94						
22-015(e)		8/30/93	10/19/94						
22-016	6/30/95	8/30/93	10/19/94						
26-001		10/16/92	1/6/93						
26-002(a)		10/16/92	1/6/93						

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
26-002(b)		10/16/92	1/6/93						
26-003		10/16/92	1/6/93						
27-001	1/30/95	5/14/93	9/23/94	1/20/95				Proposed in Permit Mod 9/96	
27-002	10/31/95	5/14/93	9/23/94	11/7/95		4/15/96		Proposed in report/work plan	
27-003	1/30/95	5/14/93	9/23/94	1/20/95				Proposed in Permit Mod 9/96	
31-001		5/1/92	5/1/93	4/28/95			9/30/95	Cleanup report Submitted	
32-001		5/1/92	5/1/93	6/30/95					
32-002(a)		5/1/92	5/1/93	6/30/95			9/30/96	Cleanup report Submitted	
32-002(b)		5/1/92	5/1/93	6/30/95			9/30/96	Cleanup report Submitted	
33-001(a)		5/20/92	7/15/93						
33-001(b)		5/20/92	7/15/93						
33-001(c)		5/20/92	7/15/93						
33-001(d)		5/20/92	7/15/93						
33-001(e)		5/20/92	7/15/93						
33-002(a)		5/20/92	7/15/93	9/30/95					
33-002(b)		5/20/92	7/15/93	9/30/95					
33-002(c)		5/20/92	7/15/93	9/30/95					
33-002(d)		5/20/92	7/15/93	9/30/95				Proposed in report/work plan	
33-002(e)		5/20/92	7/15/93	9/30/95				Proposed in report/work plan	
33-003(a)		5/20/92	7/15/93	9/30/95				Proposed in report/work plan	
33-003(b)		5/20/92	7/15/93	9/30/95					
33-004(a)		5/20/92	7/15/93	9/30/95					
33-004(b)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-004(c)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-004(d)		5/20/92	7/15/93	1/31/95				Final AA Approval of Permit Mod 12/10/96	
33-004(e)		5/20/92	7/15/93					Final AA Approval of Permit Mod 12/10/96	
33-004(f)		5/20/92	7/15/93					Final AA Approval of Permit Mod 12/10/96	
33-004(g)		5/20/92	7/15/93	1/31/95				Final AA Approval of Permit Mod 12/10/96	
33-004(h)		5/20/92	7/15/93	1/31/95				Final AA Approval of Permit Mod 12/10/96	
33-004(i)		5/20/92	7/15/93	1/31/95				Proposed in report/work plan	
33-004(j)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-004(k)		5/20/92	7/15/93	9/30/95					
33-004(m)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-005(a)		5/20/92	7/15/93	1/31/95				Proposed in report/work plan	
33-005(b)		5/20/92	7/15/93	1/31/95				Proposed in report/work plan	
33-005(c)		5/20/92	7/15/93	1/31/95				Proposed in report/work plan	
33-006(a)		5/20/92	7/15/93	12/22/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
33-006(b)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-007(a)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-007(b)		5/20/92	7/15/93	12/22/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
33-007(c)		5/20/92	7/15/93	1/31/95		9/30/95	9/30/96	Cleanup report Submitted	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
33-008(a)		5/20/92	7/15/93	9/30/95					
33-008(b)		5/20/92	7/15/93	9/30/95					
33-009		5/20/92	7/15/93	9/30/95					
33-010(a)		5/20/92	7/15/93	12/22/95			6/13/96	Cleanup report Submitted	
33-010(b)		5/20/92	7/15/93	12/22/95			6/13/96	Cleanup report Submitted	
33-010(c)		5/20/92	7/15/93	12/22/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
33-010(d)		5/20/92	7/15/93	12/22/95			6/13/96	Cleanup report Submitted	
33-010(f)		5/20/92	7/15/93	1/31/95				Proposed in Permit Mod 9/95	
33-010(g)		5/20/92	7/15/93	12/22/95			6/13/96	Cleanup report Submitted	
33-010(h)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-011(a)		5/20/92	7/15/93	1/31/95					
33-011(c)		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-011(d)		5/20/92	7/15/93	9/30/95					
33-011(e)		5/20/92	7/15/93	1/31/95				Proposed in Permit Mod 9/95	
33-012(a)		5/20/92	7/15/93	1/31/95				Proposed in Permit Mod 9/95	
33-013		5/20/92	7/15/93	9/30/95					
33-014		5/20/92	7/15/93	12/22/95				Proposed in report/work plan	
33-015		5/20/92	7/15/93	1/31/95				Proposed in report/work plan	
33-016		5/20/92	7/15/93	9/29/95			9/30/95	Cleanup report Submitted	
33-017		5/20/92	7/15/93	9/30/95					
35-002		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-003(a)		5/20/92	11/3/93						
35-003(b)		5/20/92	11/3/93						
35-003(c)		5/20/92	11/3/93						
35-003(d)		5/20/92	11/3/93						
35-003(e)		5/20/92	11/3/93						
35-003(f)		5/20/92	11/3/93						
35-003(g)		5/20/92	11/3/93						
35-003(h)		5/20/92	11/3/93	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-003(i)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
35-003(j)		5/20/92	11/3/93	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-003(k)		5/20/92	11/3/93	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-003(l)		5/20/92	11/3/93						
35-003(m)		5/20/92	11/3/93						
35-003(n)		5/20/92	11/3/93						
35-003(o)		5/20/92	11/3/93						
35-003(p)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-003(q)		5/20/92	11/3/93						
35-004(a)		6/13/94	5/22/95	7/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-004(b)		6/13/94	5/22/95	5/2/96				Proposed in report/work plan	
35-004(e)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
35-004(g)		6/13/94	5/22/95	7/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-004(h)		6/13/94	5/22/95	7/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-006		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-008		5/20/92	11/3/93	5/2/96					
35-009(a)		5/20/92	11/3/93	5/2/96			9/30/96	Proposed in cleanup report for RCRA NFA; Rad/other Component must b	
35-009(b)		5/20/92	11/3/93	5/2/96			7/25/96	Proposed in cleanup report for RCRA NFA; Rad/other Component must b	
35-009(c)		5/20/92	11/3/93	5/2/96			7/25/96	Proposed in cleanup report for RCRA NFA; Rad/other Component must b	
35-009(d)		5/20/92	11/3/93	5/2/96			7/25/96	Proposed in cleanup report for RCRA NFA; Rad/other Component must b	
35-009(e)		6/13/94	5/22/95	7/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-010(a)		5/20/92	11/3/93						
35-010(b)		5/20/92	11/3/93						
35-010(c)		5/20/92	11/3/93						
35-010(d)		6/13/94	5/22/95						
35-011(a)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-013(a)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-013(b)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-013(c)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-013(d)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
35-014(a)		5/20/92	11/3/93	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-014(b)		5/20/92	11/3/93	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-014(e)		6/13/94	5/22/95	5/2/96					
35-014(g)		6/13/94	5/22/95	7/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-015(a)		6/13/94	5/22/95						
35-015(b)		5/20/92	11/3/93	5/2/96				Proposed in report/work plan	
35-016(a)		6/13/94	5/22/95						
35-016(c)		6/13/94	5/22/95						
35-016(d)		6/13/94	5/22/95						
35-016(i)		6/13/94	5/22/95	5/2/96				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
35-016(k)		6/13/94	5/22/95						
35-016(m)		6/13/94	5/22/95						
35-016(o)		6/13/94	5/22/95						
35-016(p)		6/13/94	5/22/95						
35-016(q)		6/13/94	5/22/95						
36-001	4/30/96	6/9/93	9/23/94	6/21/96				Proposed in report/work plan	
36-002	7/16/95	6/9/93	9/23/94	7/14/95				Proposed in Permit Mod 9/96	
36-003(a)	9/30/95	6/9/93	9/23/94	9/29/95			9/30/95	EC Report Submitted	
36-003(b)	9/30/95	6/9/93	9/23/94	9/29/95			9/30/96	Cleanup report Submitted	
36-003(c)		6/9/93	9/23/94					Final AA Approval of Permit Mod 12/10/96	
36-004(d)	9/30/95	6/9/93	9/23/94	6/21/96				Proposed for Deferral	
36-005	9/30/95	6/9/93	9/23/94	9/29/95					
36-006	9/30/95	6/9/93	9/23/94	6/21/96				Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
C-36-003	9/30/95	6/9/93	9/23/94	9/29/95					
39-001(a)	6/6/96	6/18/93	9/22/94						
39-001(b)	6/6/96	6/18/93	9/22/94						
39-002(a)	4/16/95	6/18/93	9/22/94	4/28/95				EC Permit Mod Submitted	
39-003		6/18/93	9/22/94					Final AA Approval of Permit Mod 12/10/96	
39-004(a)	6/6/96	6/18/93	9/22/94						
39-004(b)	6/6/96	6/18/93	9/22/94						
39-004(c)	6/6/96	6/18/93	9/22/94						
39-004(d)	6/6/96	6/18/93	9/22/94						
39-004(e)	6/6/96	6/18/93	9/22/94						
39-005	4/16/95	6/18/93	9/22/94	4/28/95				Proposed in report/work plan	
39-006(a)	4/16/95	6/18/93	9/22/94	4/28/95					
39-006(b)		6/18/93	9/22/94					Final AA Approval of Permit Mod 12/10/96	
39-007(a)	4/16/95	6/18/93	9/22/94	4/28/95			9/30/95	Cleanup report Submitted	
39-008	6/6/96	6/18/93	9/22/94						
40-001(a)		8/30/93	10/19/94					Final AA Approval of Permit Mod 12/10/96	
40-001(b)	6/30/95	8/30/93	10/19/94						
40-001(c)	6/30/95	8/30/93	10/19/94						
40-003(a)		8/30/93	10/19/94					Closure report Submitted/Additional cleanup required	
40-004	6/30/95	8/30/93	10/19/94						
40-005		8/30/93	10/19/94						
40-006(a)	5/1/96	8/30/93	10/19/94						
40-006(b)	5/1/96	8/30/93	10/19/94						
40-006(c)	5/1/96	8/30/93	10/19/94						
40-009	5/1/96	8/30/93	10/19/94						
40-010	6/30/95	8/30/93	10/19/94						
41-001		6/4/93	11/16/93						
41-002(a)		6/4/93	11/16/93						
41-002(b)		6/4/93	11/16/93						
41-002(c)		6/4/93	11/16/93						
42-001(a)		5/20/92	11/3/93	10/6/95				Proposed in report/work plan	
42-001(b)		5/20/92	11/3/93	10/6/95				Proposed in report/work plan	
42-001(c)		5/20/92	11/3/93	10/6/95				Proposed in report/work plan	
42-002(b)		5/20/92	11/3/93	10/6/95				Proposed in report/work plan	
42-003		5/20/92	11/3/93	10/6/95				Proposed in report/work plan	
43-001(a1)	4/23/98	5/23/94	10/7/94						
43-002	4/23/98	5/23/94	10/7/94						
45-001		5/1/92	5/1/93	6/22/95		3/11/96		Proposed in report/work plan	
45-002		5/1/92	5/1/93	6/22/95		3/11/96		Proposed in report/work plan	
45-003		5/1/92	5/1/93	6/22/95		3/11/96		Proposed in report/work plan	
45-004		5/1/92	5/1/93	6/22/95		3/11/96		Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
46-002	10/1/96	8/19/93	10/14/94						
46-003(a)	5/1/96	8/19/93	10/14/94						
46-003(b)	5/1/96	8/19/93	10/14/94						
46-003(c)	5/1/96	8/19/93	10/14/94						
46-003(d)	6/1/97	8/19/93	10/14/94						
46-003(e)	5/1/96	8/19/93	10/14/94						
46-003(f)	5/1/96	8/19/93	10/14/94						
46-003(g)	5/1/96	8/19/93	10/14/94						
46-003(h)	5/1/96	8/19/93	10/14/94	6/25/96			9/30/96	Cleanup report Submitted	
46-004(a)		8/19/93	10/14/94					Proposed in Permit Mod 3/95	
46-004(a2)	9/1/95	8/19/93	10/14/94	6/25/96					
46-004(b)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(b2)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(c)	6/1/97	8/19/93	10/14/94						
46-004(c2)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(d)	6/1/97	8/19/93	10/14/94						
46-004(d2)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(e)	6/1/97	8/19/93	10/14/94						
46-004(f)	9/1/95	8/19/93	10/14/94						
46-004(g)	9/1/95	8/19/93	10/14/94	6/25/96					
46-004(h)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(m)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(p)	6/1/97	8/19/93	10/14/94						
46-004(q)	9/1/95	8/19/93	10/14/94	6/25/96					
46-004(r)	9/1/95	8/19/93	10/14/94						
46-004(s)	9/1/95	8/19/93	10/14/94	6/25/96					
46-004(t)	5/1/96	8/19/93	10/14/94						
46-004(u)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(v)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(w)	9/1/95	8/19/93	10/14/94						
46-004(x)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(y)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-004(z)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-005	5/1/96	8/19/93	10/14/94						
46-006(a)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-006(b)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-006(c)	5/1/96	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-006(d)	9/1/95	8/19/93	10/14/94	6/25/96					
46-006(f)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-006(g)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-007	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
46-008(a)	9/1/95	8/19/93	10/14/94						
46-008(b)	9/1/95	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
46-008(c)		8/19/93	10/14/94					Final AA Approval of Permit Mod 12/10/96	
46-008(d)	9/1/95	8/19/93	10/14/94						
46-008(e)	9/1/95	8/19/93	10/14/94						
46-008(f)	9/1/95	8/19/93	10/14/94						
46-008(g)	9/1/95	8/19/93	10/14/94						
46-009(a)	5/1/96	8/19/93	10/14/94						
46-009(b)	5/1/96	8/19/93	10/14/94						
46-010(d)	5/1/96	8/19/93	10/14/94	6/25/96				Proposed in report/work plan	
48-002(a)		5/20/92	11/3/93				9/30/95	EC Report Submitted	
48-002(b)		5/20/92	11/3/93			yes	9/30/95	EC Report Submitted	
48-003		5/20/92	11/3/93	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-004(a)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
48-004(b)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
48-004(c)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
48-005		5/20/92	11/3/93	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-007(a)		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-007(b)		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-007(c)		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-007(d)		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-007(f)		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
48-010		6/13/94	5/22/95	10/30/95				Reviewed for RCRA NFA; Rad/other Component must be addressed.	
49-001(a)		5/20/92	4/15/93						
49-001(b)		5/20/92	4/15/93						
49-001(c)		5/20/92	4/15/93						
49-001(d)		5/20/92	4/15/93						
49-001(e)		5/20/92	4/15/93						
49-001(f)		5/20/92	4/15/93						
49-001(g)		5/20/92	4/15/93						
49-003		5/20/92	4/15/93						
49-004		5/20/92	4/15/93						
49-005(a)		5/20/92	4/15/93						
49-006		5/20/92	4/15/93						
50-001(a)		5/20/92	4/16/93						
50-002(a)		5/20/92	4/16/93						
50-002(b)		5/20/92	4/16/93						
50-002(c)		5/20/92	4/16/93						
50-004(a)		5/20/92	4/16/93	3/1/96				Proposed in report/work plan	
50-004(b)		5/20/92	4/16/93						
50-004(c)		5/20/92	4/16/93	3/1/96				Proposed in report/work plan	

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
50-006(a)		5/20/92	4/16/93	10/13/95					
50-006(c)		5/20/92	4/16/93	10/13/95				Proposed in report/work plan	
50-006(d)		5/20/92	4/16/93						
50-009		5/20/92	4/16/93						
50-011(a)		5/20/92	4/16/93	3/1/96				Proposed in report/work plan	
52-001(a)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-001(b)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-001(c)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-001(d)		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
52-002(a)		5/20/92	11/3/93						
52-002(b)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-002(c)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-002(d)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
52-002(e)		5/20/92	11/3/93					Proposed in Permit Mod 9/96	
52-002(f)		5/20/92	11/3/93					Final AA Approval of Permit Mod 12/10/96	
53-001(a)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
53-001(b)		5/25/94	12/28/94	3/18/96				Proposed in report/work plan	
53-002(a)		5/25/94	12/28/94	3/18/96					
53-002(b)		5/25/94	12/28/94	3/18/96				Proposed for Deferral	
53-005		5/25/94	12/28/94	3/18/96					
53-006(b)		5/25/94	12/28/94						
53-006(c)		5/25/94	12/28/94						
53-006(d)		5/25/94	12/28/94						
53-006(e)		5/25/94	12/28/94						
53-006(f)		5/25/94	12/28/94						
53-007(a)		5/25/94	12/28/94					Proposed in report/work plan	
53-007(b)		5/25/94	12/28/94					Final AA Approval of Permit Mod 12/10/96	
54-001(a)		5/23/93	12/14/93	2/27/96					
54-001(c)		5/23/93	12/14/93	2/27/96				Final AA Approval of Permit Mod 12/10/96	
54-004		5/23/93	12/14/93	2/27/96					
54-005		5/23/93	12/14/93	2/27/96					
54-006		5/23/93	12/14/93	2/27/96					
54-007(a)		5/23/93	12/14/93	2/27/96					
54-007(b)		5/23/93	12/14/93					Proposed in Permit Mod 3/95	
54-007(c)		5/23/93	12/14/93	2/27/96					
54-012(b)		5/23/93	12/14/93						
54-013(a)		5/23/93	12/14/93	2/27/96				Final AA Approval of Permit Mod 12/10/96	
54-013(b)		5/23/93	12/14/93	2/27/96					
54-014(b)		5/23/93	12/14/93	2/27/96					
54-014(c)		5/23/93	12/14/93	2/27/96					
54-014(d)		5/23/93	12/14/93	2/27/96					

PRS Number	EPA Date	RFI Workplan		RFI Rpt 1		RFI Rpt 2	Cleanup Rpt	NFA Status	
		Submitted	Approved	Submitted	Approved	Submitted	Submitted		
54-015(h)		5/23/93	12/14/93	2/27/96				Proposed in Permit Mod 3/95	
54-015(k)		5/23/93	12/14/93	2/27/96					
54-017		5/23/93	12/14/93	2/27/96					
54-018		5/23/93	12/14/93	2/27/96					
54-019		5/23/93	12/14/93	2/27/96					
54-020		5/23/93	12/14/93	2/27/96					
55-008		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
55-009		5/20/92	11/3/93					Proposed in Permit Mod 3/95	
59-001		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
60-002		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
60-005(a)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
60-006(a)		7/7/93	1/7/94	2/29/96					
60-007(a)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
60-007(b)		7/7/93	1/7/94	2/29/96				Proposed in report/work plan	
61-002		7/7/93	1/7/94	2/29/96					
61-004(a)		7/7/93	1/7/94					Proposed in Permit Mod 3/95	
61-005		7/7/93	1/7/94					AA concurrence for deferral	
61-006		7/7/93	1/7/94					AA concurrence for deferral	
61-007		7/7/93	1/7/94					Proposed in Permit Mod 9/95	
63-001(a)		5/20/92	11/3/93						
63-001(b)		5/20/92	11/3/93						
69-001	5/30/95	7/23/93	10/7/94	9/30/95					
73-001(a)		10/16/92	1/6/93						
73-001(b)		10/16/92	1/6/93						
73-001(c)		10/16/92	1/6/93						
73-001(d)		10/16/92	1/6/93						
73-002		10/16/92	1/6/93						
73-004(a)		10/16/92	1/6/93				6/20/96	Cleanup report Submitted	
73-004(b)		10/16/92	1/6/93				9/30/96	Cleanup report Submitted	
73-004(c)		10/16/92	1/6/93						
73-004(d)		10/16/92	1/6/93						
73-005		10/16/92	1/6/93						
73-006		10/16/92	1/6/93						

Environmental
Restoration
University of California
Environmental Restoration Project, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: February 11, 1997
Refer to: EM/ER:97-012

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GROUND WATER BUREAU

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR RFI REPORT ON TA-50

Dear Mr. Garcia:

Enclosed please find a copy of the Los Alamos National Laboratory Environmental Restoration (ER) Project's response to the New Mexico Environment Department (NMED) request for additional Information on the Resource Conservation and Recovery Act Facility Investigation Report on Technical Area 50 (LA-UR 95-2738), Potential Release Sites 50-006(a, c), 50-007, and 50-008. The request was included as Attachment A on your letter dated August 19, 1996. In the response, the four issues raised by NMED and the Environmental Protection Agency are repeated, and the ER Project responses follow.

If you have any questions, please contact Don Krier at (505) 665-7834 or Mike Gilgosch at (505) 667-5794.

Sincerely,

Jorg Jansen, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JJ/TT/rfr

Enclosures: (1) Additional Request for information on TA-50 RFI Report
(2) Certification

Cy (w/ enc.):
S. Dinwiddie, NMED-HRMB
M. Gilgosch, LAAO, MS A316
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
D. Krier, EES-1, MS D462
M. Leavitt, NMED-GWQB, P.O. Box 26110, Santa Fe, NM 87502
N. Naraine, DOE-HQ, 19901 Germantown Road, MS: EM-453, Germantown, MD 20874-1290
D. Neleigh, EPA, (2 copies), Region 6, 6PD-N, 1445 Ross Avenue, Suite 1200, Dallas, TX 75202-2733
J. Parker, NMED-OB, P.O. Box 26110, Santa Fe, NM 87502
C. Rodriguez, CIO, MS M707
G. Saums, NMED-SWQB, P.O. Box 26110, Santa Fe, NM 87502
T. Taylor, LAAO, MS A316
J. White, ESH-19, MS K498
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o enc.):
T. Baca, EM, MS J591
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
J. Levings, AL-ERD, MS A906
L. Soholt, EM/ER, MS M992
W. Spurgeon, DOE-HQ, 19901 Germantown Road, MS: EM-453, Germantown, MD 20874-1290
J. Vozella, LAAO, MS A316
K. Zamora, LAAO, MS A316
EM/ER File, (CT#140), MS M992

CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Title: Request for Additional Information of TA-50 RFI Report, PRSs 50-006(a, c), 50-007, and 50-008

Name: ______________ Date: 2-12-97

Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name: ______________ Date: 2/12/97

Joseph Vozella,
Acting Assistant Area Manager of
Environment Projects
Environment, Safety, and Health Branch
DOE-Los Alamos Area Office

or

Theodore J. Taylor, Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

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GROUND WATER BUREAU

April 20, 1997

Mat Johansen, POC
U.S. Department of Energy
Los Alamos Area Office
528 35th Street, MS A316
Los Alamos, NM 87544

RE: Review of Los Alamos National Laboratory's Ground Water Discharge Plan Application for the TA-50 Radioactive Liquid Waste Treatment Facility (August 16, 1996)

Dear Mr. Johansen:

The DOE Oversight Bureau (DOE OB) has reviewed several sections of the subject document. The following comments are provided for the purpose of communicating the results of the review. They are not provided or intended for the purpose of representing the regulatory position of the New Mexico Environment Department.

EXECUTIVE SUMMARY

Specific Comments:

1. **Page 1, third paragraph, first sentence:**

> *Nitrate (NO3-N) and fluoride (F) concentrations in Mortandad Canyon's alluvial ground water presently exceed WQCC ground water standards but current trends are downward.*

The data do not appear to support the conclusion that current trends are downward. Further characterization and monitoring data are needed to address contaminant trends.

o Based on field observations and data review, the DOE OB's conclusion is that variation in contaminant concentration in the shallow ground water within Mortandad Canyon alluvium is dependent on (1) the concentration and volume of contaminants released through outfall(s) (i.e., TA-50 treatment outfall) and (2) the amount of recharge from natural runoff such as snowmelt.

This conclusion is based on the following: Monitoring well MCO-4B, MCO-5 was sampled by DOE OB during the spring and summer of 1996, and the results indicate that contaminant concentrations increased with respect to previous years (e.g., ^{90}Sr detected at 111 pCi/L at MCO-4B and NO2-NO3 as N at 66 mg/L at MCO-5). These high concentrations may be due to 1996 drought conditions which resulted in a lack of snowmelt runoff and infiltration as shown by the discharge data collected during 1995 and 1996 (Shaull et al., 1996a)(Shaull et al., 1996b): from May 10 through May 31, 1995 a total of 7.2 acre-feet was discharged at GS-08313200 versus 0.2 acre-feet discharged during the entire month of May, 1996. Hence, samples collected in 1996 probably contained a greater volume of effluent water versus natural runoff water, resulting in higher contaminant concentrations.

- Radioactive liquid waste effluent was discharged into Ten Site Canyon from the TA-35 wastewater treatment plant from 1951 through 1963 (RFI Work Plan for OU 1129, May 1992). Prior to the installation of an ion-exchange column in June of 1955, these discharges contained up to 1000 times the drinking water tolerance level of radiostrontium. Ten Site Canyon receives runoff from precipitation and may be a source of underflow interconnected to ground water in Mortandad Canyon alluvium. Therefore, the contribution from Ten Site Canyon to the overall hydrology of Mortandad Canyon should be considered when evaluating variations in water quality between MCO-6 and MCO-7.

- Mortandad Canyon sediments contain an inventory from 45 years of discharges of contaminated water, accidental spills and releases from SWMUs. Soluble contaminants may be re-mobilized and transported down canyon by underflow within the alluvium or down into underlying units by leakage from the alluvium. The rate of contaminant migration is influenced by many factors including the solubility of the contaminant and recharge fluxuations.

2. **Page 10, Section 7, Discharge Quality.**

See Appendix D for the complete data record for 1994 for RLWTF operational monitoring of treated effluent.

LANL's NPDES Permit No. NM0028355 lists monthly monitoring requirements for Total Toxic Organics [as defined in 40 CFR 433.11 (e)] for outfall 051. It would be useful to include these data in the discharge plan.

3. Page 10, Section 8. Location of Water Supply and Injection Wells.

Map 3.0 shows that no water supply wells or injection wells are located within 1 mile of the RLWTF discharge point (NPDES Outfall 051).

Although no water supply wells are within one mile of the outfall, contaminated ground water in Mortandad Canyon is located within one mile from several production wells. Specifically, contaminated ground water in Mortandad Canyon alluvium is located 6200 ft from PM-3, 3800 ft from PM-4, 1700 ft from PM-5 and 4000 ft from O-4. Flow direction of regional ground water near these wells has not been determined due to the lack of adequate water-level monitoring points, especially near production fields.

4. Page 10, Section 10. Location of Monitor Wells.

- It should be noted in the plan that the MCM series wells are unscreened moisture-access holes/tubes, and MCC-8.2 was abandoned in 1989. LANL may want to omit these from Map 4.0. We question the existence of the wetlands (located east of the sediment traps) illustrated on Map 4.0.

- The discharge plan would be improved if it showed all screened wells in Mortandad Canyon, defined which wells are useful for water quality and/or hydrologic data, and showed all available data associated with these wells (chemical, water-level, etc.).

- Well MCO-4 may not be useful because it is not capped and erosion has exposed a portion of the well casing.

- Based on the well records, some Mortandad Canyon wells may not be constructed as prescribed by regulatory guidance.

- DOE OB suggests that LANL evaluate historical head changes within the shallow perched aquifer prior to drilling additional wells and determining screen lengths. That is, it may be appropriate to use screen lengths that are greater than the prescribed regulatory guidance due to extreme head variations.

- DOE OB does not recommend monitoring surface water at GS-1 as a substitute for MCO-3 because underflow above or to the west of GS-1 may be mixing with infiltrated surface-water at GS-1. We recommend replacing MCO-3.

5. Page 13 - 14, Section 11. Ground Water Conditions.

a) Depth to Ground Water at the Discharge Site; b) Flow Direction of Ground Water Below the Site; and c) Gradient of Ground Water Below the Site.

- Water-level maps which show the seasonal variations in head and flow direction should be prepared. Water-level maps may show gradient anomalies which may help define areas of faulting and recharge/discharge (e.g., zones of preferential seepage to hydrologic units within the Bandelier Tuff).

- The sediment traps and artificial-channel dredging above the traps may influence the ground-water flow regime(s) near the Ten Site and Mortandad Canyon confluence; hence, seepage into the underlying tuff beneath the canyon alluvium may be greater than normal in this area.

6. Page 14, Quality of Mortandad Canyon Alluvial Ground Water

Downward contaminant trends in Mortandad Canyon ground water.

See Comment 1.

APPENDIX E

7. Page E-1, Hydrologic Setting of Mortandad Canyon, first paragraph.

The canyon contains a shallow body of ground water recharged by industrial effluent and runoff. The spatial extent of this saturation is within the Laboratory boundaries, extending from near the plant outfall on the west to near observation well MCO-8 (Figure 3.0). Transverse to the canyon axis, the saturation does not extend to the canyon walls.

Water-level data and measurement dates for all wells and assumed dry wells should be included to provide a complete description of the extent of saturation.

8. Page E-1, Hydrologic Setting of Mortandad Canyon, second paragraph.

Due to the small drainage area and the large volume of unsaturated alluvium there has been no continuous surface runoff through the canyon extending off the Laboratory since hydrologic observations began in 1960. The largest runoff *events have extended no further than a hundred or so meters past the sediment traps.*

- According to the RFI Work Plan for OU 1129, May 1992, radioactive liquid waste effluent was routinely discharged into Ten Site Canyon prior to 1960. Also, there were spills of highly contaminated liquid wastes and sludge into Ten Site Canyon from 1952 through 1956.

- DOE OB storm-water data, collected on August 29, 1995, show elevated levels of gross alpha (100 pCi/L +/- 7.7) and gross beta (87 pCi/L +/- 12) at State road 4, nearly 2 miles south of LANL property. Screening Levels for gross alpha and beta are 5 pCi/L and 50 pCi/L respectively. The Livestock Watering standard for gross alpha is 15 pCi/L.

The DOE OB is concerned that large storm events prior to 1960 may have transported contaminants via surface water downstream from the sediment traps, and that contaminants are being remobilized and transported by contemporary storm events. This remobilization may be responsible for the elevated gross alpha/beta levels detected in storm water at State Road 4.

9. Page E-1, Hydrologic Setting of Mortandad Canyon, third paragraph, fourth sentence.

The stream flow in this section is perennial from waste water and periodic releases of industrial effluents.

The DOE OB questions whether stream flow in upper Mortandad Canyon is actually perennial based on recent observations. Between October 1, 1995 and September 30, 1996, 156 days of no-flow conditions were recorded at Gaging Station #08313200 which is located approximately 500 ft east of the TA-50 outfall (Shaull et al., 1996b.

10. Page E-1, Hydrologic Setting of Mortandad Canyon, fourth paragraph.

To prevent the transport of contaminants by storm runoff out of the lower canyon, three sediment traps have been constructed between MC0-7 and MCO-7.5.

The sediment traps probably act as ground-water recharge points, and may affect ground-water quality. LANL may want to implement some type of in-situ remedial system/barrier at the bottom of the traps (e.g., absorption liner).

11. Page E-2, Extent of Saturation in Mortandad Canyon, first paragraph.

The saturated canyon alluvium is of limited extent as the recharge (effluents, waste water, and storm runoff) is sufficient only to maintain a saturated zone in the alluvium extending about 2.2 mi downstream from the outfall location (about the edge of the conceptual illustration in Figure 3.0, near observation hole MCO-8).

- Water-level data and measurement dates for all penetrations, including dry penetrations, should be included to provide a more complete description of the extent of saturation.

- The lateral extent of saturation may extend to at least MCO-13. On February 11, 1996, DOE OB, along with an LANL ESH-18 escort, detected water in MCO-13 at approximately 105' below land surface and collected two liters of sample (no purging was conducted due to the lack of time). Field specific conductance was measured at 716 uS/cm, which closely matches that of shallow perched ground water. The remaining sample was sent to DOE OB's contract laboratory for the analysis of tritium, NO2/NO3 as N and ^{90}Sr. Preliminary results for NO2/NO3 as N and ^{90}Sr are 19 mg/L and 3.8±2.3 pCi/L respectively. These data suggest that saturation may seasonally extend farther to the east than previously thought.

12. Page E-2, Extent of Saturation in Mortandad Canyon, second paragraph.

Test holes drilled or cored through the alluvium indicate that the underlying tuff, weathered to silts and clays immediately below the alluvium, is not saturated. The saturated portion of the alluvium is perched on the weathered-unweathered tuff. Moisture content generally declines to less than 50 percent of saturation conditions both transverse to canyon axis and at depth. Test holes completed in the weathered tuff below the saturated alluvium will not yield free water.

- Moisture content approaching 90% of saturation was encountered at the Tsankawi Pumice Bed and Cerro Toledo interval contact during the drilling of MCM-5.9, and it appears that other penetrations (SHB-4 and corehole 35-2028) in the same area may have encountered saturated or near saturated conditions within these units.

The DOE OB recommends that LANL characterize and monitor ground water (if present) within the Tsankawi Pumice Bed, the Cerro Toledo interval and the Guaje Pumice Bed.

If there are any questions concerning the review of these sections, please contact me at 672-0448 or Michael Dale at 672-0449.

Sincerely,

Steve Yanicak, LANL POC
Department of Energy Oversight Bureau

SY:mrd

cc: Bob Simeone, DOE LAAO, FU-4 FPC, MS A316
Allyn Pratt, LANL, FU-4 FPL, MS J521
Steve Rae, LANL, ESH-18, MS K490
Ed Kelley, NMED, Chief, SWQB
John Parker, NMED, Chief, DOE OB
Benito Garcia, NMED, Chief, HRMB
Marcy Leavitt, NMED, Chief, GWQB

c:\...\ta50rev2.aip
4.4.97

Phyllis

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
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GARY E. JOHNSON
GOVERNOR

4/21 P 181 653 421

US Postal Service
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Street & Number 528 35th Street
Post Office, State, & ZIP Code Los Alamos, NM 87544
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CERTIFIED MAIL - RETURN RECEIPT REQ

April 21, 1997

Mr. Tom Todd, Area Manager
528 35th Street
Los Alamos, New Mexico 87544

RE: Request for Additional Information, LANL, Radioactive Liquid Waste Treatment Facility (TA-50), DP-1132

Dear Mr. Todd:

The New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) has received and reviewed the discharge plan application for the Los Alamos National Laboratories (LANL), Radioactive Liquid Waste Treatment Facility (RLWTF) dated August 16, 1996. Prior to approval of the discharge plan, DP-1132, clarification of information submitted and/or additional information will be required. Please respond to the following items in writing within 60 days of receipt of this letter.

Operational Plan:

1. Prior to implementing a final treatment process for Phase II upgrades, LANL must receive approval from NMED.

   Phase II Treatment System Upgrades at the RLWTF, page 7, states:

   > Determination of satisfactory contaminant removal and operational performance for interim use will be made by DOE and the Laboratory in coordination with NMED.

   The section does not state that final selection for the treatment process will be made in coordination with NMED.

   Please commit to submitting a report to the GWQB after completion of the pilot tests which includes the following:

   a. RLWTF's preferred method of nitrate removal and an explanation supporting the preference,

b. influent nitrate, fluoride, and total dissolved solids (TDS) concentrations to each pilot process,

c. effluent nitrate, fluoride, and TDS concentrations from each pilot process.

The report must be received and approved by NMED prior to implementing a final treatment process for Phase II upgrades.

2. The discharge plan application is unclear about the effluent quality that will be achieved by Phase II upgrades. The Executive Summary, page 1, states:

> ...RLWTF treatment processes will be upgraded during Phase I and II to enable the treated effluent to meet or exceed WQCC ground water standards for nitrate (NO3-N) and fluoride...

The contingency plan, page 20, states:

> After January 31, 1998, as a contingency against discharging nitrates (NO3-N) in excess of WQCC standards, each batch of treated effluent will be screened for nitrates prior to discharge. This will enable plant operators at the RLWTF to minimize their response time to sub-standard treatment process performance.

As stated, it appears that the effluent concentrations may be greater than ground water standards. Please clarify, whether treated effluent exceeding WQCC Regulation 3103 ground water standards will be discharged to effluent canyon, tributary to Mortandad Canyon, after implementation of Phase II upgrades.

Monitoring Plan:

3. The GWQB does not agree that the data presented in the discharge plan application is sufficient to adequately demonstrate that nitrate and fluoride concentrations in ground water are consistently decreasing.

The Executive Summary, page 1, and the Quality of Mortandad Canyon Alluvial Ground Water, page 14, state that the overall nitrate and fluoride concentrations are trending downward and bases this on the data in table 2.2, (Mortandad Canyon Alluvial Ground Water Monitoring Stations: 1981-1995: Nitrate Concentrations), and the graphs provided in figures 3.0, (Nitrate Concentrations in Six Mortandad Canyon Monitoring Wells from 1981 to 1995), and 3.1, (Fluoride Concentrations in Six Mortandad Canyon Monitoring Wells from 1981 to 1995). The data and graphs illustrate fluctuations with various increases and decreases depending on monitor well and constituent. In addition, the scale of the graphs does not adequately illustrate concentrations relative to WQCC Regulation 3103 standards. Table 1.1, NPDES Monitoring Data for Outfall 051: January 1994-May 1996, shows that the average nitrate concentrations in water discharged from the RLWTF to Mortandad Canyon in 1996 was 4 times higher than in 1995. The increase in nitrate concentrations in effluent discharges may reverse any downward trends in ground water that have been suggested in the discharge plan application.

Based on the information provided in the discharge plan application, the GWQB does not agree that there is sufficient data to substantiate a consistent downward trend in constituents currently exceeding WQCC Regulation 3103 standards. Additional ground water monitoring will be required to determine any long term trends.

4. The GWQB does not believe that the proposed frequencies constitute adequate monitoring of the quality of Mortandad Canyon's alluvial ground water.

   The Executive Summary, page 1, states that:

   > ...using a network of six ground water monitoring wells the Laboratory will closely monitor the quality of Mortandad Canyon's alluvial ground water to demonstrate that the improvements in water quality are consistent with the NMWQCC standards.

   Table 3.0., Proposed Monitoring Plan for the RLWTF Ground Water Discharge Plan Application, page 22, provides a list of monitor wells, the parameters for analysis, and the monitoring frequencies. Well MCO-6 is the only monitor well proposed to be sampled on a quarterly bases. The proposal for the other monitor wells is annually.

   Please commit to quarterly sampling of all monitor wells listed in table 3.0 and analyzing the ground water samples for nitrate as nitrogen, fluoride, and TDS and any other constituent currently exceeding WQCC numerical standards. Should ground water concentrations drop below WQCC numerical standards for 4 consecutive quarters of monitoring and effluent concentrations do not exceed WQCC numerical standards for any constituent, LANL may request an amendment to their monitoring plan to reduce the frequency of sampling.

5. The system of monitor wells in Mortandad Canyon is not

adequate to monitor ground water quality as required by WQCC Regulations.

Table 3.0 states that the monitor wells to be sampled are 3,4,5,6,7,and 7.5.

a. On page 10, number 10., it is stated that MCO-3 has been out of service since 1993 due to erosion around the well casing, and that as a contingency, the Laboratory proposes to substitute a surface water sampling station, GS-1, if MCO-3 is unavailable for sampling.

The GWQB does not find this contingency acceptable. WQCC Regulation 3103 standards are for dissolved concentrations in ground water. A surface water sample is not a substitute for ground water monitoring.

Please commit to repairing MCO-3. If MCO-3 cannot be repaired, please abandon the well as to preclude migration of surface runoff or ground water along the well casing, and propose, for GWQB approval, a location for the installation of a replacement well between the TA-50 outfall and MCO-3 for routine sampling of ground water.

b. During a site visit, November 7, 1996, GWQB staff observed that the outer casing on MCO-4 had dropped below the inner pvc well casing and the well was not covered.

Please commit to repairing MCO-4. If MCO-4 cannot be repaired, please abandon the well as to preclude migration of surface runoff or ground water along the length of the well, and propose, for GWQB approval, a replacement well for routine sampling of ground water.

c. All of the monitor wells proposed for ground water monitoring are completed in the perched alluvial aquifer in Mortandad Canyon. In the discharge plan application on pages 14, and 18, and in appendix E, Purtymun (1977), it is stated that ground water from the alluvial aquifer seeps into the underlying tuff. It is also stated in appendix E, page 4, that a 1994 sampling of test well 8, a main aquifer well, showed a nitrate (as Nitrogen) value of 5.1 mg/L, while all other values since 1988 were 0.2 mg/L or less.

Based on the downward migration of alluvial aquifer ground water and the increase in nitrate concentrations in the main aquifer in Mortandad Canyon, the GWQB is requesting monitoring of the main aquifer.

Please commit to quarterly sampling and analysis of a ground water sample from a monitor well completed in the main aquifer. Please propose, for GWQB approval, a monitor well for routine monitoring of the main aquifer.

d. On page 13, Table 2.1, Well Characteristics of Mortandad Canyon Observation Wells, monitor well information is provided as; the "depth drilled" and the "depth completed". The table does not provide information on the screened section for each of the proposed monitor wells.

Contingency Plan:

6. The contingency submitted in the discharge plan application does not adequately describe the actions to be taken for the protection of ground water in the event of a contaminant spill or failure of the treatment process. The contingency plan, page 20, states that there are three main contingency plans to address actions that will be taken in the event of an emergency spill at the facility: 1) Contingency Plan; 2) Spill Prevention Control and Countermeasure Plan (SPCC); and 3) LANL Emergency Management Plan.

   a. Two of the three plans listed, the Contingency Plan and the LANL Emergency Management Plan enclosed in Appendix G do not include specific information describing the actions to be taken in the event that spills or failure of the treatment process occur or ground water standards are threatened. The SPCC was not included due to size.

   Please submit a contingency plan describing the actions to be taken in the event of a contaminant spill or failure of the treatment process. The actions should be directed at containment of the contaminant discharged and disposal of the affected substrate. Please include the actions to be taken in the event of WQCC Regulation 3103 exceedances in ground water.

   b. The contingency plan, page 21, states:

> The Laboratory's approach in developing corrective actions for this ground water discharge plan is based upon Purtymun's research (1977) and the data record for Mortandad Canyon; both strongly indicate that after reducing the input of contaminants from RLWTF effluent the alluvial ground water will naturally attenuate to below WQCC ground standards.

> ...in the event that these corrective actions prove to be inadequate, the Laboratory is committed to revisiting its approach and evaluating alternate actions.

The contingency plan and corrective actions submitted as part of the discharge plan application does not provide enough information to determine if the proposed corrective actions will be adequate to restore ground water in Mortandad Canyon to below WQCC ground water standards, and may not be an approvable contingency plan for the discharge permit. Prior to approving the corrective actions as part of the discharge permit, NMED must receive the following:

1. an accurate definition (vertical and horizontal extent) of the contamination in the alluvial aquifer of Mortandad Canyon with concentrations of all WQCC constituents currently exceeding standards from all sampling points used to define the plume. Additional wells, or transects of wells may be needed to complete this requirement.

2. well logs and well construction details of all wells used to define the plume and the depth at which samples were taken from each well,

3. a ground water level surface map of the alluvial aquifer based on all wells drilled in the alluvial aquifer in Mortandad Canyon,

4. information demonstrating whether or not an intermediate aquifer exists in Mortandad Canyon. If an intermediate aquifer does exist in Mortandad Canyon, ground water quality will need to be determined, and monitoring of the intermediate aquifer will need to be incorporated into the monitoring plan,

5. water quality analysis for samples taken from the regional aquifer. If water quality analysis indicates exceedances of WQCC ground water standards, the extent of the contamination must be defined.

6. water quality data from water above the TA-50 outfall, and

7. a time frame in which additional corrective actions will be proposed if concentrations do not drop below

WQCC Regulation 3103 numerical standards. This may be based on modeling, but determination of the effectiveness of the corrective actions must be confirmed by sampling and analysis.

Closure Plan:

6. The closure plan submitted in the discharge plan application does not provide sufficient detail. The closure plan, page 23, states:

> Currently, Los Alamos National Laboratory has no plans to discontinue RLWTF system components or abandon Mortandad Canyon ground water monitor wells during the term of the discharge permit. When the facility is ultimately closed it will be monitored, decontaminated, and decommissioned in accordance with applicable state and federal requirements.

The GWQB recognizes that LANL has no intentions of discontinuing use of the RLWTF during the term of the discharge permit, however, prior to discharge plan approval, the GWQB will need additional information for the closure plan.

a. The closure plan does not commit to a specific monitoring plan for any designated length of time after cessation of operations at the RLWTF.

Please commit to monitoring ground water at the same frequency and locations at the time of closure for at least two years after closure. This may be modified at the time of closure depending on ground water conditions at that time.

b. The closure plan does not commit to disconnecting all pipes and other wastewater works which could allow for any discharge to occur after cessation of operations.

Please commit to disconnecting and/or plugging all pipes and wastewater works that could allow a liquid waste discharge after cessation of operations at the RLWTF.

c. The closure plan does not commit to plugging and abandoning all monitor wells.

Please commit to plugging and abandoning all monitor wells once it has been determined by NMED that ground water monitoring will no longer be required.

d. The closure plan does not provide a contingency plan with corrective actions should WQCC 3103 standards be exceeded at the time of closure.

Please commit to taking corrective actions to remediate any contaminated ground water existing at the time of closure.

If you have any questions pertaining to the requests in this letter, please call me at 827-0166.

Sincerely,

Phyllis Bustamante

Phyllis Bustamante
Water Resource Specialist
Pollution Prevention Section

xc: James Bearzi, District Manager, NMED District II
Ralph Ford-Schmid, DOE Oversight Bureau
Bob Beers, LANL, MS K497, Los Alamos, New Mexico 87545

RLWTF SURVEY RESULTS --- ACCELERATOR-PRODUCED ISOTOPES

EM-RLW --- TA-50

Accelerator-produced tritium: Terry Filer (EM-RLW)/monthly analysis of TA-53 samples;
volume: avg = 200 - 300 ml max = 400 ml;
concentration: avg = 20 µCi/L max 120 µCi/L = April very unusual (Feb = 10µCi/L Mar = 20 µCi/L);
WPF=no

Other accelerator-produced isotopes: none

CST-25 -- TA-48 WMC: Matt Roybal (5-9054)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: generator/process: Keaton, Richard (CST-11); see attached (1)

ESA-FM --- TA-3 SM-102 WMC: Elmer Valasquez (5-6088)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

ESA-FM --- TA-21 WMC: Al Stadelmeir (7-9746)

Accelerator-produced tritium: Current status: none
Future project: Will Fox/Terry Buxton, ESA-TSE (7-1510); TA-21-209, R & D to determine the amount of tritium formed in targets in the Accelerator Production of Tritium (R&D) APT targets; unknown volumes and concentrations

Other Accelerator-produced isotopes: none

CST-26 --- TA-3-29 (CMR) WMC: Rick Staroski (5-6851)

Accelerator-produced tritium: none
Other Accelerator-produced isotopes: none

CST-25 --- TA-21-216 WMC: Joe Richardson (7-7348)

Accelerator-produced tritium; none
Other accelerator-produced isotopes: none

MST-FAC --- TA-3-66/32/34/210/1698 WMC: Darryl Garcia (7-2410)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

MST-FAC --- TA-35-TSL213 WMC: Darryl Garcia (7-2410)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

06-04-97

RLWTF SURVEY RESULTS --- ACCELERATOR-PRODUCED ISOTOPES

NMT-7 --- TA-55-PF4 WMC: Lorenzo Trujillo (7-2410)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

CST-25 --- TA-50-37/69 WMC: Loren Abercrombie (7-0813)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

JCI - all drains leading to RLWTF WMC: Richard Perkins (7-0401)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

CST-26 --- TA-3-29 WMC: Joe Gonzales

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

ESH-4 --- TA-3-2009/SM65 WMC: Randa Brown

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

BUS-4 --- TA-3-30 WMC: Robert T. Travis (7-2959)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

P-22 --- TA-3-216 WMC: Terry Langham (5-3041)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

CST-25 --- TA-59-OH1 WMC: R. Valasquez (5-6814)

Accelerator-produced tritium: none
Other accelerator-produced isotopes: none

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

July 21, 1997

Mr. G. Thomas Todd, Area Manager
Los Alamos Area Office
Department of Energy
528 35th Street
Los Alamos, New Mexico 87544

Dr. Sigfried Hecker, Director
Los Alamos National Laboratory
P. O. Box 1663, MS A100
Los Alamos, New Mexico 87545

RE: Change in Status of the Technical Area (TA) 53 Surface Impoundments
Los Alamos National Laboratory
NM0890010515

Dear Mr. Todd and Dr. Hecker:

The Hazardous and Radioactive Materials Bureau (HRMB) of the New Mexico Environment Department (NMED) is informing the Department of Energy (DOE)/LANL that a change in status of the three Surface Impoundments at TA-53 from a Treatment, Storage, Disposal (TSD) Unit to a Corrective Action Status under the Hazardous and Solid Waste Act (HSWA) has been approved. A closure plan for the impoundments is no longer necessary, as requested by NMED in the past. The northeast and northwest impoundments are numbered as Solid Waste Management Units (SWMU) 53-002(a and the south impoundment as SWMU 53-002(b). These SWMU's are currently listed on the HSWA Permit and shall follow the corrective action process under the Environmental Restoration (ER) Program. A RFI Workplan for the impoundments shall be submitted to HRMB within 180 days from the receipt of this letter.

Should you have any questions regarding this letter, please contact me or Mr. John Kieling, HRMB's LANL Facility Manager, at (505) 827-1558.

Sincerely,

Robert S. (Stu) Dinwiddie, Ph.D., Manager
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau

RSD:jek

cc w/ attachments: T. Baca, LANL EM-DO, MS J591
T. Davis, NMED HRMB
B. Garcia, NMED HRMB
T. Glatzmaier, LANL DDEES/ER, MS M992
K. Hill, NMED HRMB
J. Jansen, LANL EM/ER, MS M992
M. Johansen, DOE LAAO, MS A316
J. Kieling, NMED HRMB
M. Leavitt, NMED GWQB
H. LeDoux, DOE LAAO, MS A316
D. McInroy, LANL EM/ER, MS M992
D. Neleigh, EPA, 6PD-N
J. Parker, NMED DOE OB
S. Pierce, NMED SWQB
J. Plum, DOE LAAO, MS A316
G. Saums, NMED SWQB
T. Taylor, DOE LAAO, MS A316
S. Yanicak, NMED DOE OB, MS J993
File: HSWA LANL 2/1100/53
File: RED LANL TA-53 '97
Track: LANL, doc date, NA, DOE/LANL, HRMB/jek, RE, file

A:\TA_53.WPD 7/21/97

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

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GROUNDWATER BUREAU

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Dale Doremus
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Dear Ms. Doremus:

Subject: Revisions to Los Alamos National Laboratory's (LANL) Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility at Technical Area (TA) 50

In August 199~~7~~6, LANL submitted a Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. Phase I Upgrades (tubular ultrafiltration and reverse osmosis) proposed in the plan were scheduled to be fully operational by June 1997 (see Table 1.0 on page 8). Due to delays in procuring process equipment, the Phase I Upgrades will not be fully operational until October 1997. Enclosed is a revised Table 1.0 which reflects this schedule change. The revised dates are listed in bold type.

Phase II Upgrades (nitrate removal) have not been impacted by Phase I delays. Phase II Upgrades are progressing as originally scheduled in Table 1.0 of the Discharge Plan Application.

Please call Bob Beers of LANL's Water Quality and Hydrology Group (ESH-18) at (505) 667-7969, or Bonnie Koch of the DOE/Office of Environment and Projects at (505) 665-7202, if you need any additional information concerning this revision to LANL's Radioactive Liquid Waste Treatment Plant's Discharge Plan Application.

Sincerely,

G. Thomas Todd
Area Manager

LAAMEP:9BK-017

Enclosure

cc:
See page 2

APR. 2 4 1997

cc w/enclosure:
P. Bustamente
  Ground Water Quality Bureau
  New Mexico Environment Dept.
  1190 St. Francis Drive
  P. O. Box 26110
  Santa Fe, NM 87502
G. Saums
  Surface Water Quality Bureau
  New Mexico Environment Dept.
  1190 St. Francis Drive
  P. O. Box 26110
  Santa Fe, NM 87502
M. Johansen, Acting AAMEP, LAAO
J. Mack, LAAMEP, LAAO
B. Koch, LAAMEP, LAAO
T. Baca, EM-DO, LANL, MS-J591
D. Erickson, ESH-DO, LANL, MS-K491
D. Woitte, LC/GL, LANL, MS-A187
K. Hargis, EM/WM, LANL, MS-J591
S. Rae, ESH-18, LANL, MS-K497
S. Hanson, EM/RLW, LANL, MS-E518
B. Beers, ESH-18, LANL, MS-K497
A. Bond, EM/RLW, LANL, MS-E518
WQ&H File, (ESH-18/WQ&H:97-0094-1),
  LANL, MS-K497
K. McAda, EPD, AL

Table 1.0. Summary of Completed, In Progress, and Proposed Upgrades to the RLWTF. (Revised on April 3, 1997. Revised dates are in bold italics).

Plant Integrity Upgrades	**Start Date**	**Completion Date**
• Eliminate Influent from the Solids Section of the Grit Chamber.	August, 1990	Sept., 1990
• Install New Neutralization Chamber & Monitoring Station to Eliminate Grit Chamber Function.	August, 1990	August, 1993
• Install New Collection Lines from TA-55 to TA-50.	August, 1990	June, 1995
• Replace WM-66 Acid Tank with New SS Tank.	January, 1994	August, 1994
• Non-Destructive Testing of All Concrete Tanks.	June, 1994	December, 1994
• Non-Destructive Testing of all Steel Tanks.	May, 1993	September, 1993
• Refurbish Clarifiers (2).	August, 1995	October, 1996
• Install New Influent Tank Farm.	Dec., 1993	Dec., 1996
• Video Inspect Pipelines & Pressure Test Equipment.	April, 1995	On-Going
Phase I Process Upgrades: TUF and RO	**Start Date**	**End Date**
• BAT Evaluation Conducted per DOE Order 5400.5.	April, 1992	May, 1995
• Engineering of Phase I Upgrades.	February, 1994	June, 1996
• Procurement, Installation, and Start-Up.	May, 1996	***Sept, 1997***
• Test-Out Period.	***Sept, 1997***	***October, 1997***
• Phase I Fully Operational.	----	***October, 1997***
Phase II Process Upgrades: Nitrate Removal	**Start Date**	**End Date**
• BAT Evaluation Conducted.	April, 1992	May, 1995
• Parallel Evaluation of Available Technologies by RLWTF and an Independent Consultant.	March, 1996	June, 1996
• NEPA Review of Process Upgrades.	February, 1996	Sept., 1996
• Parallel Engineering of 3 Options.	July, 1996	June, 1997
• Parallel Pilot Testing of 3 Options:		
1) Evaporation.	October, 1996	May, 1997
2) Biological Denitrification.	October, 1996	April, 1997
3) Selective Ion Exchange.	October, 1996	March, 1997
• Evaluation of Pilot Testing.	May, 1997	June, 1997
• Selection of Nitrate Removal Process.	June, 1997	July, 1997
• Procurement of Equipment, Installation and Start-Up.	July, 1997	January, 1998
• Phase II Upgrades Fully Operational.	----	January, 1998

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Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

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Environmental Restoration Program
Los Alamos, New Mexico 87544
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JUN 16 1997
GROUNDWATER BUREAU

Date: June 13, 1997
Refer to: EM/ER:97-227

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: RESPONSE TO THE REQUEST FOR SUPPLEMENTAL INFORMATION TO THE NOD RESPONSE FOR RFI REPORT FOR PRSs 50-004(a, c) AND 50-011(a) IN TA-50 (FORMER OU 1147)

Dear Mr. Garcia:

Enclosed is a copy of the Los Alamos National Laboratory's response to the New Mexico Environment Department's request for additional information to the Notice of Deficiency response concerning the Resource Conservation and Recovery Act Facility Investigation Report for Potential Release Sites 50-004(a, c) and 50-011(a) in TA-50. A certification form signed by the appropriate officials is also enclosed. The enclosed response repeats each comment verbatim from the request for additional information for convenience in reviewing.

Please contact Don Krier at (505) 665-7834 or Mike Gilgosch at (505) 667-5794 if you have any questions regarding the response to the request for additional information.

Sincerely,

Jorg Jansen, Program Manager
LANL/ER Project

Sincerely,

Theodore J. Taylor, Program Manager
DOE/LAAO

JJ/TT/ss

Enclosures: (1) Interim Action Report for PRSs 50-006(a) TA-50
(2) Certification

Cy (w/ enc.):
M. Gilgosch, LAAO, MS A316
D. Griswold, AL-ERD, MS A906
J. Harry, EES-5, MS M992
D. Krier, EES-1, MS D462
N. Naraine, DOE-HQ, EM-453
D. Neleigh, EPA, R.6, 6PD-N
C. Rodriguez, CIO, MS M769
T. Taylor, LAAO, MS A316
J. White, ESH-19, MS K498
EM/ER CT # C274
RPF, MS M707

S. Dinwiddie, NMED-HRMB
M. Leavitt, NMED-GWQB
J. Parker, NMED-OB
G. Saums, NMED-SWQB
S. Yanicak, NMED-OB, MS J993

Cy (w/o enc.):
T. Baca, EM, MS J591
T. Glatzmaier, DDEES/ER, MS M992
D. McInroy, EM/ER, MS M992
G. Rael, AL-ERD, MS A906
W. Spurgeon, DOE-HQ, EM-453
J. Vozella, LAAO, MS A316
K. Zamora, LAAO, MS A316
EM/ER File, MS M992

CERTIFICATION

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

Document Title: Response to the Request for Supplemental Information for RFI Report for PRSs 50-004(a, c) and 50-011(a) in TA-50 31-001 (Former OU 11147)

Name: ______________________ Date: 6-13-97

Jorg Jansen, Program Manager
Environmental Restoration Project
Los Alamos National Laboratory

or

Tom Baca, Program Director
Environmental Management
Los Alamos National Laboratory

Name: ______________________ Date: 6/13/97

Joseph Vozella,
Acting Assistant Area Manager of
Environment Projects
DOE-Los Alamos Area Office

or

Theodore J. Taylor, Program Manager
Environment Restoration Program
DOE-Los Alamos Area Office

SUBJECT: Responses to the NMED's "Request for Supplemental Information for the RCRA Facility Investigation (RFI) Report for Potential Release Sites (PRSs) in Technical Area 50, SWMUs 50-004(a, c) and 50-011(a), at Los Alamos National Laboratory (LANL) NM0890010515" dated May 8, 1997

This letter is the LANL Environmental Restoration Project's response to NMED's Request for Supplemental Information (RSI), dated May 8, 1997, for the TA-50 Decommissioned Waste Line RFI Report. Each point raised by NMED is quoted below and the response follows each point.

Also, we note that your earlier Notice of Deficiency (dated August 19, 1996) for this report indicated that "LANL may request a Class 3 permit modification for SWMU 50-011(a) under No Further Action Criterion 5..." The current RSI appears to walk back from that conclusion, which was generated through an Environmental Protection Agency review of the report.

NMED General Comment 1: "In the revised RFI Report provide information regarding human and ecological risk assessment for SWMUs 50-004(a & c) and 50-011 (a)."

Response to NMED Comment: Chapter 3 of the RFI report provides information on the human health assessment procedure used for evaluating these PRSs. An ecological risk assessment was not performed because it was determined that these subsurface PRSs would not pose an ecological impact due to the industrial setting of TA-50 where most of the site is covered either by buildings or asphalt. However, the Laboratory ER Project, in cooperation with the NMED and EPA Region 6, is developing an approach for ecological risk assessment. This site will be evaluated for ecological concerns as soon as the ecological risk screening assessment methodology is developed, approved, and conducted for this ecological exposure unit.

NMED General Comment 2: "In the revised RFI Report, please include the following information for SWMUs 50-004 (a & c) and 50-011 (a): 1) the organic vapor readings and any associated notes (field screening) for each soil interval from each soil coring; 2) the field laboratory measurement results (especially for the volatile organics) for each soil interval from each soil coring; 3) the lithologic soil descriptions for each soil coring, which would include any noted visual or olfactory contamination. Best Professional Judgment"

Response to NMED Comment: An HNU photo ionization detector was used to screen each core barrel as it was opened. There were no measurements above 1 ppm. A field laboratory was not used for analysis of the core: all volatile organic analyses were completed at an off-site (contract) laboratory. Copies of the lithologic logs for the core holes are in Attachment 1. Field screening results are shown on the lithologic logs.

NMED General Comment 3: "In the revised RFI Report please include the following for SWMUs 50004(a) and 50-011(a): 1) A table showing the metal, volatile, and semivolatile results for each soil interval analyzed. The table shall include the analytical method used for each "active" sample, and the detection limit for each sample analyzed. The background concentrations for metals and radioactivity shall also be included in this table. Best Professional Judgment."

Response to NMED Comment: The table with the requested information can be found in Attachment 2.

"Page 1-3 of the RFI Report; Section 1.2.1.1: This paragraph mentions that contaminated soil was removed where the pipe leaked, what was the approximate depth (or the depth range) of removal of these areas? Best Professional Judgment."

Response to NMED Specific Comment: Section 1.2.1.1 refers to PRS 50-004(a) and this response is directed to that PRS. The depth of the trench ranged from 5 to 6 feet deep. Obviously, fill material in the trench was removed down 5 to 6 feet in order to remove the pipeline during the earlier decommissioning activities. It is not clear from the available information the depth of the soil (if any) below the pipe which was removed at that time. However, consolidated tuff was encountered during the drilling of our recent core holes and thus samples were collected at or below the depth of where the pipeline leaked. Analytical results from these core samples indicate only low or no levels of contamination.

"Page 5-2 RFI Report, Table 5 1: This table indicates that soil sample AACO258 was taken at .75-1.5 feet; sample AAO259 was taken at 1.5-3.0 feet; and, sample AAB6106 was taken at 3.5-4.25 feet. Previous pages in the report indicate that the trench was 5 to 6 feet in depth, were these samples taken erroneously or did the trench depth change in those locations? Please clarify in the revised RFI Report. Best Professional Judgment."

Response to NMED Specific Comment: Samples AAC0258, AAC0259 and AAB6106 were collected from core hole 50-3028. No samples were erroneously taken. As explained on page 5-2 of the RFI report , core hole 50-3028 was drilled in an open area between Buildings 54 and 69. The original ground surface was lowered by several feet during the construction of these buildings. The present-day ground surface is therefore at or near the pipeline trench bottom. This accounts for the apparent shallow depth of the collected samples.

"Page 5-9 of the RFI Report; Section 5.2.4: Corehole RDH-3 was not drilled. What alternative investigation technique is LANL planning to replace the corehole work? Also, sample borehole 50-023 was not performed due to overhead utility lines, can the sample location be moved to either side by 10-20 feet, without being affected by the overhead utility line? In addition, soil sample location 50-3024 was not found in Table 5-6. Please include it in the revised report. Best Professional Judgment."

Response to NMED Specific Comment: The radial core holes are scheduled to be drilled in fiscal year 1999 as part of the TA-50-1 building investigation. Subsurface samples were collected at location 50-3023 by hand augering. It is LANL's position that additional core holes (radial or vertical) are unnecessary to characterize the decommissioned waste lines. The waste lines were reported to have leaked at several locations, yet the sample analysis data at 34 core holes show little or no contamination present. The presence of numerous buildings and structures at TA-50 over the former waste lines severely limit potential drilling sites. Open areas between buildings are further restrictive to drilling by the presence of underground and overhead utilities. LANL believes that potential safety and environmental hazards posed by additional drilling at former TA-50 waste lines outweighs any benefits gained from additional sampling, and requests that no further characterization be required for PRSs 50-004(a, c). Sample location 50-5024 was drilled at a location common to both PRSs 50-004(a) and 50-004(c). This sample was evaluated with the 50-004(a) data and the requested information on 50-3024 is found in Table 5-1 in the RFI report.

"Page 5-14; Page 5-14: Sample AAC0230 at the 6-7 foot interval was found to be almost 3 times the background concentration for lead. NMED recommends deeper sampling at this location. Best Professional Judgment."

Response to NMED Specific Comment: Although this lead value (70.1 mg/kg) is above background, there were no other elevated inorganic or radiochemical values reported for the three sampled intervals in this core hole. The decommissioned waste line carried radioactive and chemical wastes. Hence, it would not be unreasonable to expect to find other elevated chemicals levels in the core hole samples. It should also be noted that the reported lead value is an order of magnitude less than the screening action level for lead

(400 mg/kg). The lead value for sample AAC0230 appears to be an anomaly and further sampling based on this low concentration is not warranted.

"Page 5-18; Table 5-9: Table 5-9 does not include the semivolatile results. Also, please include the analytical method used and the detection limit for each result. Best Professional Judgment."

Response to NMED Specific Comment: Table 5-9 does not include the semivolatile results because none were detected. However, a supplemental table with the semivolatile results is enclosed as Attachment 3.

"Page 5-21; Field Investigation: Please include a larger scaled map of the decommissioned septic tank system showing the locations of the soil corings. Also, NMED disagrees with LANL's conclusion that the 45 degree corehole (as required in the approved workplan) which was supposed to intersect the 50 foot shaft is not needed. NMED will require this coring, although it may not be necessary for the coring to be at an 45 degree angle. It would appear that a boring placed next to the 50 foot "drywell" would be sufficient, provided that appropriate sampling intervals were included and that the boring went 55-60 feet in depth. Best Professional Judgment."

Response to NMED Specific Comment: Building TA-50-83 is located over the seepage pit and it is not clear how close a vertical core hole could be drilled to the pit. It seems likely that an angled core hole might be required. The planned drilling activities at TA-50 (building TA-50-1) are currently scheduled for fiscal year 1999 and it is requested that drilling of the core hole be deferred until that time. As requested, a larger scaled map of the decommissioned septic tank system is included as Attachment 4.

Attachment 1

LOS ALAMOS NATIC   L LABORATORY ENVIRONMENTAL F   TORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3004 TA/OU 50/1147 Drill Depth From 0 To 10 Page 1 of 1

Driller Elmer Velasque Box #(s) ——— Start Date/Time 11-7-94/13:47 End Date/Time 11-7-94/14:03

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 0.5'/5'		α = 0 βγ = 215 VOC = 0 reading on cuttings 11/28/94	N/A	0-0.5' - med brown fine clay w/ 5-10% med-coarse sand, 60-70% rounded gravels, 20-25% angular clasts of asphalt.	N.C.	FILL	13:47 Cuttings ≅ 90% rounded gravels very loose. 13:50/13:52/13:53
6.0 7.0 8.0 9.0 10.0	Run 2 5'/5'	AACO 270 5.0-6.25' + Rad/Metal AACO 271 6.25-7.25' + Rad/Metal	α = 0 βγ = 182 VOC = 0		5.0-6.25' - SAA. % fine clay increases. 6.25-10.0' - Pink grey tuff w/ 30-50% phenos (qtz, sanidine, Feox), 3-5% grey white, sugary, rexstlzd pumice, moderately welded.		TSHIREGE MEMBER OF BANDELIER TUFF	Cuttings w/ finer material. 14:00/14:03/14:06
11.0 12.0					TD = 10' Recovery = 5.5'/10' = 55% Drill Rate = 10'/16m = 0.625'/min			0:16.

Prepared By R. Evans Date 11-9-94 Checked By Date 10-16-94

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LOS ALAMOS I IONAL LABORATORY ENVIRONMEN . RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3005 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 10-27-94/12:10 End Date/Time 10-27-94/12:28

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2.75'/5'		α = 1cpm βγ = 223 VOC = 0	N/A	0 - 2.75' - Med brown, loamy, silty clay w/ 15-20% sand + gravels + 25-35% angular + subrounded grey, red, pink tuff clasts, grasses @ surface, roots 0-1.5'. 2.25 - 2.75' - Powdered grey tuff clast.	 NC	FILL	12:10 Drilling. "soft" v. easy penetration. No asphalt top. 12:14 Dry barrel
5.0 6.0 7.0 8.0 9.0	Run 2 5'/5'	AACO 260 5.25-6.25' + Rad/Metal AACO 261 6.25-7.25 + tfr Rad/Metal	α 0 βY 215 voc 0		5.0 - 6.25 - SAA 6.25 - 10' - Pink tuff w/ 25-30% grey sugary rexslzd pumice, 40-50% phenos (80-90% qtz, 10-20% sanidine), moderately welded. 6.75' - Horizontal fracture 50% filled w/ orange-brown clay.		TSHIREGE MEMBER OF BANDELIER TUFF	Drilling pressure upto 500 psi. Still soft No apparent interface. 12:28 Dry
10.0 11.0 12.0					TD 10' Recovery = 7.75'/10' = 77.5% Drill Rate = 10'/18m = 0.56'/min			0:18

Prepared By R. Evans Date 10-31-94 Checked By Stephanie L. Cl Date 2-Nov-94

R1

LOS ALAMOS NAT. NAL LABORATORY ENVIRONMENTAL ESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

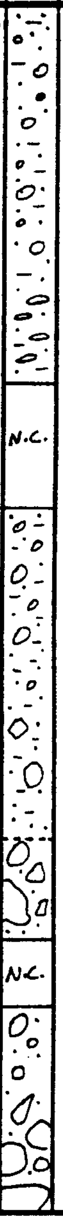
CORE SAMPLE LOG

Borehole ID 50-3007 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Elmer Velasquez Box #(s) ______ Start Date/Time 11-1-94/12:42 End Date/Time 11-1-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 3.75'/5'		α = ∅ βγ = 183 VOC = ∅	N/A	0 - 3.75' - Med. red brown to grey brown fine clay w/ 15-25% tuff clasts, 1-5% gravels, 5-10% medium - coarse sand. Indurated in zones. grey blue fluttered? tuff clasts	N.C.	FILL	12:42
5.0 6.0 7.0 8.0 9.0	Run 2 4.25'/5'		α ∅ βγ 223 VOC ∅		5.0 - 8.25' - SAA. 8.25 - 9.25' - Beige to grey brown fine silt, loose, friable w/ 25-45% clasts of pink grey tuff. "chunky fill"	N.C.		12:45/12:47/12:51
10.0 11.0 12.0	Run 3 2.25'/5'		α ∅ βγ 208 VOC ∅		10.0 - 12.25' - SAA			12:54/12:57/13:00



Prepared By R. Evans Date 11-3-94 Checked By Stephanie Cohen Date 10-Nov-94

R.1

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-300 TA/OU 50/1147 Drill Depth From 12' To 20' Page 2 of 2

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-1-94/ End Date/Time 11-1-94/13:28

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0						N.C.	FILL	13:05/13:09/13:11
15.0 16.0 17.0 18 19.0	Run4 4.5'/5'	AACO 272 16.0-17.0' + Rad/Metal AACO 273 17.0-18.0' + Rad/Metal	α ∅ βγ 227 VOC ∅	N/A	15.0 - 17.0 - SAA 17.0 - 19.5' - Pink tuff w/5-10% white grey sugary, rexstlzd pumice, 35-50% phenos (mostly qtz w/ << sanidine + 5-10% Feox), mod. weld.	N.C.	TSHIREGE MEMBER of BANDELIER TUFF	13:23/13:28/13:32
20 21.0 22 23.0 24.0					TD = 20' Recovery = $\frac{14.75'}{20'}$ = 73.7% Drilling Rate = 20/46 = 0.43'/min			0:46

Prepared By R. Evans Date 11-3-94 Checked By Stephanie Date 10-Nov-94

R.1

LOS ALAMOS NATI AL LABORATORY ENVIRONMENTAL STORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3008 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Bill Kopp Box #(s) ______ Start Date/Time 11-1-94/9:26 End Date/Time 11-1-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 3'/5'		α = 0 βγ = 240 VOC = 0	N/A	0 - 3.0' - Med brown to dark grey brown (gradual transition 0.25 - 0.5') fine clay w/ 5% angular cobbles, <1 - 10% altered blue-grey tuff clasts, flattened into lenses, % increases down hole, & 5-10% med - coarse sand.	 N.C.	FILL	9:26 Finish penetrating length of run • Corebarrel delivered to EZ. • finish screening 9:27/9:30/9:34
6.0 7.0 8.0 9.0 10.0	Run 2 2.25'/5'		α 0 βγ 213 VOC 0		5.0 - 7.25' - SAA. Fade back to brown. 6.5 - Bright orange red stain in clay. 6.5 - 7.25' - Fresher tuff clasts.	 N.C.		
11.0 12.0	Run 3 2.75'/5'		α 0 βγ 229 VOC 0		10.0 - 12.~~7~~5' - SAA ARE 11/3/94			

Prepared By R. Evans Date 11/3/94 Checked By Date 10-Nov-94

R.1

LOS ALAMOS N/ 'ONAL LABORATORY ENVIRONMENTA' RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3008 TA/OU 50/1147 Drill Depth From 12' To 20' Page 2 of 2

Driller Bill Kopp Box #(s) ———— Start Date/Time 11-1-94/ End Date/Time 11-1-94/10:05

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaylical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0		AACO 274 11.4-12.4' + Rad/Metal		N/A	12.5 - 12.6' - 2" fine - coarse sand w/1-3% fine beige clay. 12.6 - 12.75' - Pink grey tuff w/1-3% grey pumice, sugary, rextlzd, w/50-60% phenos (mostly qtz, >> sanidine, 5-10% oxidized brown Fe oxides).	N.C	FILL ← TSHIREGE MEMBER OF BANDELIER TUFF →	9:46/9:49
15.0 16.0 17.0 18 19.0	Run 4 5'/5'	AACO 275 12.4-16.0' + 19.4' + tfr Rad/Metal	α 0 βγ 194 VOC 0		15.0 - 20.0' - SAA 18.0 - 18.4' - white powder w/ 10-20% qtz phenos. (pumice?) 19.4 - Horizontal fracture, 2mmtk, falls open, lined w/ orange red clay w/ black splotches.  white powder			9:59/10:05/
20 21.0 22 23.0 24.0					TD = 20' RECOVERY = 13'/20' = 65% DRILLING RATE = 20'/39min = 0.51'/min			0:39

Prepared By R. Evans Date 11/3/94 Checked By Stephanie A. Cohen Date 10-Nov-94

R 1

LOS ALAMOS NATIC AL LABORATORY ENVIRONMENTAL F TORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3009 TA/OU 50/1147 Drill Depth From 0' To 12 Page 1 of 2

Driller Elmer Velasquez Box #(s) ———— Start Date/Time 11-1-94/14:04 End Date/Time 11-1-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2'/4'		α = 0 βγ= 231 VOC= 0	N/A	0 - 2.0' - Med red brown fine clay w/ 10-25% pink, white + orange tuff clasts, 5-10% med - coarse sand. 0 - 0.5' - Roots.	N.C.	FILL	14:04 No asphalt. Due to the ∠ (angle) of the ground to rig set up, only 4' penetration possible on 1st Run. 14:08/14:10/14:12
5.0 6.0 7.0 8.0 9.0	Run 2 2.75'/5'	AACO 278 5.0-6.0' + Rad/Metal AACO 279 6.0-9.5' + Rad/Metal	α = 0 βγ= 246 VOC= 0		4.0 - 6.0' - SAA. Red, yellow, grey tuff clasts. 6.0 - 6.75' - Alt. pink / brown banded tuff w/ 5% pumice + 40-50% phenos.	N.C.	TSHIREGE MEMBER OF BANDELIER TUFF	/14:18
10.0 11.0 12.0	Run3 5/5'		α = 0 βγ = 194 VOC = 0		9.0 - 14.0' - SAA. Pink grey. falling apart into "potatoe chips".			

Prepared By R. Evans Date 11-3-94 Checked By Stephanie Cohen Date 10-Nov-94

R.1

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3009 TA/OU 50/1147 Drill Depth From 12' To 14' Page 2 of 2

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-1-94/ End Date/Time 11-1-94/14:30

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12. 13.0 14.0		AACO 294 12.25-13.5' for Rad/Metal/VOCs		N/A	12.25 - 13.5' - Orange waxy deposit 75 w/wedges of white clay-like wht material. Fracture ? 75°		TSHIREGE MBR OF BANDELIER	Tuff /14:30/14:33
15.0 16.0 17.0 18 19.0 20 21.0 22 23.0 24.0					TD = 14' Recovery = $\frac{9.75}{14}$ = 69.6% Drill Rate = 14/26 = 0.54'/min			0:26

Prepared By R Evans Date 11-3-94 Checked By Date 10-Nov-94

LOS ALAMOS NATIC AL LABORATORY ENVIRONMENTAL R TORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3010 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-7-94/12:57 End Date/Time 11-7-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 3.75'/5'		α = 0 βγ = 245 voc = 0	N/A	0 - 0.25' - Asphalt. 0.25 - 3.75' - med brown fine clay w/ 5-10% medium-coarse sand, 10-20% gravels, 10-26% clasts of tuff.	 N.C.	FILL	12:57 Lower 0.5' - whining auger. 13:01/13:04/13:0
5.0 6.0 7.0 8.0 9.0	Run 2 2.75'/5'	AACO 280 6.75-7.75' + Rad/Metal	α = 0 βγ = 223 Voc = 0		5.0 - 7.75' - SAA 7.1' - Bright red orange horizon 2-5 mm tk.	 N.C.		13:12/13:14/13:16
10.0 11.0 12.0	Run 3 5'/5'	AACO 281 10.0-11.0' + Rad/Metal	α = 0 βγ = 218 γ = 0		10.0 - 15.0' - pink grey tuff w/ 30-40% phenos (qtz, sanidine, red oxidized Fe oxides), 3-5% grey, sugary, rexstlzd pumice, moderately welded.		TSHIREGE MBR. BANDELIER TF.	

Prepared By R Evans Date 11-9-94 Checked By Date 10-Nov-94

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LOS ALAMOS N TIONAL LABORATORY ENVIRONMENT RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3010 TA/OU 50/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Elmer Velasquez Box #(s) ———— Start Date/Time 11-7-94/ End Date/Time 11-7-94/13:25

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12							TSHIREGE MEMBER OF BANDELIER TUFF	
13.0				N/A				
14.0								
15.0					TD = 15' Recovery = $11.5/15$ = 76.6% Drill Rate = $15'/28m$ = 0.54'/min.			13:22/13:25/13:28 0:28
16.0								
17.0								
18								
19.0								
20								
21.0								
22								
23.0								
24.0								

Prepared By R Evans Date 11-9-94 Checked By Stephanie Coburn Date 10-Nov-94

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LOS ALAMOS NAT. NAL LABORATORY ENVIRONMENTAL . ESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID ~~50-5011~~ 60-3011 SRE 12/2/94 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Elmer Velasquez Box #(s) ________ Start Date/Time 11-7-94/11:05 End Date/Time 11-7-94/11:19

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 3.75'/5'		α = 0 βγ = 202 voc = 0	N/A	0 - 0.25' - Asphalt. 0.25 - 3.75' - med red brown fine clay w/ 5 - 15% med - coarse sand, 15 - 25% gravels, 20 - 30% tuff clasts.	 N.C.	[illegible] FILL	11:05 11:08/11:11/11:14
5.0 6.0 7.0 8.0 9.0	Run 2 4.5'/5'	AACO 276 7.0 - 8.0' + Rad/Metal AACO 277 8.0 - 9.0' + Rad/Metal	α = 0 βr = 251 Voc = 0		5.0 - 8.0' - SAA. Tuff clast >1'. 8.0 - 9.5' - grey slight pink tuff w/ 40 - 50% phenos (qtz, sanidine) + 5 - 10% grey, sugary, rexstlzd pumice, moderate welded.	N.C.	TSHIREGE MBR OF BANDELIER T.	11:19/11:22
10.0 11.0 12.0					TD = 10' Recovery = 8.25/10' = 82.5% Drill Rate = 10'/14 m = 0.71'/min.			0:14

Prepared By R. Grant Date 11-9-94 Checked By Date 10-Nov-94

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LOS ALAMOS .TIONAL LABORATORY ENVIRONME L RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3012 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-1-94/11:07 End Date/Time 11-1-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 3/5'		α= 0 βγ= 229 voc= 0		0 - 3.0' - Med brown fine clay w/ 10-25% gravels + clasts of grey tuff, 10-25% med to coarse sand. (0-0.25'- 75% sand.)	N.C.	FILL	11:07
5.0 6.0 7.0 8.0 9.0	Run2 3.5'/5'	AACO 262 7.0-8.0' + Rad/Metal AACO 263 8.0-11.0' + Rad/Metal	α 0 βγ 250 Voc 0 VOCs	N/A	5.0 - 8.0' - SAA 35-50% alt pink grey + grey clast of friable tuff. 8.0 - 8.5' - Pink tuff wedged in shoe.	N.C.	FILL TSHIREGE MEMBER OF BANDELIER TUFF	11:11/11:14/11:17
10.0 11.0 12.0	Run3 5'/5'		α 0 βγ 221 Voc 0		10.0 - 15.0' - Pink tuff w/3-5% grey rexstlzd pumice + 40-50% phenos (mostly qtz), mod. welded.			11:21/11:23/11:27 ~12.0' auger "singing"

Prepared By R. Evans Date 11-3-94 Checked By Stephanie Cohen 10-Nov-94

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LOS ALAMOS NATI[illegible]AL LABORATORY ENVIRONMENTAL [illegible]STORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3012 TA/OU 50/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-1-94/ End Date/Time 11-1-94/11:36

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0				N/A	13.5 - 4" White - grey fine powder w/ 10% qtz phenos. (pumice?)		TSHIREGE MEMBER OF BANDELIER TUFF	11:32/11:36/11:40
15.0 16.0 17.0 18 19.0 20 21.0 22 23.0 24.0					TD = 15' Recovery = 11.5/15 = 76.7% Drill Rate = 15/29 = 0.52'/min			0:29

Prepared By R. Evans Date 11-3-94 Checked By Stephanie Hoch Date 10-Nov-94

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LOS ALAMOS N IONAL LABORATORY ENVIRONMENT RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3014 TA/OU 50/1147 Drill Depth From 0 To 9.3' Page 1 of 1

Driller Elmer Velasquez Box #(s) ______ Start Date/Time 11-1-94/10:27 End Date/Time 11-1-94/10:44

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 3.5'/5'		α = 0 βγ = 186 VOC = 0	N/A	0 - 3.5' - Red - med brown fine clay w/10-25% gravels + clasts of tuff, 5-10% med - coarse sand.	 N.C.	FILL	10:27 10:29/10:32
5.0 6.0 7.0 8.0 9.0	Run 2 3.5'/4.3'	AACO 264 6.5 - 7.5' f Rad/ Metal/ VOC... AACO 265 7.5 - 8.5' t + f Rad/ Metal	α 0 βγ 225 VOC 0		5.0 - 7.5' - SAA 7.5 - 8.5' - alt pink tuff w/5-10% grey rexstlzd, sugary pumice, 40 - 50% phenos (mostly qtz). 7.75 - 8.25' - 70° fracture w/ brown stain. 70°	 N.C.	TUFF	TSHIREGE MBR OF BANDELIER TUFF. @ ~ 9.3' drill bit encountered impenetrable material. Sub-surface Cement has been reported in area. 10:40/10:44
10.0 11.0 12.0					TD = 9.3' RECOVERY = 7/9.3' = 75% DRILL RATE = 9.3'/17min = 0.55'/min			0:17

Prepared By R. Evans Date 11-3-94 Checked By ______ Date 10-Nov-94

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LOS ALAMOS NATIC ıL LABORATORY ENVIRONMENTAL F. ;TORATION PROGRAM

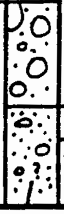
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3016 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Elmer Velasquez Box #(s) ———— Start Date/Time 10-27-94/12:51 End Date/Time 10-27-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 3'/5'		α = 0 βγ = 227 VOC = 0	N/A	0 - 3' - Med. brown fine silty clay w/ 15-30% ang + rounded red, pink, grey tuff clasts, 10-15% angular + rounded cobbles, 10-15% med-coarse sand + gravels. grasses at top, roots 0-1.5'.	 N.C.	FILL	12:51 Drilling 1-2' 200psi 2-5', 200psi 12:56/12:59
6.0 7.0 8.0 9.0 10.0	Run 2 2.5'/5'		α 0 βγ 236 VOC 0		5.0 - 7.5'- SRE SAA. Some clasts of tuff grey & fresh. ~~7.25' - 7.5'~~ SRE. 10/31/94	 N.C.		Scraping sound in lower run, last 1-2'. 13:08
11.0 12.0	Run 3 5'/5'	AACO 266, 10-11' F Rad/Metal AACO 267, 11-12' Rad/M + + 6r	α 0 βγ 244 VOC 0		10.0 - 11.0' - SAA 11.0' - 15.0' - Pink tuff w/ 10-25% grey pink pumice, sugary, rexstlzd, 30-50% phenos (qtz, sanidine, brown oxidized Fe oxides),		TSHIREGE MBR.	13:20 Drillstem dipping 3-5° to SE. 500 psi Hard

Prepared By R. Evans Date 10-31-94 Checked By Stephanie J. Carr Date 2-Nov 94

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LOS ALAMOS N ONAL LABORATORY ENVIRONMENT RESTORATION PROGRAM

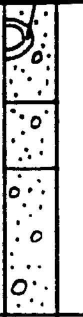
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3016 TA/OU 50/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Elmer Velasquez Box #(s) ______ Start Date/Time 10-27-94/ End Date/Time 10-27-94/13:26

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0 15.0		AACO 292 12.5-13.6' fr + pumice halo Rad/Metal/SVOL			11.? - 12.25 - Vertical tight fracture, 1mm tk, yellow brown stain. 12.5' - 2" grey round pumice w/1-2mm tk red brown halo 13.0-13.25' - Fracture, 2mm tk, damp, orange brown clay w/ black splotches. 13.6 - Fracture SAA. 			13:26
16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0					TD 15' Recovery 10.5'/15' = ~~0.0~~ 70% BKE 10/31/94 Drill Rate 15'/35m = 0.43'/min			0:35

Prepared By R. Evans Date 10-31-94 Checked By Stephanie [illegible] Date 2-Nov-94

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LOS ALAMOS NATI AL LABORATORY ENVIRONMENTAL STORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3017 TA/OU 50/1147 Drill Depth From 0' To 12.0' Page 1 of 2

Driller Blair Art Box #(s) ——— Start Date/Time 10-27-94/9:46 End Date/Time 10-27-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 2.5'/5'		α = 0 βγ = 206 VOC = 0	N/A	0 - 2.25' - Med. brown fine clay w/25-35% pink - grey alt tuff (rounded clasts) + 5-15% med - coarse sand + gravels. 1.25' - Dark pink/red rndd tuff clast. 1.4' - Bright orange splotch 1.5"x1" on/in clay of fill. (sampled w/ fill). 2' - 2.5" grey tuff clast. 2.25' - 7, 2"? black asphalt w/gravels. 2.25 - 2.5' - Dark pink alt. tuff jammed into shoe.	? N.C.	FILL ? BACKFILL ASPHALT	9:46 Drilling ~1' higher topographically than 50-3018. 9:50 @ ~3' heard a scraping sound, drill stem vibrating. Grey tuff rubble in cuttings. sa[illegible] "Seemed to punch through, but continued to be hard." 9:52/9:56
6.0 7.0 8.0 9.0 10.0	Run 2 3'/5'	AACO 268 7'-10.5' (N.C. 8-10') f Rad/Metals	α 0 βγ 200 VOC 0		5.0 - 8.0' - Same as 0-2.25' above.	N.C.	FILL	RCT: 300 βγ ~ 2x background (150 cpm). measured in cuttings. Driller: "200 psi 5 - 10'." 10:16
11.0 12.0	Run 3 5'/5'	AACO 269 10.5-11.5' f Rad/Metals	α 0 βγ 188 VOC 0		10 - 10.5 - SAA 10.5 - 15.0' - Dark pink, red tuff, alt., falling apart horizontally ≡ when handled, w/10-20% grey sugary rexstlzd pumice, (continued)		TSHIREGE MBR	1100 psi throughout. Not able to penetrate last few inches.

Prepared By R. Evans Date 10-28-94 Checked By Date 2-Nov-94.

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LOS ALAMOS NA ЭNAL LABORATORY ENVIRONMENT ƎSTORATION PROGRAM

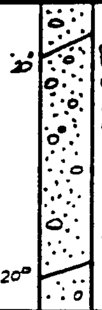
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3017 TA/OU 50/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Blair Art Box #(s) ______ Start Date/Time 10-27-94/ End Date/Time 10-27-94/10:36

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0		AACO 291 @12.5' + 14.5' fr Rad/ Metal			(10.5 - 15.0 continued) - w/ 40-50% phenos (mostly qtz, sanidine). 12.5' - Tight fracture <2mm th, filled w/ orange brown clay. 14.5' - Fracture SAA.		TSHIREGE MEMBER OF BANDELIER TUFF.	10:36
15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0					TD = 15.0' Recovery = 10.5' / 15' = 70% Drill Rate = 15'/50m = 0.3'/min			0:50

Prepared By R. Evans Date 10-28-94 Checked By Date 2-Nov-92

LOS ALAMOS NATI AL LABORATORY ENVIRONMENTAL . STORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3018 TA/OU 50/1147 Drill Depth From 0' To 12.0' Page 1 of 2

Driller Bill Kopp Box #(s) ——— Start Date/Time 10-27-94/8:34 End Date/Time 10-27-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0	Run 1 1.75'/4'		α = 0 βγ = 225 VOC = 0 JRE 10/28/94 249	N/A	0 - 1.25' - Med brown fine clay w/ 20-25% clasts of alt pink tuff, 1-5% ¼ clasts of asphalt, 5-10% gravels, <5% sand. 1.25 - 1.5' - Small grains of black asphalt + 25% gravels. No "skin". 1.5 - 1.75' - Same as 0 - 1.25'.	 N.C.	FILL ?? BURIED ASPHALT ↑	8:34 Drilling. Drill stem dipping 3° to N  200 psi until 4.5' 300 psi. 4' run due to ∆ of rig set up. 8:37/8:42 Dry barrel
4.0 5.0 6.0 7.0 8.0	Run2 4'/5'	AACO 249 6-7' for Rad/Metal AACO 250 ± 4 fr 7-9.5' Rad/Metal	α 0 βγ 160 VOC 0		4.0 - 6.5 - SAA. 6.0' - Piece of metal (aluminum?) encountered in drilling, came up in cuttings. No fresh edges, no rad. (culvert?) 6.5 - 7.0' - SAA except Orange clay rich zone. 7.0 - 7.8' - Dark pink, red alt tuff w/ 40-50% phenos (mostly qtz), 5-10% yellow + grey pumice, sugary rexstlzd, flattened, mod. welded.	 N.C.	↓ FILL	
9.0 10.0 11.0 12.0	Run3 5/5'	AACO 290 10.5-12.5' for Rad/Metal VOCs...	α 0 βγ 200 VOC 0		9.0 - 14.0' - SAA 9.15' - Horizontal fracture w/ dark brown scaly deposit.  0° 30° 10.5' - Fracture 3mm tk red clay filled. 10.6' - 11.6' SAA 3-5mm tk. Subvertical.		TSHIREGE MEMBER OF BANDELIER TUFF	8:52

Prepared By R. Evans Date 10-28-94 Checked By Stephanie ... Date 2-Nov-94

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LOS ALAMOS N/)NAL LABORATORY ENVIRONMENT/]ESTORATION PROGRAM

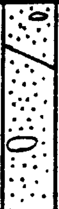
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3018 TA/OU 50/1147 Drill Depth From 12' To 14' Page 2 of 2

Driller Bill Kopp Box #(s) ——— Start Date/Time 10-27-94/ End Date/Time 10-27-94/9:05

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0					12.5' - Fracture SAA. 20°		TSHIREGE MBR OF BANDELIER TF	9:05 Dry barrel
15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0					TD 14' Recovery $= \frac{10.75'}{14'} = 76.8\%$ Drill Rate $= 14'/31\text{ min} = 0.45'/\text{min}$			0:31

Prepared By R. Evans Date 10-28-94 Checked By Stephanie J [illegible] Date 2-Nov-94

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LOS ALAMOS NATI ,AL LABORATORY ENVIRONMENTAL STORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3020 TA/OU 50/1147 Drill Depth From 0' To 12.0' Page 1 of 2

Driller Blair Art Box #(s) ——— Start Date/Time 10-27-94/14:30 End Date/Time 10-27-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 2'/5'		α = 0 βγ = 252 VOC = 0	N/A	0-1.0' - Tan sand w/ 25-35% rounded cobbles, <1% angular clasts of asphalt. 1.0-2.0' - Brown fine clay w/ 10-25% angular & subrounded grey tuff clasts, 10-15% gravels to cobbles, 10-15% med. to coarse sand.	N.C.	FILL	14:30 Drilling "100 psi the whole way" Have 4 core barrels RR expects f/t interface @ least 15'. 2.5' run not possible. 14:36/14:41 Dry
6.0 7.0 8.0 9.0 10.0	Run 2 4.5'/5'	AACO 252 5-6.0' f Rad/Metal AACO 253 6-7.0' t Rad/Metal AACO 293 7-9.5' fr Rad/Metal/VOCs	α 0 βγ 248 VOC 0		5.0-6.25' - SAA. Compacted 6.25-9.5' - Pink grey to grey tuff, altered w/<3% grey sugary rxstlzd pumice, 40-50% phenos (mostly qtz, some sanidine), crumbling + falling apart. 7.0-9.5' - Fracture cluster, tight, subverticle, lined w/ white fine grained material, also rock stained orange red.	N.C.	TSHIREGE MEMBER OF BANDELIER TUFF	5-8' 200psi 8-10' 500 psi RCT detected βγ 300cpm ~ 2x BG. α 0. 14:51/14:55 Dry
11.0 12.0	Run 3 4'/5'		α 0 βγ 248 Voc 0		10-14.0' - SAA. So soft the core can be indented w/ thumb. 11.0', 11.5' - Brown orange zones, sub-horizontal band across core.			

Prepared By R Evans Date 10-31-94 Checked By Stephanie l Date 1-Nov-94

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LOS ALAMOS N/)NAL LABORATORY ENVIRONMENT/ RESTORATION PROGRAM'

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3020 TA/OU 50/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Blair Art Box #(s) ______ Start Date/Time 10-27-94/ End Date/Time 10-27-94/15:10

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12 13.0 14.0					12.5 - 13.0 - Solid, competent tuff.	N.C.	TSHIREGE MEMBER OF BANDELIER TUFF	15:10
15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0					TD = 15.0' Recovery = 10.5'/15' = 70% Drill Rate = 15'/40m = 0.375'/min			0:40

Prepared By R. Evans Date 10-31-94 Checked By Date 2-Nov-94

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LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3021 TA/OU 50/1147 Drill Depth From 0' To 9.5' Page 1 of 1

Driller Bill Kopp et al Box #(s) ——— Start Date/Time 10-18-94/~~[illegible]~~ 13:15 [illegible] 10/26/94 End Date/Time 10-18-94/13:45

Drilling Equip./Method Hand Auger Sampling Equip./Method

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0					0-9.0' Red brown silty, sandy fine clay.			13:15
1.0								
2.0								
3.0								
4.0								
5.0				N/A	5.0'-9.0' Chunks of grey tuff begin to appear.			13:30 ~ 5.0'
6.0								
7.0	AACO 220 7-9' f Rad/Metals	→						
8.0								
9.0	AACO 221 9-9.5' & Rad/Metals	→						Very difficult to penetrate 13:45
					TD = 9.5'			0:30 Stop due to lack of penetration
10.0								
11.0								
12.0								

Prepared By R. Evans Date 10-26-94 Checked By Date 26-[illegible]

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

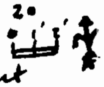
CORE SAMPLE LOG

Borehole ID 50-3023 TA/OU 50/1147 Drill Depth From 6' To 6.5' Page 1 of 1

Driller: Richard Romero et al Box #(s) —— Start Date/Time 10-18-94/13:[illegible] End Date/Time 10-19-94/11:53

Drilling Equip./Method Hand Auger Sampling Equip./Method

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0	Run N/A		α = NDA βγ = 182 VOC = NDA		0 -			10-18-94 10 10-19-94 30 10-19-94 20 x 3023
1.0								11:30 Start drilling 3rd hole for 50-3023.
2.0					~2.5' - wx tuff clasts, pink-grey appear in brown fine loamy clay.			
3.0					~3.0' - Rounded quartzite cobbles appear ~3.5' - Grey angular, weathered clasts of tuff appear w/ 25-35% qtz phenos.			
4.0								
5.0		AA CO 231 5.5-6.5 f Rad/Metal	βγ = 138		~5.0' - "Clean" white tuff clasts appear. 5.8' - ~~wx~~ Altd SRE 10/26/94 pink-grey clasts of tuff w/ 25% phenos (qtz).			11:46
6.0			βγ = 107					11:53
7.0					TD = 6.5'			0:23
8.0								
9.0								
10.0								
11.0								
12.0								



Prepared By R. Evans Date 10-26-94 Checked By S. Coker Date 26-OCT-94

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3024 TA/OU 50/1147 Drill Depth From 0' To 7' Page 1 of 1

Driller Richard Romero Box #(s) —— Start Date/Time 10-19-94/10:35 End Date/Time 10-19/94/11:00

Drilling Equip./Method Hand Auger Sampling Equip./Method

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0	Run NA		α = NDA βγ= 127 voc= NDA		0.0'—? Dark brown loamy fine mud w/ 1-10% angular clasts of tuff. fine roots in upper footage.			10:35 Start turning.
1.0								
2.0				N/A				
3.0	7'/7'	AACO 227 f 4.5-5.5' Rad/Metal			? to 4.75' - Increasing tuff clast % age 10-15%. Rounded quartzite cobbles + gravels in qtz rich coarse sand			
4.0								
5.0		AACO 228, 6-7' & ? Rad/Metal	α NDA β α 746		fine muds, clays			
6.0			/VOA/SVOA/PCB		75% clasts of alt tuff.			Penetration v. difficult. 11:00
7.0					TD 7.0'			Stop due to lack of penetration. 0:25
8.0								
9.0								
10.0								
11.0								
12.0								

Prepared By R. Evans Date 10/24/94 Checked By S. Cohen Date 2-6-[illegible]

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3025 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 10-25-94/12:55 End Date/Time 10-25-9-/13:15

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2.5'/5'		α = NDA βγ = 176 VOC = NDA	N/A	0-0.5'- Red orange brown sand w/ 25-35% gravels. 0.5-1.5'- Grey/pale brown to med brown sand w/ 25-35% gravels 1.5-2.5'- med brown fine clay w/ 3% & grey tuff clasts (alt, powdery + soft, still hold together), 15-20% gravels in upper 0.5', plastic ribbon, 10-15% sand. Small (4mm x 1mm) pale tan horiz lenses.	N.c.	FILL	12:55 Drilling. As of 10-19-94 asphalt removed by jack-hammer. Squeaking, scraping sound 13:02 Dry barrel
5.0 6.0 7.0 8.0 9.0	Run 2 5'/5'	AACD 254 5-6.1' Rad/Metal AACD 255 6.1-7.0' & Rad/Metal	α = NDA βγ = 214 VOC = NDA		5.0'-6.25'- med brown fine clay w/ ~~[illegible]~~ large (0.75') v. alt brown tuff clast + 3-5% qtz. sand. 6.25'- 3mm tk red fine clay horizon. 6.25-8.9'- Pink/grey tuff mottled w/ orange brown horizontal zones @ 7.0, 8.0 + 8.9'. <1% white sugary, powdery pumice + 45-55% phenos (qtz), mod. welding. 8.9'- Sharp contrast of brown tuff over pink grey tuff.		TSHIREGE MEMBER OF BANDELIER TUFF	13:15 Dry barrel
10.0 11.0 12.0					TD 10' Recovery = $\frac{7.5'}{10'}$ = 75% Drill rate = 10'/20m = 0.5'/min			0:20

Prepared By R. Evans Date 10-25-94 Checked By S. Coler Date 14-OCT

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3026 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Blair Art Box #(s) ——— Start Date/Time 10-25-94/11:49 End Date/Time 10-25-94/12:15

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2.75' / 5'		α = NDA βγ = 208 VOC = NDA		0 - 0.5' - 25%. Quartzite (dark) gravels in sand. 0.5'-1.3' - Med brown to slight grey fine clay w/ 10% ? tuff clasts (grey w/ bright ox? red inclusion), 1.5" max diam. 1.3-1.75' - Red brown fine clay w/ 25-30% rounded quartzite cobbles + 10-20% qtz + dark lithic sand. 1.75-2.75' - Dark brown to med red brown v. alt tuff w/ <1% pumice, 10-20% phenos (qtz) Clast?	 N.C.	FILL	11:49 ~1.5' short-lived resistance reported by driller. 11:58 Dry barrel
5.0 6.0 7.0 8.0 9.0	Run 2 3.8' / 5'	AACO 256 6-7' f Rad/Metal AACO 257 7-8' t Rad/Metal	α = NDA βγ = 218 VOC: NDA		5.0-~~5.5~~ ARE 10/26/94 See bottom of v. alt tuff clast. 5.0 - 5.5' - Red brown fine clay w/ 10-20% sand. 5.5 - 7.5' - Red orange brown clay w/ 25-30% qtz sand + 20-25% large (<10") alt pink tuff clasts. 7.5' - 2mm tk clay. 7.5 - 9.0' - Pink-grey tuff w/ v. alt. ox. red brown zones, sugary texture, 1-3% v. sugary, rexstlzd, grey pumice + 40-50% phenos (qtz mostly) in mod. welded matrix.	 N.C.	FILL TSHIREGE MBR BANDELIER TUFF	Last 3-4" hard + resistant reported by driller. 12:15 Dry barrel
10.0 11.0 12.0					TD = 10' Recovery = 6.55' / 10' = 65.5% Drilling Rate = 10'/26 min = 0.38'/min			0:26

Prepared By R Evans Date 10-25-94 Checked By L. Coker Date 26-

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3028 TA/OU 50/1147 Drill Depth From 0′ To 5′ Page 1 of 1

Driller Bill Kopp Box #(s) ——— Start Date/Time 10-25-94/10:04 End Date/Time 10-25-94/10:10

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 4.5′/5′	AACO 258 0.75-1.5′ f Rad/Metal AACO 259 1.5-3.0′ £+fr Rad/Metal AAB 6106 3.5-4.25′	α = NDA βγ = 201 VOC = NDA "fr" "surge?" Rad/Metal	N/A	0- 0.25′- med brown clay w/grasses. 0.25-0.8′- grey - lt brown silty clay w/ 20% qtz sand. 0.8 - 1.5′- 5-10% gravels + sand in brown clay. 1.5′-3.5′- Undulating contact w/ pink tuff w/ 10-15% phenos (mostly qtz), oxidized red brown flat blotches along otherwise unfilled fracture. 2.5-3.25′ - Curving subvertical unfilled fracture. 3.5-4.25′- Horizontally banded yellow to brown 70-90% qtz med sand, 5-10% dark lithics, 10-15% fine yellow brown ash. Surge deposit? gradational top, sharp bottom contact. 4.25-4.5′- Pink tuff 10-25% phenos (qtz), <1% grey v. alt pumice (powder).	 NC	← FILL → TSHIREGE MEMBER OF BANDELIER TUFF	10:04 Drilling no asphalt here. 10:10 0:06
6.0								
7.0					TD = 5′			
8.0					Recovery = 4.5′/5′ = 90%			
9.0					Drill rate = 5′/6 min = 0.83′/min			
10.0								
11.0								
12.0								

Prepared By R. Evans Date 10/25/94 Checked By J. Cohen Date 26-11

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-50 30 TA/OU 50/1147 Drill Depth From 0 To 10' Page 1 of 1

Driller Bill Kopp Box #(s) ______ Start Date/Time 10-18-94/9:02 End Date/Time 10-18-94/9:24

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2'/5'	AACO 229 1-1.5' & Rad/Metal	α = NDA βγ = 160 VOC = NDA	N/A	0-0.5'- Asphalt & quartzite cobbles (1.54). 0.5'-1.5'- Crushed, angular clasts of light brown to grey tuff (altered) w/ 10-20% phenos (mostly qtz) & 1% lithics.	 NL	Asphalt <—?—?— FILL —>	9:02 Spud into asphalt, change drill bit + insert corebarrel. 9:10 Drilling. Fill coming out of "annulus". NOTE: DWL JUNCTION IN PECOS ROAD. 9:15 Wet shoe
5.0 6.0 7.0 8.0 9.0	Run 2 4.5'/5'	AACO 250 5.5-6.5' & Rad/Metal	α = NDA βγ = 220 VOC = NDA		5.0-9.5'- Light grey tuff w/ 15-25% phenos (qtz, sanidine), 1-5% grey pumice (sugary, recrystallized, v. slightly flattened), <1% Fe-oxide minerals, moderately welded. 5.0-6.3'- Disking 7.75-8.1'- Very indurated. 8.0-9.5'- Horizontal banding of interfingered grey SAA and brown oxidized? zones w/ 30-40% phenos (mostly qtz), sandy texture.	 NL	TSHIREGE MEMBER OF BANDELIER?	9:24
10.0 11.0 12.0					TD = 10' overall recovery = 6.5'/10' = 65%. Drilling rate = 10'/22m = 0.45'/min.			0:22

Prepared By R. Evans Date 10-26-94 Checked By Date 26-OCT-94

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LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3031 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Bill Kopp Box #(s) ______ Start Date/Time 10-18-94/8:20 End Date/Time 10-18-94/8:39

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Analytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 3.5'/5'	AACO 225 1.5 - 2.5 f Rad/metal	α = NDA βγ = 192 voc = NDA	N/A	0 - 0.5' - Asphalt chunks & gravels of quartzite in dark brown sand. 0.5 - 2.75' - Med. red brown fine silty clay w/ < 5% v. fine sand. 2.75 - 3.5' - Tuff, grey to tan, altered?, poorly welded.	N.C.	ASPHALT FILL TSHIREGE MEMBER OF BANDELIER TUFF	8:20 Driller reports: "No resistance to penetration." 8:27 Moist
6.0 7.0 8.0 9.0 10.0	Run 2 4.5'/5'	AACO 232 5-6' t Rad/metal	α = NDA βγ = 208 voc = NDA		5.0 - 9.5' - Grey to light tan tuff w/ MEB 10/26 ~~15-30%~~ 20 - 35% phenocrysts (10-20% qtz, 5-10% sanidine, 5% alt. Fe oxides), no visible pumice. 6.2' - 8.5' - Brown mod. altered zone. 8.5' - 9.5' - Grey & brown banding.	N.C.		8:39
11.0 12.0					TD = 10' Recovery = 8'/10' = 80% Drill rate = 10'/19 min = 0.53'/min.			0:19

Prepared By ______ Date 10-26-94 Checked By S. Cohen Date 26-OCT

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3032 TA/OU 50/1147 Drill Depth From 0 To 10' Page 1 of 1

Driller Bill Kopp Box #(s) ——— Start Date/Time 10-18-94/9:45 End Date/Time 10-18-94/10:09

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2'/5'	f+FR ADCO 233 + 235 0.75-2.0' Rad/Metal	α = NDA βγ = 224 VOC = NDA	N/A	0 - 0.5' wet black asphalt clasts 0.5'-2.0'- Med-dark brown v. fine compacted clay w/ silt, 10% qtz. sand (wx tuff source?).	N.C.	[illegible] ↑ FILL — ? — ? ↓	9:45 Spud into asphalt. 9:55 Δ bit, add corebarrel. 9:58 Drilling. Brwn moist fill coming out @ annulus. Moist core 10:01 Muddy shoe
5.0 6.0 7.0 8.0 9.0	Run 2 5'/5'	t AACO 234 5.5'-6.5' Rad/Metal	α = NDA βγ = 208 VOC = NDA		5.0 - 8.5'- Light grey - light red brown altd tuff, "clayey" texture, w/ 25-35% phenos (mostly qtz, << sanadine), 1-3% mod flattened, rxstled, sugary pumice. 8.5'-10.0'- Light grey competent tuff 30-50% phenos (mostly qtz), <1% lithics, <1% Fe ox phenos. 9.25'- Brown clay filled vein 1/4"tk		? TSHIREGE MBR BANDELIER TUFF	10:09 Moist core
10.0 11.0 12.0					TD = 10' Overall Recovery = 7'/10' = 70% Drilling Rate = 10'/24min = 0.42'/min			0:24

Prepared By R. Evans Date 10/24/94 Checked By Date 26-OCT

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LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3033 TA/OU 50/1147 Drill Depth From 0 To 10' Page 1 of 1

Driller Bill Kopp Box #(s) ——— Start Date/Time 10-18-94/11:24 End Date/Time 10-18-94/12:23

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0	Run 1 1.7'/2.5'		α= NDA βγ= 218cp VOC= NDA	N/A	0 - 0.5'- Asphalt chips (angular clasts), rounded gravels in loose sand. Friable. (Examine hole: Asp ≤6"tk) 0.5 - 1.7'- gravel, 10-20% qtz sand in fine brown clay. 1.75'- Red clay horizon.	N.C	Asphalt FILL	11:24 Grub into asp. 11:26 Eng. died. 11:28 " , gas 11:48 Start up 11:51 Δ Auger bit. 11:54 Drilling 2.5' Run to improve recovery. 11:56
3.0 4.0	Run2 1.5'/2.5'		α= NDA βγ= 190 VOC= NDA		2.5'- 3.25'- Dark brown fine sandy, silty clay. 3.0' - Roots @ base of dark fill. 3.25'- 4.0'-Red med brown silty, sandy clay, 10% qtz sand.	N.C		12:05 Dry barrel
5.0 6.0 7.0 8.0 9.0 10.0	Run3 5'/5'	f AACO 236 7-8' Rad/Metal t AACO 237 8-9' Rad/Metal	α= NDA βγ= 216 VOC= NDA		5.0'- 8.25' SAA Down hole % qtz sand increase to 25-30%, also clasts of tuff increase to 1-3%. 7.25' - Roots 8.25'- 1/3" tk Red brown clay horizon. 8.25'- 10.0' Tan to grey altered tuff w/20-35% phenos (<3% sanadine, 15% qtz, <1% FeOxides), 1-3% flattened, rexstlzd pumice, mod. welded, med. hard.		TSHIREGE MEMBER	Slow down to improve recovery 12:23 Dry barrel
11.0 12.0					TO = 10' Overall recovery = $\frac{8.2'}{10'}$ = 82% Drilling rate = 10'/59m = 0.169'/min			0:59

Prepared By R. Evans Date 10/24/94 Checked By S. Cohen Date 24-OCT

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3034 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Blair Art Box #(s) ——— Start Date/Time 10-19/94/14:38 End Date/Time 10-19-94/15:08

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run1 3.25'/5'		α = NDA βγ = 91 VOC = <1ppm	N/A	0–0.35' Loose gravel + sand grading into finer sands, pale tan to pale grey. 0.35'-1.0'- Abrupt contact w/ angular clasts of grey tuff in clay. 1.0'-3.25'- Red brown fine clay w/ 5-10% sand. 1.75' = 1.5" Tree root	 N.C.	FILL	14:38 Drilling. No asphalt, jack-hammered out. 14:44 Hit root Drillstem ∡ 5° dip toward East. 30' pine SW of hole Driller reports hard below root. 14:52
5.0 6.0 7.0 8.0 9.0	Run2 5'/5'	AACO 238 8-9' ± Rad/Metal AACO 239	α = NDA βγ = 100 VOC = <1 9'-10' ± Rad/Met VOA/SVOA PCB		5.0 – 7.75' SAA 5.0 - 6.0'- White fuzz (zeolite?) in cavities (old root molds?). Also dark brown almost charcoal, woody material. 7.75-8.75'- Gradation into increasing mottled zone. Clasts of altered grey tuff in red brown fine clay matrix (SAA). 8.75-8.9'- Red clay 8.9'-10.0'- Pink to grey tuff, v. altered sugary throughout, 25-35% phenos (qtz), 1-5% pumice white, grey, yellow, rxstlzd, altering to powder.		TSHIREGE MBR	Driller: "Run v. similar to 50-3034" Harder downhole. 15:08
10.0 11.0 12.0					TD = 10' Overall recovery = 8.25'/10' - 83% Drilling rate = 10'/30m = 0.33'/min			0:30

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LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3035 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Blair Art Box #(s) —— Start Date/Time 10-19-94/13:30 End Date/Time 10-19-94/14:13

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/%)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 4'/5'		α = NDA βγ = 90 VOC = <1ppm	N/A	0 - 0.5' - Red - med. brown 25% gravels of qtzite, granite, 20-30% course qtz sand, in silty clay w/ roots. 0.5 - 1.75' - Abrupt contact w/grey brown silty clay supporting 30-35% qtz sand (xstls), + 25% clasts of ground up tuff (angular) 1.75' - 4.0' - Sharp change to v. fine compacted red brown clay, indurated, w/ 5-10% rounded sand grains. 3.5 - 4.0' - Black brown roots.	N.C.	FILL	13:30 Drilling Asphalt removed w/ jack hammer. Drilling p. ≈ 100psi 13:49 Dry barrel
6.0 7.0 8.0 9.0 10.0	Run 2 4'/5'	AACO 240 6.75' - 7.86' f- Rad/ Metals AACO 241, 8'-9' + Rad/ Metals	α = NDA βγ = 106 VOC = <1ppm		5.0' - 7.5' SAA 7.5' - 3mm tk. Orange red clay 7.5' - 9.0' - Abrupt contact w/ banded grey tuff w/ 25% phenos (mostly qtz), 1-5% rexstlzd, flattened pumice + flat shards. 1-2 mmtk brown banding common near 7.5', rarer down hole.	N.C.	TSHIREGE MBR OF BANDELIER TUFF	~6.0 - 7.0' 300 - 400 psi 8' - 10' 700 psi 9' - 10' v. hard 14:13
11.0 12.0					TD = 10.0' overall recovery = 8'/10' = 80% Drilling rate = 10'/43m = 0.23'/min			0:43

Prepared By R. Evans Date 10/24/94 Checked By S. Cohen Date 24-OC

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

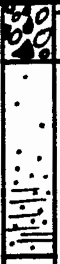
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3036 TA/OU 50/1147 Drill Depth From 0 To 10' Page 1 of 1

Driller Bill Kopp Box #(s) —— Start Date/Time 10-18-94/10:39 End Date/Time 10-18-94/11:02

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2.5'/5'	f	α = NDA βγ = 186 VOC = NDA		0-0.5' - asphalt rubble, and gravels. 0.5-2.5' - Med brown ≤1% - 15% qtz fine sand (increasing downhole), in silty clay. w/ wet wood. 1.75'-2.5' - Horizontal faint pale grey banding.	 NL	FILL	10:39 Spud into asphalt. Δ bit + add core barrel. 10:51
5.0 6.0 7.0 8.0 9.0	Run 2 2.5'/5'	AACO 242 6-7' Rad/Metal AACO 243 7.0'-7.5' & Rad Metals	α = NDA βγ = 224 VOC = NDA	N/A	5.0'-7.0' - Med red brown v. fine silty, sandy clay w/ 10-25% ~~qtz~~ sand, <3% angular grey tuff clasts. 7.0'-7.5' - Light grey tuff w/ 20-30% phenos (mostly qtz).	 NL.		TSHIREGE MEMBER of BANDELIER TUFF 11:02 Moist barrel
10.0 11.0 12.0					TD = 10.0' overall recovery 5'/10' = 50% Drilling rate = 10'/23m = 0.43'/min			0:23

Prepared By R Evans Date 10/24/94 Checked By S Colon Date 26-OCT

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3037 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Blair Art Box #(s) ______ Start Date/Time 19OCT94/11:40 End Date/Time 19 OCT 94/ 12:25

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel SOP 6.26

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 2.75'/5'		α = NDA βγ= 140 voc= NDA	N/A	0-0.5'- Asphalt bits, sand, granite gravels in fine red brown silty mud, dry, friable, wood bits. 0.5'- 1.25'- Abrupt contact w/ pale pink-grey fine silt supporting sub angular to well rounded tuff clasts + 10-15% qtz sand/xstls. 1.25'- 2.75'- Abrupt contact w/ 3-5% sand to gravel size clasts of qtzite + granite in brown fine clay, indurated. <1%. Alt red ox clasts of tuff. Rare lense of fine grey silt. 5.0'-6.0' SAA		FILL	11:40 Drilling Asphalt previously removed by jack-hammer. Drilling pressure = 200 - 400 psi. 12:00 Dry barrel
5.0 6.0 7.0 8.0 9.0	Run2 5'/5'	AAEO 244 6.0-7.0' f- Rad/~~[illegible]~~ AAEO 245 7.0-8.5' t-SAA + 246 = tr-SAA	α = NDA βγ= 146 VOC= NDA		6.0'-~~7~~.0'- Abrupt contact, much more indurated, 2-4mm irreg. shaped, sub horiz pore spaces lined w/ white fuzz (zeol?) qtz sand 40-50%. SRE 10/31/94 7.0 - 10.0' Abrupt contact w/ wx grey + brown tuff. Horizontal banding grey-brown common to 8.5'. Tuff w/ <1% xxlzd, flattened, dark grey pumice, phenos 25-45% (mostly qtz), 5-10% pumice shards? flat, horiz, ‖ banding, sugary txt.		TSHIREGE MEMBER OF BANDELIER TUFF	Driller reports 500 psi 5.0 - 7.0' 700 psi 7.0 - 10.0' Pressure decreases somewhat downhole 12:25
10.0 11.0 12.0					TD = 10.0' overall recovery = 7.75'/10' = 78% Drilling rate = 10'/45m = 0.22'/min			0:45

Prepared By R. Evans Date 10/24/94 Checked By S Coker Date 26-[illegible]

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3038 TA/OU 50/1147 Drill Depth From 0' To 12' Page 1 of 2

Driller Bill Kopp w Elmer Velasquez Box #(s) ——— Start Date/Time 10-19-94/8:50 End Date/Time 10-19-94/

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel SoP 6.26

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 .2 .4 .6 .8 1.0 2.0 3.0 4.0	Run 1 25'/5'		α = NDA βγ= 96/88 VOC= NDA	N/A	0-2 inches - Organics, grasses mainly w/ occ. quartzite cobbles in med brown fine silty clay, loose. 2" - 1.25' - Med. to drk brown sandy (5-10% qtz), silty clay w/<3% angular tuff clasts, roots, indurated. 1.25' - 1.5' - Red brwn clay rich horizon <1% sand. 1.5' - 2.5' - Gradual transition to compacted light brown fine silty clay w/ 15% qtz, roots, compacted, indurated. w/compacted angular clasts of alt. tuff.	 1.25' 1.5' NC	FILL	8:50 Drilling. No asphalt @ surface. Fill coming up annulus. Located in field between ⓣ Lot. Drilling slow + careful. Barrel is moist. Shoe is dry. 8:58
5.0 6.0 7.0 8.0 9.0	Run 2 3.75'/5'	7.25 AACO 247 8.25	α = NDA βγ= 120 VOC= NDA f- Rad/Metals		5.0 - 8.75' - med brown fine clay matrix supporting 30-75% qtz sand + 10-25% angular tuff clasts, + <1% rounded black lithics (% increasing down hole). Roots 6.75' - Large > 2" diam. angular clasts of tuff 8.25' - Large angular clast of ligth grey friable tuff filling core barrel.	6.75' 8.25' NC	FILL	9:02 Drilling slow + careful 9:18 Encounter resistance. 9:24 Dry barrel
10.0 11.0 12.0	Run 3 5/5'	AACO 248 9.25-10.5' L-SAA fr	α = NDA βγ= 100 VOC= NDA		10.0 - 10.25' Alt angular tuff clasts in brn clay. 10.25' - 15.0' - Tuff, grey to pale tan matrix w/25-50% phenos (mostly qtz), 1-5% lithics (alt. tuff?), 1-3% grey pumice (recrystalized < 1/2 flattened) in indurated mod. welded matrix.	10.25'	TSHIREGE MBR BANDELIER	Driller reports easy penetration then increase in resistance then easy.

Prepared By R. Evans Date 10-19-94 Checked By L. Coker Date 2-6-??

LOS ALAMOS NATIONAL LABORATORY ENVIRONMENTAL RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3038 TA/OU 60/1147 Drill Depth From 12' To 15' Page 2 of 2

Driller Bill Kopp or Elmer Velasquez Box #(s) ———— Start Date/Time 19 OCT 94/ End Date/Time 19 OCT 94/9:54

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel SOP 6.26

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
12.0 13.0 14.0 15.0		fr AB 6105 10.5- 13.0' Rad/ Metals		N/A	SAA - 12.0 - 15.0		TSHIRGGE MEMBER OF BANDELIER TUFF	Driller reports higher (700 psi) pressure to drill. 9:54
					TD 15.0' overall recovery = $\frac{11.25'}{15'}$ = 75% Drilling rate = $\frac{15'}{64m}$ = $0.23'/\text{min}$			1:04

Prepared By R. Evans Date 10-19-94 Checked By S. Cohen Date 26-11

LOS ALAMOS NATIC L LABORATORY ENVIRONMENTAL F TORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3042 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Blair Art Box #(s) ——— Start Date/Time 11-7-94/10:25 End Date/Time 11-7-94/ 10:44

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run 1 5'/5'		α = 0 βγ= 227 voc= 0	N/A	0 - 0.5' - Asphalt. 0.5 - 5.0' - Brown fine clay w/ 10-20% med - coarse sand, 20-30% gravels, 20-80% tuff clasts (% increase downhole to 80%)		ASPHALT FILL	10:25 10:30/10:34
5.0 6.0 7.0 8.0 9.0	Run 2 4'/5'	AACO 285 6.5 - 7.5' t/f + fr Rad/Metal AACO 296 8.0 - 9.0' fr Rad/Metal	α = 0 βγ = 253 voc = 0		5.0 - 7.0' - SAA. 6.5' - Brown horizontal band. 7.0 - 9.0' - Pink grey tuff w/ 40-50% phenos (mostly qtz), 3-5% grey sugary pumice. 8.6' - Fracture, 1mm tk, red brown stain. 25°		TSHIREGE MEMBER OF BANDELIER TUFF	10:40/10:44/10:46
10.0 11.0 12.0					TD = 10' Recovery = 9'/10' = 90% Drill Rate = 10'/19m = 0.53'/min			0:19

Prepared By R Evans Date 11-9-94 Checked By [illegible] Date 10-Nov-94

R.1

LOS ALAMOS TIONAL LABORATORY ENVIRONMEN RESTORATION PROGRAM

SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3048 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Elmer Velasquez Box #(s) ——— Start Date/Time 11-7-94/9:45 End Date/Time 11-7-94/10:06

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core In Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0 5.0	Run 1 4.25'/5'		$\alpha = 0$ $\beta\gamma = 229$ VOC = 0	N/A	0 - 0.25' - Asphalt. 0.25 - 4.25' - Fine brown clay w/ 10-15% med-coarse sand, 15-25% rounded gravels, 15-25% clasts of tuff.	N.C.	FILL	9:45 9:48/9:52/9:55
6.0 7.0 8.0 9.0 10.0	Run 2 3.5'/5'	AACO 287 6.0-7.0' fr Rad/Metal AACO 295 7.75-8.5' fr Rad/Metal	$\alpha = 0$ $\beta\gamma = 169$ VOC = 0		5.0' - 6.6' - SAA. % clasts of tuff increase down hole. 6.5' - Horizontal band. 6.6 - 8.5' - Pink grey tuff w/ 40-50% phenos, 3-5% grey, sugary pumice. 8.0' - Fracture, 2mm thk, lined w/ red clay + organic material. 45°	N.C.	TSHIREGE MEMBER OF BANDELIER TUFF	10:01/10:03/10:06
11.0 12.0					TD = 10' Recovery = 7.75'/10' = 77.5% Drill Rate = 10'/18m = 0.56'/min			0:18

Prepared By R. Evans Date 11-9-94 Checked By Date 10-Nov-94

R.1

LOS ALAMOS NATI AL LABORATORY ENVIRONMENTAL STORATION PROGRAM

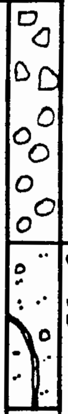
SAMPLE MANAGEMENT FACILITY

CORE SAMPLE LOG

Borehole ID 50-3044 TA/OU 50/1147 Drill Depth From 0' To 10' Page 1 of 1

Driller Bill Kopp Box #(s) ——— Start Date/Time 11-7-94/8:50 End Date/Time 11-7-94/9:13

Drilling Equip./Method CME-45 Hollow Stem Auger Sampling Equip./Method Corebarrel

Depth (Feet)	Recovery (feet per feet/ %)	Field Borehole Anaytical Sample Number	Field Screening Results	Top/Bottom of Core in Box	Lithology - Petrology - Soil	Graphic Log	Lithologic Unit	Notes
0 1.0 2.0 3.0 4.0	Run1 3.5'/5'		α = 0 βY = 198 VOC = 0	N/A	0.0 - 0.5' - Asphalt 0.5 - 3.5' - med brown fine clay w/ 10-15% med-coarse sand, 15-20% gravels, 10-80% clasts of tuff (grey, % increases downhole). 2.9' 3.1' } horizontal brown fine clay bands.	 N.C.	ASPALT FILL	8:50 ·Finish penetrating length of run ·Corebarrel delivered to SZ ·Finish screening 8:55/8:58/9:03
5.0 6.0 7.0 8.0 9.0 10.0	Run 2 4.0'/5'	AACO 289 7.25-8.75' t + fr Rad/ Metal	α = 0 βY = 208 VOC = 0		5.0 - 8.25' - SAA. Rounded gravels increase downhole to 50%. Tuff clasts 25-30%. 7.25' - 9.0' - Pink grey Tuff w/ 40-50% phenos (mostly qtz), 3-5% grey sugary pumices. 8.0-9.0' - Fracture, 4-6mm tk, lined w/ red clay. 60°	 N.C.	TSHIREGE MBR OF BANDELIER TUFF	9:10/9:13/9:18
11.0 12.0					TD = 10' Recovery = 7.5'/10' = 75% Drilling Rate = 10'/23m = 0.43'/min			0:23

Prepared By R Kraus Date 11-9-94 Checked By Stephanie J. Cohen Date 10-Nov-94

R.1

Attachment 2

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3024	AAC0227	54 - 66	Americium-241	-0.03	PCI/G		G	0.1965	PCI/G	NA	NA
50-004(a)	50-3024	AAC0227	54 - 66	Cesium-137	0.036	PCI/G		G	0.045	PCI/G	NA	NA
50-004(a)	50-3024	AAC0227	54 - 66	Plutonium-238	0.014	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3024	AAC0227	54 - 66	Plutonium-239	0.135	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3024	AAC0227	54 - 66	Tritium	0.001	PCI/G	J	LS	600	PCI/L	NA	NA
50-004(a)	50-3024	AAC0227	54 - 66	Uranium-234	0.592	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3024	AAC0227	54 - 66	Uranium-235	0.029	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3024	AAC0227	54 - 66	Uranium-238	0.613	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3024	AAC0227	54 - 66	Water (Unbound)	6.55	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3024	AAC0227	54 - 66	Aluminum	3130	MG/KG	J	ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Antimony	4.5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Arsenic	1.2	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Barium	41.8	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Beryllium	0.39	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Cadmium	0.53	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Calcium	3110	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Chromium, Total	3.5	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Cobalt	1.2	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Copper	2.1	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Iron	4500	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Lead	3.3	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Magnesium	856	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Manganese	119	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Mercury	0.02	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Nickel	2.8	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Potassium	522	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Selenium	0.54	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Silver	0.8	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3024	AAC0227	54 - 66	Sodium	105	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Thallium	0.34	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Vanadium	7.3	MG/KG	UJ	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3024	AAC0227	54 - 66	Zinc	15.4	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Acetone	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aroclor-1242	0.2647	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aroclor-1254	0.2647	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aroclor-1260	0.2647	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aroclors (Mixed)	0.2647	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2
PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3024	AAC0228	72 - 84	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Butanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3024	AAC0228	72 - 84	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Americium-241	0.045	PCI/G		G	0.2565	PCI/G	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Cesium-137	0.028	PCI/G		G	0.036	PCI/G	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-238	0.034	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-238	0.038	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-238	0.065	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-239	0.068	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-239	0.108	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Plutonium-239	0.14	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Tritium	0.00903	PCI/G	J	LS	600	PCI/L	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Tritium	0.01104	PCI/G	J	LS	600	PCI/L	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-234	0.52	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-234	0.59	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-235	0.02	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-235	0.036	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-238	0.559	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Uranium-238	0.655	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3024	AAC0228	72 - 84	Water (Unbound)	14	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Water (Unbound)	14	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Aluminum	3420	MG/KG	J	ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Antimony	4.8	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Arsenic	0.8	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Barium	40.2	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Beryllium	0.53	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Cadmium	0.43	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Calcium	1700	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Chromium, Total	4.7	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Cobalt	1.5	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Copper	2.7	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Iron	6310	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Lead	6.4	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Magnesium	1190	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Manganese	225	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Mercury	0.02	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Nickel	6.8	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Potassium	536	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Selenium	0.58	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Silver	0.85	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3024	AAC0228	72 - 84	Sodium	135	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Thallium	0.3	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Vanadium	6.9	MG/KG	UJ	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3024	AAC0228	72 - 84	Zinc	27.6	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Aluminum	10500	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Antimony	4.8	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Arsenic	1.4	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Barium	146	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Beryllium	1	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Cadmium	0.73	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Calcium	3860	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Chromium, Total	7.1	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Cobalt	5	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Copper	5.8	MG/KG		ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Iron	10300	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Lead	14.4	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Magnesium	1790	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Manganese	362	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Nickel	5.6	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Potassium	1580	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Selenium	0.57	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3025	AAC0254	60 - 73.2	Silver	0.84	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3025	AAC0254	60 - 73.2	Sodium	115	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Thallium	0.47	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Vanadium	17.4	MG/KG		ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Zinc	25.9	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3025	AAC0254	60 - 73.2	Americium-241	0.104	PCI/G		G	0.213	PCI/G	NA	NA
50-004(a)	50-3025	AAC0254	60 - 73.2	Cesium-137	0.018	PCI/G		G	0.0465	PCI/G	NA	NA
50-004(a)	50-3025	AAC0254	60 - 73.2	Plutonium-238	-0.011	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3025	AAC0254	60 - 73.2	Plutonium-239	0.002	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3025	AAC0254	60 - 73.2	Tritium	0.19685	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3025	AAC0254	60 - 73.2	Uranium-234	0.736	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3025	AAC0254	60 - 73.2	Uranium-235	0.054	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3025	AAC0254	60 - 73.2	Uranium-238	0.77	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3025	AAC0254	60 - 73.2	Water (Unbound)	12.1	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3025	AAC0255	73.2 - 84	Aluminum	4730	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Arsenic	0.59	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Barium	67.2	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Beryllium	0.72	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Calcium	742	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Chromium, Total	1.9	MG/KG	UJ	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Cobalt	0.77	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Copper	2	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Iron	5190	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Lead	9.2	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Magnesium	729	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Manganese	262	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Nickel	2	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Potassium	667	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Silver	0.81	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3025	AAC0255	73.2 - 84	Sodium	73.3	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Thallium	0.28	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Vanadium	5.4	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Zinc	21.6	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3025	AAC0255	73.2 - 84	Americium-241	0.044	PCI/G		G	0.165	PCI/G	NA	NA
50-004(a)	50-3025	AAC0255	73.2 - 84	Cesium-137	-0.011	PCI/G		G	0.033	PCI/G	NA	NA
50-004(a)	50-3025	AAC0255	73.2 - 84	Plutonium-238	0.004	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3025	AAC0255	73.2 - 84	Plutonium-239	0.002	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3025	AAC0255	73.2 - 84	Tritium	0.19439	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3025	AAC0255	73.2 - 84	Uranium-234	0.622	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3025	AAC0255	73.2 - 84	Uranium-235	0.034	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3025	AAC0255	73.2 - 84	Uranium-238	0.732	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3025	AAC0255	73.2 - 84	Water (Unbound)	8.94	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Aluminum	6940	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Antimony	5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Arsenic	0.65	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Barium	63.3	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Beryllium	0.81	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Cadmium	0.47	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Calcium	1570	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Chromium, Total	4.8	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Cobalt	1	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Copper	3.6	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Iron	7870	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Lead	7.8	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Magnesium	1120	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Manganese	219	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Nickel	3.6	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Potassium	857	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Selenium	0.6	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Silver	0.89	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Sodium	152	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Thallium	0.5	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Vanadium	7.1	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Zinc	26	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3026	AAC0256	72 - 84	Americium-241	0.027	PCI/G		G	0.0465	PCI/G	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Americium-241	0.05	PCI/G		G	0.09	PCI/G	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Cesium-137	-0.005	PCI/G		G	0.0345	PCI/G	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Cesium-137	0.005	PCI/G		G	0.045	PCI/G	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Plutonium-238	0.009	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3026	AAC0256	72 - 84	Plutonium-239	0.002	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3026	AAC0256	72 - 84	Tritium	0.22163	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3026	AAC0256	72 - 84	Uranium-234	0.631	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3026	AAC0256	72 - 84	Uranium-235	0.016	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3026	AAC0256	72 - 84	Uranium-238	0.82	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3026	AAC0256	72 - 84	Water (Unbound)	15.7	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Aluminum	5370	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Antimony	5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Arsenic	0.64	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Barium	31.7	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Beryllium	0.87	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Cadmium	0.52	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Calcium	1190	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Chromium, Total	4.1	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Cobalt	0.83	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Copper	4.6	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3026	AAC0257	84 - 96	Iron	8190	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Lead	5.2	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Magnesium	957	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Manganese	220	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Nickel	3.6	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Potassium	784	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Selenium	0.59	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Silver	0.87	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Sodium	156	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Thallium	0.4	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Vanadium	7.1	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Zinc	29.5	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3026	AAC0257	84 - 96	Americium-241	0	PCI/G		G	0.1065	PCI/G	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Americium-241	0.027	PCI/G		G	0.0855	PCI/G	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Cesium-137	-0.002	PCI/G		G	0.033	PCI/G	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Cesium-137	0.007	PCI/G		G	0.0345	PCI/G	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Plutonium-238	0.034	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3026	AAC0257	84 - 96	Plutonium-239	0.016	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3026	AAC0257	84 - 96	Tritium	0.26965	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3026	AAC0257	84 - 96	Uranium-234	0.642	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3026	AAC0257	84 - 96	Uranium-235	0.023	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3026	AAC0257	84 - 96	Uranium-238	0.574	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3026	AAC0257	84 - 96	Water (Unbound)	14.5	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Acetone	0.023	MG/KG	U	GCMS	0.023	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3027	AAC0211	102 - 108	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Butanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3027	AAC0211	102 - 108	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Aluminum	1332	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Aluminum	2180	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Arsenic	0.6	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Arsenic	0.6	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Barium	17.4	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Barium	18.1	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Beryllium	0.42	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Beryllium	0.45	MG/KG		ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Cadmium	0.38	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Cadmium	1.7	MG/KG		ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Calcium	353	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Calcium	377	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Chromium, Total	1.2	MG/KG	UJ	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Chromium, Total	1.2	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Cobalt	0.77	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Cobalt	0.77	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Copper	1.2	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Copper	1.5	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Iron	3416	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Iron	3510	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Lead	5	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Lead	5.4	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Magnesium	242	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Magnesium	246	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG

Attachment 2
PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3027	AAC0211	102 - 108	Manganese	160	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Manganese	162	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Nickel	1.7	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Nickel	2.5	MG/KG		ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Potassium	366	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Potassium	861	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Silver	0.82	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Silver	0.82	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Sodium	185	MG/KG		ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Sodium	615	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Thallium	0.29	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Thallium	0.29	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Vanadium	1.4	MG/KG		ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Vanadium	1.7	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Zinc	15.5	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Zinc	17.9	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3027	AAC0211	102 - 108	Americium-241	-0.056	PCI/G		G	0.279	PCI/G	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Cesium-137	-0.016	PCI/G		G	0.057	PCI/G	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Plutonium-238	0.004	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Plutonium-238	0.027	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Plutonium-239	0.011	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Plutonium-239	0.09	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Tritium	0.03603	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-234	0.552	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-234	0.608	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-235	0.018	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-235	0.038	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-238	0.518	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Uranium-238	0.565	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3027	AAC0211	102 - 108	Water (Unbound)	9.03	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3027	AAC0211	102 - 108	Water (Unbound)	9.03	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Aluminum	4340	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Antimony	4.8	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Arsenic	0.95	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Barium	50.1	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Beryllium	0.91	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Cadmium	0.94	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Calcium	854	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Chromium, Total	2.7	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Cobalt	0.87	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Copper	1.6	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Iron	5100	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Lead	5	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Magnesium	703	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Manganese	207	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Nickel	4.8	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Potassium	563	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Selenium	0.57	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Silver	0.84	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Sodium	109	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Thallium	0.3	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Vanadium	4.1	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Zinc	21.7	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Americium-241	0.119	PCI/G		G	0.2655	PCI/G	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Cesium-137	0	PCI/G		G	0.0405	PCI/G	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Plutonium-238	0.07	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Plutonium-239	0.009	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Tritium	0.0803	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Uranium-234	0.676	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Uranium-235	0.027	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Uranium-238	0.561	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Water (Unbound)	12.6	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3027	AAC0210	63.6 - 69.6	Water (Unbound)	12.6	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3028	AAC0259	18 - 36	Aluminum	1970	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Antimony	6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Arsenic	0.77	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Barium	35.3	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Beryllium	0.58	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Cadmium	0.48	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Calcium	1020	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Chromium, Total	2.5	MG/KG	UJ	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Cobalt	1	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Copper	1.6	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Iron	6850	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Lead	4	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Magnesium	900	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Manganese	226	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Nickel	1.7	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Potassium	787	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Selenium	0.71	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Silver	1.1	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3028	AAC0259	18 - 36	Sodium	285	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Thallium	0.81	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Vanadium	3.6	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAC0259	18 - 36	Zinc	26.3	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3028	AAC0259	18 - 36	Americium-241	0.008	PCI/G		G	0.0555	PCI/G	NA	NA
50-004(a)	50-3028	AAC0259	18 - 36	Cesium-137	-0.034	PCI/G		G	0.051	PCI/G	NA	NA
50-004(a)	50-3028	AAC0259	18 - 36	Plutonium-238	0.018	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3028	AAC0259	18 - 36	Plutonium-239	0	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3028	AAC0259	18 - 36	Tritium	0.14891	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3028	AAC0259	18 - 36	Uranium-234	0.358	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3028	AAC0259	18 - 36	Uranium-235	0.016	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3028	AAC0259	18 - 36	Uranium-238	0.417	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3028	AAC0259	18 - 36	Water (Unbound)	25.2	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Acetone	0.057	MG/KG	U	GCMS	0.057	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aroclor-1242	0.2881	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aroclor-1254	0.2881	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aroclor-1260	0.2881	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aroclors (Mixed)	0.2881	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Butanone[2-]	0.028	MG/KG	U	GCMS	0.028	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAB6106	42 - 51.6	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Aluminum	8180	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Aluminum	8250	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Antimony	5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Antimony	5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Arsenic	0.64	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Arsenic	1.01	MG/KG		GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Barium	38.3	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Barium	42.1	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Beryllium	1.9	MG/KG		ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Beryllium	2.1	MG/KG		ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Cadmium	0.49	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Cadmium	0.57	MG/KG		ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Calcium	1814	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Calcium	1830	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Chromium, Total	4.8	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Chromium, Total	5.4	MG/KG		ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Cobalt	0.9	MG/KG		ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Cobalt	1	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Copper	4.6	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Copper	4.8	MG/KG		ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Iron	8411	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Iron	8980	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Lead	5	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Lead	5.4	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Magnesium	1960	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Magnesium	2006	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Manganese	198	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Manganese	253	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Mercury	0.02	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Nickel	8.9	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Nickel	9.5	MG/KG		ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Potassium	1210	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Potassium	1267	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Selenium	0.59	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Selenium	0.59	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAB6106	42 - 51.6	Silver	0.88	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Silver	0.88	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Sodium	44.9	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Sodium	62.3	MG/KG		ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Thallium	0.31	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Thallium	0.34	MG/KG		GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Vanadium	6.8	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Vanadium	7.3	MG/KG		ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Zinc	30.1	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Zinc	31.4	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3028	AAB6106	42 - 51.6	Americium-241	-0.085	PCI/G		G	0.2025	PCI/G	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Cesium-137	-0.002	PCI/G		G	0.0375	PCI/G	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Plutonium-238	-0.004	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Plutonium-238	0.018	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Plutonium-239	0	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Plutonium-239	0.007	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Tritium	0.06111	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Tritium	0.09507	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-234	0.376	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-234	0.554	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-235	0.009	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-235	0.043	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-238	0.536	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Uranium-238	0.604	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3028	AAB6106	42 - 51.6	Water (Unbound)	14.9	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3028	AAB6106	42 - 51.6	Water (Unbound)	14.9	%		GRAV	NA	NA	NA	NA
50-004(a)	50-3028	AAC0258	9.6 - 18	Aluminum	11700	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Antimony	5.3	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Arsenic	1.8	MG/KG	UJ	GFAA	0.5	MG/KG	7.82	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Barium	124	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Beryllium	1.1	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Cadmium	0.58	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Calcium	2570	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Chromium, Total	8.2	MG/KG	J	ICPES	0.5	MG/KG	19.3	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Cobalt	4.6	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Copper	6.5	MG/KG		ICPES	0.5	MG/KG	15.5	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Iron	10700	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Lead	16.9	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Magnesium	1930	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Manganese	317	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Mercury	0.05	MG/KG	U	CVAA	0.01	MG/KG	0.1	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Nickel	6.4	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Potassium	1570	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Selenium	0.63	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Silver	0.93	MG/KG	U	ICPES	1	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-004(a)	50-3028	AAC0258	9.6 - 18	Sodium	144	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Thallium	0.61	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Vanadium	16.4	MG/KG		ICPES	0.5	MG/KG	41.9	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Zinc	38.4	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-004(a)	50-3028	AAC0258	9.6 - 18	Americium-241	-0.016	PCI/G		G	0.2175	PCI/G	NA	NA
50-004(a)	50-3028	AAC0258	9.6 - 18	Cesium-137	-0.429	PCI/G		G	0.285	PCI/G	NA	NA
50-004(a)	50-3028	AAC0258	9.6 - 18	Plutonium-238	0.002	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-004(a)	50-3028	AAC0258	9.6 - 18	Plutonium-239	0.059	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-004(a)	50-3028	AAC0258	9.6 - 18	Tritium	0.12628	PCI/G		LS	600	PCI/L	NA	NA
50-004(a)	50-3028	AAC0258	9.6 - 18	Uranium-234	0.955	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-004(a)	50-3028	AAC0258	9.6 - 18	Uranium-235	0.041	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-004(a)	50-3028	AAC0258	9.6 - 18	Uranium-238	0.887	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-004(a)	50-3028	AAC0258	9.6 - 18	Water (Unbound)	19.3	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3011	AAC0276	84 - 96	Aluminum	2870	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Arsenic	1.2	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Barium	28.1	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Beryllium	0.76	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Calcium	568	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Chromium, Total	1.7	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Cobalt	0.92	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Copper	3.3	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Iron	5250	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Lead	4.6	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Magnesium	438	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Manganese	136	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Mercury	0.06	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Nickel	1.5	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Potassium	441	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Silver	0.81	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3011	AAC0276	84 - 96	Sodium	73.5	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Thallium	0.29	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Vanadium	4.6	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Zinc	29.3	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3011	AAC0276	84 - 96	Americium-241	-0.018	PCI/G		G	0.225	PCI/G	NA	NA
50-011(a)	50-3011	AAC0276	84 - 96	Cesium-137	0.053	PCI/G		G	0.069	PCI/G	NA	NA
50-011(a)	50-3011	AAC0276	84 - 96	Plutonium-238	0.02	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Plutonium-238	0.03	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Plutonium-239	0.06	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Plutonium-239	0.06	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Tritium	1.41531	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-234	0.64	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-234	0.77	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-235	0.04	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-235	0.06	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-238	0.64	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Uranium-238	0.75	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3011	AAC0276	84 - 96	Water (Unbound)	7.9	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3011	AAC0277	96 - 108	Aluminum	522	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Antimony	4.4	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Arsenic	0.57	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Barium	4.6	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Beryllium	0.4	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Cadmium	0.36	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Calcium	196	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Chromium, Total	1.2	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Cobalt	0.74	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Copper	1.2	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Iron	4690	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Lead	2.3	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Magnesium	117	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Manganese	47.2	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Mercury	0.02	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Nickel	1.2	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Potassium	166	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Selenium	0.53	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Silver	0.78	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3011	AAC0277	96 - 108	Sodium	75.5	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Thallium	0.27	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Vanadium	1.6	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Zinc	27.6	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3011	AAC0277	96 - 108	Americium-241	0.002	PCI/G		G	0.0435	PCI/G	NA	NA
50-011(a)	50-3011	AAC0277	96 - 108	Cesium-137	0.015	PCI/G		G	0.03	PCI/G	NA	NA
50-011(a)	50-3011	AAC0277	96 - 108	Plutonium-239	0.01	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3011	AAC0277	96 - 108	Tritium	0.75149	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3011	AAC0277	96 - 108	Uranium-234	0.56	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3011	AAC0277	96 - 108	Uranium-235	0.03	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3011	AAC0277	96 - 108	Uranium-238	0.57	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3011	AAC0277	96 - 108	Water (Unbound)	5.06	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3042	AAC0285	79.2 - 90	Aluminum	2230	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Arsenic	0.67	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Barium	21	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Beryllium	0.93	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Calcium	384	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Chromium, Total	1.3	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Cobalt	0.77	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3042	AAC0285	79.2 - 90	Copper	2.4	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Iron	4480	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Lead	2.9	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Magnesium	344	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Manganese	109	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Mercury	0.04	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Nickel	1.3	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Potassium	351	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Silver	0.81	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3042	AAC0285	79.2 - 90	Sodium	59.3	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Thallium	0.28	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Vanadium	3.8	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Zinc	26.3	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3042	AAC0285	79.2 - 90	Americium-241	-0.017	PCI/G		G	0.0465	PCI/G	NA	NA
50-011(a)	50-3042	AAC0285	79.2 - 90	Cesium-137	0.021	PCI/G		G	0.036	PCI/G	NA	NA
50-011(a)	50-3042	AAC0285	79.2 - 90	Plutonium-238	0	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3042	AAC0285	79.2 - 90	Plutonium-239	0.01	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3042	AAC0285	79.2 - 90	Tritium	0.45586	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3042	AAC0285	79.2 - 90	Uranium-234	0.51	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3042	AAC0285	79.2 - 90	Uranium-235	0	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3042	AAC0285	79.2 - 90	Uranium-238	0.59	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3042	AAC0285	79.2 - 90	Water (Unbound)	7.54	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Acetone	0.088	MG/KG		GCMS	0.057	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aroclor-1242	0.2848	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aroclor-1254	0.2848	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aroclor-1260	0.2848	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aroclors (Mixed)	0.2848	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3042	AAC0296	96 - 108	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Butanone[2-]	0.027	MG/KG	J	GCMS	0.027	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3042	AAC0296	96 - 108	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3042	AAC0296	96 - 108	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Aluminum	1750	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Aluminum	2028	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Antimony	4.5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Antimony	4.5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Arsenic	0.58	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Arsenic	0.58	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Barium	14.9	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Barium	16.6	MG/KG		ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Beryllium	0.84	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Beryllium	0.95	MG/KG		ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Calcium	256	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Calcium	320	MG/KG		ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Chromium, Total	1.7	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Chromium, Total	2	MG/KG		ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Cobalt	0.76	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Cobalt	0.76	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Copper	1.2	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Copper	1.8	MG/KG		ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Iron	4060	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Iron	4514	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Lead	1.9	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3042	AAC0296	96 - 108	Lead	1.9	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Magnesium	240	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Magnesium	296	MG/KG		ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Manganese	43.9	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Manganese	49.8	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Mercury	0.02	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Mercury	0.02	MG/KG		CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Nickel	1.3	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Nickel	2	MG/KG		ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Potassium	252	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Potassium	309	MG/KG		ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Selenium	0.54	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Selenium	0.57	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Silver	0.8	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Silver	0.8	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Sodium	59.6	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Sodium	66.8	MG/KG		ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Thallium	0.28	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Thallium	0.28	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Vanadium	2.8	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Vanadium	3.2	MG/KG		ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Zinc	23.5	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Zinc	25.06	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3042	AAC0296	96 - 108	Americium-241	0.036	PCI/G		G	0.0825	PCI/G	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Cesium-137	0.008	PCI/G		G	0.027	PCI/G	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Plutonium-239	0.02	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Plutonium-239	0.02	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Tritium	0.29378	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-234	0.68	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-234	0.7	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-235	0.04	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-235	0.05	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-238	0.86	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Uranium-238	1.14	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3042	AAC0296	96 - 108	Water (Unbound)	6.18	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3043	AAC0287	72 - 84	Aluminum	2960	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Antimony	4.6	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Arsenic	0.87	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Barium	28.7	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Beryllium	0.86	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Cadmium	0.37	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Calcium	564	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Chromium, Total	2.3	MG/KG		ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Cobalt	0.77	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Copper	2.9	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3043	AAC0287	72 - 84	Iron	4680	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Lead	5.7	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Magnesium	465	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Manganese	133	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Mercury	0.04	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Nickel	1.9	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Potassium	439	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Selenium	0.55	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Silver	0.81	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3043	AAC0287	72 - 84	Sodium	64.7	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Thallium	0.29	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Vanadium	5.1	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Zinc	26.1	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3043	AAC0287	72 - 84	Americium-241	0.003	PCI/G		G	0.084	PCI/G	NA	NA
50-011(a)	50-3043	AAC0287	72 - 84	Cesium-137	-0.002	PCI/G		G	0.027	PCI/G	NA	NA
50-011(a)	50-3043	AAC0287	72 - 84	Plutonium-238	0.01	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3043	AAC0287	72 - 84	Plutonium-239	0.02	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3043	AAC0287	72 - 84	Tritium	0.85337	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3043	AAC0287	72 - 84	Uranium-234	0.66	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3043	AAC0287	72 - 84	Uranium-235	0.03	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3043	AAC0287	72 - 84	Uranium-238	0.63	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3043	AAC0287	72 - 84	Water (Unbound)	8.48	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Acetone	0.069	MG/KG		GCMS	0.057	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aroclor-1242	0.2816	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aroclor-1254	0.2816	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aroclor-1260	0.2816	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aroclors (Mixed)	0.2816	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Butanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3043	AAC0295	93.6 - 102	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Aluminum	1240	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Antimony	4.5	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Arsenic	0.58	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Barium	13.4	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Beryllium	0.86	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Cadmium	0.36	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Calcium	303	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Chromium, Total	1.2	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Cobalt	0.75	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Copper	1.5	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Iron	3970	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Lead	2.3	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Magnesium	208	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Manganese	84.3	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Mercury	0.02	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Nickel	1.3	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Potassium	238	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Selenium	0.53	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Silver	0.79	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Sodium	54.7	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Thallium	0.28	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Vanadium	4	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Zinc	26.2	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3043	AAC0295	93.6 - 102	Americium-241	-0.01	PCI/G		G	0.048	PCI/G	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3043	AAC0295	93.6 - 102	Cesium-137	-0.015	PCI/G		G	0.036	PCI/G	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Plutonium-238	0.01	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3043	AAC0295	93.6 - 102	Plutonium-239	0	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3043	AAC0295	93.6 - 102	Tritium	0.29971	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3043	AAC0295	93.6 - 102	Uranium-234	0.68	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3043	AAC0295	93.6 - 102	Uranium-235	0.01	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3043	AAC0295	93.6 - 102	Uranium-238	0.98	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3043	AAC0295	93.6 - 102	Water (Unbound)	6.18	%		GRAV	NA	NA	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Acenaphthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Acenaphthylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Acetone	0.059	MG/KG		GCMS	0.057	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aniline	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aroclor-1242	0.2742	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aroclor-1254	0.2742	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aroclor-1260	0.2742	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aroclors (Mixed)	0.2742	MG/KG	U	GCEC	0.06	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Azobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzidine	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzo(a)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzo(a)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzo(b)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzo(g,h,i)perylene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzo(k)fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzoic Acid	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Benzyl Alcohol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bis(2-chloroethoxy)methane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bis(2-chloroethyl)ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bis(2-ethylhexyl)phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromochloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromodichloromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromoform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromomethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Bromophenyl-phenylether[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Butanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Butylbenzene[n-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Butylbenzene[sec-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Butylbenzene[tert-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Butylbenzylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Carbon Disulfide	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Carbon Tetrachloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloro-3-methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorobenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorodibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloroethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloroform	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chloronaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorophenyl-phenyl[4-] Ether	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorotoluene[2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chlorotoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chrysene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Di-n-butylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Di-n-octylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dibenz(a,h)anthracene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dibenzofuran	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dibromo-3-chloropropane[1,2-]	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dibromoethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dibromomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzene[1,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorobenzidine[3,3'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorodifluoromethane	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloroethane[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloroethane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloroethene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloroethene[cis-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloroethene[trans-1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichlorophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropane[1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropane[1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropane[2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropene[1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropene[cis-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dichloropropene[trans-1,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Diethylphthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dimethyl Phthalate	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dimethylphenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dinitro-2-methylphenol[4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dinitrophenol[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dinitrotoluene[2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Dinitrotoluene[2,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Ethylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Fluoranthene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Fluorene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Hexachlorobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Hexachlorobutadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Hexachlorocyclopentadiene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Hexachloroethane	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Hexanone[2-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Indeno(1,2,3-cd)pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Iodomethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Isophorone	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Isopropylbenzene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Isopropyltoluene[4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Methyl-2-pentanone[4-]	0.02	MG/KG	U	GCMS	0.02	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Methylene Chloride	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Methylnaphthalene[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Methylphenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Methylphenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Naphthalene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitroaniline[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitroaniline[3-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitroaniline[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitrobenzene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitrophenol[2-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitrophenol[4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitroso-di-n-propylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitrosodimethylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nitrosodiphenylamine[N-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Oxybis(1-chloropropane)[2,2'-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Pentachlorophenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Phenanthrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Phenol	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Propylbenzene[1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Pyrene	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Styrene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Tetrachloroethane[1,1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Tetrachloroethane[1,1,2,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Tetrachloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Toluene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichlorobenzene[1,2,4-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichloroethane[1,1,1-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichloroethane[1,1,2-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichloroethene	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichlorofluoromethane	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA

Attachment 2

PRSs 50-004a & 50-011a data.xls

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULT	Units	LAB QUALIFIER	TECHNIQUE CODE	Detection Limit	DL Units	Backgound Value	BKG Units
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichlorophenol[2,4,5-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichlorophenol[2,4,6-]	0.33	MG/KG	U	GCMS	0.33	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trichloropropane[1,2,3-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trimethylbenzene[1,2,4-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Trimethylbenzene[1,3,5-]	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Vinyl Chloride	0.01	MG/KG	U	GCMS	0.01	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Xylene (Total)	0.005	MG/KG	U	GCMS	0.005	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Aluminum	2770	MG/KG		ICPES	17	MG/KG	38700	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Antimony	4.7	MG/KG	U	ICPES	5	MG/KG	1	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Arsenic	0.6	MG/KG	U	GFAA	0.5	MG/KG	7.82	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Barium	20	MG/KG	U	ICPES	0.14	MG/KG	315	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Beryllium	0.81	MG/KG	U	ICPES	0.08	MG/KG	1.95	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Cadmium	0.38	MG/KG	U	ICPES	0.4	MG/KG	2.6	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Calcium	525	MG/KG	U	ICPES	60	MG/KG	6120	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Chromium, Total	1.9	MG/KG	U	ICPES	0.5	MG/KG	19.3	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Cobalt	0.78	MG/KG	U	ICPES	0.5	MG/KG	19.2	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Copper	2.9	MG/KG	U	ICPES	0.5	MG/KG	15.5	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Iron	4480	MG/KG		ICPES	14	MG/KG	21300	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Lead	2.3	MG/KG		GFAA	0.5	MG/KG	23.3	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Magnesium	436	MG/KG	U	ICPES	5	MG/KG	4610	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Manganese	73	MG/KG		ICPES	0.2	MG/KG	714	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Mercury	0.04	MG/KG	UJ	CVAA	0.01	MG/KG	0.1	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Nickel	2.7	MG/KG	U	ICPES	2	MG/KG	15.2	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Potassium	465	MG/KG	U	ICPES	74	MG/KG	3410	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Selenium	0.56	MG/KG	U	GFAA	0.4	MG/KG	1.7	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Silver	0.82	MG/KG	U	ICPES	1	MG/KG	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Sodium	79.5	MG/KG	U	ICPES	14	MG/KG	915	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Thallium	0.29	MG/KG	U	GFAA	0.2	MG/KG	1	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Vanadium	5.6	MG/KG	U	ICPES	0.5	MG/KG	41.9	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Zinc	25.7	MG/KG		ICPES	1	MG/KG	50.8	MG/KG
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Americium-241	-0.066	PCI/G		G	0.2145	PCI/G	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Americium-241	0.015	PCI/G		G	0.1545	PCI/G	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Cesium-137	0.011	PCI/G		G	0.03	PCI/G	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Cesium-137	0.013	PCI/G		G	0.0435	PCI/G	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Plutonium-238	0.01	PCI/G		RAS	0.002	PCI/G	0.014	PCI/G
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Plutonium-239	0.01	PCI/G		RAS	0.002	PCI/G	0.052	PCI/G
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Tritium	1.31588	PCI/G	J	LS	600	PCI/L	NA	NA
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Uranium-234	0.78	PCI/G		RAS	0.002	PCI/G	1.94	PCI/G
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Uranium-235	0	PCI/G		RAS	0.002	PCI/G	0.084	PCI/G
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Uranium-238	0.63	PCI/G		RAS	0.002	PCI/G	1.82	PCI/G
50-011(a)	50-3044	AAC0289	87.6 - 105.6	Water (Unbound)	8.32	%		GRAV	NA	NA	NA	NA

Attachment 3

Attachment 3

Semivolatile results for
50-004(c)

PRS ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3020	AAC0293	84 - 114	Chrysene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Fluorene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Isophorone	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Naphthalene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Phenol	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Pyrene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Aniline	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Anthracene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Azobenzene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzo(a)pyrene	0.33	U	GCMS

Attachment 3
Semivolatile results for
50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3034	AAC0239	108 - 120	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Chrysene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Fluorene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Isophorone	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Naphthalene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Nitrosodiphenylamine[N-]	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

PRS ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3034	AAC0239	108 - 120	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Phenol	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Pyrene	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3034	AAC0239	108 - 120	Trichlorophenol[2,4,6-]	0.33	U	GCMS

U = Result Below Detection Limit

Attachment 3
Semivolatile results for
50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (ft)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3001	AAC0212	68.4 - 72	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Aniline	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Anthracene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Azobenzene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Chrysene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Fluorene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Isophorone	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Naphthalene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitroaniline[3-]	0.33	U	GCMS

Attachment 3
Semivolatile results for
50-004(c)

PR[illegible] ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Phenol	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Pyrene	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3001	AAC0212	68.4 - 72	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Aniline	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Anthracene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Azobenzene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Chrysene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Dinitrotoluene[2,4-]	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3009	AAC0294	147.6 - 162	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Fluorene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Isophorone	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Naphthalene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Phenol	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Pyrene	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3009	AAC0294	147.6 - 162	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Aniline	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Anthracene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Azobenzene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Chrysene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dibenz(a,h)anthracene	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

PRL ID	LOCATION ID	SAMPLE ID	DEPTH (in)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3012	AAC0263	96 - 132	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Fluorene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Isophorone	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Naphthalene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Phenol	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Pyrene	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3012	AAC0263	96 - 132	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Aniline	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Anthracene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Azobenzene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Benzoic Acid	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3014	AAC0265	90 - 102	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Chrysene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Fluorene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Isophorone	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Naphthalene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Phenol	0.33	U	GCMS

Attachment 3

Semivolatile results for

50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (In.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3014	AAC0265	90 - 102	Pyrene	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3014	AAC0265	90 - 102	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Aniline	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Anthracene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Azobenzene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Chrysene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dimethyl Phthalate	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Fluorene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Isophorone	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Methylphenol[2-]	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

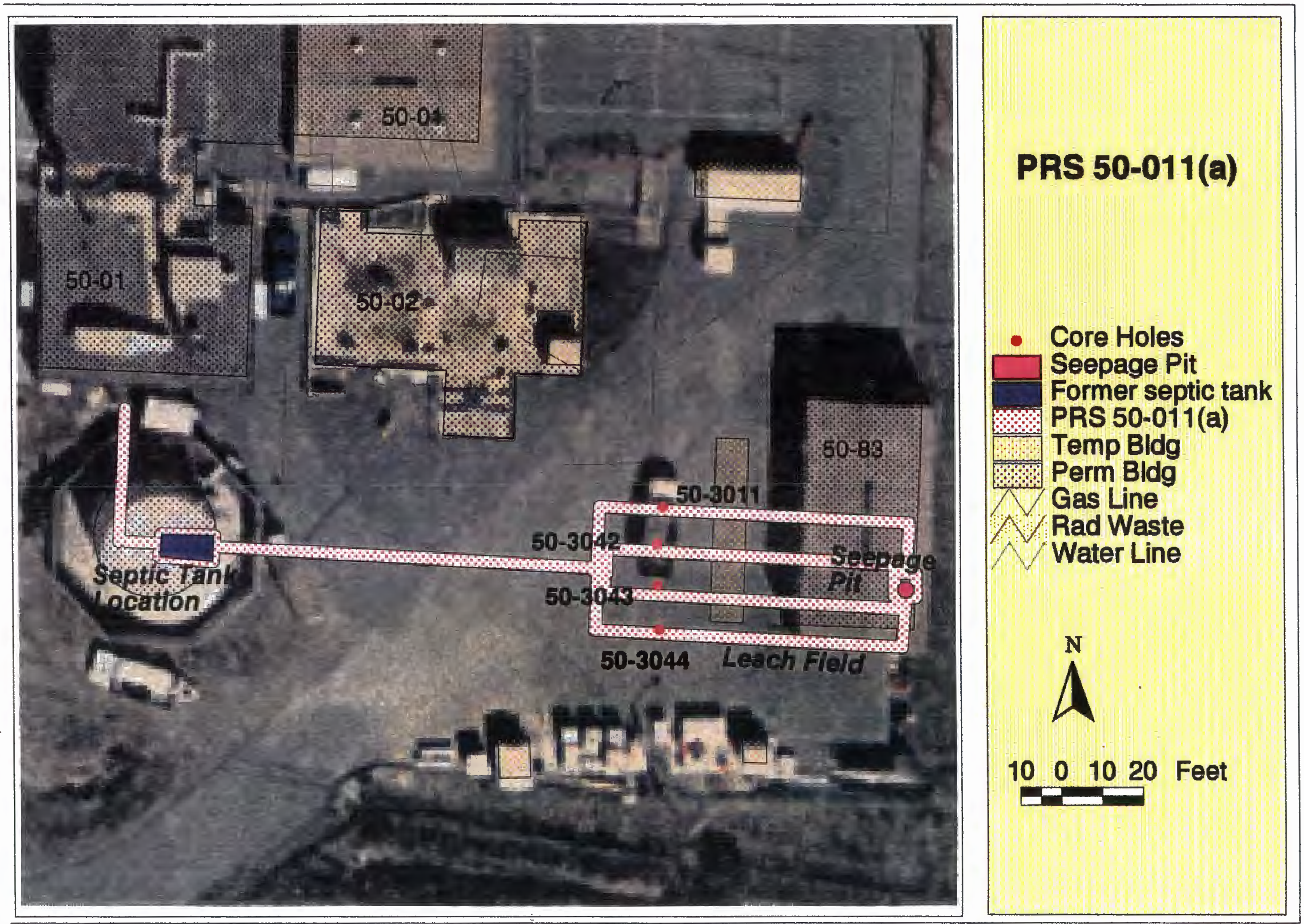
PRA ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3016	AAC0292	150 - 163.2	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Naphthalene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Phenol	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Pyrene	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3016	AAC0292	150 - 163.2	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Aniline	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Anthracene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Azobenzene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Chrysene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Di-n-butylphthalate	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Di-n-octylphthalate	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dibenz(a,h)anthracene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dibenzofuran	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,2-]	0.005	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,3-]	0.005	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,3-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,4-]	0.005	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzene[1,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorobenzidine[3,3'-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dichlorophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Diethylphthalate	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dimethyl Phthalate	0.33	U	GCMS

Attachment 3

Semivolatile results for
50-004(c)

PR ID	LOCATION ID	SAMPLE ID	DEPTH (in.)	ANALYTE	RESULTS (MG/KG)	LAB QUALIFIER	TECHNIQUE CODE
50-004(c)	50-3018	AAC0290	126 - 150	Dimethylphenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dinitro-2-methylphenol[4,6-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dinitrophenol[2,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dinitrotoluene[2,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Dinitrotoluene[2,6-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Fluoranthene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Fluorene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Hexachlorobenzene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Hexachlorobutadiene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Hexachlorocyclopentadiene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Hexachloroethane	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Indeno(1,2,3-cd)pyrene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Isophorone	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Methylnaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Methylphenol[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Naphthalene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitroaniline[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitroaniline[3-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitrobenzene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitrophenol[2-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitrophenol[4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitroso-di-n-propylamine[N-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitrosodimethylamine[N-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Nitrosodiphenylamine[N-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Oxybis(1-chloropropane)[2,2"-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Pentachlorophenol	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Phenanthrene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Phenol	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Pyrene	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Trichlorobenzene[1,2,4-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Trichlorophenol[2,4,5-]	0.33	U	GCMS
50-004(c)	50-3018	AAC0290	126 - 150	Trichlorophenol[2,4,6-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Acenaphthene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Acenaphthylene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Aniline	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Anthracene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Azobenzene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzo(a)anthracene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzo(a)pyrene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzo(b)fluoranthene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzo(g,h,i)perylene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzo(k)fluoranthene	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzoic Acid	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Benzyl Alcohol	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Bis(2-chloroethoxy)methane	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Bis(2-chloroethyl)ether	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Bis(2-ethylhexyl)phthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Bromophenyl-phenylether[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Butylbenzylphthalate	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Chloro-3-methylphenol[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Chloroaniline[4-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Chloronaphthalene[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Chlorophenol[2-]	0.33	U	GCMS
50-004(c)	50-3020	AAC0293	84 - 114	Chlorophenyl-phenyl[4-] Ether	0.33	U	GCMS

Attachment 4



PRS 50-011(a)
50-01
50-04
50-02
50-83
50-3011
50-3042
50-3043
50-3044
Septic Tank Location
Seepage Pit
Leach Field
● Core Holes
Seepage Pit
Former septic tank
PRS 50-011(a)
Temp Bldg
Perm Bldg
Gas Line
Rad Waste
Water Line
N
10 0 10 20 Feet

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

JUN 23 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Dale Doremus
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502

RECEIVED
JUN 25 1997
GROUNDWATER BUR

Dear Ms. Doremus:

Subject: NMED's Request for Additional Information, Los Alamos National Laboratory's Ground Water Discharge Plan Application, Radioactive Liquid Waste Treatment Facility (TA-50), DP-1132

Enclosed is Los Alamos National Laboratory's response to your April 21, 1997 letter requesting clarification and/or additional information on the Radioactive Liquid Waste Treatment Facility's (TA-50) Ground Water Discharge Plan Application, DP-1132.

If you desire any additional information concerning this response, please call Bonnie Koch of the Los Alamos Area Office at (505) 665-7202, or Bob Beers of the Laboratory's Water Quality and Hydrology Group (ESH-18) at (505) 667-7969.

Sincerely,

G. Thomas Todd
Area Manager

LAAMEP:9BK-022

Enclosure

cc:
See page 2

cc w/enclosure:
P. Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502
B. Garcia, Bureau Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo St., Bldg. A
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J. Mack, LAAMEP, LAAO
B. Koch, LAAMEP, LAAO
D. Erickson, ESH-DO, LANL, MS-K491
D. Woitte, LC/GL, LANL, MS-A187
K. Hargis, EM/WM, LANL, MS-J591
S. Hanson, EM/WM, LANL, MS-E518
A. Bond, EM/WM, LANL, MS-E518

cc w/o enclosure:
J. Vozella, AAMEP, LAAO
S. Rae, ESH-18, LANL, MS-K497

1) **NMED Comment.** *Prior to implementing a final treatment process for Phase II upgrades, LANL must receive approval from NMED. Please commit to submitting a report to the GWQB after completion of pilot tests which includes the following:*

   a. RLWTF's preferred method of nitrate removal and an explanation supporting the preference;

   b. influent nitrate, fluoride, and TDS concentrations to each pilot process; and

   c. effluent nitrate, fluoride, and TDS concentrations to each pilot process.

   Laboratory Response. The Laboratory is evaluating three technologies for nitrate removal/destruction at the RLWTF: biological nitrate destruction, selective ion exchange, and evaporation. As soon as this evaluation is completed the Laboratory will present its findings and conclusions to the NMED GWQB. Representatives from the Laboratory's Waste Management Program Office, the RLWTF, and the Environment, Safety, and Health Division will participate in this presentation.

2) **NMED Comment.** *The Discharge Plan is unclear about the effluent quality that will be achieved by Phase II upgrades. Please clarify, whether treated effluent exceeding WQCC Regulation 3103. ground water standards will be discharged to effluent canyon, tributary to Mortandad Canyon, after implementation of Phase II upgrades.*

   Laboratory Response. After implementation of Phase II upgrades all effluent discharged by the RLWTF to Mortandad Canyon will be compliant with WQCC Regulation 3103. ground water standards. Compliance can be assured due to the RLWTF's batch treat/batch discharge method of operation. Non-complying effluent will be routed back to the RLWTF's influent storage tanks for re-treatment.

3) **NMED Comment.** *The GWQB does not agree that the data presented in the discharge plan application is sufficient to adequately demonstrate that nitrate and fluoride concentrations in ground water are consistently decreasing. Additional ground water monitoring will be required to determine any long term trends.*

   Laboratory Response. The Laboratory will conduct the additional monitoring necessary to determine long term trends in the quality of Mortandad Canyon's alluvial ground water. The Laboratory's Environmental Restoration (ER) Project is currently developing a Sampling and Analysis Plan (SAP) to further characterize the quality of Mortandad Canyon's alluvial ground water. The SAP is scheduled for completion in September of 1997. The NMED GWQB will be copied on all ER Project plans and reports which address the investigation of ground water in Mortandad Canyon.

4) **NMED Comment.** *The GWQB does not believe that the proposed frequencies constitute adequate monitoring of the quality of Mortandad Canyon's alluvial ground water. Please commit to quarterly monitoring of all monitor wells listed in Table 3.0 and analyzing the ground water samples for nitrate as nitrogen, fluoride, and TDS and any other constituent currently exceeding WQCC numerical standards.*

Laboratory Response. The Laboratory proposes quarterly monitoring at three monitor wells, MCO-4B, 6, and 7, to provide representative samples of Mortandad Canyon's alluvial ground water. Quarterly monitoring parameters will be: nitrate as nitrogen, fluoride, and TDS. It should be noted that weather conditions in Mortandad Canyon may prohibit safe access to the wells during the winter quarter. A revised Table 3.0, Proposed Monitoring Plan, has been provided as Attachment 1.

5) **NMED Comment.** *The system of monitor wells in Mortandad Canyon is not adequate to monitor ground water quality as required by the WQCC Regulations.*

a. *Please commit to repairing MCO-3.*

b. *Please commit to repairing MCO-4.*

c. *Please commit to quarterly sampling and analysis of a ground water sample from a monitor well completed in the main aquifer. Please propose, for GWQB approval, a monitor well for routine monitoring of the main aquifer.*

d. *The table does not provide information on the screened section for each of the proposed monitor wells.*

Laboratory Response.

a. MCO-3 will be replaced. Due to the remote nature of the site the replacement well will be constructed by hand. The Laboratory will submit to the NMED GWQB the geologic log and well construction data for the MCO-3 replacement well when it becomes available.

b. MCO-4 will not be repaired. MCO-4B will replace MCO-4 as a monitoring well for the Ground Water Discharge Plan Application. Geologic log and well construction data for MCO-4B have been provided in Attachment 2.

c. The Laboratory will add TW-8 to the Ground Water Discharge Plan Application (See Attachment 1) for monitoring of the main aquifer. TW-8 will be sampled quarterly for nitrate as nitrogen, fluoride, and TDS as long as weather conditions permit safe access. Geologic log and well construction data for TW-8 have been provided in Attachment 2.

d. Well construction information for each of the Discharge Plan monitor wells has been provided in Attachment 2.

6) **NMED Comment**. *The contingency submitted in the discharge plan application does not adequately describe the actions to be taken for the protection of ground water in the event of a contaminant spill or failure of the treatment process.*

a. *Please submit a contingency plan describing the actions to be taken in the event of a contaminant spill or failure of the treatment process. The actions should be directed at the containment of the contaminant discharged and disposal of the affected substrate. Please include the actions to be taken in the event of WQCC Regulation 3103 exceedances in ground water.*

b. *The contingency plan and corrective actions submitted as part of the discharge plan application does not provide enough information to determine if the proposed corrective actions will be adequate to restore ground water in Mortandad Canyon to below WQCC ground water standards, and may not be an approvable contingency plan for the discharge permit. Prior to approving the corrective action as part of the discharge permit, NMED must receive the following:*

  1. *an accurate definition (vertical and horizontal extent) of the contamination in the alluvial aquifer of Mortandad Canyon with concentrations of all WQCC constituents currently exceeding standards from all sampling points used to define the plume.*
  2. *well logs and well construction details of all wells ;used to define the plume.*
  3. *a ground water level surface map.*
  4. *information demonstrating whether or not an intermediate aquifer exists in Mortandad Canyon.*
  5. *water quality analysis for samples taken from the regional aquifer.*
  6. *water quality data from water above the TA-50 outfall, and*
  7. *a time frame in which additional corrective actions will be proposed if concentrations do not drop below WQCC Regulation 3103. numerical standards.*

Laboratory Response.

a. The Laboratory's Incident Reporting Process (LIR 201-00-04.0) requires that upon discovery all Laboratory personnel report emergencies to the Emergency Management and Response (EM&R) Office. The EM&R Office has overall responsibility for coordinating a response for all emergency situations which arise at the Laboratory. In the event of a spill at the RLWTF, EM&R's response would include prompt notification of the Laboratory's Water Quality and Hydrology Group (ESH-18). Attachment 3, a Type 4 Chemical Spill or Release check list, is used by the EM&R Office to direct the appropriate notifications. Any spill reported to ESH-18 is investigated and the following actions are taken in accordance with Section 1203. of the New Mexico Water Quality Control Commission Regulations: (1) Within twenty-four (24) hours the NMED is verbally notified of the spill; (2) Within seven (7) days the NMED is provided a written report on the spill; and (3) Within fifteen (15) days the NMED is provided a Corrective Action Plan for the spill.

a. As a contingency against treatment process failure the RLWTF has the capability of holding approximately ten (10) days of influent in storage while the treatment system is being returned to service. The RLWTF's hold-up capacity is based upon a current influent storage capacity of 200,000 gallons and an influent design flow of 20,000 gallons per day. Additionally, in the event of treatment process failure, the Laboratory would implement waste minimization measures which would reduce influent flows and further extend the RLWTF's hold-up capacity.

b. 1. Using available data, the Laboratory will submit to the NMED GWQB a draft definition of contaminant plumes in Mortandad Canyon by December 31, 1997.

2. Well logs and well construction details for all wells used in defining the plume will accompany the above submittal.

3. A ground water level surface map of the alluvial aquifer in Mortandad Canyon will be included in the final RFI Work Plan for Mortandad Canyon. A copy of this plan will be submitted to the NMED GWQB when it is finalized in September, 1997.

4. Current well information has shown no evidence for the presence of intermediate water beneath Mortandad Canyon. As indicated on Page 19 of the Ground Water Discharge Plan Application, the Laboratory's Environmental Restoration (ER) Project is currently developing a RCRA Facility Investigation (RFI) Work Plan for Mortandad Canyon. One of the objectives of the Mortandad Canyon work plan will be to further assess the potential for interconnections between ground water in alluvium, possible perched intermediate zones, and the regional aquifer.

5. Extensive water quality data from the regional aquifer is provided to the NMED annually in the Laboratory's Environmental Surveillance Report. Water supply well PM-5 and main aquifer test well TW-8 are two wells within the vicinity of Mortandad Canyon. Recent water quality data for these two wells show no exceedances of WQCC standards.

6. No recent water quality data are available for water from above the TA-50 outfall.

7. If contaminant concentrations do not drop below WQCC Regulation 3103. numerical standards by the end of the Discharge Plan term (5 years from the date of approval) then additional corrective actions will be proposed in the Ground Water Discharge Plan Renewal Application.

7. **NMED Comment.** *The closure plan submitted in the discharge plan application does not provide sufficient detail. The GWQD recognizes that LANL has no intentions of discontinuing use of the RLWTF during the term of the discharge permit, however, prior to discharge plan approval, the GWQB will need additional information for the closure plan.*

a. Please commit to monitoring ground water at the same frequency and locations at the time of closure for at least two years after closure.

b. Please commit to disconnecting and/or plugging all pipes and wastewater works that could allow a liquid waste discharge after cessation of operations of the RLWTF.

c. Please commit to plugging and abandoning all monitor wells once it has been determined by the NMED that ground water monitoring will no longer be required.

d. Please commit to taking corrective actions to remediate any contaminated ground water existing at the time of closure.

Laboratory Response.

a. The Laboratory will monitor alluvial ground water in Mortandad Canyon at the same frequency and locations at the time of closure for at least two years after closure.

b. If operations at the RLWTF should cease and the facility is decommissioned or converted for use by other Laboratory programs then the Laboratory will submit a closure plan to the NMED.

c. The Laboratory cannot commit to plugging and abandoning all monitor wells after closure since their use may be required by other programs within the Institution. As monitoring wells are retired from service they will be plugged and abandoned in accordance with all applicable state and federal regulations.

d. The HSWA Module VIII of the Laboratory's RCRA Permit (NM0890010515) establishes the requirement for the ER Project to investigate the nature and extent of contamination in soil and water media present in Mortandad Canyon. If the results of the investigations show levels of contamination in ground water which present a risk to human health and the environment then the ER Project will be required to remediate the ground water. As indicated previously, the Mortandad Canyon Sampling and Analysis Plan (SAP), which is due to NMED HRMB in September of 1997, will specify sampling methods and locations for the investigation of ground water present in the Bandelier Tuff. If this investigation shows that contamination has migrated into ground water present in rock units deeper than tuff then further investigation will be performed to determine if remediation is required. The GWQB will be copied on all ER Project plans and reports which address the investigation and remediation of ground water in Mortandad Canyon.

ATTACHMENT 1

Revised Table 3.0: Proposed Monitoring Plan for the RLWTF Ground Water Discharge Plan Application

Table 3.0. **[REVISED: JUNE, 1997]** Proposed Monitoring Plan for the RLWTF Ground Water Discharge Plan Application

LOCATION	PARAMETER	NOTE	MONITORING FREQUENCY*
Discharge Point	Batch Volume, in gallons		Per batch
NPDES Sampling Tap	pH		Per batch
NPDES Sampling Tap	Nitrate Screening		Per batch
NPDES Sampling Tap	Total Nitrogen	1	1/week
NPDES Sampling Tap	Health Standards	3	1/month
NPDES Sampling Tap	Total Toxic Organics	7	1/month
NPDES Sampling Tap	Radium-226 & Radium-228		1/month
NPDES Sampling Tap	Secondary & Irrigation Stds	4,5	1/month
Wells MCO-4B, 6, 7	Nitrates(NO3-N), F, TDS		Quarterly
Wells TW-8	Nitrates(NO3-N), F, TDS		Quarterly
Wells MCO-6	Health Stds	3	Quarterly
Wells MCO-6	Secondary Stds	4	Quarterly
Wells MCO-6	Irrigation Stds	5	Quarterly
Wells MCO-3,4B,5,6,7,7.5	Radiochemistry	2	Annual
Wells MCO-3,4B,5,7,7.5	Health Stds	3	Annual
Wells MCO-3,4B,5,7,7.5	Secondary Stds	4	Annual
Wells MCO-3,4B,5,7,7.5	Irrigation Stds	5	Annual
Wells MCO-3,4B,5,6,7,7.5	Organics	6	1 per 3 Years
Mortandad Canyon Gaging Station	Surface Flows		Continuous

Notes

1. Total Nitrogen: TKN, Ammonia, NO2, NO3.
2. Radiochemistry: Uranium, Combined Ra-226 & Ra-228.
3. Health Standards (3103 A.): Ag, As, Ba, Cd, CN, Cr, F, Hg, NO3, Pb, Se.
4. Secondary Standards (3103 B.): Cl, Cu, Fe, Mn, SO4, Zn, TDS, and pH.
5. Irrigation Standards (3103 C.): Al, B, Co, Mo, Ni.
6. Volatile and Semivolatile Compounds, EPA SW 846 and Methods 8240 and 8270.
7. Total Toxic Organics (TTOs): See Appendix B for a listing of analytes in this method.

* Monitoring Plan data will be reported to the NMED annually.

ATTACHMENT 2

Geologic Logs & Construction Data for Observation Wells in Mortandad Canyon

Excerpted From:
Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Springs, and Surface Water Stations in the Los Alamos Area.
W.D. Purtymun, 1995.
LA-12883-MS.

TABLE VI-A. Hydrologic Data for Observation Wells in Mortandad Canyon

					Water Levels					
Observation Wells	Date Completed	Depth Drilled (ft)	Depth Completed (ft)	Depth 1991	At Completion (ft)	At Present Date	(ft)	Elevation Land-Surface Datum (LSD) (ft)	Top of Casing (Measuring Point) to Land Surface Datum	Remarks
MCO-1	11/60	8	8	—	2.8	—	—	7153	—	Unable to locate in 1991
MCO-2	11/60	10	9	7.5	0.3	4/91	5.06	7133	2.00	
MCO-3	3/67	18	12	10.1	4.4	4/91	3.36	7052.72	1.54	Originally drilled 11/60; redrilled and cased 3/67
MCO-4	10/63	24	19	16.3	3.3	4/91	7.19	6900.36	1.02	
MCO-4.9	7/73	42	30	23.4	—	4/91	22.10	6879.31	1.25	
MCO-5	10/60	47	46	44.9	24.6	2/91	20.75	6875.80	1.95	
MCO-6	10/60	82	71	—	38.1	—	—	6849	—	Plugged and abandoned (relocated)
MCO-6	3/74	47	47	41.5	28.9	2/91	33.75	6848.96	2.34	
MCO-6.5A	11/61	47	45	33.3	41.0	2/91	Dry	6840	2.15	
MCO-6.5B	11/61	42	42	36.0	36.3	2/91	Dry	6839	0.70	
MCO-7	10/60	77	69	54.7	39.7	2/91	37.47	6827.40	1.24	
MCO-7.5A	11/61	63	60	—	41.2	—	—	6809	—	Well damaged (relocated)
MCO-7.5B	4/74	62	60	56.0	42.1	2/91	43.71	6808.80	1.28	
MCO-8	10/60	92	84	22.7	61.6		—	6796.70	0.25	Obstruction in well
MCO-8A	11/61	52	50	48.5	Dry	2/91	Dry	6800	0.61	
MCO-8.2	11/61	72	70	60.3	59.2	2/91	Dry	6782	2.00	
MCO-9	11/60	57	55	54.6	Dry	2/91	Dry	6747.77	1.44	
MCO-9.5	11/61	57	46	40.3	Dry	2/91	Dry	6740	2.00	
MCO-11	11/61	23	20	—	Dry	—	—	6720	—	Unable to locate in 1991
MCO-12	11/61	64	60	—	Dry	—	—	6700	—	Casing pulled; hole plugged (relocated)
MCO-12	6/71	112	108	96.2	Dry	2/91	Dry	6702	0.62	
MCO-13	7/70	112	107	106.2	Dry	2/91	Dry	6674	0.67	
TSCO-1	11/61	37	35	23.1	Dry	2/91	8.93	6857	0.97	

Sources: Baltz et al. 1963; Purtymun 1964, 1971, and 1974.

TABLE VI-B. Geologic Logs and Construction Data for Observation Wells in Mortandad Canyon (20 Obs. Wells)

1. Observation Well MCO-1

Geologic Log	Thickness (ft)	Depth (ft)
Tuff, unweathered, overlain by about 1 ft of silt and sand	8	8

Note: Well abandoned, in stream channel.

2. Observation Well MCO-2

Geologic Log	Thickness (ft)	Depth (ft)
Tuff, unweathered, overlain by about 1 ft of silt and sand	10	10

Note: Well abandoned: in stream channel.

3. Observation Well MCO-3

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay	7	7
Tuff (weathered in place)		
Silt and clay with some lenses of sand and gravel	11	18

Construction

12 ft of 3-in.-diam plastic pipe, lower 10 ft perforated.

4. Observation Well MCO-4

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay	18	18
Tuff (weathered in place)		
Silt and clay with lenses of sand	6	24

Construction

19 ft of 3-in.-diam plastic pipe, lower 15 ft perforated.

5. Observation Well MCO-4.9

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay	27	27
Tuff (weathered in place) silt and clay with gravel	16	43

Construction

30 ft of 3-in.-diam plastic pipe, lower 20 ft perforated.

TABLE VI-B. Geologic Logs and Construction Data for Observation Wells in Mortandad Canyon (20 Obs. Wells)(Continued)

6. Observation Well MCO-5

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel with lenses of silt and clay	35	35
Tuff (weathered in place)		
Silt and clay with some lenses of sand and gravel	12	47

Construction

46 ft of 3-in.-diam plastic pipe, lower 25 ft perforated.

7. Observation Well MCO-6

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand, gravel, and occasional cobbles in a matrix of silt and clay	36	36
Tuff (weathered in place)		
Silt and clay with minor amounts of sand and gravel	46	82

Construction

71 ft of 3-in.-diam plastic pipe, lower 35 ft perforated, well drilled October 1960. Well destroyed by flood, summer 1973; redrilled and constructed as a new well about 10 ft to the northeast (March 1974): 47 ft of 4-in.-diam plastic pipe, lower 20 ft perforated.

8. Observation Well MCO-6.5A

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay	47	47

Construction

45 ft of 2-in.-diam plastic pipe, lower 20 ft perforated.

9. Observation Well MCO-6.5B

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay	42	42

Construction

42 ft of casing, upper 22 ft of 4-in.-diam steel pipe; lower 20 ft of 4-in.-diam plastic pipe, perforated.

TABLE VI-B. Geologic Logs and Construction Data for Observation Wells in Mortandad Canyon (20 Obs. Wells)(Continued)

10. Observation Well MCO-7

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a silt and clay matrix	55	55
Tuff (weathered in place)		
Silt and clay with lenses of sand and gravel	22	77

Construction

69 ft of 3-in.-diam plastic pipe, lower 30 ft perforated.

11. Observation Well MCO-7.5A/7.5B

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay; silt and clay increase with depth	60	60
Tuff (weathered in place) silt and clay	3	63

Construction

November 1961, 60 ft of 3-in.-diam plastic pipe, lower 20 ft perforated; well destroyed by falling tree, replaced April 1974 about 6 ft to the west: 60 ft of 4-in.-diam plastic pipe, lower 25 ft perforated.

12. Observation Well MCO-8

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay; silt and clay increase with depth	61	61
Tuff (weathered in place)		
Silt and clay with lenses of fine to coarse sand	31	92

Construction

84 ft of 3-in.-diam plastic pipe, lower 20 ft perforated; well damaged, bailer stuck at about 23 ft.

13. Observation Well MCO-8A

Geologic Log	Thickness (ft)	Depth (ft)
Alluvium		
Sand and gravel in a matrix of silt and clay; silt and clay increase with depth	52	52

Construction

50 ft of 2-in.-diam plastic pipe, lower 10 ft perforated.

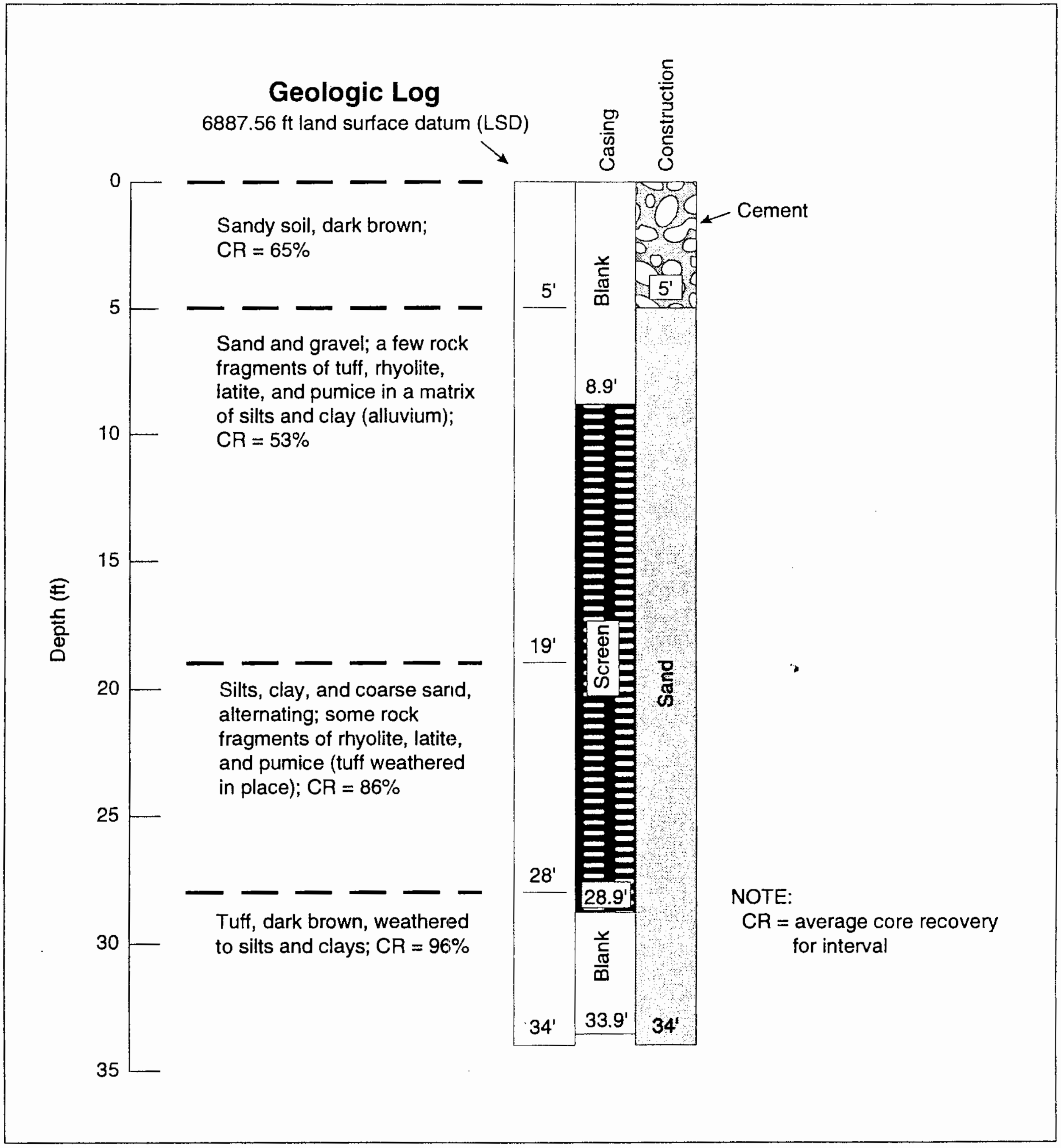


Fig. VIII-L. Mortandad Canyon observation well MCO-4B, completed August 1990, water level 21.7 ft (Purtymun and Stoker 1990).

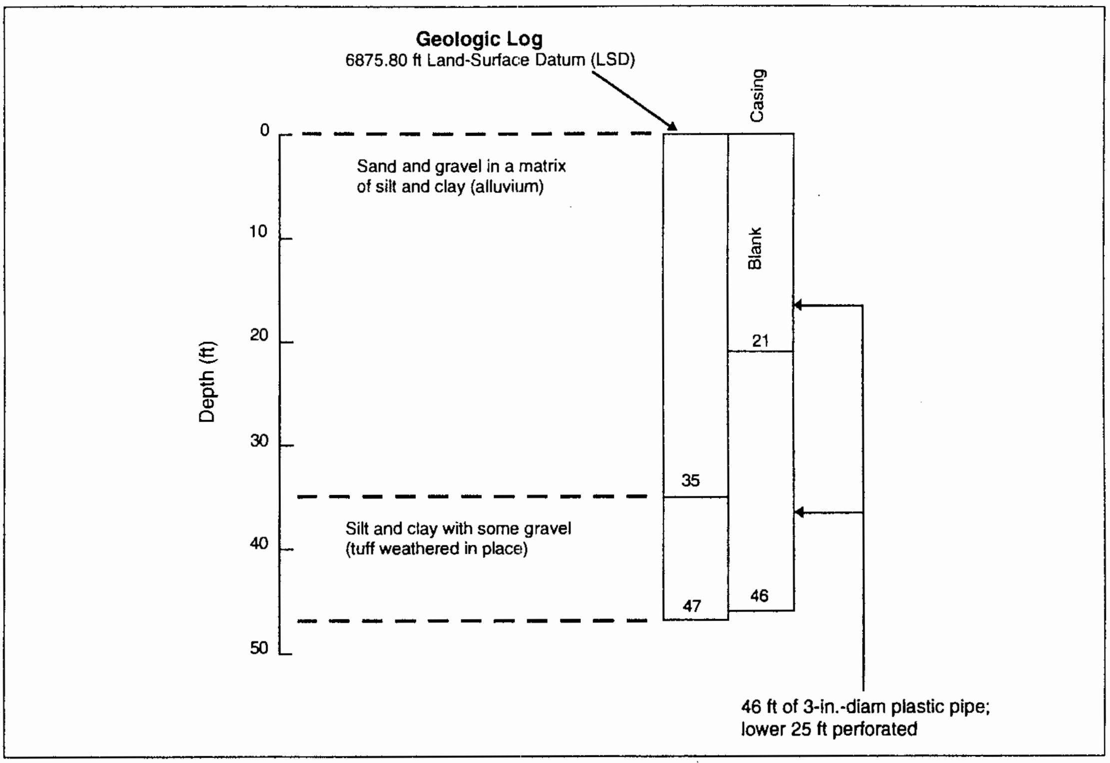


Fig. VI-G. Mortandad Canyon observation well MCO-5, completed October 1960, water level 24.6 ft (Baltz et al. 1963).

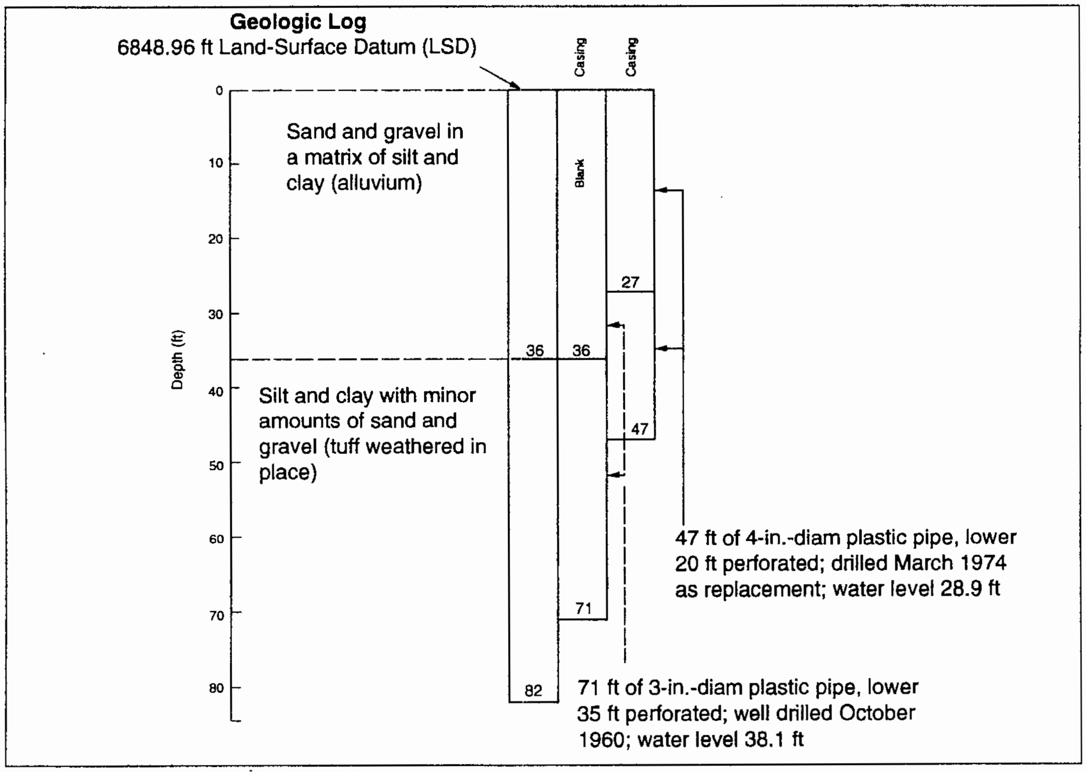


Fig. VI-H. Mortandad Canyon observation well MCO-6, completed October 1960, replaced March 1974 (Baltz et al. 1963, Purtymun 1974).

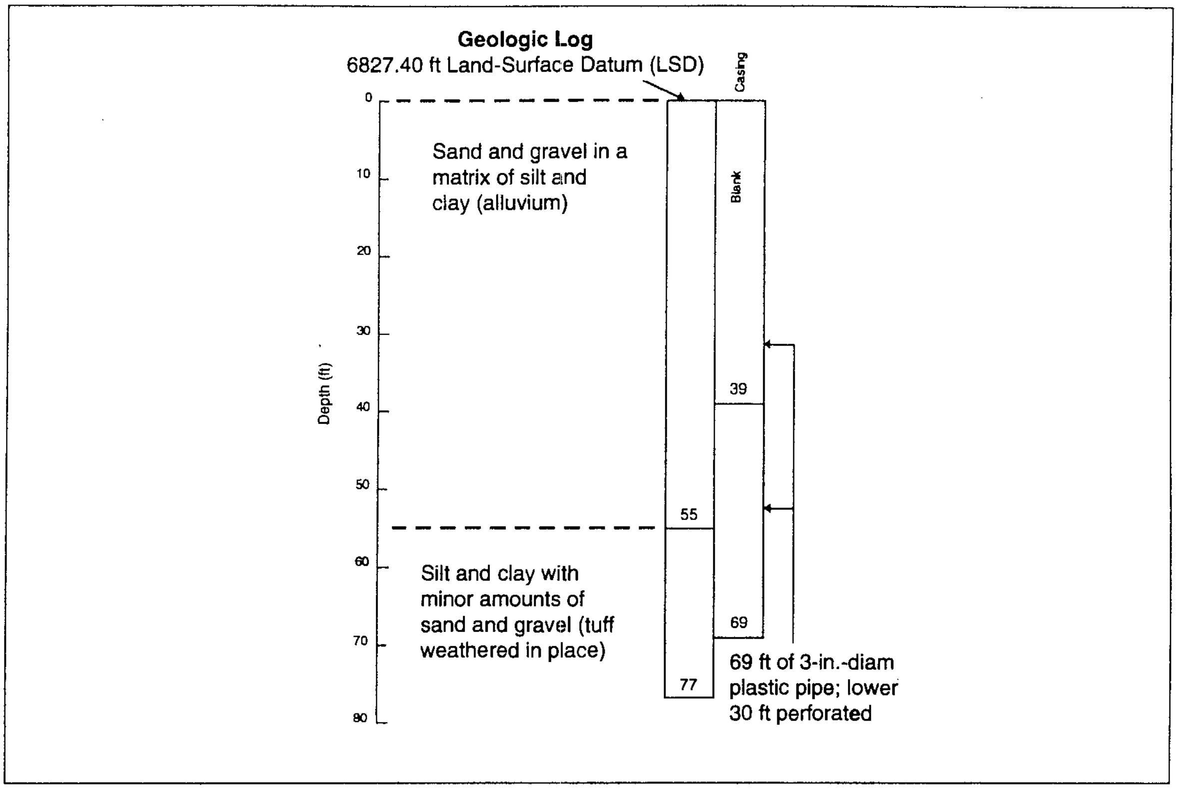


Fig. VI-K. Mortandad Canyon observation well MCO-7, completed October 1960, water level 39.7 ft (Baltz et al. 1963).

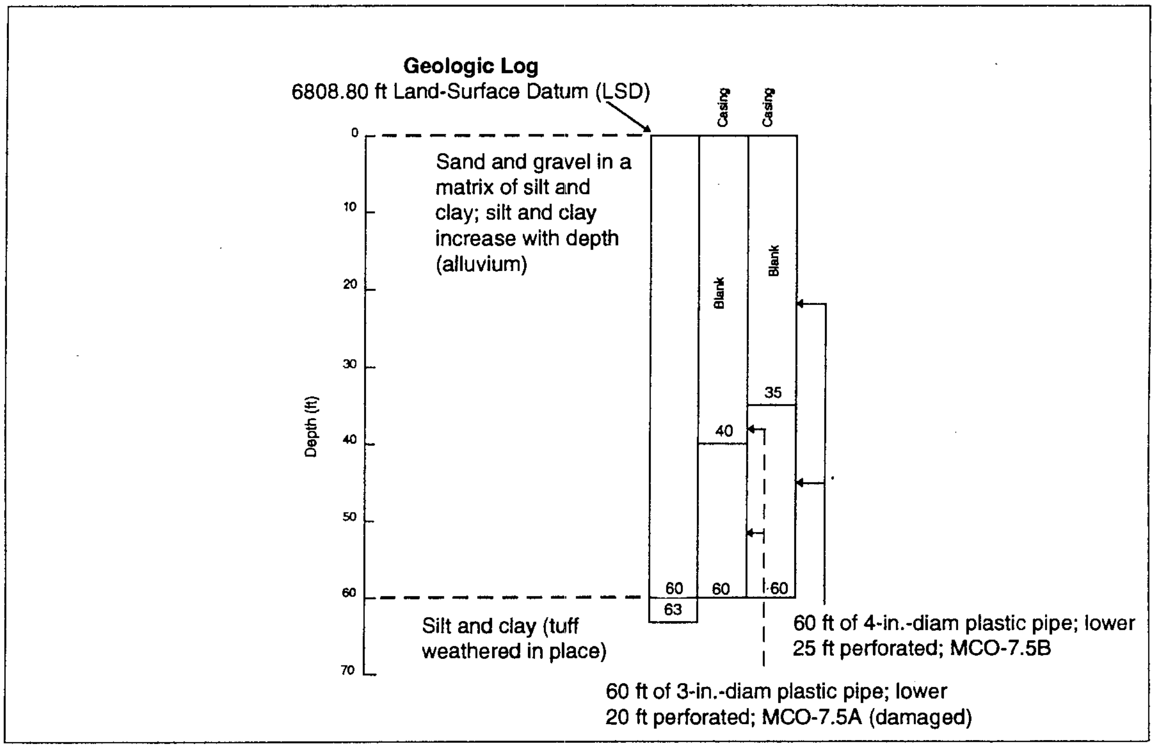


Fig. VI-L. Mortandad Canyon observation well MCO-7.5A (damaged), completed November 1961, water level 41.2 ft; and adjacent well MCO-7.5B, completed April 1974, water level 42.1 ft (Purtymun 1964, 1974).

TABLE XVII-A. Construction and Hydrologic Data for Test Wells and Test Holes on the Pajarito Plateau

Test Wells or Test Holes	Month Completed	Depth Drilled (ft)	Depth Completed (ft)	Elevation (LSD) (ft)	Water Level at Completion (ft)	Remarks
Test Well TW-1	1/50	642	642	6369.19	585	
Test Well TW-1A	1/50	225	225	6369.28	188	
Test Well TW-2	11/49	789	789	6648.1	759	
Test Well TW-2[a]	1/91	834	834	6648.06	791	
Test Well TW-2A	11/49	133	133	6650.40	121	
Test Hole TH-2B	11/49	233	—	6647	Dry	
Test Well TW-3	11/49	815	815	6595.31	743	
Test Well TW-4	3/50	1205	1205	7244.6	1171	
Test Hole TH-5	3/50	263	—	6591.6	Dry	
Test Hole TH-6	3/50	300	—	6642.1	Dry	
Test Hole TH-7	4/50	55	—	6224	Dry	plugged and abandoned
Test Well TW-8	12/60	1065	1065	6877.62	968	
Test Hole H-19	9/49	2000	—	7178	950	plugged and abandoned
Test Hole Sigma Mesa	12/79	2292	1425	7215	1330	
Layne Western	3/50	157	147	5971	100	yielded water to drill Guaje wells
Ski Basin Well	6/85	400	392	9310	245	

[a] Well completed to 789 ft in 1949, drilled and cased to 834 ft in 1991.

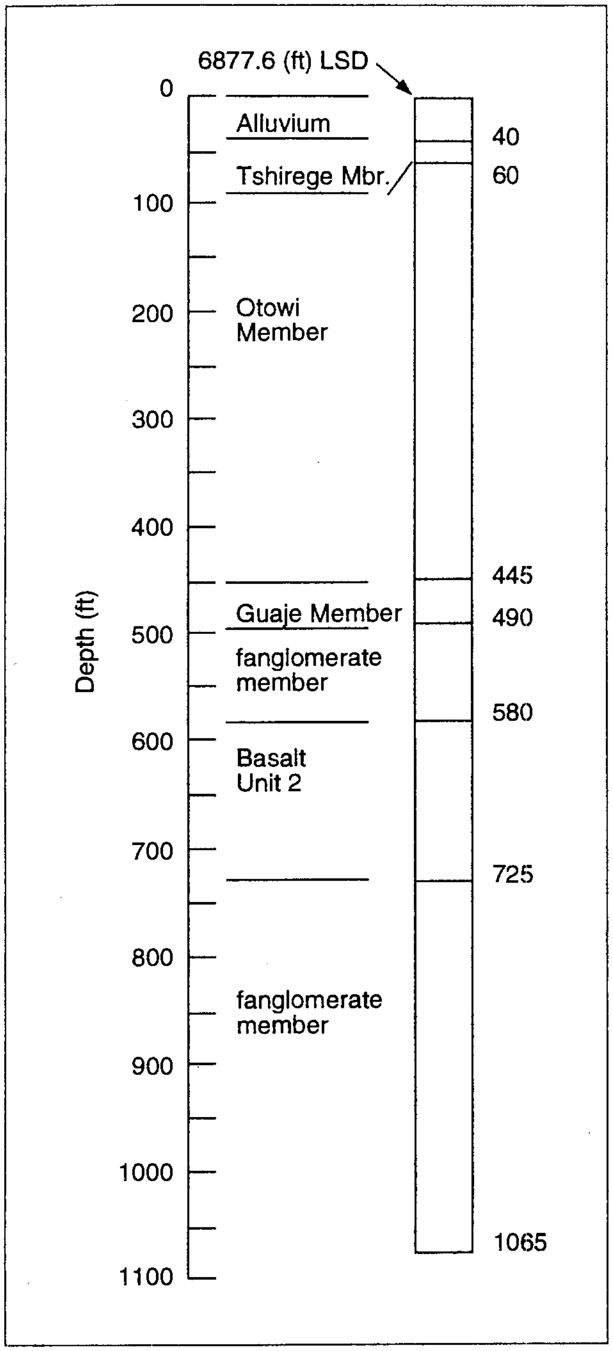


Fig. XVII-I. Geologic log of test well TW-8, completed December 1960, water level 968 ft (Baltz et al. 1963).

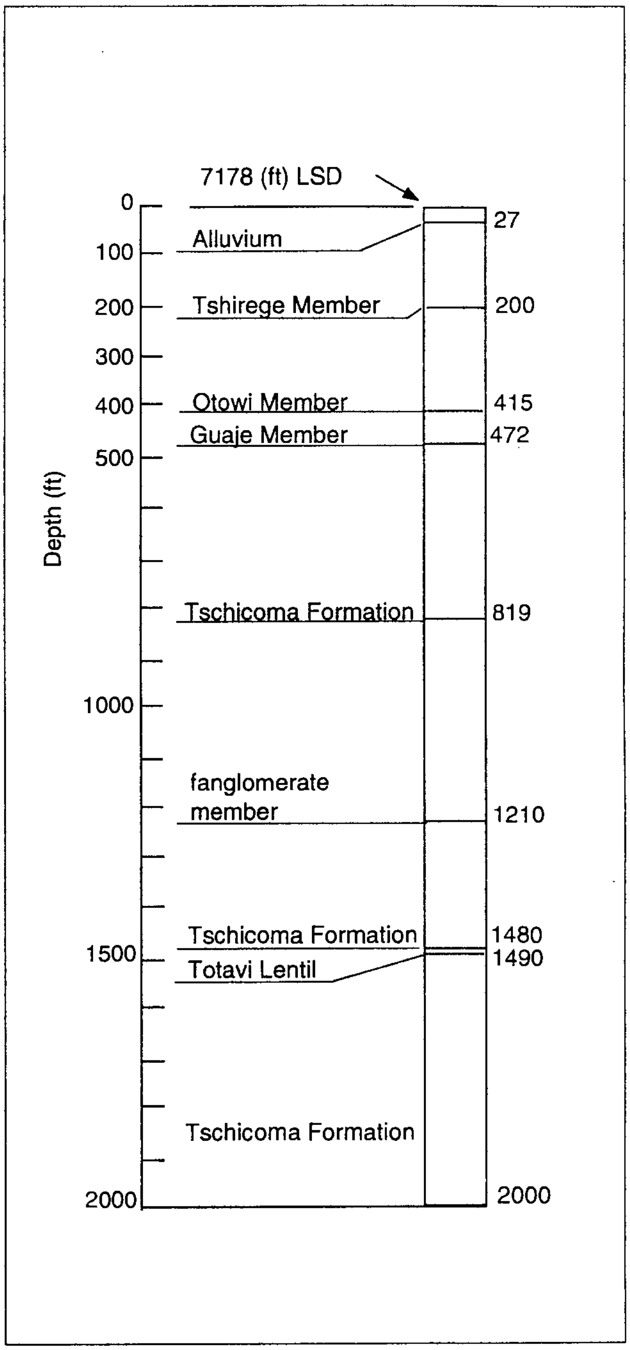


Fig. XVII-J. Geologic log of test hole H-19, completed September 1949, water level 950 ft (Griggs 1955).

ATTACHMENT 3

Emergency Management and Response (EM&R) Office Notification Checklist for Type 4 Chemical Spills or Releases

CHEMICAL SPILL OR RELEASE
TYPE 4

- ☐ Occurs on property under control of a Facility Manager
  - ☐ Facility Manager

- ☐ Any Potential Release to or Contamination of Air, Land, or Water
  - ☐ ESH-17,18,19

- ☐ Small Spill, Post-Mitigation Clean-Up, Vehicle Fluids, PCB-Contaminated Oil
  - ☐ JCI Environmental: Duty Hrs: 7-0104
    After Hours: JCI UCC
  - ▨ *Consider* ESH-5 IH Field Support, 5-4427

- ☐ Hazmat Team Resources Required
  - ☐ EM&R Group Office
  - ☐ DOE-LAAO Duty Officer
  - ☐ PTLA Central Alarm Station
  - ▨ *Consider* Public Affairs
  - ▨ *Consider* ESH-5 Safety
  - ▨ *Consider* LAFD Battalion Chief
  - ☐ Chlorine or Chlorine Alarm
    - ☐ JCI UCC

- ☐ Biohazards
  - ☐ Blood, Urine, Body Secretions or Excretions
    - ☐ JCI Custodial or Zone Coordinator
  - ☐ Animal Droppings, Possible Hanta Virus Environment
    - ☐ JCI Roads and Grounds

- ☐ Stack Release Above Regulatory Limits
  - ☐ EM&R Group Office
  - ☐ DOE-LAAO Duty Officer
  - ☐ PTLA Central Alarm Station (to keep workers out of area)
  - ☐ ESH-17,18,19
  - ☐ Facility Manager
  - ☐ JCI UCC (to keep workers out of area)

- ☐ External Carrier or Offsite
  - ☐ NM State Police
  - ☐ Shipper

Form Date 1/29/97 P.O.C. C.S.Bequette

Original to Phyllis
(copy to Dennis)

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: July 3, 1997
In Reply Refer To: ESH-18/WQ&H:97-0190
Mail Stop: K497
Telephone: (505) 665-1859

RECEIVED
JUL 10 1997
GROUNDWATER BUREAU

Mr. Sam Coleman, P. E., Director
Compliance Assurance and Enforcement Division (6-EN)
U. S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

SUBJECT: NOTICE OF CHANGED CONDITIONS AT NPDES OUTFALL 051

Dear Mr. Coleman:

On May 21, 1997, and May 28, 1997, Mike Saladen of the Laboratory's Water Quality and Hydrology Group (ESH-18) discussed the following information with Everett Spencer and Fred Humke, of your staff. Mr. Saladen was advised to submit this notification of changed condition since these types of operations were not specified in the Laboratory's NPDES Permit Re-Application, dated August 31, 1990.

In accordance with Part III, Section III.D.1.a of the National Pollutant Discharge Elimination System (NPDES) Permit issued to the Los Alamos National Laboratory (Laboratory) on August 1, 1994, I am providing this notification of change in the waste streams contributing to the effluent discharged at outfalls authorized under NPDES Permit No. NM0028355.

In support of the Laboratory's NPDES Permit Re-Application, the Laboratory submitted an NPDES Application Form 2C on August 31, 1990, for the TA-50 Radioactive Liquid Waste Treatment Plant (RLWTP). In the transmittal letter, it was noted that the information used in preparation of the 1990 NPDES Permit Re-Application was collected at Laboratory outfalls over an 18 month period and represented the best available information to the Laboratory at the time. However, since that time, additional waste streams have been identified. The NPDES Re-Application did not identify liquid waste streams derived from Environmental Restoration (ER) Project activities which are disposed into the TA-50 RLWTP. Most of the ER wastewater is derived from activities (e.g. decontamination of field equipment, well purging, etc.) at Potential Release Sites around the Laboratory. A summary of the ER Project activities, waste streams, estimated volumes and potential contaminants of concern that may be disposed at TA-50 RLWTP are included in Attachment 1. Locations of Potential Release Sites that may produce wastewater for disposal at TA-50 RLWTP are identified in Attachments 2 and 3.

Attachment 1 also lists other waste streams flowing to the TA-50 RLWTP which were not identified in the Laboratory's original re-application. These include wastewater originating from the decontamination of Personal Protective Equipment (PPE), containment vessels, and materials used for shielding purposes. The Laboratory has also identified trace amounts of accelerator produced isotopes discharging to the TA-50 RLWTP during its annual RLWTP Collection System Survey. These are reported on Attachment 4.

The treatment technologies currently used at TA-50 RLWTP include primary neutralization, chemical flocculation, precipitate settling, filtration, sludge de-watering and/or solidification via cementation. The solidified waste is transferred from TA-50 to TA-54, Area G, for storage and disposal. Treated effluent from the TA-50 RLWTP is discharged into Mortandad Canyon at NPDES Outfall 051. There are 20,885 gallons of effluent per each effluent tank batch discharged. Typically, the TA-50 RLWTP discharges 0 to 2 tanks of treated effluent on a run day resulting in daily volumes of 0 gallons per day (gpd) to 41,770 gpd. The TA-50 RLWTP runs 4 to 6 days per week. During a typical week the TA-50 RLWTP discharges between 2 and 8 tanks of treated effluent. The large variability in the discharge quantities is due to fluctuations in influent flow. Based on these figures, it is estimated that the TA-50 RLWTP will discharge between 104 and 416 times during the year, or between 2.17 million gallons per year (MGY) and 8.69 MGY. During 1996, the ER effluent derived waste and wastewater from decontamination activities discharged approximately 40, 000 gallons into the TA-50 RLWTP. The Laboratory anticipates fluctuations in influent at the TA-50 RLWTP based on ER clean up schedules. Operational samples are collected prior to each batch discharge to ensure compliance with the Laboratory's NPDES Permit limits.

Additionally, an integral part of the TA-50 RLWTP's operation is the Laboratory's program for administratively controlling influent quality. Each group or division that generates radioactive liquid waste is represented by a Waste Management Coordinator (WMC), the primary contact between generators and RLWTP personnel. A waste profile form is completed for all waste streams discharged to the TA-50 RLWTP. Potential contaminants of concerns from ER sites are also identified in the Resource Conservation and Recovery Act Facility Investigation (RFI) documents prepared by the Laboratory's Environmental Restoration (ER) Group. Analytical data is available upon request. The WMC must ensure that:

(1) Waste streams not identified and listed under the Laboratory's NPDES permit are not discharged into the TA-50 RLWTP collection system.

(2) Operating personnel are familiar with pertinent administrative requirements, and waste management regulations.

(3) The wastewater does not exceed the recommended limits set forth in the TA-50 RLWTP's Waste Acceptance Criteria (WAC). A Waste Profile Form must be provided for any ER effluent derived waste that discharges to the TA-50 RLWTP.

(4) Listed hazardous waste are not discharged into the RLWTP collection system.

(5) The TA-50 RLWTP is notified immediately of unusual or accidental discharges that may violate waste management regulations.

(6) The TA-50 RLWTP is contacted to coordinate waste that does not meet the requirements for disposal into the collection system.

Based on the information provided above, it is not expected that the waste streams derived from ER or decontamination activities has significantly changed the nature or increased the quantity of pollutants discharged at Outfall 051 in the future. Planned upgrades to the treatment units present at the TA-50 RLWTP will help ensure that no degradation of effluent quality is experienced at NPDES Outfall 051. In fact, it is expected that these upgrades will result in an overall improvement in the quality of effluent discharged at this outfall, especially with respect to radionuclides, fluoride, and nitrates.

Should you have any questions regarding this notification, please contact Mike Saladen at (505) 665-6085 or me at (505) 665-1859.

Sincerely,

Neil Williams for

Steven R. Rae
Group Leader
Water Quality and Hydrology Group

SR:MS/rj

Cy:
E. Spencer, EPA, Region VI, Dallas, Texas
F. Humke, EPA, Region VI, Dallas, Texas
J. Douherty, EPA Region VI, Dallas, Texas
M. Saladen, ESH-18, MS K497
B. Edeskuty, ESH-18, MS K497
B. Beers, ESH-18, MS K497
A. Puglisi, ESH-19, MS K498
P. Shanley, ESH-19, MS K498
T. Grieggs, ESH-19, MS K498
D. Moss, EM/RLW, MS E518
S. Hansen, EM/RLW, MS E518
M. Romero, CST-7, MS E520
D. McInroy, EM-ER, MS M992
Y. Jansen, EM-ER, MS M992
B. Koch, DOE/LAAO, MS A316
B. Garcia, NMED/HRMB, Santa Fe, New Mexico
J. Archuleta, NMED/HRMB, Santa Fe, New Mexico
S. Yanicek, DOE/OB, Santa Fe, New Mexico
B. Hoditschek, NMED/SWQB, Santa Fe, New Mexico
K. Hill, NMED/HRMB, Santa Fe, New Mexico
M. Leavitt, NMED/GWB, Santa Fe, New Mexico
WQ&H File, MS K497
CIC-10, MS A150

Attachment 1

Function	**Operations Controlling Flow**	**Waste Streams**	**Types of Contaminants**	**Volume**	**Comments**
Respiratory, Protective Equipment	TA-50, Building 1, Room 41	Radioactive Materials Respirators used on Asbestos Jobs Respirators used on Tritium Jobs Respirators used on Beryllium Jobs Respirators used on Lead/Paint Jobs Wash Water	All types Mainly Pu, U, Am. Asbestos Tritium Beryllium Lead Detergents.	~22,500 gallons/yr	Respirators used by the Lab Hazmat Team and other certified respirator users for chemical protection are also processed by CST-7 Decontamination Operations Group.
Radiation, Detection Instruments	TA-50, Building 1, Rm. 49	Radioactive Materials Nitric Acid Hydrochloric Acid Wash Water	All types. Mainly Pu. Detergents.	~200 gallons/yr	
ER Drilling Equipment (Augers, Cores, Etc.)	PRS Sites. See Attachments 2 and 3	Radioactive Materials Water Water mixed with contaminated soil	All types. Mainly Pu, Cs, U, AM. Detergents, Degreaser, Grease/Oil. VOCS, SVOCS Metals.	~800 gallons/yr.	
DX Confinement Chambers	TA-50, Building 1, Rm. 34B	Radioactive Materials Lead Beryllium Water	D38	~110 gallons/yr.	
Lead Bricks/Pieces	TA-50, Building 185, Decon Trailer	Radioactive Materials Metals Wash Water	All types. Mainly Pu. CS, U, Am. Lead	~2,500 gallons/yr.	
Lab Equipment	TA-50, Building 1, Room 35	Radioactive Materials	All types. Mainly Pu.	~20 gallons/yr.	

Function	Operations Controlling Flow	Waste Streams	Types of Contaminants	Volume	Comments
Pumps	TA-50, Building 1, Room 34B	Water	Detergents.		
Precious Metals (Platinum Gold, Rhodium, Silver)	TA-50, Building 1, Room 35	Radioactive Materials Hydrochloric Acid Water	All types. Mainly Pu.	~30 gallons/yr.	
Miscellaneous Tools	TA-50, Building 1, Room 35 and various PRS Sites (See Attachments 2 and 3).	Radioactive Materials	All types. Mainly Pu, Cs, U, Am.	~150 gallons/yr.	
Hand Tools	TA-50, Building 1, Room 35, D + D activities, and PRS sites (Attachments 2 and 3).	Water/Soil	Detergents. Possible low concentrations of VOCs, SVOCs, Radioactivity		
Heavy Equip. (Power Tools, Vehicles, Lowboys, Backhoes)	TA-50 Building 1, Room 34B	Radioactive Materials Contaminated Soil Wash Water	All types. Mainly Pu, Cs, U, Am. Possible low concentrations of VOCS, SVOCS, Metals, Radioactivity. Detergents, Grease, Soil.	~700 gallons/yr.	

Attachment 2

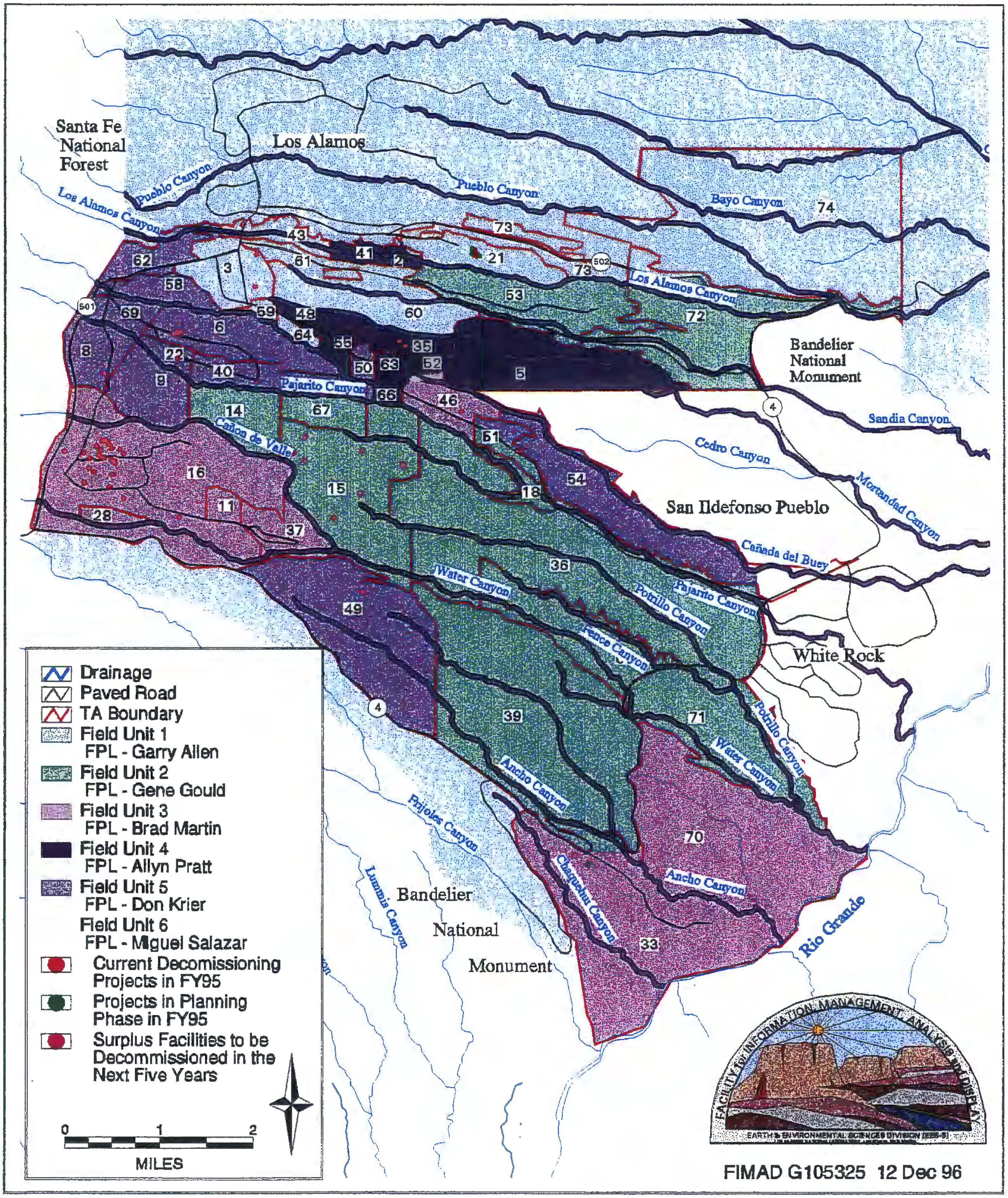
Los Alamos National Laboratory Environmental Restoration Sites

Field Unit Number (Field Unit Leader)	Operable Units	Technical Areas
1 (Gary Allen)	1071	0, 19, 26, 73, 74
	1078	1
	1079	10, 31, 32, 45
	1106	21
	1114	3, 30, 59, 60, 61, 64
	1136	43
2 (Gene Gould)	1085	12, 14, 67
	1086	15
	1093	18, 27, 65
	1100	20, 53, 72
	1130	36, 68, 71
	1132	39
3 (Brad Martin)	1082	11, 13, 16, 24, 25, 28, 37
	1122	33, 70
	1140	46
4 (Allyn Pratt)	1049	Canyons
	1098	2, 41
	1129	4, 5, 35, 42, 48, 52, 55, 63, 66
5 (Don Krier)	1111	6, 7, 22, 40, 58, 62
	1144	49
	1147	50
	1148	51, 54
	1154	57
	1157	8, 9, 23, 69

Note: See attached map of LANL Environmental Restoration Sites.

Attachment 3

Los Alamos National Laboratory



Attachment 4

TA-48 Building 1
RC-1 and Hot Cell Wing
Accelerator Produced Isotopes

Radionuclide	Min	Max	Unit
GRBETA	0.000E+00	5.000E-07	CIL
GAMMA	0.000E+00	5.000E-07	CIL
CS134	0.000E+00	2.000E-09	CIL
CS137	0.000E+00	3.000E-09	CIL
I133	0.000E+00	1.000E-08	CIL
NB95	0.000E+00	1.000E-07	CIL
SR90	0.000E+00	1.000E-09	CIL
ZR95	0.000E+00	1.000E-07	CIL
AS74	0.000E+00	4.000E-08	CIL
BE7	0.000E+00	1.000E-06	CIL
CO56	0.000E+00	1.000E-08	CIL
CO57	0.000E+00	1.000E-07	CIL
CO58	0.000E+00	4.000E-08	CIL
CO60	0.000E+00	5.000E-09	CIL
CR51	0.000E+00	1.000E-07	CIL
EU152	0.000E+00	2.000E-08	CIL
MN52	0.000E+00	2.000E-08	CIL
MN54	0.000E+00	5.000E-08	CIL
RB83	0.000E+00	2.000E-08	CIL
RB84	0.000E+00	1.000E-08	CIL
SE75	0.000E+00	2.000E-08	CIL
SR82	0.000E+00	1.000E-07	CIL
SR85	0.000E+00	7.000E-08	CIL
V48	0.000E+00	2.000E-08	CIL
Y88	0.000E+00	3.000E-08	CIL
ZN65	0.000E+00	9.000E-09	CIL
ZR88	0.000E+00	3.000E-08	CIL
BI207	0.000E+00	1.000E-07	CIL
AS73	0.000E+00	2.000E-08	CIL
NA22	0.000E+00	3.000E-08	CIL
NA24	0.000E+00	3.000E-08	CIL
TI44	0.000E+00	1.000E-08	CIL
FE59	0.000E+00	1.000E-08	CIL
GE68	0.000E+00	4.000E-08	CIL
TC95M	0.000E+00	3.000E-08	CIL
AG110M	0.000E+00	1.000E-08	CIL
CD113M	0.000E+00	4.000E-08	CIL
CD109	0.000E+00	4.000E-08	CIL
CD115M	0.000E+00	4.000E-08	CIL
SN113	0.000E+00	4.000E-08	CIL
SC46	0.000E+00	2.000E-08	CIL
GA68	0.000E+00	4.000E-08	CIL

NPDES 051050

Date - UNKNOWN

OUTFALL 051

During the period beginning the effective date and lasting through the expiration date, the permittee is authorized to discharge from Outfall 051 - industrial waste treatment plant discharge.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations			
	Mass(lbs/day)		Other Units (Specify)	
	Daily Avg	Daily Max	Daily Avg	Daily Max
Flow (MGD)	N/A	N/A	(*1)	(*1)
Ammonia (as N)	N/A	N/A	(*1) mg/l	(*1) mg/l
Chemical Oxygen Demand	94	156	125 mg/l	125 mg/l
Total Suspended Solids	18.8	62.6	N/A	N/A
Total Cadmium	0.06	0.30	(*3) mg/l	(*3) mg/l
Total Chromium	0.19	0.38	(*3) mg/l	(*3) mg/l
Total Copper	0.63	0.63	(*3) mg/l	(*3) mg/l
Total Iron	1.0	2.0	N/A	N/A
Total Lead	0.06	0.15	(*3) mg/l	(*3) mg/l
Total Mercury	0.003	0.09	(*3) mg/l	(*3) mg/l
Total Nickel	N/A	N/A	(*1) mg/l	(*1) mg/l
Total Nitrogen	N/A	N/A	(*1) mg/l	(*1) mg/l
Nitrate-Nitrite (as N)	N/A	N/A	(*1) mg/l	(*1) mg/l
Total Zinc	0.62	1.83	(*3) mg/l	(*3) mg/l
Total Toxic Organics (*2)	N/A	N/A	1.0 mg/l	1.0 mg/l
Radium-226 + Radium-228	N/A	N/A	30.0 pCi/l	30.0 pCi/l
Other WQ Parameters	N/A	N/A	(*3)	(*3)

Effluent Characteristic	Monitoring Requirements	
	Measurement Frequency	Sample Type
Flow (MGD)	Continuous	Record
Ammonia (as N)	1/Month	Grab
Chemical Oxygen Demand	1/Week	Grab
Total Suspended Solids	1/Week	Grab
Total Cadmium	1/Week	Grab
Total Chromium	1/Week	Grab
Total Copper	1/Week	Grab
Total Iron	1/Week	Grab
Total Lead	1/Week	Grab
Total Mercury	1/Week	Grab
Total Nickel	1/Week	Grab
Total Nitrogen	1/month	Grab
Nitrate-Nitrite (as N)	1/month	Grab
Total Zinc	1/Week	Grab
Total Toxic Organics (*2)	1/Month	Grab
Radium-226 + Radium-228	1/Month	Grab
Other WQ Parameters	1/Year	Grab

OUTFALL 051

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored continuous, record.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Following the final treatment, prior to or at the point of discharge from TA-50-1 Treatment Plant (Latitude 35°51'58.3" and Longitude 106°17'48.5") to Mortandad Canyon.

(*1) Report reported, but no limits set.
(*2) As defined in 40 CFR 433.11(e).
(*3) See Part II, Paragraph L.

e. The permittee shall give 120 days prior notice to the Director of any change planned in the sewage sludge disposal practice. Any change shall include any planned physical alterations or additions to the permitted treatment works, changes in the permittee's sludge use or disposal practice, and also alterations, additions, or deletions of disposal sites. These changes may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional disposal sites not reported during the permit application process or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR 122.62(a)(1).

f. Pathogen Control (If Land Applied)

1. Sewage sludge or septic tank pumpings that are applied to the land surface or incorporated into the soil shall be treated by a Process to Significantly Reduce Pathogens (PSRP) or a Process to Further Reduce Pathogens (PFRP) prior to application. Processes to significantly reduce pathogens include aerobic digestion, air drying, anaerobic digestion, composting, lime stabilization and other approved methods as defined at 40 CFR 257, Appendix II. Processes to further reduce pathogens include composting, heat drying, heat treatment, thermophilic aerobic digestion and other approved methods, as defined at 40 CFR 257, Appendix II. If PSRP is conducted, public access to the facility shall be controlled for at least 12 months, and grazing by animals whose products are consumed by humans shall be prevented for at least one month.

2. The permittee shall report annually on the Discharge Monitoring Report in the month the permit is effective the level of disinfection attained (i.e., PSRP or PFRP) if land applied.

3. A detailed description of all treatment processes including information such as residence time, temperature, and volatile solids reduction used to achieve PSRP and/or PFRP, or any other data which is necessary to demonstrate the pathogen reduction level of sludge, must be kept on site for purposes of inspection.

L. WQS EFFLUENT LIMITS

The following daily average and daily maximum WQS effluent limits apply.

Total Aluminum	5.0 mg/l
Total Arsenic	0.04 mg/l
Total Boron	5.0 mg/l
Total Cadmium	0.2 mg/l
Total Chromium	5.1 mg/l
Total Cobalt	1.0 mg/l
Total Copper	1.6 mg/l
Total Lead	0.4 mg/l

Total Mercury	0.01 mg/l
Total Selenium	0.05 mg/l
Total Vanadium	0.10 mg/l
Total Zinc	95.4 mg/l
Radium-226 + radium-228	30.0 pCi/l
Tritium(*1)	3,000,000 pCi/l

(*1) When accelerator produced.

M. MINIMUM QUANTIFICATION LEVELS (MQL)

If any individual analytical test result is less than the MQL, a value of zero (0) may be reported for that individual result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

PARAMETER	MQL
Total Arsenic	0.01 mg/l
Total Cadmium	0.001 mg/l
Total Chromium	0.01 mg/l
Total Copper	0.01 mg/l
Total Lead	0.005 mg/l
Total Mercury	0.0002 mg/l
Total Selenium	0.005 mg/l
Total Zinc	0.02 mg/l
Total Nickel	0.04 mg/l
Total Silver	0.002 mg/l
Total Residual Chlorine	0.011 mg/l

This permit may be reopened to revise these MQLs if changes occur during the term of the permit.

N. REOPENER CLAUSE

This permit may be reopened for modification under the following circumstances:

(A) to reflect any applicable changes to the New Mexico Water Quality Standards;

(B) to impose new or additional limitations as allowed by law or regulation that arise as a result of the information obtained from the study required under the settlement agreement between the permittee and the NMED, dated April 20, 1993; and

(C) as provided by law. For this purpose , Petitioners will provide NMED with copies of its annual environmental surveillance reports, the addition and deletion of new outfalls, its waste stream characterization final studies, and its NPDES discharge monitoring reports.

1912

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 1, 1997

Douglas Meiklejohn, Attorney
New Mexico Environmental Law Center
1405 Luisa St., Suite 5
Santa Fe, New Mexico 87505

RE: Discharge Plan (DP-1132) for Los Alamos National Laboratory, Radio Active Liquid Waste Treatment Facility

Dear Mr. Meiklejohn:

This is in response to your letter of December 17, 1996 requesting a public hearing for the discharge plan referenced above. The public comment period ended on December 17, 1996.

The New Mexico Environment Department (NMED) will be making a decision on holding a public hearing within the next several weeks. Your request is being given due consideration, and you will receive written notification of NMED's decision.

Please call the Ground Water Pollution Prevention Section at 827-2900 if you have any questions.

Sincerely,

Karen McCormack for Dale M. Doremus

Dale M. Doremus, Program Manager
Ground Water Quality Bureau
Pollution Prevention Section

DMD:PAB/pab

xc: James Bearzi, District Manager, NMED District II

INTERNAL MEMORANDUM

DRAFT

TO: Phyllis Bustamante, GWPR, NMED 827-2965
Steve Yanicak, DOE OB, Program Manager, NMED
File, DOE OB, NMED

FROM: Michael Dale, DOE OB, NMED

DATE: August 1, 1997

SUBJECT: **Suggestions or recommendations concerning LANL's response to GWPR's review for the TA-50 discharge plan**

Phyllis, these are some suggestions or recommendations concerning LANL's response to your review for the TA-50 discharge plan:

Page 4, b. 3. LANL has only one water-level map, and the data were obtained by our bureau during November, 1996 (extremely low-head conditions due to drought). Major head fluctuations occur in the shallow aquifer within Mortandad Canyon; therefore, LANL should periodically collect water-level data from all wells (dry and wet), and produce water-level maps.

Page 4, b. 4. It should be noted that intermediate ground water was encountered during the drilling of ER well 35-2028 which is located approximately 2000' south of the outfall. Intermediate ground water was also encountered during the drilling of SHB-4, which is located approximately 7000' south of the eastern extent of the shallow contaminated aquifer within Mortandad Canyon.

Page 4, b. 5. TW-8 is screened across approximately 100' of saturation; hence, the potential for massive dilution exists, which may be the reason for nitrate variations observed at TW-8 (e.g., 1994 NO3 as N at 5.1 ppm, 1995 NO3 as N at 0.35 ppm).

Page 4, b. 6. LANL's ESH-18 group needs to check with the LANL ER group concerning the existence of any surface-water data upstream of the TA-50 outfall. In addition, outfall(s) above the TA-50 outfall discharges an unknown amount of water which does make its way past the TA-50 outfall, and subsequently may be being sampled at ESH-18's annual surveillance station Mortandad at GS-1. Hence, water-quality data collected at GS-1 may not always reflect that of the TA-50 outfall.

a. As a contingency against treatment process failure the RLWTF has the capability of holding approximately ten (10) days of influent in storage while the treatment system is being returned to service. The RLWTF's hold-up capacity is based upon a current influent storage capacity of 200,000 gallons and an influent design flow of 20,000 gallons per day. Additionally, in the event of treatment process failure, the Laboratory would implement waste minimization measures which would reduce influent flows and further extend the RLWTF's hold-up capacity.

b. 1. Using available data, the Laboratory will submit to the NMED GWQB a draft definition of contaminant plumes in Mortandad Canyon by December 31, 1997.

2. Well logs and well construction details for all wells used in defining the plume will accompany the above submittal.

3. A ground water level surface map of the alluvial aquifer in Mortandad Canyon will be included in the final RFI Work Plan for Mortandad Canyon. A copy of this plan will be submitted to the NMED GWQB when it is finalized in September, 1997.

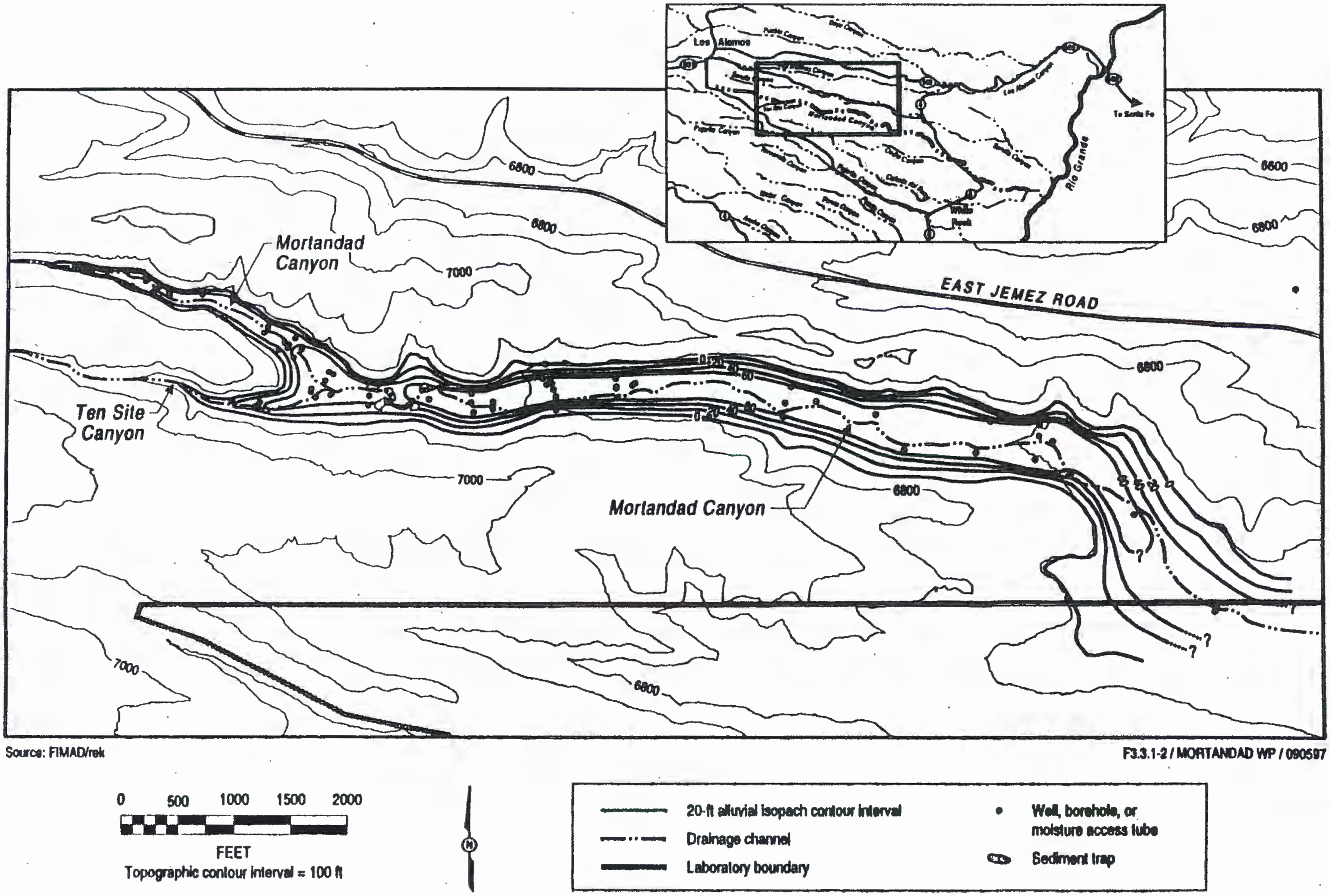
4. Current well information has shown no evidence for the presence of intermediate water beneath Mortandad Canyon. As indicated on Page 19 of the Ground Water Discharge Plan Application, the Laboratory's Environmental Restoration (ER) Project is currently developing a RCRA Facility Investigation (RFI) Work Plan for Mortandad Canyon. One of the objectives of the Mortandad Canyon work plan will be to further assess the potential for interconnections between ground water in alluvium, possible perched intermediate zones, and the regional aquifer.

5. Extensive water quality data from the regional aquifer is provided to the NMED annually in the Laboratory's Environmental Surveillance Report. Water supply well PM-5 and main aquifer test well TW-8 are two wells within the vicinity of Mortandad Canyon. Recent water quality data for these two wells show no exceedances of WQCC standards.

6. No recent water quality data are available for water from above the TA-50 outfall.

7. If contaminant concentrations do not drop below WQCC Regulation 3103. numerical standards by the end of the Discharge Plan term (5 years from the date of approval) then additional corrective actions will be proposed in the Ground Water Discharge Plan Renewal Application.

Figure 1

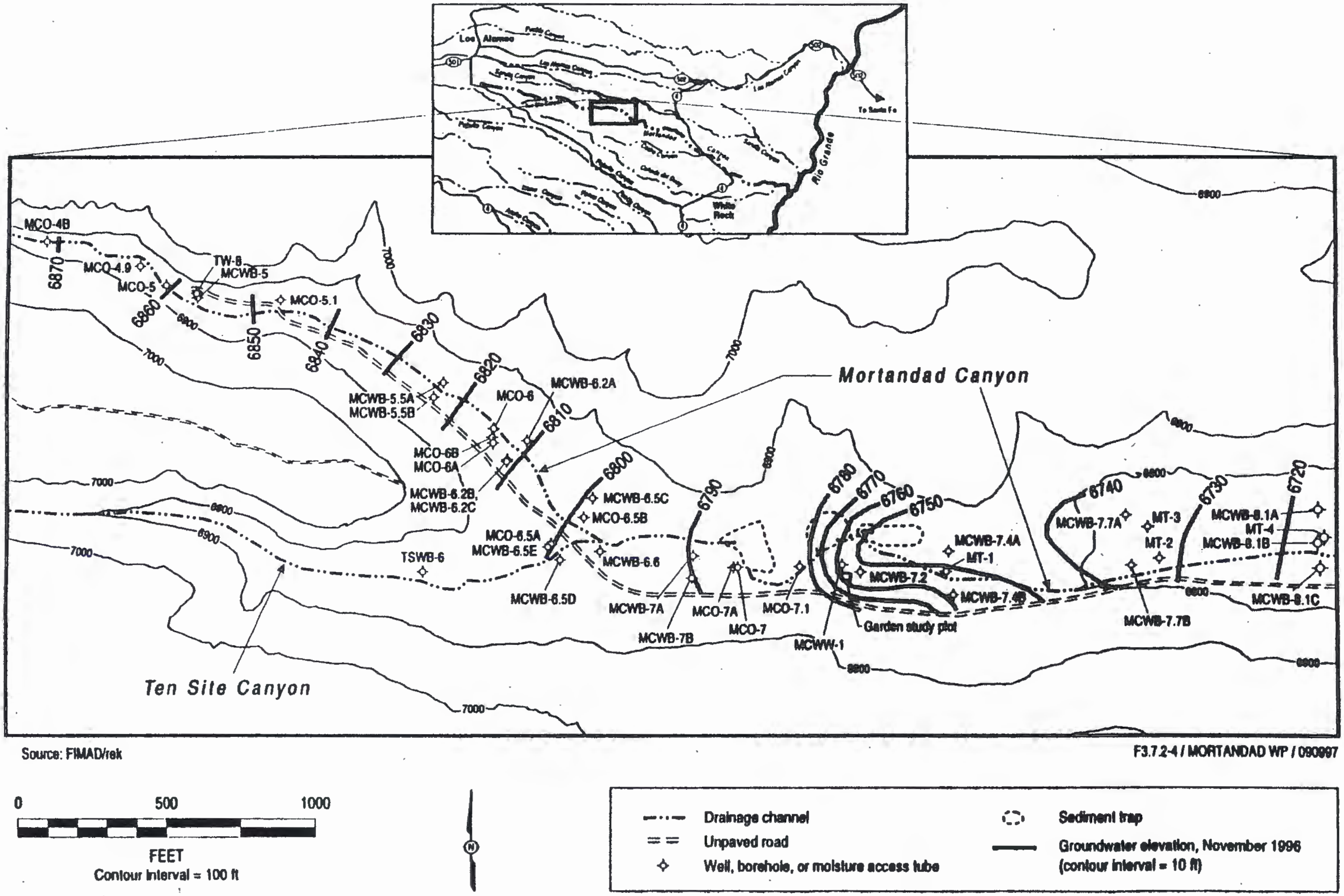


Source: FIMAD/rek

F3.3.1-2 / MORTANDAD WP / 090597

Figure 3.3.1-2. Preliminary isopach map of the alluvium in lower Mortandad Canyon.

Figure 2



Source: FIMAD/rek

F3.7.2-4 / MORTANDAD WP / 090997

Figure 3.7.2.4. Recent elevations of alluvial groundwater in lower Mortandad Canyon.

NEW MEXICO
ENVIRONMENTAL LAW CENTER

September 29, 1997

Marcy Leavitt
Bureau Chief
Ground Water Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, N.M. 87502

RECEIVED
OCT 02 1997
OUND WATER BUR

Re: Discharge Plan 1132
Radioactive Liquid Waste Treatment Facility
Los Alamos National Laboratory

Dear Marcy:

I write on behalf of the San Ildefonso Pueblo to request pursuant to the Inspection Public Records Act copies of all documents in the custody of the Ground Water Bureau pertaining to the above referenced discharge plan. I would appreciate your contacting Allison Dellinger of my office to arrange for copying when these documents are available.

I would also appreciate it if you would inform Susan Jordan of my office and Bill Wyatt of the San Ildefonso Pueblo if you receive any other documents pertaining to this matter and if you take any action concerning the discharge plan or our request for a hearing.

Thank you for your cooperation.

Yours truly,

Doug

Douglas Meiklejohn
Executive Director

pc: Bill Wyatt
Environmental Program manager
San Ildefonso Pueblo

1405 Luisa St., Suite 5 Santa Fe, N.M. 87505
(505) 989-9022 FAX (505) 989-3769

FIELD TRIP REPORT
GROUND WATER POLLUTION PREVENTION SECTION

Date: 9-30-97 **Inspector(s):** P. Bustamante
L. Quemada

FACILITY

Facility Name: LANL- TA-50 **Contact:** Bob Beers / Alan Bond
Location: Los Alamos
Discharge Plan Number: DP-132 **UIC Related? (Yes/[✓ No]):**
Type of Operation: Radio Active Liquid Waste Treatment Facility

INSPECTION SUMMARY

Purpose:

✓ a. Evaluation of Proposed Discharge Plan
____ b. Compliance Inspection (Complete Checklist on Reverse Side)
____ c. Other (specify):

ACTIVITIES

a. Inspection [✓ of Facilities] [✓ of Construction] (specify): Phase 1 & 2 upgrades to system

Flow Measurement: Type: Condition:

b. Effluent Sample(s) (provide sampling location):

No. of Ponds: No. in Use: Condition of Ponds:
Condition of Pond Liner (s):

c. Ground Water Sample(s) (provide well name and location):

No. of Monitor Wells: Well Condition:

d. Other (specify):

OBSERVATIONS AND INFORMATION OBTAINED

- A presentation and tour was given to discuss the findings of the three pilot projects for nitrate removal - 1) biological, 2) ion exchange, 3) evaporation
- all three met nitrate removal goals but biological treatment was selected because of limited biproducts
- 1 new system will be online possibly by march

ACTION REQUIRED

- send response to this additional information - need updated operational plan

WATER QUALITY INSPECTION & SAMPLING CHECKLIST
Reference: Regulation No. HED 86-14 (EID)

ENTRY CONFERENCE:

______ Was facility representative informed of EID's right of entry and authority: (To access records, inspect monitoring equipment or methods and sample effluents under Section 74-6-9.E of the New Mexico Water Quality Act (NMSA 1978)?

______ Was EID identification presented?

______ Were potential or suspected violations which prompted inspection listed?

______ During the inspection, was the facility representative immediately advised or addition potential violations?

EXIT CONFERENCE

______ Were the preliminary inspection results summarized?

______ Was the facility representative advised if violations discussed during the entry conference remain under investigation?

______ Were other potential violations discovered during the inspection discussed?

______ Was a date provided as to when EID expects to complete consideration of potential violations.

WATER QUALITY SAMPLING

______ Was the facility representative offered a reasonable opportunity to obtain split/replicate samples, perform simultaneous tests, measurements or photographs?

______ Were copies of EID's results (sampling, testing, photos) requested? If yes, copies must be provided within ten working days after such results are in EID's possession.

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: October 16, 1997
In Reply Refer To: ESH-18/WQ&H:97-0344
Mail Stop: K497
Telephone: (505) 667-7969

RECEIVED
OCT 17 1997
GROUND WATER BUREAU

Ms. Phyllis Bustamante
Water Resource Specialist
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: LOS ALAMOS NATIONAL LABORATORY'S WORK PLAN FOR MORTANDAD CANYON

Dear Ms. Bustamante:

Please find attached a copy of Los Alamos National Laboratory's Work Plan for Mortandad Canyon (LA-UR-97-3291). This work plan, prepared by the Laboratory's Environmental Restoration (ER) Project, is being submitted to your agency as additional information for the Radioactive Liquid Waste Treatment Facility's (TA-50) Ground Water Discharge Plan Application, DP-1132.

Please call me at 667-7969 if you have questions or concerns regarding this submittal.

Sincerely,

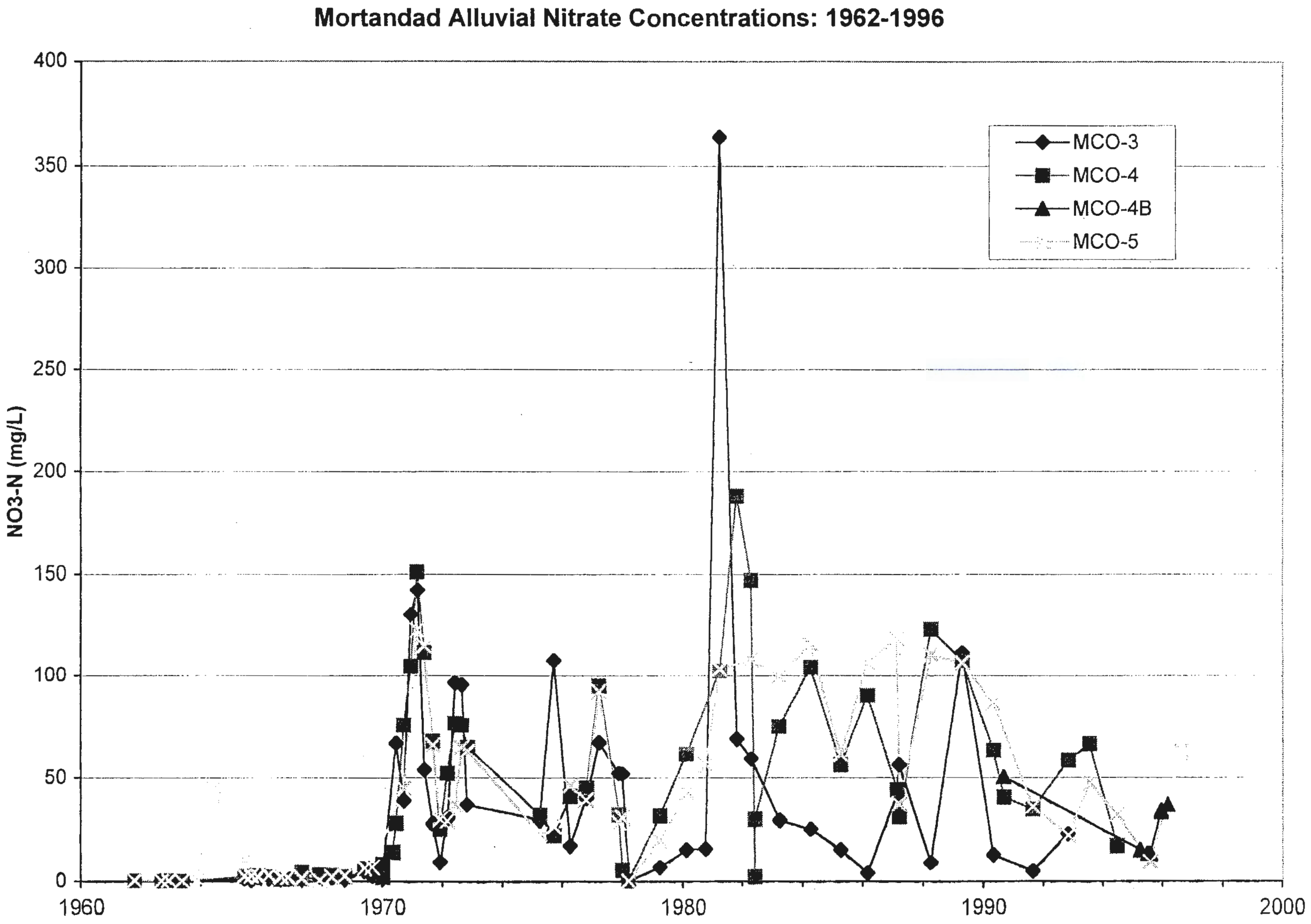
Bob Beers
Water Quality and Hydrology Group

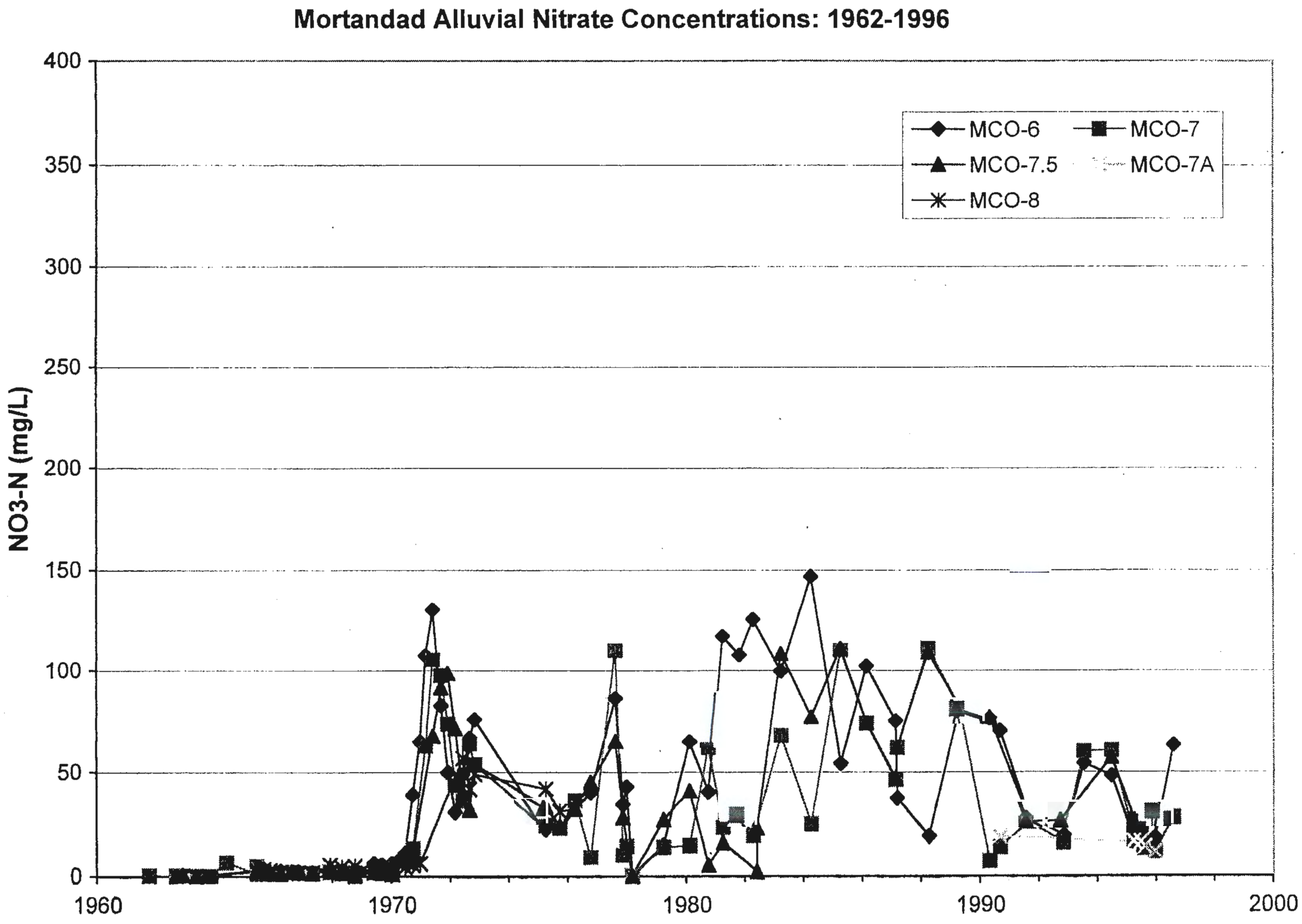
RB/em

Cy: J. Plum, DOE/LAAO, w/o enc., MS A316
K. Hargis, LANL, EM/WM, w/o enc., MS J591
S. Rae, LANL, ESH-18, w/o enc., MS K497
S. Hanson, LANL, EM/WM, w/o enc., MS E518
A. Bond, LANL, EM/WM, w/o enc., MS E518
N. Williams, LANL, ESH-18, w/o enc., MS K497
WQ&H File, w/o enc., MS K497
CIC-10, LANL, w/o enc., MS A150

Figure 3

12/11/97





Mortandad Alluvial Nitrate Concentrations: 1962-1996

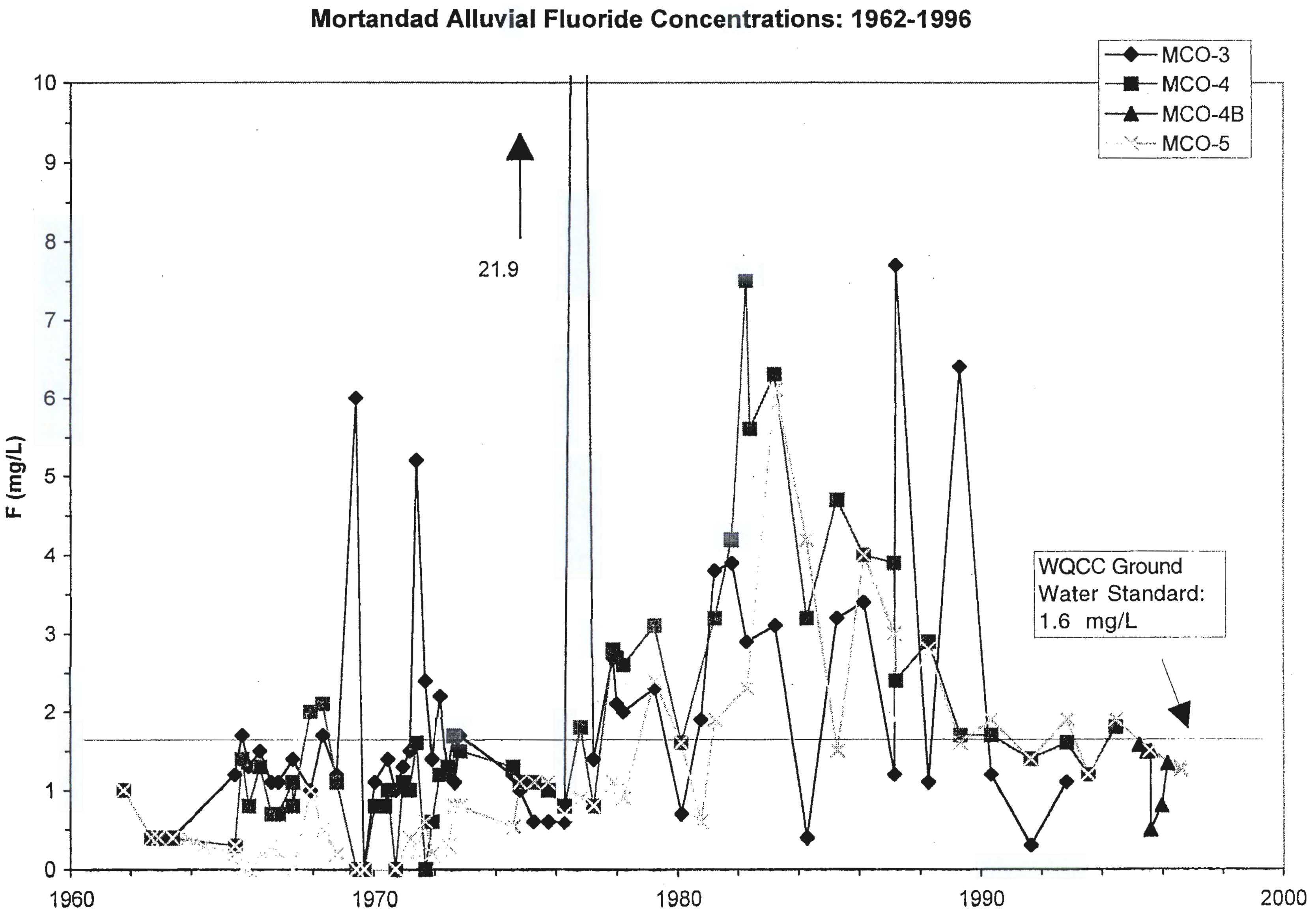
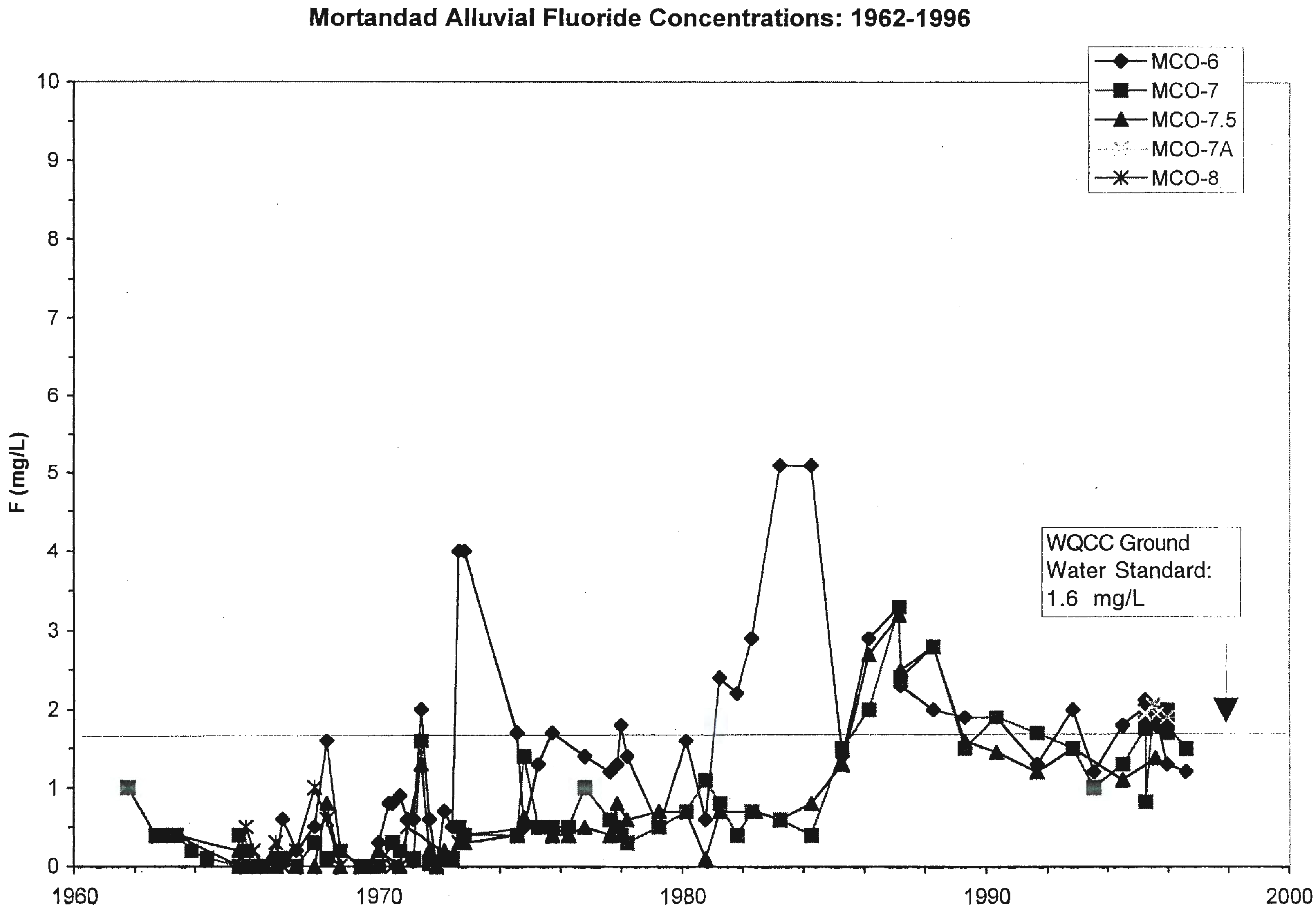

Mortandad Alluvial Fluoride Concentrations: 1962-1996
MCO-3
MCO-4
MCO-4B
MCO-5
21.9
WQCC Ground Water Standard: 1.6 mg/L
F (mg/L)
0
1
2
3
4
5
6
7
8
9
10
1960
1970
1980
1990
2000

Figure 6


Mortandad Alluvial Fluoride Concentrations: 1962-1996
F (mg/L)
0
1
2
3
4
5
6
7
8
9
10
1960
1970
1980
1990
2000
MCO-6
MCO-7
MCO-7.5
MCO-7A
MCO-8
WQCC Ground Water Standard: 1.6 mg/L

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

DEC 2 2 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Dale Doremus
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502

RECEIVED
DEC 24 1997
[illegible]

Dear Ms. Doremus:

Subject: NMED Request for Additional Information, Los Alamos National Laboratory (LANL) Ground Water Discharge Plan Application, Radioactive Liquid Waste Treatment Facility (TA-50), DP-1132.

In an April 21, 1997 letter to Mr. G. Thomas Todd of the Department of Energy's Los Alamos Area Office (DOE/LAAO), your agency requested additional information on LANL's Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility (DP-1132). In DOE's response to your request (June 23, 1997 letter from Mr. Todd), LANL did not address comment number 6.b.1, but committed to do so by December 31, 1997. Enclosed is LANL's response to comment number 6.b.1.

Additionally, please be advised of changes in dates for installation and operation of the Phase I upgrades for TUF and RO, scheduled for October 1997, and the Phase II upgrades for Nitrate Removal, scheduled for January 1998. A new schedule for the upgrades is being prepared and will be provided to you in January 1998. The schedule will be submitted as a revision to Table 1.0 of the Discharge Plan Application.

Please call Bob Beers of the LANL Water Quality and Hydrology Group (ESH-18) at 667-7969 if you desire any additional information concerning this response.

Sincerely,

Herman C. Le-Doux
Acting Area Manager

LAAME:3BK-016

Enclosure

cc:
See page 2

cc w/enclosure:

Phyllis Bustamante
  Ground Water Quality Bureau
  New Mexico Environment Department
  1190 St. Francis Drive
  P. O. Box 26110
  Santa Fe, NM 87502
Glenn Saums
  Surface Water Quality Bureau
  New Mexico Environment Department
  1190 St. Francis Drive
  P. O. Box 26110
  Santa Fe, NM 87502

NMED Comment

6. *The contingency submitted in the discharge plan application does not adequately describe the actions to be taken for the protection of ground water in the event of a contaminant spill or failure of the treatment process.*

   b. *The contingency plan and corrective actions submitted as part of the discharge plan application does not provide enough information to determine if the proposed corrective actions will be adequate to restore ground water in Mortandad Canyon to below WQCC ground water standards, and may not be an approvable contingency plan for the discharge permit. Prior to approving the corrective action as part of the discharge permit, NMED must receive the following:*

      1. *an accurate definition (vertical and horizontal extent) of the contamination in the alluvial aquifer of Mortandad Canyon with concentrations of all WQCC constituents currently exceeding standards from all sampling points used to define the plume.*

Laboratory Response

Alluvial ground water in Mortandad Canyon extends from above well MCO-3 (where the alluvium is 7 ft thick) to about borehole MCC-8.2 (where the alluvium is 76 ft thick). Figure 1 (taken from the Environmental Restoration Program's Work Plan for Mortandad Canyon) is an isopach map of the alluvium. Alluvium is thin and discontinuous above MCO-3. The thickness of saturation is generally about 10 ft, but varies seasonally up to about 20 ft. The extent of saturation at the down-canyon limit near MCC-8.2 also varies with seasonal changes in inflows. Figure 2 (taken from the Work Plan for Mortandad Canyon) is a map of water levels for the alluvial ground water system. The alluvial ground water is monitored by numerous wells which are screened throughout most of the saturated thickness.

The constituents in Mortandad Canyon alluvial ground water that currently exceed WQCC ground water standards are nitrate and fluoride. Figures 3, 4, 5, and 6 show concentration data for nitrate and fluoride in alluvial wells from 1962 through 1996. Several features can be noted from these plots. First, concentrations are at times higher for wells MCO-3, MCO-4, and MCO-4B, as these wells are nearest to the TA-50 outfall and mixing of the effluent with ground and surface water may have been variable at the time of sample collection. Second, concentrations appear to decrease downstream from the TA-50 outfall. This apparent tendency is the result of the occasional higher values previously noted for wells MCO-3, MCO-4, and MCO-4B. And third, concentrations of nitrate and fluoride were highest between 1970 and 1990, and have decreased since 1990. In conclusion, while there is some variation of concentrations between wells, the overall picture is that concentrations of the constituents are generally similar throughout the ground water system at a given time. The plots show that long term concentration trends occur over the alluvial ground water system as a whole.

Because the wells are screened through most of the saturated thickness and the saturated zone is thin, it is not possible to distinguish any vertical differences in ground water concentrations of nitrate and fluoride.

To a first approximation, the entire body of ground water is chemically well mixed, and variations in concentration spread throughout the ground water system in times of about a year, as discussed by Purtymun et al. (1977). Because the alluvial groundwater is uniformly contaminated, it is misleading to think in terms of a contaminant plume existing within the alluvial ground water. Rather, a relatively small volume of ground water (with a volume of about 20,000 cubic meters) is completely replenished annually by recharge water (with a volume of about 90,000 to160,000 cubic meters) which includes the discharges from TA-50. Purtymun et al. (1977) attributed the losses of water to evapotranspiration and infiltration into the underlying tuff. The composition of the alluvial ground water is a combination of input from TA-50 and other sources such as runoff and other Laboratory discharges. The ground water composition nearest the TA-50 outfall shows short-term (weekly or daily) variations related to the TA-50 input, but over the longer-term (annually), these variations are spread throughout the alluvial ground water body.

In light of the conclusion that contamination is relatively well mixed throughout the alluvium, the extent of alluvial ground water also defines the extent of contamination. The horizontal and vertical extent of contaminated ground water can be inferred from Figure 1 (showing the extent of the alluvium), combined with the observation that alluvial groundwater extends approximately from above MCO-3 to about MCC-8.2 (though the extent varies seasonally), and that the thickness of saturation varies from near zero at the upper end of saturation to about 10 to 20 ft near the lower end.

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

RECEIVED
JAN 01 1998
GROUND WATER BUREA

DEC 30 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Dale Doremus
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502

Dear Ms. Doremus:

Subject: Revisions to Los Alamos National Laboratory's (LANL) Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility (RLWTF) at Technical Area (TA) 50

In April 1997, the Department of Energy Los Alamos Area Office (LAAO) submitted to your agency a revised schedule for completing the Phase I upgrades (tubular ultrafiltration and reverse osmosis) at the LANL RLWTF at TA-50. In the revised schedule, the Phase I ugrades were to be fully operational by October 1997. Currently, construction of the Phase I ugrades have been completed and the system in undergoing preoperational testing. These upgrades, however, are not expected to be fully operational until March 1998. This change has been indicated in the enclosed Table 1.0.

In addition to the delays in completing the Phase I upgrades, LANL is also experiencing delays in implementing the Phase II upgrades (biological denitrification). Due to difficulties in procuring the biological denitrification equipment, LANL will be unable to meet the January 1998 schedule proposed in the August 1996 Ground Water Discharge Plan Application. A revised expected completion date of June 1998 has been indicated in the enclosed Table 1.0.

Please call Bonnie Koch of my staff at (505) 665-7202, or Bob Beers of the LANL Water Quality and Hydrology Group (ESH-18) at (505) 667-7969 if you desire any additional information concerning this revision to the LANL Ground Water Discharge Plan Application for the RLWTF at TA-50.

Sincerely,

G. Thomas Todd

G. Thomas Todd
Area Manager

LAAME:3BK-018

Enclosure

cc:
See page 2

cc w/enclosure:
Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502
Glenn Saums
Surface Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, NM 87502

Table 1.0. Summary of Completed, In Progress, and Proposed Upgrades to the RLWTF. (Revised on December 18, 1997. Revised dates are in bold italics).

Plant Integrity Upgrades	**Start Date**	**Completion Date**
• Eliminate Influent from the Solids Section of the Grit Chamber.	August, 1990	Sept., 1990
• Install New Neutralization Chamber & Monitoring Station to Eliminate Grit Chamber Function.	August, 1990	August, 1993
• Install New Collection Lines from TA-55 to TA-50.	August, 1990	June, 1995
• Replace WM-66 Acid Tank with New SS Tank.	January, 1994	August, 1994
• Non-Destructive Testing of All Concrete Tanks.	June, 1994	December, 1994
• Non-Destructive Testing of all Steel Tanks.	May, 1993	September, 1993
• Refurbish Clarifiers (2).	August, 1995	October, 1996
• Install New Influent Tank Farm.	Dec., 1993	Dec., 1996
• Video Inspect Pipelines & Pressure Test Equipment.	April, 1995	On-Going

Phase I Process Upgrades: TUF and RO	**Start Date**	**End Date**
• BAT Evaluation Conducted per DOE Order 5400.5.	April, 1992	May, 1995
• Engineering of Phase I Upgrades.	February, 1994	June, 1996
• Procurement, Installation, and Start-Up.	May, 1996	***Dec, 1997***
• Test-Out Period.	***Dec, 1997***	***March, 1998***
• Phase I Fully Operational.	----	***March, 1998***

Phase II Process Upgrades: Nitrate Removal	**Start Date**	**End Date**
• BAT Evaluation Conducted.	April, 1992	May, 1995
• Parallel Evaluation of Available Technologies by RLWTF and an Independent Consultant.	March, 1996	June, 1996
• NEPA Review of Process Upgrades.	February, 1996	Sept., 1996
• Parallel Engineering of 3 Options.	July, 1996	June, 1997
• Parallel Pilot Testing of 3 Options:		
1) Evaporation.	October, 1996	May, 1997
2) Biological Denitrification.	October, 1996	April, 1997
3) Selective Ion Exchange.	October, 1996	March, 1997
• Evaluation of Pilot Testing.	May, 1997	June, 1997
• Selection of Nitrate Removal Process.	June, 1997	July, 1997
• Procurement of Equipment, Installation and Start-Up.	***Sept, 1997***	***March, 1998***
• Test-Out Period	***March, 1998***	***June, 1998***
• Phase II Upgrades Fully Operational.	----	***June, 1998***

LOS ALAMOS NATIONAL LABORATORY
WASTE PROFILE SYSTEM
WPF #: 22921

28-Mar-1997 10:59 AM (Version: 2)

Generator : HEATON, RICHARD C **MS :** J514 **PH :** 71141 **Z#:** 080793
WMC : ROYBAL, MATTHEW **MS :** J514 **PH :** 59054 **Z#:** 096152
CSR : ART, KELLIE **MS :** J593 **PH :** 75909 **Z#:** 112794
Status : ACTIVE **Activation Date :** 13-FEB-96 **Expiration Date:** 13-FEB-98

Group : CST11 **TA :** 48 **Bldg :** 000001 **Room:** 0

RMMA : N/A
Waste Accumu : N/A
Method of Char : **KNOWLEDGE OF PROCESS (KOP)**

Waste Type : **PROCESS WASTE/SPENT CHEMICAL**
Waste Classes: **ON-GOING GENERATION**
RADIOACTIVE
WASTE WATER
Assoc Docum: **Process SOP# CST-SOP-015**

Waste Category: **NOT APPLICABLE**

Waste Sources : **DECON/DECOM**
MAINTENANCE
MATERIAL PROCESSING
RESEARCH AND DEVELOPMENT

Waste Matrix : **AQUEOUS LIQUID**

Matrix Type : **HOMOGENEOUS**

Waste/Proc Desc : LIQUID WASTE DISCHARGED INTO THE LIQUID RADWASTE COLLECTION SYSTEM (ACID DRAIN) WASTES CONSIST OF ONCE-THROUGH CONDENSER WATER, LOW-LEVEL AQUEOUS DISTILLATES, AND HOT ALL WASH DOWNS. SINKS, FLOOR DRAINS, AND DECON SHOWERS IN THE HOT CELL WING OF TA-48, RC-1 ARE ALSO CONNECTED WITH THIS SYSTEM.

Ignitability : **NOT IGNITABLE**

Corrosivity : **LIQUID CORROSIVE TO STEEL**

Reactivity : **NON REACTIVE**

Boiling Point : **GREATER THAN 95 DEGREES F.**

Toxicity Characteristic Metals :

Contaminant	LTR	Min	Max	Unit	Method
ARSENIC	Y				
BARIUM	Y				
CADMIUM	Y				
CHROMIUM	Y				
LEAD	Y				
MERCURY	Y				
SELENIUM	Y				
SILVER	Y				

Toxicity Characteristic Organic Compounds: N/A

CD115M	0.000E+00	4.000E-08	CIL
SN113	0.000E+00	4.000E-08	CIL
SC46	0.000E+00	2.000E-08	CIL
GA68	0.000E+00	4.000E-08	CIL

Rad Contamination Type : **VOLUME CONTAMINATION**

Waste Water Contaminants :

Contaminant	LTR	Min	Max	Unit	Method
ALUMINUM	**Y**				
BORON	**Y**				
COBALT	**Y**				
COPPER	**Y**				
VANADIUM	**Y**				
ZINC	**Y**				

Additional Information: ** SUM OF ALL NUCLIDES NOT TO EXCEED 5.0E-7 CI/L

WASTE CHARACTERIZATION INFORMATION

Radioactivity Category : **Low Level Rad**

RCRA Category : **Hazardous Waste**

Misc. Category : **FOR DISPOSAL AT TA-50**

Waste Classification : **FOR DISPOSAL AT TA-50**

EPA Hazardous Waste Code : **D002**

Los Alamos
NATIONAL LABORATORY

Hazardous & Solid Waste Group
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

ESH-19:98-057

March 24, 1998

RECEIVED
MAR [illegible]
DOE OVERSIGHT BUREAU

Ms. Janice Archuleta
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
2044 Galisteo, P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Ms. Archuleta:

SUBJECT: TRANSMITTAL OF TA-50 SAMPLING AND ANALYSIS PLAN

I have enclosed a copy of the Radioactive Liquid Waste Treatment Facility Sampling and Analysis Plan (SAP) for your information and files. As you probably recall, we discussed this plan during several of your site visits to the Laboratory in 1997. The plan was also referenced in our response to the February 18, 1997, letter from Benito Garcia concerning "Reconfiguration of the Low-level Radioactive Waste Water Treatment Facility". As stated in this response, the Laboratory's RCRA/CWA Working Group was developing an influent and sludge monitoring program to characterize the waste streams received and produced by the Radioactive Liquid Waste Treatment Facility (RLWTF) and demonstrate that applicable RCRA exclusions, such as those contained in 40 CFR 261.3 and 261.4, were being met. The enclosed SAP is a result of that group's effort. Copies of the revised RLWTF Waste Acceptance Criteria and Conceptual Design Report were also transmitted to your office in response to Mr. Garcia's letter on February 10, 1997, and July 2, 1997, respectively.

If you would like to discuss the RLWTF SAP in more detail, or if you have any questions regarding the plan, please feel free to contact me at 667-4882. Thank you.

Sincerely,

Alex A. Puglisi

Alex A. Puglisi
Hazardous & Solid Waste

AP:em

Enclosure: EM-RLW Radioactive Liquid Waste Treatment Facility, Administrative Procedure, Sampling and Analysis Plan

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EM-RLW

RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

ADMINISTRATIVE PROCEDURE

SAMPLING AND ANALYSIS PLAN

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EM-RLW

RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

SAMPLING AND ANALYSIS PLAN

Administrative Procedure
For
Sampling and Analysis Plan

HISTORY OF REVISIONS

Superseded Document	**Date**	**Superseded By**	**Date**
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RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

SAMPLING AND ANALYSIS PLAN

1.0 INTRODUCTION

Environmental Management-Radioactive Liquid Waste (EM-RLW) manages and operates the Radioactive Liquid Waste Treatment Facility (RLWTF) within Facility Management Unit (FMU)-84 at the Los Alamos National Laboratory (LANL). The RLWTF consists of the Main Plant at Technical Area (TA)-50-1 and two pretreatment plants: the Room 60 Pretreatment Plant at TA-50-1 (Pretreatment Plant) and TA-21-257 (DP-257).

The majority of influent received at the Main Plant enters the plant through the Radioactive Liquid Waste Collections System (RLWCS). Small volumes of influent enter the Main Plant in batch loads by way of a tanker truck.

The Main Plant also receives and further treats the effluent from the Pretreatment Plant and DP-257. Volumes of effluent transferred to the Main Plant are variable and depend on the influent volumes treated through these plants. DP-257 operates approximately twice a month; the Pretreatment Plant operates infrequently. The Main Plant operates at least five days a week.

1.1 Federal Regulations

The Main Plant's Mortandad Canyon Outfall, Outfall 051, is regulated under the Clean Water Act by LANL's National Pollutant Discharge Elimination System (NPDES) Permit NM0028355. This permit sets limits for specific constituents in the final effluent discharged from its effluent tanks at TA-50-2 (WM-2) to Outfall 051. The Pretreatment Plant is included in LANL's Hazardous Waste Facility Permit and is a Resource Conservation and Recovery Act (RCRA) treatment facility. The Main Plant and DP-257 operations are not included in the RCRA permit, but both are covered in the 1990 NPDES permit application.

1.2 RCRA Exclusions

Title 40 of the Code of Federal Regulations (CFR) lists exclusions for waste treated through a wastewater treatment plant regulated under the Clean Water Act by an NPDES permit. These exclusions (Attachment 1) are

- §261.4(a)(2), for industrial wastewater discharges that are point source discharges subject to regulation under Section 402 of the Clean Water Act. NOTE: this exclusion applies only to the actual point source discharge. It does not exclude industrial wastewater while it is collected, stored, or treated before discharge, nor does it exclude sludge that is generated by industrial wastewater treatment.
- §261.3(a)(2)(iv)(A-G), for "de minimis" volumes of hazardous waste contained in wastewater subject to regulation under the Clean Water Act.

Definitions for RCRA hazardous waste categories are in Laboratory Implementation Requirement (LIR) 40.00.03.0 "Hazardous and Mixed Waste Requirements for Generators."

1.3 Sampling Operations

As part of routine operations, EM-RLW operation's personnel at the Main Plant collect RCRA operational samples of raw feed and plant sludge generated. Analysis of these samples ensures the RLWTF is operating safely within operational limits and complies with applicable RCRA exclusions.

RLWTF personnel collect NPDES compliance samples of the Main Plant final effluent. Analysis of final effluent samples ensures that the Main Plant effluent meets the NPDES discharge limits. In particular, samples will be used to validate the following:

- Sludge generated during Main Plant and DP-257 operations is not a RCRA waste. NOTE: RCRA listed waste is not accepted for treatment at the RLWTF. Because influent is not a RCRA listed waste, the sludge derived from the treatment of this wastewater will not be classified as a RCRA listed waste. If the sludge exhibits a RCRA hazardous characteristic, the sludge would be classified as a RCRA waste.
- Influent entering the Main Plant and DP-257 is not a RCRA waste and meets applicable RCRA exclusions (Attachment 1).
- Main Plant final effluent meets the discharge limits set by the NPDES Permit No. NM0028355.

Sampling these streams requires carefully collecting adequately sized, representative samples. The sampling method, container type, preservation method, and equipment selected must ensure that chemical and physical properties of the sample are preserved. The appropriate number of quality assurance samples must be analyzed to ensure valid data.

RLWTF sampling operations are described in detail in DOP-50RLWTF-08, "Detailed Operating Procedure (DOP) for Sampling Associated With TA-50 Main Plant Operations".

1.4 Purpose and Scope

This plan helps ensure scientifically valid analytical results that are obtained in accordance with methods required by regulation. The plan applies to all EM-RLW personnel participating in the sampling described in this document. It does not apply to Chemical Science and Technology (CST) analytical and sample management personnel unless otherwise involved in the sampling described in this document. CST personnel perform their operations according to their established procedures. Description of CST analytical and quality assurance/quality control (QA/QC) procedures is beyond the scope of this document.

Personnel collect samples of DP-257 and Pretreatment Plant influent before treatment through these plants. After treatment, the final effluent from these plants is analyzed for radiological components before transfer to the Main Plant for further treatment. Raw feed samples from the Main Plant influent tanks includes these streams; therefore, this document does not include Pretreatment Plant and DP-257 samples. Samples related to the Pretreatment Plant and DP-257 are described in DOP-50RLWTF-01 and DOP-50RLWTF-06, respectively.

This plan does not detail instructions for collecting and handling samples. DOP-50RLWTF-08, "Detailed Operating Procedure (DOP) for Sampling Associated With TA-50-1 Main Plant Operations," details instructions for all aspects of sampling, including collection, submittal for analysis, and health and safety concerns. DOP-50RLWTF-14, "Packaging and Transportation of Samples," details instructions for packaging and transport of samples according to Department of Transportation (DOT) regulations. These DOPs are available at the Main Plant operator's desk in Room 116C at TA-50-1 and through the EM-RLW Document Control Manager at TA-50-1-6. Personnel are trained according to DOPs and reference controlled copies of DOPs when conducting sampling covered by this plan. Additionally, personnel should be familiar with SOP-50RLWTF-01, "Safe Operating Procedure (SOP) for RLWTF Operations"

2.0 DEFINITIONS,ACRONYMS, AND ABBREVIATIONS

2.1 Definitions

accuracy	The closeness of agreement between an observed value and an accepted reference value.
blank sample	A sample of deionized or distilled water or analyte-free media used to verify the quality of sampling activities by identifying contamination introduced from outside sources.
composite sample	A single sample of combined individual samples collected from the same location at different points in time and combined into a single sample.
final effluent	Treated water flowing from a treatment plant to the final point of discharge (outfall 051) for the plant into Mortandad Canyon.
flow-weighted composite	A sample consisting of a minimum of three grab samples of collection at regular intervals over a normal operating day and combined proportional to flow or a sample continuously collected proportional to flow over a normal day.
grab sample	A single sample collected in less than 15 minutes. {NPDES Permit No. NM0028355} [redacted]
headworks	The point of entry of waste into a wastewater treatment plant. In this document, the influent tanks, where all influent streams to the Main Plant converge.
NPDES compliance sample	Samples taken in compliance with the monitoring requirements following final treatment, prior to or at the point of discharge from the TA-50-1 Treatment Plant.
precision	The agreement among a set of replicate measurements without assumption of knowledge of the true value. Precision is estimated by means of

duplicate/replicate analyses.

raw feed	Wastewater pumped from an influent tank for treatment to be treated through the Main Plant. This water is representative of wastewater treated through the Main Plant.
raw influent	Wastewater entering the Main Plant through the Radioactive Liquid Waste Collection System (RLWCS) before being stored in an influent tank. This stream may not be representative of waste treated through the Main Plant.
RCRA operational samples	Samples routinely collected and analyzed to determine regulatory compliance and ensure that the RLWTF is operating within operational limits. These samples are collected prior to final treatment for NPDES.
reagent grade	Reagents conforming to the current specifications of the Committee on Analytical Reagents of the American Chemical Society (ACS). Synonymous terms for such reagents are analytical reagent grade and ACS reagent grade.
Representative Sample	A sample of a universe or whole (e.g., sludge, lagoon, wastewater) which can be expected to exhibit the average properties of the universe or whole.
Sludge	Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant. {40 CFR 260.10}
SW-846	The EPA publication intended to provide a unified, up-to-date source of information on sampling and analyses related to compliance with RCRA regulations.
TCLP	Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"EPA SW-846. TCLP is the test method used to determine if a waste exhibits a RCRA toxic characteristic. SW-846 details the TCLP procedure.
TCLP metals	TCLP metals are the eight RCRA metals analyzed for using the TCLP test method. These metals are Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver.
time-weighted composite	Individual samples collected from the same location at incremental points in time and combined into a single sample.

2.2 Acronyms and Abbreviations

ALARA	as low as reasonably achievable

CFR	Code of Federal Regulations
CLP	contract laboratory program
CST	Chemical Science and Technology (Division)
DOE	U.S. Department of Energy
DOP	Detailed Operating Procedure
DOT	U.S. Department of Transportation
EM-RLW	Environmental Management-Radioactive Liquid Waste
EPA	U.S. Environmental Protection Agency
ESH	Environmental Safety and Health (Division)
ESH-1	Health Physics Operations Group
ESH-18	Water Quality and Hydrology Group
ESH-19	Hazardous and Solid Waste Group
LIR	Laboratory Implementation Requirement
NPDES	National Pollutant Discharge Elimination System
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SVOC	Semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
TTO	Total Toxicity Organics
VOC	Volatile Organic Compounds

3.0 ROLES AND RESPONSIBILITIES

The quality of sampling operations and the safety of sampling personnel depend on personnel fulfilling specific responsibilities. This section describes these personnel and their responsibilities.

3.1 EM-RLW

3.1.1 Group Leader

The EM-RLW Group Leader is ultimately responsible for the quality of the sampling program and ensuring the RLWTF complies with all regulatory requirements. This includes

- Reviewing and approving this plan and any subsequent revisions.
- Providing written authorization for any deviation from this plan, routine sampling procedures, or routine transportation procedures.
- Ensuring adequate staffing and funding resources for EM-RLW sampling operations, analysis of all samples, and quality assurance related to the sampling according to this plan and associated DOPs.
- Ensuring EM-RLW sampling operations do not pose a threat to humans or the environment.

3.1.2 Sampling Plan Manager

The Operations Supervisor typically serves as the Sampling Plan Manager. The Sampling Plan Manager or designee does the following:

- With the EM-RLW Training Coordinator and applicable Environment, Safety, and Health (ESH) personnel, identifies the training requirements for sampling personnel and verifies these people are adequately trained.
- Ensures EM-RLW personnel follow all sampling procedures established by this plan and the associated DOPs.
- Ensures EM-RLW personnel follow DOT regulations when transporting samples.
- Ensures QA records generated by sampling operations are maintained as described in the DOP and this plan.
- Notifies applicable ESH-18 or ESH-19 personnel of any nonconformance identified by audits and assessments of the sampling program.
- Ensures EM-RLW personnel submit samples for analysis according to appropriate analytical methods.

3.1.3 Sampling Personnel

Typically EM-RLW operation's personnel conduct routine sampling operations. These personnel do the following:

- Conduct sampling according to procedures established by this plan, DOP-50RLWTF-16, DOP-50RLWTF-14, and SOP-50RLWTF-01.
- Attend all required training identified by the Sampling Plan Manager and the EM-RLW Training Coordinator.
- Consult with CST-9 and CST-12 analytical personnel to determine the appropriate type, size, and number of samples to comply with the laboratory's analytical and quality assurance/quality control (QA/QC) requirements.
- Safely conduct sampling operations as described in the associated DOPs and the SOP.
- Resolve all safety concerns with the Operations Supervisor, and, if appropriate, ESH-5 and/or ESH-1 personnel.
- Maintain appropriate documentation of sampling and analyses such that data is readily available.
- Report all spills occurring during sampling operations to the site spill coordinator, as required by the Laboratory's *Spill Prevention Control and Countermeasures Plan*, the Group Spill Implementation Plan (GSIP), and the "TA-50-1 Site Emergency Plan."

3.1.4 Training Coordinator

The EM-RLW Training Coordinator does the following:

- With the EM-RLW Sampling Plan Manager and applicable ESH personnel, establishes minimum qualifications for EM-RLW sampling personnel.
- Schedules personnel for training to ensure personnel are adequately trained for the operations they perform and that this training remains current.
- Tracks employee training and qualification in the Employee Development System (EDS) and maintains records in employee training files.

3.2 CST

3.2.1 Analytical Personnel

CST analytical personnel have the capability to perform some of the sample analysis required. CST analytical personnel:

- Provide guidance related to sampling containers, volumes, preservatives, and holding times.
- Analyze samples before the holding time has expired.
- Analyze samples according to the appropriate analytical methodology.

3.2.2 Sample Management Personnel

Sample Management personnel do the following:

- Package samples according to DOT regulations for transport to off-site analytical laboratories .
- Transport samples for analysis according to DOT regulations.
- Deliver samples to meet holding times.
- Notifies EM-RLW personnel if holding times are missed.
- Complete all appropriate forms, including the Chain-of-Custody record, to ensure samples can be adequately tracked.

3.2.3 CST-3

CST-3 provides sampling quality assurance. The sampling QA section does the following:

- Reviews the sampling contract and assures that samples are being analyzed according to the specified level of QA.
- Assist the EM-RLW Sampling Plan Manager in determining the root cause of nonconformances, initiating corrective actions, and verifying that corrective actions have been completed.
- Review analytical data records.

3.3 ESH

3.3.1 ESH-18

Personnel from the Water Quality and Hydrology Group (ESH-18) provide environmental compliance support for issues related to the Clean Water Act, including the following:

- Provides technical support for NPDES permitted outfalls.
- Oversees the NPDES permit.
- Evaluates and reports sampling data used to determine NPDES compliance.
- Acts as the primary interface between the permitted outfall owner and regulatory agencies.

3.3.2 ESH-19

Personnel from the Hazardous and Solid Waste Group (ESH-19) provide environmental compliance support for issues related to RCRA, including the following:

- Oversees LANL's RCRA Permit.
- Evaluates and reports sampling data used to determine RCRA compliance.

3.3.3 ESH-1

Health Physics Operations Group (ESH-1) personnel provide health physics support including the following:

- Provide guidance for working with waste containing radioactive components.
- Recommend personal protective equipment (PPE) for radiological work.
- Perform radiological surveys on filled sample containers before transportation.

3.3.4 ESH-5

Industrial Hygiene and Safety Group (ESH-5) personnel provide industrial hygiene support, including recommending appropriate PPE to be worn by sampling personnel.

3.4 BUS-6

BUS-6 Packaging and Transportation Group personnel provide guidance on DOT requirements.

4.0 SAMPLES

EM-RLW operations personnel routinely collect samples from the Main Plant final effluent stream for NPDES compliance. Additionally they collect raw feed and sludge samples to ensure compliance with RCRA.

4.1 NPDES Compliance Sampling (Main Plant Final Effluent)

As required by its NPDES permit, EM-RLW personnel collect samples of Main Plant final effluent as it discharges from the effluent tanks at TA-50-2 to Mortandad Canyon, Outfall 051. Flow and pH are continuously monitored and recorded during all discharges to the canyon. The flow and pH sample is drawn from a point in the effluent line that is located between the effluent holding tank and the canyon outfall. The following sections list the samples collected for analysis. Sampling associated with facility operations is detailed in DOP-50RLWTF-08.

4.1.1 Weekly Grab Samples

Personnel collect weekly grab samples of Main Plant final effluent on a random basis and submit them for the following analysis:

- Chemical Oxygen Demand
- Total Suspended Solids
- Total Cadmium
- Total Chromium
- Total Copper
- Total Iron
- Total Lead
- Total Mercury
- Total Nickel
- Total Zinc

4.1.2 Monthly Grab Samples

Personnel collect monthly grab samples of Main Plant final effluent on a random basis and submit them for the following analysis:

- Ammonia as Nitrogen (N)
- Total Nitrogen
- Nitrate-Nitrite (as N)
- Total Toxic Organics (TTO) (VOC)
- TTO (SVOC)
- Ra-226 and -228
- TTO, Dioxin
- TTO (Pesticides)

4.1.3 Yearly Grab Samples

Personnel collect yearly grab samples of Main Plant final effluent on a random basis and submit them for the following analysis:

- Total Aluminum
- Total Arsenic
- Total Boron
- Total Selenium
- Total Vanadium
- Total Cobalt
- Tritium

4.2 RCRA

Sampling of the influent and sludge helps ensure the RLWTF meets the applicable RCRA exclusions and the plant is operating within operating limits.

Historically, EM-RLW sampling personnel have taken samples from three sampling points at the facility to ensure compliance with RCRA. These samples were raw influent, raw feed, and sludge.

Currently, samples are taken and analyzed to meet the requirements of RCRA exclusions on only the raw feed and sludge (Subsections 4.2.1 and 4.2.2). The raw feed sample is representative of all the influent treated through the plant, whereas the raw influent only represents the influent entering the Main Plant through the Radioactive Liquid Waste Collections System (RLWCS).

4.2.1 Raw Feed

Since wastewater in the influent tanks (raw feed) is representative of the waste treated through the plant, the influent tanks are considered to be the headworks of the Main Plant. In addition to the influent entering the Main Plant through the RLWCS, the raw feed includes DP-257 effluent, Pretreatment Plant effluent, and batch waste added directly to the influent tank.

The Main Plant is currently being retrofitted with an influent tank system consisting of four influent tanks. Sample points will be engineered to be representative of the raw feed. Piping configuration and valving on these tanks allows for segregation of waste in the tanks. Each tank of waste is well mixed before entering the plant for treatment and each tank is treated separately in a batch-wise mode.

Operations personnel collect grab samples of raw feed randomly on a weekly basis on a day that the plant is operated. Personnel submit these samples for analysis of VOC, SVOC, and TCLP metals and record this event in the Plant Daily Log. This sample is used for verification that the influent in the headworks of the plant meets the applicable RCRA exclusions, and that the influent is not a RCRA characteristic waste. Details on raw feed and raw feed sample operations can be found in SOP-50RLWTF-01 and DOP-50RLWTF-08.

The Waste Profile system at LANL facilitates that the treatment plant does not receive any RCRA listed waste. Before a waste generator can discharge any waste to the RLWCS, he/she must fill out and submit a Waste Profile Form. Waste Profile Forms containing a listed RCRA waste are not accepted for treatment at the Radioactive Liquid Waste Treatment Facility. Waste acceptance criteria for the RLWTF is located in the LANL document PLAN-WASTEMGMT-002.

4.2.2 DP-257 and Main Plant Sludge

Sludge is transferred from the clariflocculator, collected in sludge holding tanks, and well-mixed before dewatering to less than 27% solids on the vacuum filter. Each time the characteristics of the sludge in a sludge holding tank changes, an operator collects three random grab samples of dewatered sludge from the vacuum filter cake while the filter is operating. The operator collects these samples each time sludge is drawn from the clariflocculator a few days after draining to ensure samples are well-mixed and as representative as possible. EM-RLW uses these samples to determine whether the sludge is a mixed waste. If an analysis indicates the sludge is a RCRA characteristic waste, then EM-RLW will manage the sludge accordingly. Details on sludge and sludge sample operations can be found in SOP-50RLWTF-01 and DOP-50RLWTF-08.

The following analysis is done on sludge samples:

- VOC
- SVOC
- zinc
- percent solids
- radiological constituents
- antimony
- TCLP metals
- nickel
- thallium

4.3 Representative Samples

A single sample may be representative of a homogeneous material because it has a uniform composition throughout the matrix; however, heterogeneous materials vary in composition throughout the matrix. Sampling accuracy is typically achieved by random sampling. Sampling precision is usually achieved by taking an appropriate number of samples from the source.

Representative samples must be obtained to ensure high confidence in analytical data. To ensure samples are representative of the entire waste volume, a sufficient number of samples must be collected. The required number of samples is based on the type of statistical information required and the type of material collected. This plan does not describe representative sampling strategies in detail. The Sampling Plan Manager consults with applicable ESH personnel and CST analytical personnel to determine the appropriate number of samples required to obtain a representative sample and follows their guidance.

4.4 Quality Assurance Samples

QA/QC ensures precision and accuracy, which are essential components of sampling operations. QA principles, practices, and procedures described in this section ensure analytical data is scientifically valid and regulatorily compliant.

4.4.1 Trip Blanks

Trip blanks are not relevant to normal operations at EM-RLW; they are taken on an as needed basis. Trip blanks provide data on contamination acquired during the handling and transporting of samples. Sampling personnel prepare trip blanks in the CST analytical laboratory. Trip blanks are laboratory-grade distilled or deionized water or some other analyte-free media specified by CST analytical personnel placed in containers of the same lot and type as those in which the waste samples will be placed. Personnel label the container with an identification number similar to routine samples, carry the blank throughout the entire sampling process, record the sample on the Chain-of-Custody Record, and transfer the sample to CST personnel in the same manner as routine samples. Personnel also record the event on the Plant Daily Log. Personnel prepare and submit trip blanks for analysis of VOCs, SVOCs, and TCLP metals.

4.4.2 Sampling Blanks

Sampling blanks provide data on potential container, preservative, or media contamination. With the exception of preparing the blank with laboratory-grade distilled or deionized water or analyte-free media specified by CST analytical personnel, sampling personnel handle this blank as a routine sample, adding preservative, if applicable, and labeling the container with a unique identification label similar to routine samples. Personnel record the sample on the Chain-of-Custody Record and record the event in the Plant Daily Log. Personnel prepare and submit field blanks for the analysis of VOCs, SVOCs, and TCLP metals in the raw feed routinely five times a year to validate data obtained for this stream.

4.4.3 Duplicate Samples

Duplicate samples verify the reproducibility of analytical data. Sampling personnel collect duplicate samples at the same time from the same sampling apparatus and preserve and handle duplicates samples identically. This sample is divided into identical containers prepared in the same way and filled to the same volume. CST analytical personnel analyze these samples using the same procedure and instrument. Sampling personnel label duplicate samples with a sequential number similar to other waste samples, record the samples on the Chain-of-Custody, and record the event on the Plant Daily Log. Sampling personnel routinely collect duplicates on the raw feed five times a year to validate data on VOCs, SVOCs, and TCLP metals in this stream.

4.4.4 Replicate Samples

When the analytical laboratory wants to validate data obtained from different analytical methods or analytical laboratories, sampling personnel may collect a replicate sample. Replicate samples are collected from the same source at the same time, and are contained, preserved, and transported in the same manner. Personnel collect two equal volumes of sample in two identical containers. The samples are analyzed by different accepted analytical techniques or by separate laboratories that participate in the EPA Contract Laboratory Program (CLP). Because obtaining accurate replicate samples from heterogeneous or multi-layered samples is often very difficult, sampling personnel must collect these samples with great care to ensure that each portion has the same composition. Sampling personnel record this sample on the Chain-of-Custody Record and on the Plant Daily Log.

4.5 Radiological Screening Samples

Personnel collect a representative sample for radiological screening of any sample stream before the sample is analyzed for nonradioactive components or transported for analysis.

4.6 Analytical Methods

Wastewater samples are analyzed according to the methods in 40 CFR 136 for samples related to NPDES samples. Alternate NPDES analytical methods can be used, but EPAs approval is needed prior to implementation. For samples related to RCRA, wastewater samples are analyzed according to the methods in EPA SW 846. Sludge samples are also analyzed according to EPA SW 846.

5.0 SAMPLE HANDLING AND MANAGEMENT

Personnel carefully collect, handle, and track sampling throughout sample collection, transport, and analysis. Careful sample management ensures samples can be tracked from collection, through analysis and interpretation of analytical results thus enabling EM-RLW and ESH personnel to recreate a sampling event.

General procedures to ensure quality of data are provided in this section. By following the guidelines in this section and detailed instructions in DOP-50RLWTF-08 and SOP-50RLWTF-01, sampling personnel ensure samples are representative, thus providing scientifically valid and regulatorily compliant analytical data. Details in DOP-50RLWTF-08 include required PPE, sample container types and sizes, volume and type of preservatives.

5.1 Decontamination

Sampling personnel minimize contamination of the collected samples by using sampling containers originally purchased in taped uncontaminated packages. These sample containers are quality-assured EPA standard sample containers that are bought through LANL. To avoid contaminating clean equipment or cross-contaminating samples, sampling personnel use new gloves each time they collect a batch of samples.

Because of radiological concerns, EM-RLW does not decontaminate the composite sampler after each sampling. However, if equipment is not decontaminated this would skew data to a worst-case scenario. If applicable, sampling personnel contact ESH-1 for assistance in radioactive decontamination.

After each sampling event, CST personnel wash the glass composite sample collection bottles in a dishwasher using laboratory-grade detergent and rinsing in distilled water. These cleaned sample containers are maintained in the analytical laboratory.

5.2 Holding Times

The holding time is the maximum time the sample can be held before analysis and begins the date and time the sample is collected. Holding times are specified in 40 CFR 136 for samples related to NPDES, and SW 846 for samples related to RCRA. If sample holding times exceed those specified in 40 CFR 136 and SW 846, the analytical data may be considered invalid. By notifying Sample Management when sampling occurs and/or transferring the sample to the appropriate analytical laboratory immediately after sampling, sampling personnel ensure established sample holding times are not exceeded. To ensure sample holding times are capable of being determined, sampling personnel complete the Chain-of-Custody Record when collecting and relinquishing the samples.

5.3 Sample Preservation and Reagents

The sample must retain the properties of the original waste from the time of sampling to analysis. Except in circumstances where preservation might cause safety problems, personnel preserve samples to ensure samples retain the properties of the original waste. Personnel use the proper volume of recommended preservatives as appropriate following CST guidance and specified in SW-846 or 40 CFR 136. SW-846 specifies preservatives for RCRA samples, and 40 CFR 136 specifies preservatives for NPDES samples. When recommended by CST personnel, sampling personnel will add preservatives to the sample container before collecting the sample. If preservatives are used, special care is taken not to overfill the container, as preservative may be lost or diluted.

Degradation or alteration of the sample through exposure to air, excessive heat or cold, microorganisms, or contaminants from the container must be avoided. Volatilization, loss of acidic gases, and biodegradation can be reduced by storing and transporting the samples at a reduced temperature, approximately 4°C. Samples are stored in a refrigerator at approximately 4°C.

To avoid freezing aqueous samples, personnel never store samples outside. If frozen, the sample could fracture, resulting in separation of slightly immiscible phases and the release of volatile compounds. Sample fracture can also result in the precipitation of some salts that might not redissolve, resulting in inaccurate analytical results. Further, glass containers may break at freezing temperatures thereby creating a physical hazard.

CST analytical personnel at TA-50-1 ensure preservatives and reagents used for collecting samples are of adequate purity. They also ensure that expiration dates, if any, of preservatives and reagents are not exceeded. Preservatives and sampling equipment, such as pipettes and droppers used for adding sample preservatives are maintained and stored in analytical laboratories. Sample packaging is stored at TA-50-1 in the Main Plant operations area.

5.4 Nonconformances

Sampling personnel are responsible for continual self-assessment to ensure compliance with this plan. EM-RLW sampling plan manager periodically assesses the quality of the sampling process, and sampling events to ensure sampling personnel follow the QA principles and established sample collection procedures.

CST-3, sampling QA section, assesses the analytical process to ensure the required level of QA/QC is being met.

EPA requires LANL to analyze a Discharge Monitoring Report/Quality Assurance (DMR/QA) sample once per year. This sample assures that the analytical methods used are producing accurate data. EPA provides the sample, and EPA knows the composition. LANL analyzes the sample and reports the analysis to EPA. EPA compares LANLs analysis to the known composition and then rates LANLs analytical performance.

If a nonconformance results in a DOE 232.1 occurrence, the EM-RLW Records Manager maintains this documentation in the occurrence files. Otherwise, documentation is retained with sampling records in the Main Plant.

The NPDES permit requires LANL to continue sampling if samples are found out of compliance with NPDES permit limits. Upon receipt of analytical results, any effluent limited parameter found to be out of compliance shall be re-sampled for that noncompliant parameter within 7 days. This will continue until sample results are returned to compliant status.

5.5 Calibration and Maintenance

EM-RLW calibration personnel and CST analytical personnel calibrate the instruments related to sampling and analysis according to the manufacturer's specifications. Personnel use the pH meter and electrode with care to avoid equipment damage, decontaminate the pH electrode between samples, ensure periodic maintenance is performed according to the manufacturer's specifications or permit requirements, and document calibration and maintenance. EM-RLW calibration personnel routinely calibrate instrumentation used for continuous monitoring of effluent. EM-RLW calibration personnel perform calibrations according to LANL calibration standards and AP-RLWTF-24, "Calibration Plan."

5.6 Discrepancy and Corrective Action Reports

If EM-RLW personnel note significant deficiencies or discrepancies while collecting samples or reviewing the analytical results, they write a report describing the deficiencies or discrepancies and the action required for correction. The report describes how the deficiency or discrepancy was identified, who is responsible for creating and correcting the discrepancy, and contains a recommended schedule for and type of corrective action necessary to ensure that the waste stream is properly characterized. EM-RLW personnel forward a copy of the report to ESH-18 or ESH-19, whichever is appropriate, file the discrepancy and corrective action report with plant records and track implementation of corrective action.

5.7 Sample Labels

Sampling personnel prepare a unique EM-RLW alphanumeric sample label for each sample, and label each sample container at the time of sample collection. Sample labels are necessary to prevent sample misidentification and are used to track samples from collection to analysis and to correlate the analytical results to the original waste stream. This EM-RLW sample number is cross-referenced with the CST Sample Management sample identification number on the Chain-of-Custody Record form. Chain-of-Custody Record form protocol is described in detail in DOP-50RLWTF-08.

5.8 Sample Containers

Sample container size and types vary according to the matrix and nature of the sample to be collected. Wide-mouth containers are generally used for sludge; narrow-mouth containers are used for liquid samples. Sampling personnel consult with the appropriate analytical personnel to determine the number and type of containers required for the sampling effort. Types of sample containers required can also be found in 40 CFR 136. Sampling personnel determine the number of each type of container required by including duplicates and blanks with the number of collection samples. Except when sampling for analysis of VOC, personnel leave an air space equivalent to approximately 1% of the container volume to allow for thermal expansion during shipment. Container types and sizes for each sample type are listed in DOP-50RLWTF-08.

5.9 Sample Volume

Sampling personnel collect a sufficient volume of sample to ensure that all the required analyses can be performed and to provide for any quality control needs, split samples, or repeat laboratory procedures. The required volumes are listed in DOP-50RLWTF-08. Sampling personnel consult CST analytical personnel to ensure adequate sample volumes are collected to ensure enough volume for reanalysis of a sample if necessary.

5.10 Post-Operation Activities

Sampling personnel verify all sample bottles have been correctly labeled and crosscheck label information for filled sample bottles against information recorded on the Chain-of-Custody Record. Sampling personnel confirm PPE has been disposed of in an approved waste disposal container. Further, sampling personnel maintain custody of filled sample bottles by keeping them in their possession, within view, locked or sealed to prevent tampering, or bring them into an area under lock and key with controlled access. Finally, sampling personnel prepare samples for transport to CST analytical facilities in compliance with applicable DOT regulations.

5.11 Data Review

The Operations Supervisor reviews the raw influent data on a weekly basis to ensure applicable requirements are met. Because of the timeframe required to obtain the analytical data from the laboratories and the need to maintain continuous plant operations, this data cannot be reviewed before the waste is treated through the Main Plant. If a potential noncompliance situation arises, the Operations Supervisor informs ESH-19. ESH-19 personnel also perform periodic reviews of this data to verify that the influent meets the exclusion.

ESH-18 and the Operations Supervisor also review plant effluent data to ensure compliance with the NPDES permit. Effluent data is submitted to ESH-18 so it can be included in monthly Discharge Monitoring Reports (DMRs). DMRs are submitted to EPA and NMED as required by the permit.

Sampling personnel collect ample sample volumes so that the sample may be reanalyzed should a potential noncompliance situation arise.

6.0 TRAINING

To ensure the safety of operations, sampling personnel attend appropriate LANL training courses, as specified in the EM-RLW training matrix, and on-the-job training (OJT) for the type of sampling. OJT also ensures that personnel know the sampling methods and preservation, sample containers, PPE, and strategies that allow for accurate and precise results. OJT includes training on applicable DOPs, the SOP, and this plan.

7.0 RECORDS

Sampling personnel complete and maintain records documenting the sampling and analysis of waste streams to assure quality. Copies of the forms and logs used to document samples and analysis can be found in DOP-50RLWTF-08, Attachments 1 – 6. These records ensure that this plan is properly implemented and that analytical results can be traced back to the waste that was sampled. Personnel retain these records in the Plant Operations Room at TA-50-1. Records pertinent to the waste sampling program, including laboratory records generated by the activities performed, are listed below.

- Request for Analysis Log Sheet/Chain-of-Custody Record
- Analytical reports
- Nonconformance and corrective action reports
- Sampling equipment maintenance and calibration forms

Written requests and approvals for any temporary modifications to sample collection procedures or to shipping papers for samples and reagents are maintained by CST analytical personnel housed at TA-50-1.

Sampling personnel make entries on records with indelible, blue or black ink in a legible, consistent, direct, and succinct manner. Personnel ensure that the records are identifiable, retrievable, and protected against damage, deterioration, and loss. Personnel make changes to records by drawing a single line through the original information so it remains legible, writing the correct information next to the original information, and initialing and dating the change.

7.1 Chain-of-Custody Record

The Chain-of-Custody Record accompanies the sample from the time the sample is collected through the sample transfer and analysis process. Sampling personnel complete the appropriate Chain-of-Custody Record to ensure that they can account for the sample at all times until the sample is relinquished to CST analytical or sample management personnel.

Each time a sample is transferred from the custody of one person to another, the person relinquishing and accepting the sample must complete the required information on the Chain-of-Custody Record. NPDES samples require an NPDES Sample Chain-of-Custody Record. Influent and sludge samples require the EM-RLW Chain-of-Custody Record. This record allows the sample to be tracked throughout the analytical process, assuring control over tracking of the sample and its corresponding analytical results.

More than one sample may be included on one Chain-of-Custody Record. EM-RLW personnel maintain a copy of the signed Chain-of-Custody Record at TA-50-1.

At a minimum, the Chain-of-Custody Record includes the following information:

- Names of the sampling personnel
- date and time of sample collection
- Date and time of the sample shipment/transfer
- Sampling site (station) location
- Unique EM-RLW sample number for each sample being transferred
- Number of containers
- Type of analyses to be performed
- CST Sample Management sample label number
- Signature of person relinquishing the sample(s)
- Date and time the sample(s) is relinquished
- Signature of the person receiving the sample(s)
- Signatures of all persons involved in the chain of possession

Additional information, for example sample description, quantity, and preservation, may also be added to the Chain-of-Custody Record as necessary.

7.2 Shipping Papers

Historical data verifies that influent and final effluent samples qualify as a DOT "limited quantity" of radioactive materials. DOP-50RLWTF-14 contains instructions for packaging and transportation of samples and required documentation in accordance with DOT regulations in 49 CFR Part 173 Subpart I, Radioactive Materials. The Main Plant Operator maintains records of shipping papers associated with Main Plant samples in the plant operations areas.

7.3 Analytical Results Reports

CST analytical personnel generate a report of the analytical results for each sample submitted by the sampling personnel. The following information is included in each report:

- Unique sample number (provided by CST person to whom the sample was transferred)
- Unique sample number assigned by the analytical laboratory
- Date the sample was received by CST analytical personnel
- Date and time of analysis
- Name of the analyst (or initials)
- Analyses requested
- Analytical results for each requested analysis
- Analytical methods used for each analysis
- Data from QC samples (e.g., replicates, matrix spikes, and surrogates) introduced by the analytical laboratory into the sample analysis stream

Additional information, such as problems encountered during analysis that may affect validity of data, is also recorded with the analytical results.

CST submits the analytical reports to the sampling personnel, who compare the reports to Chain-of-Custody Record numbers to identify cross contamination, blank contamination, or other discrepancies. Chain-of-Custody Record numbers are cross-referenced to the analytical transfer number and the analytical transfer number is then correlated with the RLWTF sample number.

7.4 Retention of Records

7.4.1 NPDES

The NPDES permit requires that EM-RLW retains records of monitoring information for a period of at least three years from the date of the sample, measurement, or report. This period may be extended by the request of the State.

These records include the following:

- Calibration and maintenance records.
- Original strip chart recordings for continuous monitoring instrumentation.
- Copies of all reports required by this permit.

7.4.2 RCRA

As a matter of policy, all data related to RCRA must be retained for the life of the facility.

8.0 DISTRIBUTION

Personnel work only from a controlled copy of this document. A controlled copy is maintained for reference with the sampling DOP, DOP-50RLWTF-08, at the operator's desk in TA-50-1-116C. Controlled copies may be obtained through the Document Control Manager located in TA-50-1-6.

9.0 REFERENCES

9.1 Working Documents

EM-RLW; DOP-50RLWTF-14, "Detailed Operating Procedure for Packaging and Transportation of Samples"; most recent revision.

EM-RLW; DOP-50RLWTF-08, "Detailed Operating Procedure for Samples Associated with TA-50-1 Main Plant Operations"; most recent revision.

EM-RLW; SOP-50RLWTF-01, "Safe Operating Procedures for RLWTF Operations"; most recent revision.

9.2 Reference Documents

EM-RLW; AP-50RLWTF-24, "Calibration Plan"; most recent revision.

EM-RLW; Group Spill Implementation Plan (GSIP); most recent revision

FMU-84; AP-FMU84-08, "FMU-84, TA-50 Site Emergency Plan"; most recent revision.

Los Alamos National Laboratory; Laboratory Implementation Requirement (LIR) 40.00.03.0 "Hazardous and Mixed Waste Requirements for Generators"; most recent revision.

Los Alamos National Laboratory; *Spill Prevention Control and Countermeasures Plan;* most recent revision.

New Mexico Environment Department; *Hazardous Waste Facility Permit.* Permit No. NM0890010515-1; issued to Los Alamos National Laboratory November 8, 1989, Santa Fe,.

U.S. Environmental Protection Agency (EPA); National Pollutant Discharge Elimination System Permit. Permit No. NM0028355, issued to the Los Alamos National Laboratory's August 1, 1994, Santa Fe.

U.S. Department of Transportation, *Code of Federal Regulation;* 49 CFR Parts 173 Subpart I, "Radioactive Materials; most recent edition.

U.S. Environmental Protection Agency, *Code of Federal Regulation*; 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutant"; most recent edition.

U.S. Environmental Protection Agency, Office of Solid Waste; *EPA* SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* Volumes I and II.; most recent edition

ATTACHMENT 1: APPLICABLE RCRA EXCLUSIONS

261.3 (a) (2) (iv) (A-G)

(iv) It is a mixture of solid waste and one or more hazardous wastes listed in Subpart D of this part and has not been excluded from paragraph (a)(2) of this section under §§260.20 and 260.22 of this chapter; however, the following mixtures of solid wastes and hazardous wastes listed in Subpart D of this part are not hazardous wastes (except by application of paragraph (a)(2) (i) or (ii) of this section) if the generator can demonstrate that the mixture consists of wastewater the discharge of which is subject to regulation under either Section 402 or 307(b) of the Clean Water Act (including wastewater at facilities which have eliminated the discharge of wastewater) and:

(A) One or more of the following solvents listed in § 261.31--carbon tetrachloride, tetrachloroethylene, trichloroethylene—*Provided*, That the maximum total weekly usage of these solvents (other than the amounts that can be demonstrated not to be discharged to wastewater) divided by the average weekly flow of wastewater into the headworks of the facility's wastewater treatment or pretreatment system does not exceed 1 part per million; or

(B) One or more of the following spent solvents listed in § 261.31--methylene chloride, 1,1,1-trichloroethane, chlorobenzene, o-dichlorobenzene, cresols, cresylic acid, nitrobenzene, toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, spent chlorofluorocarbon solvents—provided that the maximum total weekly usage of these solvents (other than the amounts that can be demonstrated not to be discharged to wastewater) divided by the average weekly flow of wastewater into the headworks of the facility's wastewater treatment or pretreatment system does not exceed 25 parts per million; or

(C) One of the following wastes listed in § 261.32 -- heat exchanger bundle cleaning sludge from the petroleum refining industry (EPA Hazardous Waste No. K050); or

(D) A discarded commercial chemical product, or chemical intermediate listed in § 261.33, arising from *de minimus* losses of these materials from manufacturing operations in which these materials are used as raw materials or are produced in the manufacturing process. For purposes of this paragraph (a)(2)(iv)(D), "*de minimus*" losses include those from normal material handling operations (e.g., spills from the unloading or transfer of materials from bins or other containers, leaks from pipes, valves or other devices used to transfer materials); minor leaks of process equipment, storage tanks or containers; leaks from well-maintained pump packings and seals; sample purgings; relief device discharges; discharges from safety showers and rinsing and cleaning of personal safety equipment; and rinsate from empty containers or from containers that are rendered empty by that rinsing; or

(E) Wastewater from laboratory operations containing toxic (T) wastes listed in Subpart D of this part, *Provided*, That the annualized average flow of laboratory wastewater does not exceed one percent of total wastewater flow into the headworks of the facility's wastewater treatment or pretreatment system, or provided the wastes, combined annualized average concentration does not exceed on part per million in the headworks of the facility's wastewater treatment or pretreatment facility. Toxics (T) wastes used in laboratories that are demonstrated not to be discharged to wastewater are not to be included in this calculation; or

(F) One or more of the following wastes listed in § 261.32—wastewaters from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste No. K157)—Provided that the maximum weekly usage of formaldehyde, methyl chloride, methylene chloride, and triethylamine (including all amounts that can not be demonstrated to be reacted in the process, destroyed through treatment, or is recovered, i.e., what is discharged or volatilized) divided by the average weekly flow of process wastewater prior to any dilutions into the headworks of the facility's wastewater treatment system does not exceed a total of 5 parts per million by weight; or

(G) Wastewaters derived from the treatment of one or more of the following wastes listed in § 261.32—organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes (EPA Hazardous Waste Code No. K156).—Provided, that the maximum concentration of formaldehyde, methyl chloride, methylene chloride, and triethylamine prior to any dilutions into the headworks of the facility's wastewater treatment system does not exceed a total of 5 milligrams per liter.

261.4
Exclusion

(a) *Materials which are not solid wastes.* The following materials are not solid wastes for the purpose of this part:

(2) Industrial wastewater discharges that are point source discharges subject to regulation under Section 402 of the Clean Water Act, as amended.

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☒ Telephone ☐ Meeting

Time 4:15

Date 4-1-98

Individuals Involved

Doug MickelJohn

P. Bustamante

Subject TA-50 DP application

Discussion called to ask what the position of his client is on the request for public hearing. Said they were going to withdraw the request. Said he will send a letter for the request.

Conclusions

Distribution

Initialed

8/89

1912

State of New Mexico
ENVIRONMENT DEPARTMEN
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

Z 128 813 021

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Bob Beers, ESH-18	
Street & Number Mail Stop K497	
Post Office, State, & ZIP Code Los Alamos National Lab Los Alamos, NM 8754	
Postage	$

CERTIFIED LETTER - RETURN RECEIPT REQUIRED

April 9, 1998

Bob Beers, ESH-18
Mail Stop K497
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

RE: Follow Up - Meeting April 1, 1998, Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility, DP-1132

Dear Mr. Beers:

Thank you for taking time to meet with representatives from the New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) to discuss issues on the discharge plan application for the Los Alamos National Laboratory (LANL), Radioactive Liquid Waste Treatment Facility (RLWTF), DP-1132. As discussed in the meeting, the GWQB must determine what radioactive constituents discharged from the RLWTF may be regulated under the Water Quality Act (WQA) and the Water Quality Control Commission (WQCC) Regulations as a water contaminant. As a preliminary review, the GWQB has evaluated the WQCC Regulation 1101.XX. definition of water contaminant and the Atomic Energy Act (AEA) definitions for byproduct material, source material and special nuclear material. Based on those definitions, certain radioactive constituents currently existing in ground water as a result of discharges from the RLWTF may fall under the WQCC definition of "water contaminant" if they are not exempted by the AEA. Specifically, we discussed in our meeting gathering additional information on the following constituents: ^{3}H, ^{90}Sr, ^{137}Cs, U, and ^{241}Am.

Thank you for your cooperation in this matter. If you have any questions, please call me at 827-0166.

NEW MEXICO
ENVIRONMENTAL LAW CENTER

RECEIVED
APR 28 1998
GROUND WATER

April 27, 1998

Phyllis Bustamante
Ground Water Bureau
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, N.M. 87502

By mail and facsimile
(505) 827-2965

Re: Proposed ground water discharge plan 1132

Dear Phyllis:

I write to confirm our telephone conversations in which I informed you that the Pueblo of San Ildefonso wishes to withdraw its request that the Environment Department conduct a public hearing on the proposed discharge plan 1132 for the Los Alamos National Laboratory radioactive liquid waste treatment facility.

Please do not hesitate to contact me if you have any questions about this.

Yours truly,

Doug

Douglas Meiklejohn
Attorney

pc: Bill Wyatt
Environmental Program Manager
Pueblo of San Ildefonso

1405 Luisa St., Suite 5 Santa Fe, N.M. 87505
(505) 989-9022 FAX (505) 989-3769

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: May 29, 1998
In Reply Refer To: ESH-18/WQ&H:98-0178
Mail Stop: K497
Telephone: (505) 667-7969

RECEIVED
JUN 01 1998
OUND WATER BURE

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: STATUS OF PHASE I AND II UPGRADES, LOS ALAMOS NATIONAL LABORATORY'S GROUND WATER DISCHARGE PLAN APPLICATION FOR THE RADIOACTIVE LIQUID WASTE TREATMENT FACILITY AT TECHNICAL AREA (TA) 50.

Dear Ms. Bustamante:

In December 1997, the Department of Energy Los Alamos Area Office (LAAO) submitted to your agency a revised schedule for completing the Phase I (tubular ultrafiltration and reverse osmosis) and Phase II (nitrate removal) upgrades at Los Alamos National Laboratory's Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. In the revised schedule, the Phase I upgrades were to be fully operational by March 1998, and the Phase II upgrades by June 1998. On April 1, 1998, I notified you (personal communication; meeting in Santa Fe) that both the Phase I and II upgrades were experiencing delays and would not meet the completion dates specified in the December 1997 revised schedule. I would like to take this opportunity to update you on the current status of the Phase I and II upgrades.

In February 1998, during pre-operational testing of the Phase I equipment, the Laboratory discovered a manufacturing defect in the tubular ultrafiltration tubes. As a result, the Laboratory was forced to remove all of the tubular ultrafiltration tubes and return them to the manufacturer for repair. Currently, the Laboratory is waiting for the manufacturer to return the repaired tubes. Once the tubes have been returned, the Laboratory will provide your agency with a new completion date for the Phase I upgrades.

In September 1997, the Laboratory contracted with a vendor to design, fabricate, and install a complete biodenitrification system for the Phase II upgrades. Recently, the vendor informed the Laboratory that due to problems internal to the company, they will supply only a portion of the complete system. This change has forced the RLWTF to re-negotiate the vendor's contract and procure the missing components from new vendors. The Laboratory will provide your agency with a new completion date for the Phase II upgrades once the RLWTF has negotiated the contracts necessary to complete the project.

Please call me at (505) 667-7969 if you desire any additional information concerning the Phase I and II upgrades to the RLWTF.

Sincerely,

Bob Beers

Bob Beers
Water Quality and Hydrology Group

RB/rj

Cy: J. Vozella, DOE/LAAO, MS A316
B. Koch, DOE/LAAO, MS A316
G. Saums, NMED/SWQB, Santa Fe, New Mexico
D. Woitte, LC/GL, MS A187
K. Hargis, EM/WM, MS J591
S. Hanson, EM/WM, MS E518
D. Moss, EM/RLW, MS E518
S. Rae, ESH-18, MS K497
N. Williams, ESH-18, MS K497
M. Saladen, ESH-18, MS K497
WQ&H File, MS K497
CIC-10, MS A150

LARGE COLOR PLOT MAP
PROPOSED REGIONAL WELLS
MAY 12, 1998

SEE ORIGINAL FILE FOR MAP

LARGE COLOR PLOT MAP
PROPOSED ALLUVIAL AND
INTERMEDIATE WELLS
MAY 12, 1998

SEE ORIGINAL FILE FOR MAP

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: June 1, 1998
In Reply Refer To: ESH-18/WQ&H:98-0171
Mail Stop: K497
Telephone: (505) 665-1859

RECEIVED
JUN 0 1 1998
GROUND WATER BUREAU

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION, GROUND WATER DISCHARGE PLAN APPLICATION FOR THE RADIOACTIVE LIQUID WASTE TREATMENT FACILITY, DP-1132

Dear Ms. Bustamante:

In your April 9, 1998, letter (copy enclosed) you requested additional information on the Laboratory's Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. Specifically, you asked for our opinion on which of the following radioactive constituents discharged from the RLWTF are subject to regulation by the New Mexico Water Quality Act: Tritium (^{3}H), Strontium-90 (^{90}Sr), Cesium-137 (^{137}Cs), Uranium (U), and Americium-241 (^{241}Am).

Since 1954, the Atomic Energy Act (42 U.S.C. 2011 et seq., as amended) has provided the Federal Government with the exclusive authority to regulate three types of nuclear materials: source, special nuclear, and byproduct materials (Please see Attachment A). Both the Clean Water Act (33 U.S.C. 1251 et seq., as amended) and the New Mexico Water Quality Act (20 NMAC 6.2) have recognized this authority by exempting source, special nuclear, and byproduct materials from their regulations. The Clean Water Act provides additional specificity by identifying two types of nuclear materials which are not regulated by the Atomic Energy Act: Radium (naturally occurring radioactive material) and accelerator-produced isotopes (40 CFR 122.2).

The U.S. Department of Energy and the Laboratory have concluded that all ^{90}Sr, ^{137}Cs, and ^{241}Am in the RLWTF effluent is byproduct material and, therefore, is regulated under the Atomic Energy Act (42 U.S.C. 2011 et seq., as amended) and is exempt from regulation by the Clean Water Act (33 U.S.C. 1251 et seq., as amended) and the New Mexico Water Quality Act (20 NMAC 6.2). Uranium (U) in the RLWTF effluent may be subject to regulation by the New Mexico Water Quality Act if it is naturally occurring in the Laboratory's source water supply. All Uranium that is not naturally occurring is source material and, therefore, is regulated under the Atomic Energy Act and is exempt from regulation by the Clean Water Act and the New Mexico Water Quality Act.

As you know, ^{3}H may occur as byproduct material (reactor-produced) or accelerator-produced material. In June 1997, the RLWTF conducted a survey of all dischargers to determine if any accelerator-produced ^{3}H was being discharged into the RLWTF collection system. The survey results confirmed that all ^{3}H in the RLWTF effluent is reactor-produced for Laboratory programs with weapon missions. Additionally, the RLWTF Waste Acceptance Criteria (WAC) prohibits the discharge of accelerator-produced ^{3}H into the RLWTF collection system. It is the Laboratory's current policy to discharge all accelerator-produced ^{3}H into the TA-53 Rad Lagoon for evaporation. To the best of my knowledge, there is no accelerator-produced ^{3}H entering the RLWTF collection system at the present time. The Laboratory is also completing plans to eliminate all reactor-produced ^{3}H from the RLWTF collection system.

Please note that other accelerator-produced isotopes are present in small amounts in the influent to the RLWTF. These isotopes originate primarily from medical tracer and environmental monitoring research.

Please contact me at 665-1859, or Bob Beers at 667-7969, if you require additional information on the Laboratory's Ground Water Discharge Plan Application for the RLWTF at TA-50.

Sincerely,

Steven Rae

Steven Rae
Group Leader
Water Quality and Hydrology Group

BB:SR/mv

Enclosures: a/s

Cy: G. Saums, NMED SWQB, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/LAAO, w/enc., MS A316
B. Koch, DOE/LAAO, w/enc., MS A316
L. Cummings, DOE/LAAO, w/enc., MS A316
T. Baca, EM Program, w/enc., MS J591
D. Erickson, ESH-DO, w/enc., MS K491
W. Hansen, ESH-DO, w/enc., MS K491
D. Woitte, LC/GL, w/enc., MS A187
K. Hargis, EM/WM, w/enc., MS J591
B. Beers, ESH-18, w/enc., MS K497
S. Hanson, EM-RLW, w/enc., MS E518
D. Moss, EM-RLW, w/enc., MS E518
N. Williams, ESH-18, w/enc., MS K497
T. Buhl, ESH-4, w/enc., MS G761
D. Armstrong, ESH-17, w/enc., MS J978
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
Secretary

CERTIFIED LETTER - RETURN RECEIPT REQUIRED

April 9, 1998

Bob Beers, ESH-18
Mail Stop K497
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

RE: Follow Up - Meeting April 1, 1998, Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility, DP-1132

Dear Mr. Beers:

Thank you for taking time to meet with representatives from the New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) to discuss issues on the discharge plan application for the Los Alamos National Laboratory (LANL), Radioactive Liquid Waste Treatment Facility (RLWTF), DP-1132. As discussed in the meeting, the GWQB must determine what radioactive constituents discharged from the RLWTF may be regulated under the Water Quality Act (WQA) and the Water Quality Control Commission (WQCC) Regulations as a water contaminant. As a preliminary review, the GWQB has evaluated the WQCC Regulation 1101.XX. definition of water contaminant and the Atomic Energy Act (AEA) definitions for byproduct material, source material and special nuclear material. Based on those definitions, certain radioactive constituents currently existing in ground water as a result of discharges from the RLWTF may fall under the WQCC definition of "water contaminant" if they are not exempted by the AEA. Specifically, we discussed in our meeting gathering additional information on the following constituents: ^{3}H, ^{90}Sr, ^{137}Cs, U, and ^{241}Am.

Thank you for your cooperation in this matter. If you have any questions, please call me at 827-0166.

Sincerely,

Phyllis Bustamante

Phyllis Bustamante
Ground Water Quality Bureau
Pollution Prevention Section

xc: James Bearzi, District Manager, NMED District II

Attachment A

Atomic Energy Act (42 U.S.C. 2011 et seq., as amended)
Since 1954 the Atomic Energy Act (AEA) has exercised regulatory authority over the production, possession, and use of three types of nuclear materials: byproduct, source, and special nuclear materials. These terms are defined in Section 2014 of the AEA (42 U.S.C. 2014), as follows:

(1) The term "byproduct material" means (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

(2) The term "source material" means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 2091 of this title to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time.

(3)) The term "special nuclear material" means (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 2071 of this title, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

Clean Water Act (33 U.S.C. 1251 et seq., as amended)
The federal Clean Water Act (CWA) regulates the discharge of pollutants, including radioactive materials, into waters of the U.S. Those radioactive materials regulated by the AEA, byproduct, source, and special nuclear materials, are exempt from CWA regulation by definition (40 CFR 122.2):

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or (b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Note: Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials. Examples of materials not covered include radium and accelerator-produced isotopes. See Train v. Colorado Public Interest Research Group, Inc., 426 U.S. 1 (1976).\

Attachment A

New Mexico Water Quality Act (Section 74-6-1 et seq. NMSA 1993)
The New Mexico Water Quality Act regulates the discharge of water contaminants to the environment, as defined in Section 1101.(XX) of the New Mexico Water Quality Control Commission Regulations (20 NMAC 6.2):

Water contaminant means any substance that could alter if discharged or spilled the physical, chemical, biological, or radiological qualities of water. *Water contaminant* does not mean source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954.

Los Alamos
NATIONAL LABORATORY

memorandum

Environment, Safety, and Health Division

To/MS: *Distribution*
From/MS: *Dennis J. Erickson, ESH-DO/K491* DJE
Tom Baca, EM-DO/J591
Phone/FAX: 7-4218/5-3811
Symbol: *ESH-DO:98-192*
Date: *July 10, 1998*

SUBJECT: RADIOACTIVE LIQUID WASTE ZERO DISCHARGE PROJECT

We would like to thank the members of the Zero Discharge Working Group for their efforts and the presentation of their recommendations on April 8, 1998. The presentation outlined regulatory compliance issues, stakeholder concerns, and institutional program issues that persist with continued release of radioactive liquid effluent from the existing TA-50 Radioactive Liquid Waste (RLW) Treatment Plant. The Working Group proposed a series of solutions for the problems, as outlined in the attached report. We agree that the Laboratory should set a goal of zero discharge of radioactive liquid effluent to the environment. To reach this ambitious goal, ESH and EM Divisions will jointly initiate the Radioactive Liquid Waste Zero Discharge Project.

The Zero Discharge Working Group suggested a phased approach to achieve the goal. This approach starts with upgraded monitoring and waste minimization at the sources, continues with adding more advanced treatment and proceeds to complete reuse or evaporation of the effluent. We concur with the Working Group that reduction of tritium concentrations below the drinking water limit of 20,000 pCi/L in the TA-50 Plant effluent should be the first step towards full implementation.

The RLW Zero Discharge Project Leaders will be Neil Williams for ESH Division and Pete Worland for EM Division. They will develop a project plan for presentation within the next month. The project plan will provide the technical approach, cost estimates, funding recommendations and schedule for implementation of the RLW Zero Discharge Project. We also would like the Zero Discharge Working Group to assist facility managers, operating groups and others with implementation of their recommendations, including tritium reduction, waste minimization and improved monitoring. They will work closely with the operating groups and facility managers that generate the radioactive liquid waste to ensure that the project plan provides for the operational needs of the generators.

This project will require active participation by the RLW generating programs and the Laboratory as a whole. We request your support for the zero discharge goal and welcome your input.

DJE:TB:SR/rj

Attachments: a/s

Distribution:

John Browne, DIR, w/att., MS A100
James Jackson, DIR, w/att., MS A100
Philip Thullen, DIR, w/att., MS A100
Warren Miller, DIR, w/att., MS A121
Thomas Garcia, DIR, w/att., MS A113
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Tom Alexander, DX-DO, w/att., MS P915
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Pete Worland, EM-RLW, w/att., MS E518
Deb Hall, EM-RLW, w/att., MS E518
Robert Harris, EM-RLW, w/att., MS E518
Dave Moss, EM-RLW, w/att., MS E518
Mort Sanders, EM-RLW, w/att., MS E518
Steve Hanson, EM-RLW, w/att., MS E518
Tony Stanford, EM-SWO, w/att., MS J595
Ken Hargis, EM-WM, w/att., MS J591
Richard Burick, ESA-DO, w/att., MS P945
Dennis Carathers, ESA-FM, w/att., MS C928
Lee McAtee, ESH-DO, w/att., MS K491
Steve Rae, ESH-18, w/att., MS K497
Mike Saladen, ESH-18, w/att., MS K497
Neil Williams, ESH-18, w/att., MS K497
William Hamilton, FE-DO, w/att., MS P913
Wally McCorkle, FE-IFMPO, w/att., MS M720
Ron Brodd, FE-7, w/att., MS M713
Dave Padilla, FE-8, w/att., MS K718
Karl Braithwaite, GR, w/att., MS A103
Roger Pynn, LANSCE-DO, w/att., MS H845
Jim Fraser, LANSE-FM, w/att., MS H814
Deb Woitte, LC-GL, w/att., MS A187
Jim Mitchell, LC-GL, w/att., MS A187
Edwin Bradbury, LS-DO, w/att., MS M888
Julie Wilson, LS-DO, w/att., MS M888
Ross Lemons, MST-DO, w/att., MS G754
Lisa Woodrow, MST-OPS, w/att., MS G752
Houston Hawkins, NIS-DO, w/att., MS F650
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Evelyn Mullen, NIS-18, w/att., MS J562
Dave Post, NMT-DO, w/att., MS G745
R. Bruce Matthews, NMT-DO, w/att., MS E500
Steve Yarbro, NMT-2, w/att., MS E511
Joel Williams, NMT-2, w/att., MS E511
Jim Balke, NMT-7, w/att., MS E501
Peter Barnes, P-DO, w/att., MS D434
Don Rej, P-DO, w/att., MS D434
Larry Rowton, P-FM, w/att., MS D459
Marty Strones, PTLA/EXT, w/att., MS G724
Michael Henderson, TSA-DO, w/att., MS F606
Stew Voit, TSA-7, w/att., MS F609
Terry Helm, TSA-7, w/att., MS F609
WQ&H File, (ESH-18/WQ&H:98-0210) w/att., MS K4

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Post Office, State, & ZIP Code	Los Alamos National Laboratory Los Alamos, New Mexico 87545
Postage	$

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

PETER MAGGIORE
Secretary

CERTIFIED LETTER - RETURN RECEIPT REQUIRED

August 6, 1998

Bob Beers, ESH-18
Mail Stop K497
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

RE: Effluent Quality and Ground Water Monitoring Data, Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility, DP-1132

Dear Mr. Beers:

The New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) is in the process of reviewing the discharge plan application for the Radioactive Liquid Waste Treatment Facility (RLWTF) at the Los Alamos National Laboratory (LANL). For review of the permit application, the NMED is requesting all effluent quality data and ground water monitor well data for 1997 and 1998. Data should include radiochemistry, general chemistry, metals, and organics. Please submit this information by August 26, 1998.

Thank you for your cooperation. If you have any questions, please call me at 827-0166.

Sincerely,

Phyllis Bustamante

Phyllis Bustamante
Ground Water Quality Bureau
Pollution Prevention Section

xc: James Bearzi, District Manager, NMED District II

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☒ Telephone	☐ Meeting	*Time* 10:55	*Date* Aug. 6, 98

Individuals Involved

Bob Beers

P. Bustamante

Subject TA-50 outfall -

Discussion Asked Bob if they had any new information on the biological Treatment. He said not yet. He said there is going to be a meeting Monday for DOE to be updated on moving to zero discharge.

Told Bob that this is taking too much time and that this is becoming a discharge that does not comply with regulations - still don't have an operational plan. Told him we would be sending a letter.

Conclusions

Distribution

Initialed

8/89

Fultam. Docs 030714/caseloads/LANL/DP1132 TA 50 RLWTF/Elimination of Liquid discharge to the environment

LA-13452-MS

UC-902
Issued: June 1998

Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility

David Moss
Neil Wlliams
Deb Hall
Ken Hargis
Mike Saladen
Mort Sanders
Stewart Voit
Pete Worland
Steve Yarbro

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Los Alamos
NATIONAL LABORATORY
Los Alamos, New Mexico 87545

DISCLAIMER

EXECUTIVE SUMMARY

Determining viable options for eliminating the discharge of treated radioactive liquid waste to Mortandad Canyon was the directive of the outfall 051 elimination working group. It may no longer be in the best interests of Los Alamos National Laboratory (LANL) to continue using this outfall. Incentives for eliminating outfall 051, regulatory and technical issues involved, and recommended steps to accomplish this goal are presented in this report.

Treatment processes used at the Radioactive Liquid Waste Treatment Facility (RLWTF) at Technical Area -50 (TA-50) presently remove radioactive and other contaminants from 18–20 million L of radioactive wastewater per year. The liquid effluent is discharged to Effluent Canyon where it flows a short distance before entering Mortandad Canyon. Over 1.3 billion L have been treated and discharged since the RLWTF was commissioned in 1963.

The existing facility currently uses a precipitation and filtering process for removal of radioactive materials. Radioactive nuclides discharged in waters are regulated by Department of Energy (DOE) Order 5400.5. The existing precipitation technique does not produce water of a quality that can meet this Order. The Phase I upgrade being installed at the RLWTF addresses this problem by using tubular ultrafiltration (TUF) and reverse osmosis (RO) units instead of precipitation. A permeate (product) and a reject (concentrate) stream are produced from the TUF and RO. The permeate stream will meet DOE 5400.5 requirements. Additionally, the New Mexico Environment Department (NMED) has required that LANL discharges to Mortandad Canyon meet all State of New Mexico ground water standards. The effluent from the TA-50 plant does not consistently meet state ground water standards for nitrate, fluoride, and total dissolved solids. The Phase II upgrade addresses the nitrates with a biosystem that will convert the entrained nitrates in the water to nitrogen gas. The Phase I upgrade will take care of the fluoride and total dissolved solids concerns.

Treatment parameters for the Phase I and II upgrades, which were presented in the 95% Conceptual Design Report (CDR), are used in this study. The treatment parameters gained from the optimized Phase I and II upgrades, along with the additional recommendations by this working group, should be used in the design of the new radioactive liquid waste treatment facility. Some recommendations made in this report are not included in the CDR and need DOE approvals. Successful implementation of the Phase I and Phase II upgrades at the RLWTF, and the future construction of a new radioactive liquid waste treatment facility designed to meet the needs of LANL for the next 30 years are fundamental to the recommendations proposed in this report.

Options considered by the working group for eliminating liquid discharge to outfall 051 are:

1. redirect the treated liquid flow to another discharge point,
2. further treatment and reuse/recycle of the RLWTF effluent, and
3. further treatment and subsequent evaporation of RLWTF effluent.

Evaluation criteria for each option included environmental protection, regulatory compliance, public perception, institutional requirements, corporate excellence and sustainability, technical feasibility, and economic feasibility.

The working group recommends a combination of options two and three that will begin a phased transition toward zero liquid discharge to Mortandad Canyon. Each phase of effort will result in improvements to environmental water quality and will increase stakeholders' confidence in the Laboratory's commitment to environmental stewardship. Zero liquid discharge to Mortandad Canyon will help alleviate public concern regarding the transport of contaminants into and from Mortandad Canyon. Three design and construction phases over the next five years are recommended to maintain the course toward zero liquid discharge.

Phase III deals with the reduction of tritiated wastewaters from the RLWTF influent to less than 20 000 pCi/L, which is the drinking water standard. The segregation and evaporation of Tritium Systems Test Assembly (TSTA) tritiated wastewater would be a step toward reducing tritium to that level. It would also allow decommissioning the cross-country transfer pipeline from TA-21-257 to TA-50-2. Also included in Phase III is the identification and minimization of other radioactive and hazardous constituents and the reduction of flow volumes into the RLWTF. Improved administration and monitoring of waste acceptance criteria (WAC) influent limits are proposed. During this phase, after biodenitrification and ferric hydroxide precipitation treatment, the RO concentrate waste stream will be commingled with the RO permeate and discharged at outfall 051.

Phase IV includes further treatment of the RO concentrate to separate solid and liquid phases. The solids will be removed and packaged for disposal at TA-54. The treated RO concentrate will be mixed with the RO permeate and the combined volume discharged at outfall 051. This additional treatment will further improve effluent quality and prepare the way for industrial reuse of effluent.

Phase V includes the design and construction of an evaporative process(es) that will result in zero liquid discharge to the environment. Productive reuse of the purified water stream to the extent practical is recommended. Evaporative processes were also studied to eliminate the discharge of liquid to Mortandad Canyon and conceptual level recommendations are presented to accomplish this goal.

The working group studied the alternative of discharging treated radioactive liquid waste to the Sanitary Wastewater Systems Consolidation (SWSC) plant as a means of obtaining zero discharge from the RLWTF outfall into Mortandad Canyon. Assuming all regulatory approvals could be obtained, the working group concluded that it would be unwise to mix treated radioactive liquid waste and sanitary wastewater at LANL. This conclusion was reached because of potential contamination of other canyons and facilities, regulatory issues, and public perception concerns.

In summary, the working group advises the Laboratory to set a course toward zero liquid discharge of treated radioactive liquid waste. In pursuit of this goal, the following action steps are advised:

1. complete and optimize the Phase I and Phase II upgrades at the present RLWTF,
2. design, fund, and construct a modern treatment facility with capability to treat LANL's radioactive liquid waste for the next 30 years,
3. initiate Phase III upgrade to segregate tritiated wastes from the RLWTF influent and to identify and minimize radioactive and hazardous wastes and flow volumes to the RLWTF as feasible,
4. undertake Phase IV upgrade to remove dissolved solids from the RO concentrate stream, and
5. begin Phase V upgrade to design and construct an evaporative process that will reuse or evaporate treated radioactive liquid waste and result in zero liquid discharge to the environment.

Table of Contents

ELIMINATION OF LIQUID DISCHARGE TO THE ENVIRONMENT FROM THE TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

by

David Moss, Neil Williams, Deb Hall, Ken Hargis, Mike Saladen, Mort Sanders,
Stewart Voit, Pete Worland, and Steve Yarbro

ABSTRACT

Alternatives were evaluated for management of treated radioactive liquid waste from the radioactive liquid waste treatment facility (RLWTF) at Los Alamos National Laboratory. The alternatives included continued discharge into Mortandad Canyon, diversion to the sanitary wastewater treatment facility and discharge of its effluent to Sandia Canyon or Cañada del Buey, and zero liquid discharge. Implementation of a zero liquid discharge system is recommended in addition to two phases of upgrades currently under way. Three additional phases of upgrades to the present radioactive liquid waste system are proposed to accomplish zero liquid discharge. The first phase involves minimization of liquid waste generation, along with improved characterization and monitoring of the remaining liquid waste. The second phase removes dissolved salts from the reverse osmosis concentrate stream to yield a higher effluent quality. In the final phase, the high-quality effluent is reused for industrial purposes within the Laboratory or evaporated. Completion of these three phases will result in zero discharge of treated radioactive liquid wastewater from the RLWTF.

INTRODUCTION

Problem Statement

Defining viable steps for eliminating the discharge of treated radioactive liquid waste into Mortandad Canyon at Los Alamos National Laboratory (LANL) is the ultimate goal of the outfall 051 elimination working group's recommendations. The working group was established in October 1997, by the group leaders of Environmental Management/Radioactive Liquid Waste (EM-RLW) and Water Quality and Hydrology (ESH-18).

The liquid effluent from the Radioactive Liquid Waste Treatment Facility (RLWTF) contains constituents that are regulated by federal and state laws, US Department of Energy

(DOE) orders, and Pueblo standards. To meet these increasingly more stringent discharge requirements, LANL is presently installing new processes at the Technical Area 50 (TA-50) RLWTF.

This report defines a path that leads to zero liquid discharge of treated radioactive liquid waste to outfall 051. These recommendations encompass a broad spectrum of radioactive liquid waste management efforts involving waste characterization, liquid waste volume reduction, source minimization of regulated constituents, reuse and recycle, evaporation technologies, and the placement of constituents in their most environmentally benign state.

Evaluation Criteria

Evaluation of various alternatives studied to eliminate the RLWTF discharge was based on the following criteria:

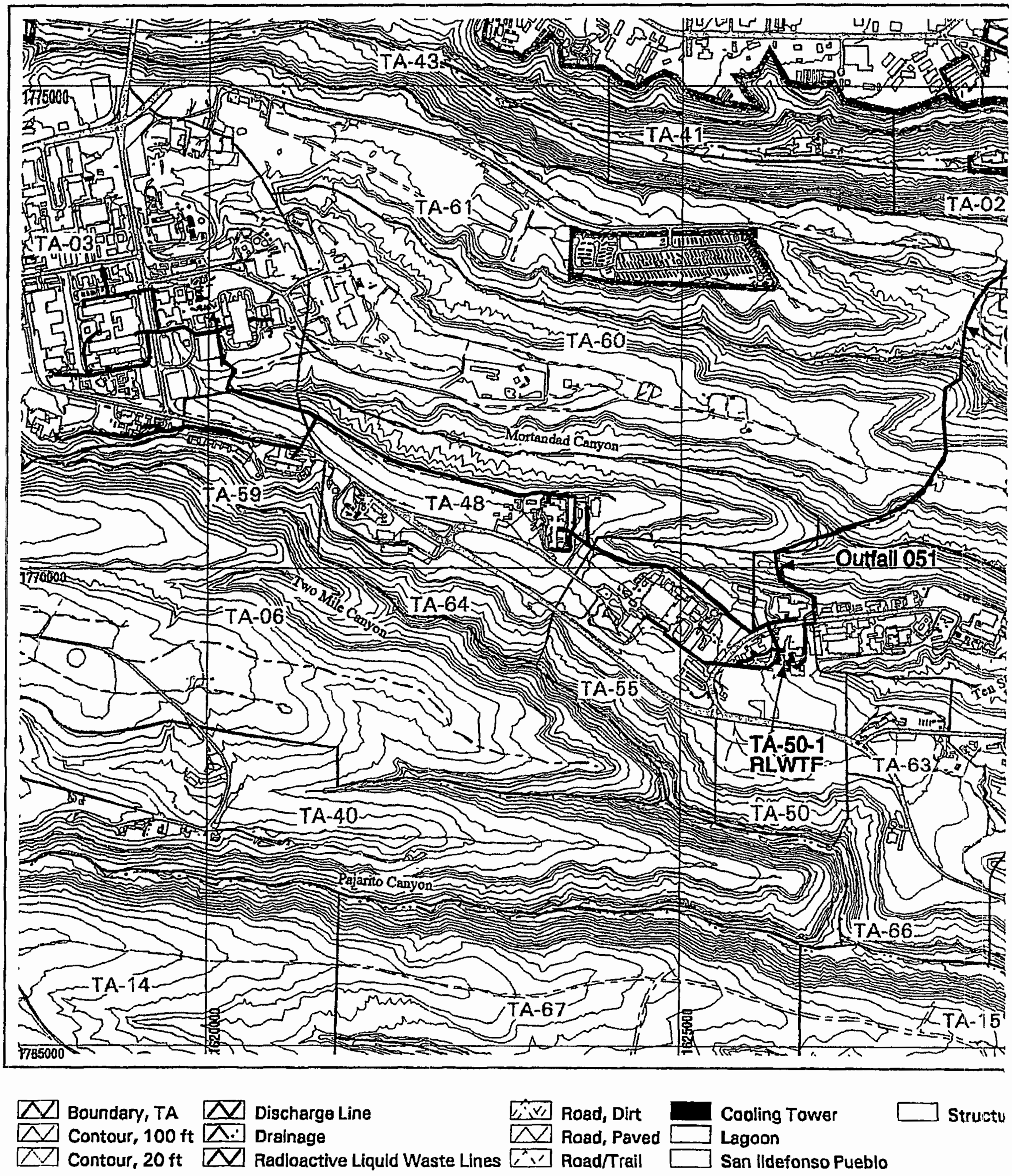
1. ability to provide for long-term protection of the environment,
2. ability to meet regulatory compliance requirements and prevent future legal liability,
3. ability to satisfy public concerns and perceptions,
4. ability to meet institutional requirements with minimal impact,
5. ability to support goals of corporate excellence and sustainability,
6. technical feasibility, and
7. economic feasibility.

ENVIRONMENTAL AND REGULATORY ISSUES

Hydrologic Setting of Mortandad Canyon

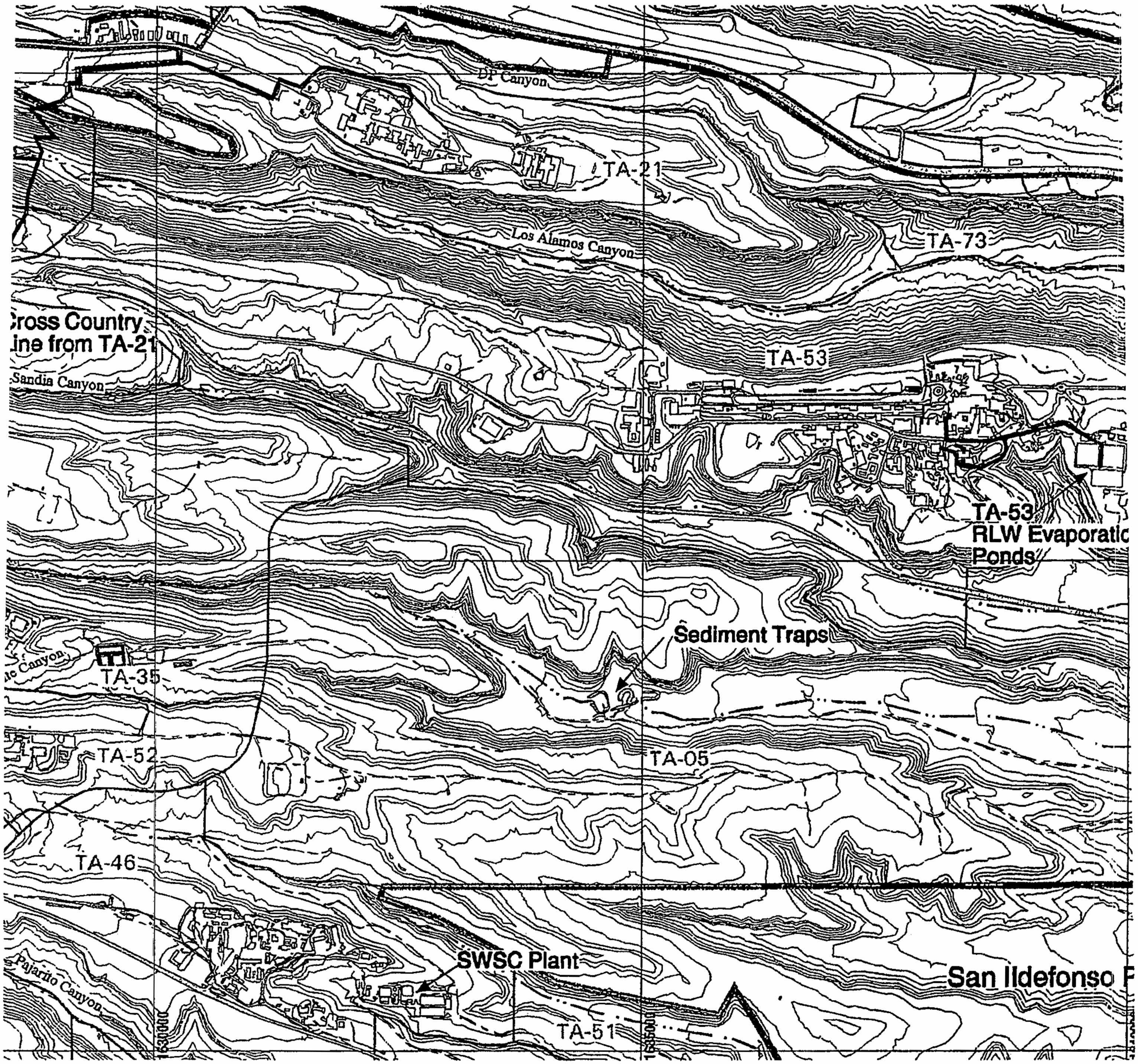
Mortandad Canyon is an east to southeast-trending canyon that heads on the western part of the Pajarito Plateau and is tributary to the Rio Grande to the east. The canyon contains a shallow body of ground water recharged by industrial effluent from the RLWTF, other smaller effluent flows, and storm water runoff (see Map 1). The spatial extent of this saturation is within the Laboratory boundaries, extending from near the RLWTF outfall on the west to approximately one mile above the boundary between the Laboratory and San Ildefonso Pueblo.

The greatest potential for the surface transport of contaminants from the RLWTF is with storm runoff, either in solution or adsorbed on sediments. Because of Mortandad Canyon's small drainage area, the presence of sediment traps constructed by the Laboratory, and the large volume of unsaturated alluvium, there has been no record of surface runoff off Laboratory property since hydrologic observations began in 1960.



MAP 1

Radioactive Liquid Waste Collection System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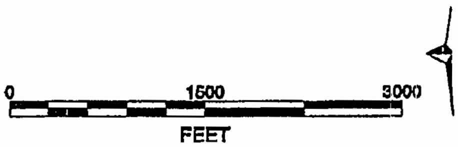
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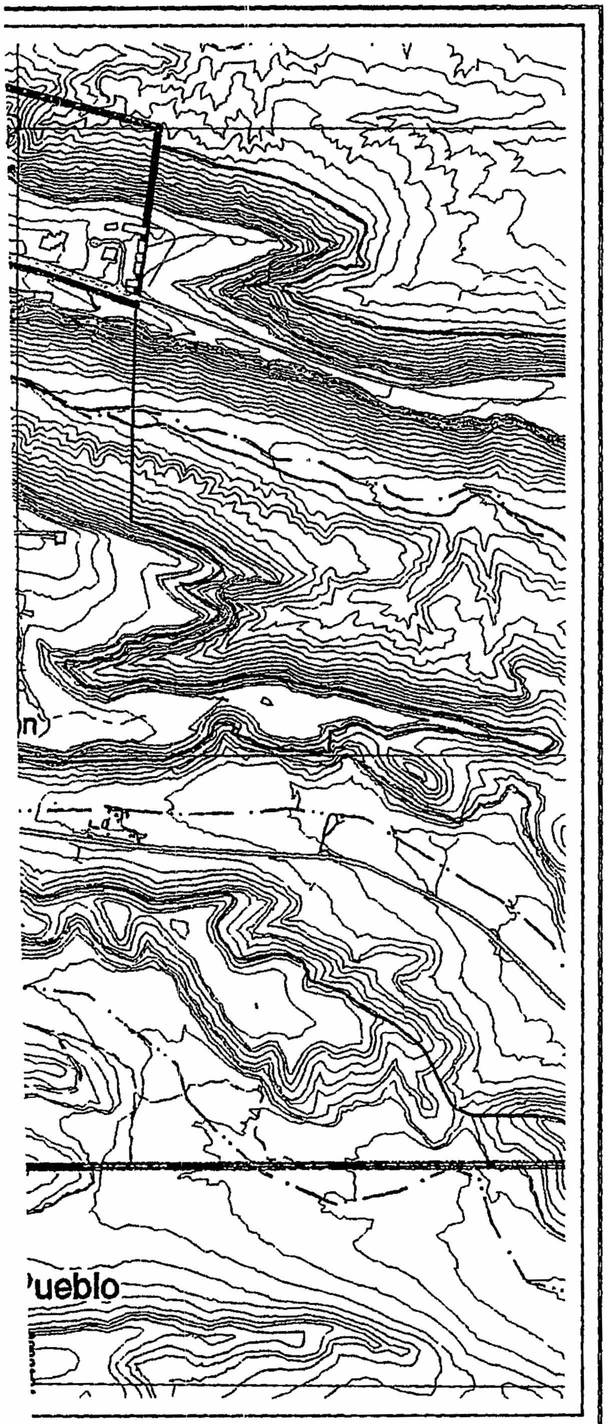

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EARTH & ENVIRONMENTAL SCIENCES DIVISION (EES-5)

l by 'Marcia Jones' Date: June 02, 1998

Recharge by industrial effluents, principally from the RLWTF, occurs in the upper canyon. Storm runoff recharge is roughly equal to the effluent input volume on an annual basis. The volume of recharge since 1960 has not been sufficient to significantly change the volume of the shallow ground water.

Discharge Quality

Since the existing RLWTF treatment process was designed in the early 1960s for radionuclide removal, the facility's current effluent quality does not routinely meet all of the New Mexico Water Quality Control Commission (NMWQCC) ground water standards adopted in 1977. National Pollutant Discharge Elimination System (NPDES) compliance and RLWTF operational data show that the RLWTF treated effluent has consistently exceeded NMWQCC ground water standards for fluoride and nitrate, and occasionally exceeded the standards for cyanide, total dissolved solids (TDS), and pH.

DOE Order 5400.5 regulates the discharge of radioactive constituents from outfall 051 into Mortandad Canyon. Six radionuclides exceeded their respective derived concentration guideline (DCG) values in the RLWTF effluent during calendar years 1990 through 1996: ^{90}Sr, ^{137}Cs, ^{238}Pu, ^{239}Pu, ^{240}Pu, and ^{241}Am. The nuclides ^{90}Sr and ^{137}Cs exceeded their DCG values only in 1991. DCG values for ^{238}Pu were exceeded in 1994 through 1996. Plutonium-239 and ^{240}Pu exceeded their DCG levels in 1991 and 1995. DCG levels for ^{241}Am were exceeded each year from 1990 through 1996.

Groundwater Quality

Routine environmental monitoring has been conducted in Mortandad Canyon since 1960. The routine monitoring program includes regular collection and analysis of surface water, sediments, shallow alluvial, and main aquifer ground water samples from the canyon. The Environmental Surveillance Report at Los Alamos (1996) contains data on samples collected in Mortandad Canyon.

As RLWTF effluents are released into the canyon and move downgradient, radionuclides (except tritium) and some inorganic chemicals are adsorbed or bound to the bed sediments, reducing the amount of radionuclides or chemicals in the water or effluents. A high buildup of radionuclides or chemicals does not occur in the alluvium at the effluent outfall because periodic storm runoff transports sediments and contaminants down the channel in the canyon. Adsorption of contaminants reduces the concentrations in the perched ground water.

Nonradioactive Contaminants

RLWTF effluent quality has a significant influence on the quality of the shallow ground water. The perched alluvium ground water contains a number of inorganic constituents listed in the NMWQCC 3103 Ground Water Standards. TDS concentrations typically range from 300–600 mg/L.

A comparison of alluvial monitor well data with the NMWQCC nitrate standard shows that the alluvial ground water has consistently exceeded the standard of 10 mg/L for nitrate nitrogen. While high concentrations of nitrate nitrogen have been present as recently as 1994, (61 mg/L of nitrate nitrogen at monitor well MCO-7), the current trend is downward. In 1995 shallow alluvial monitor wells averaged about 15 mg/L as nitrate nitrogen. The current downward trend reflects both reductions in nitrates discharged to the RLWTF by programmatic activities over the recent past and attenuation within the natural canyon system. Purtymun (1977) determined that the loss of nitrates within the shallow ground water could be attributed to uptake by plants, adsorption onto alluvial material, and infiltration into underlying tuff.

A 1994 sampling of Test Well 8, a main aquifer-monitoring well in Mortandad Canyon, showed a nitrate as nitrogen value of 5.1 mg/L, while all other values since 1988 were 0.2 mg/L or less. The 1994 result could be an anomaly or it could represent evidence of actual nitrate contamination migrating from the shallow Mortandad alluvial ground water into the deeper main aquifer.

Beside nitrate, only one parameter, fluoride, has consistently exceeded NMWQCC ground water standards in the alluvium. There is currently a downward trend in fluoride concentrations in the alluvial ground water. Research by Purtymun (1977) indicates that once the concentrations of nitrates and fluorides in the RLWTF effluent are reduced or eliminated, then concentrations of those contaminants in the alluvial ground water will naturally decline due to the relatively rapid turnover of water and chemicals in storage. Comparing chemical concentrations in yearly effluent samples and ground water samples shows that ground water concentrations are about 30–50% of effluent concentrations. Purtymun (1977) concluded that, with regard to these mobile inorganic chemicals, "The rapid loss of water and its associated chemicals from the aquifer prevents chemical accumulation and indicates that cessation of effluent release to the canyon would rapidly improve the quality of water in the aquifer."

Cyanide and TDS have, on occasion, been discharged by the RLWTF at concentrations greater than NMWQCC ground water standards, but recent (1990–1995) monitoring data does not show elevated concentrations in the alluvial ground water. The New Mexico Water Quality Control Commission #3103 Standards are shown in Table 1.

Table 1. New Mexico Water Quality Control Commission Standards

Parameter	**(mg/L)**
Al	5.0
As	0.1
Ba	1.0
B	0.75
Cd	0.01
Cl	250
Cr	0.05
Co	0.05
Chemical oxygen demand (COD)	NA
Cu	1.0
CN	0.2
Fluoride	1.6
Fe	1.0
Pb	0.05
Hg	0.002
Ni	0.20
NH_3-N	NA
Nitrate-N	10.0
Nitrite-N	NA
N (total)	NA
NO_3–NO_2	NA
pH	6 to 9
$^{226,228}Ra$	30 pCi/L
Se	0.05
Ag	0.05
Sulfate	600
Total dissolved solids	1000
Total suspended solids (TSS)	NA
Total toxic organics (TTO)	NA
U	5.0
Zn	10.0

No organic chemical constituents (listed in the Resource Conservation and Recovery Act [RCRA] Appendix IX) have been identified in the alluvial ground water (Purtymun, 1988). Similarly, no cores taken in or beneath the alluvium to depths of approximately 100 ft showed any detectable organic chemical (volatiles, semivolatiles, herbicides, pesticides, or polychlorinated biphenyls [PCBs]) contaminants (Stoker et al., 1991).

Radioactive Contaminants

The main radioactive contaminants of concern in the Mortandad system include tritium, cesium, strontium, americium, and plutonium. Most of the radioactive residuals from the RLWTF effluents are removed from the water phase within a short distance of the outfall by adsorption onto sediments, in or immediately adjacent to, the stream channel. Aqueous concentrations are also highest near the RLWTF outfall. The levels of ^{90}Sr and gross alpha and gross beta contamination exceed Environmental Protection Agency (EPA) drinking water standards in many of the monitoring wells. In some years the levels of contamination (except for tritium) exceed DOE DCGs for a drinking water system but do not exceed the DCGs for ingestion of environmental water. The derived concentration guidelines for radioactive contaminants as stated in DOE Order 5400.5 are shown in Table 2.

Recent data indicates variable movement of contaminants into the unsaturated tuff beneath the saturated portion of the alluvium. Some boreholes showed migration of tritium, nitrate, and chloride to depths of at least 195 ft.

Except for tritium, radioactive constituents have apparently moved less than 10 ft in the unsaturated zone, based on analysis of cores from two on-site core holes (Stoker et al., 1991). However, more recent work by the Laboratory's Environmental Systems and Waste Characterization group, CST-7, has indicated that metallic radioactive contaminants may be more mobile in saturated alluvium than previously thought. The metallic radionuclides have been observed to travel in ground water sorbed onto colloid particles. The source and composition of the colloidal particles is not well defined yet, but some may originate as a byproduct of the coprecipitation process involving ferric sulfate and lime used at the RLWTF. Colloid density in the RLWTF effluent may be on the order of tens of millions of particles per milliliter (Longmire, 1997).

In 1993 trace levels (89 pCi/L) of tritium, as tritiated water, were detected in the main aquifer beneath Mortandad Canyon in Test Well 8. These levels are less than 1% of the EPA drinking water maximum contaminant level (MCL) of 20 000 pCi/L. Nonetheless, the levels are significant because they are indicative of recharge from the surface within the past four decades. Tritium is of great interest in evaluating the hydrologic process because tritium, the radioactive isotope of hydrogen, is chemically part of the water molecule and moves with water virtually unaffected by any geochemical processes such as ion exchange, chelation, or adsorption. Accordingly, it can be used as a fundamental conservative tracer to follow the movement of water.

The confirmed movement of water and tritium from the shallow zones to the deep aquifer during the period of LANL operations raises the possibility of ongoing migration of other LANL contaminants into the main aquifer. The present main aquifer monitoring well network is considered inadequate to detect the presence of very low-level radioactive contamination at the surface of the main aquifer. The results of the ongoing Monitor Well Installation Project will provide a much more detailed picture of the extent and movement of contaminants in the Mortandad system.

Table 2. Department of Energy Standards for Radionuclides in Water (DOE Order 5400.5)

Constituent	Uncontrolled Area (pCi/L)	Drinking Water (pCi/L)
^{3}H	2 000 000	80 000
^{7}Be	1 000 000	40 000
^{89}Sr	20 000	800
^{90}Sr	1 000	40
^{137}Cs	3 000	120
^{234}U	500	20
^{235}U	600	24
^{238}U	600	24
^{238}Pu	40	1.6
^{239}Pu	30	1.2
^{240}Pu	30	1.2
^{241}Am	30	1.2

Summary of Regulatory Issues

The following is not a complete summary of environmental regulatory issues facing the RLWTF. Nor is it even a listing of all potential environmental issues affecting implementation of zero discharge. The following text is intended to identify water-related regulatory issues that influenced the working group's recommendations.

Discharges of wastewater from Laboratory facilities are regulated under a complicated system of state and federal laws and regulations that involve a number of permits administered by different state and federal agencies. The regulation and management of radioactive constituents covered under the Atomic Energy Act is delegated to DOE. All other constituents, including some other radionuclides, are regulated by the EPA and the State of New Mexico Environment Department (NMED). Under the Clean Water Act (CWA) amendments of 1987, San Ildefonso Pueblo has the same potential authority to set stream standards as the State of New Mexico.

Clean Water Act

The primary goal of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's water. The CWA established the NPDES Program that requires permitting of point-source discharges to the nation's water. The Laboratory's RLWTF is permitted to discharge industrial/radioactive wastewater into Mortandad Canyon through NPDES outfall 051. The RLWTF has consistently met NPDES permit limits with a few exceptions.

Under the authority reserved to EPA and the states by the CWA, the Laboratory's NPDES permit contains effluent limits for ^{226}Ra, ^{228}Ra, and accelerator-produced tritium. Section 1102 G. of the New Mexico Stream Standards requires that the radioactivity of surface waters be maintained at the lowest "practicable" level. In the Laboratory's case, this should minimally be protective of the livestock watering and wildlife habitat designated use. Additionally, NMED has proposed new stream standards for domestic water supplies including: dissolved uranium 5.0 mg/L, ^{226}Ra and ^{228}Ra 5 pCi/L, ^{90}Sr 8 pCi/L, ^{3}H 20 000 pCi/L, and gross alpha (including ^{226}Ra, but excluding uranium). These stream standards could be used as guidelines for future effluent-based limits in NPDES permits. For example, the current limit for tritium would be reduced from 3 000 000 pCi/L to 20 000 pCi/L, and ^{226}Ra and ^{228}Ra may be reduced from 30 pCi/L to 5 pCi/L. NMED has indicated in previous state certifications that these standards should apply to any outfall discharging a "regulated" radionuclide, including those that discharge a mixture of regulated and nonregulated radioactive waste. Additionally, there have been several attempts by Congress recently to pass legislation to amend the CWA and make federal facilities subject to stricter policing authority over nuclear waste that pollutes water.

Use Study

In 1992 the NMED issued a conditional certification of a draft NPDES permit for the Laboratory based upon effluent limits to protect fish in the Rio Grande. The agreement also required that a study be conducted to identify the stream uses associated with watercourses in the canyons into which the Laboratory discharges NPDES-permitted wastes. The study was conducted by the US Fish & Wildlife (USF&W) Service in 1997. The USF&W is currently evaluating its findings from the study and a final report is due in late 1998. EPA and NMED may develop the Laboratory's new NPDES effluent limits based on the findings from this study.

Stream Standards

New stream standards are being developed by NMED that will impact the effluent limits contained in the Laboratory's NPDES permit. The proposed new Wildlife Habitat Standards are quite stringent, including total mercury 0.0012 µg/L, total DDT and metabolites 0.000011 µg/L, and PCBs 0.014 µg/L. In some cases, the proposed standards are below analytical detection limits or minimum quantification limits (MQLs).

San Ildefonso Pueblo

San Ildefonso Pueblo has also drafted stream standards but, to date has not applied to EPA for their approval and adoption under the CWA Amendments of 1987. Section III-I of the draft standards, Water Quality Code for the Pueblo of San Ildefonso (1991), require that "The radioactivity of surface water shall be maintained at concentrations which do not exceed the maximum natural concentrations in surface and ground waters of the Pueblo." This standard would apply to any watercourse that crosses Pueblo lands. Even though storm runoff has not been observed to cross from LANL property onto San Ildefonso property, its standards could affect the Laboratory's NPDES permit.

When San Ildefonso Pueblo finalizes its Water Quality Standard and completes all other requirements set forth in the CWA amendments of 1987, its standards will have to be considered by EPA when it reissues the LANL NPDES permit. Before EPA could reissue the NPDES permit, the Pueblo would have to certify that the permit limits would be adequate to meet the Pueblo's stream standards.

NMWQCC Regulations

The State of New Mexico Ground and Surface Water Quality Protection Regulations (20 NMAC 6.2) authorize NMED to require a discharge plan approved by the secretary of NMED. On April 3, 1996, the NMED Ground Water Bureau (GWB) notified the Laboratory that a discharge plan was required for the discharge of NMWQCC-regulated contaminants at the RLWTF. The Laboratory submitted the Ground Water Discharge Plan for Application for the TA-50 RLWTF to NMED on August 16, 1996. Since then, at the request of NMED the Laboratory has provided technical clarifications in response to NMED's questions and the NMED has proposed some revisions in sampling schedules, etc. The discharge plan application is still pending NMED approval at the time of this report.

Abatement Plan

Subpart IV, Prevention and Abatement of Water Pollution of the State of New Mexico Ground and Surface Water Quality Protection Act (20 NMAC 6.2), was developed to abate pollution of subsurface water so that ground water is either remediated or protected for use as a domestic and agricultural water supply. NMED personnel have indicated that if the ground water or surface water is contaminated above standards and the Laboratory's Environmental Restoration (ER) Project does not address the contamination, NMED can enforce the abatement regulations.

Resource Conservation and Recovery Act and Hazardous and Solid Waste Amendments

The NMED Hazardous and Radioactive Materials Bureau (HRMB) considers the RLWTF to be a low-level waste treatment facility and is aware of the new upgrades or modifications to the facility. HRMB is concerned about the potential generation of RCRA waste streams, especially any process that may generate mixed waste and mixed transuranic (TRU) waste. To alleviate this concern the Laboratory must properly characterize its waste to ensure that there is a mechanism for proper waste storage and disposal. Administrative controls, such as the Waste Acceptance Criteria (WAC), have been adopted to prohibit the discharge of some RCRA-listed hazardous waste into the radioactive liquid waste (RLW) collection system. Some hazardous wastes are allowed under certain circumstances; however, they must meet exemptions. Additional efforts are needed to administratively implement and document the effectiveness of the WAC program. Current monitoring of RLW sources to verify compliance with the WAC is limited and needs to be expanded.

Under RCRA, wastewater treatment facilities that are subject to NPDES permit limits may qualify for exemption from certain RCRA requirements, including engineering design standards. When the RLWTF implements zero liquid discharge, if the NPDES permit for Mortandad Canyon is deleted, current exemptions would not apply. RCRA-listed wastes are already administratively prohibited from the RLW waste stream. However, the potential for exposure to increased RCRA regulatory coverage with zero discharge underscores the need for better administration and documentation of compliance with WAC requirements.

The Laboratory has prepared a site-wide hydrogeologic work plan. The work plan addresses both the RCRA regulatory ground water monitoring requirements and the Hazardous and Solid Waste Amendments (HSWA) hydrogeologic permit requirements.

The work plan describes proposed ground water characterization and monitoring activities Laboratory-wide, including activities in and adjacent to Mortandad Canyon.

The Laboratory has an ongoing ER Project that is responsible for preparing RCRA Facility Investigation (RFI) task or site work plans that establish the technical approach and methodology for environmental investigations. The general purpose of the RFI investigation in Mortandad Canyon is to:

1. determine the potential for contaminant transport into or within Mortandad Canyon watersheds,
2. evaluate human health risks and ecological impacts associated with the presence of contaminants,
3. refine conceptual models for contaminant transport,
4. assess the potential for interconnections between ground water in alluvium, perched intermediate zones, and the regional aquifer, and
5. assess the projected impact that contaminants may have on off-site receptors and the Rio Grande.

DOE Regulations

The Atomic Energy Act establishes a regulatory framework by which DOE, as successor to the Atomic Energy Commission, is authorized to prescribe and enforce regulations and other requirements necessary for sound management of its activities. Under this authority DOE developed Order 5400.5 with DCGs that specify dose and concentration limits for radioactive wastewater discharges. The RLWTF currently does not meet all DOE DCGs for radioactive constituents.

EPA and State of New Mexico authority to regulate radioactive pollutants is limited. Under 40 CFR 122.2, EPA and state authority is confined to "...radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended)." This same section further notes that "...radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials. Examples of materials not covered include radium and accelerator-produced isotopes."

Other Regulatory Programs

Air Quality and National Environmental Protection Act (NEPA) Requirements

The Laboratory's Air Quality Program (managed by ESH-17) is currently under a Federal Facilities Compliance Agreement (FFCA) that may impact selected treatment options (e.g., evaporators, lagoons, etc.). Additionally, a NEPA review and an environmental assessment, or only a NEPA review, may be needed if treatment options are selected that would move the discharge into another canyon. For example, discharge into Sandia Canyon could impact the wetlands and transport potentially contaminated radioactive wastewater off DOE property. Additionally, impact to Laboratory stakeholders (Pueblos, the public, etc.) must be evaluated.

RADIOACTIVE LIQUID WASTE AT LANL

Generation and Collection

Radioactive liquid wastes from LANL facilities have been treated at the TA-50 RLWTF since 1963. During the past 35 years, nearly 1.3 billion L of treated radioactive liquid waste have been discharged to Mortandad Canyon. Table 3 summarizes the quantity of radionuclides discharged in treated wastewater from the RLWTF from 1963 through 1995 (Longmire, 1997).

Table 3. Quantity of Radionuclides Discharged to Mortandad Canyon from the RLWTF (1963–1995)

Constituent	Curies
^{241}Am	>0.146
^{238}Pu	>0.097
^{239,240}Pu	0.194
^{137}Cs	>2.11
^{89}Sr	>1.06
^{90}Sr	>0.469
Gross beta and gamma	>8.51
^{3}H	817

The amount of effluent discharged yearly to Mortandad Canyon from the RLWTF is shown graphically in Figure 1.

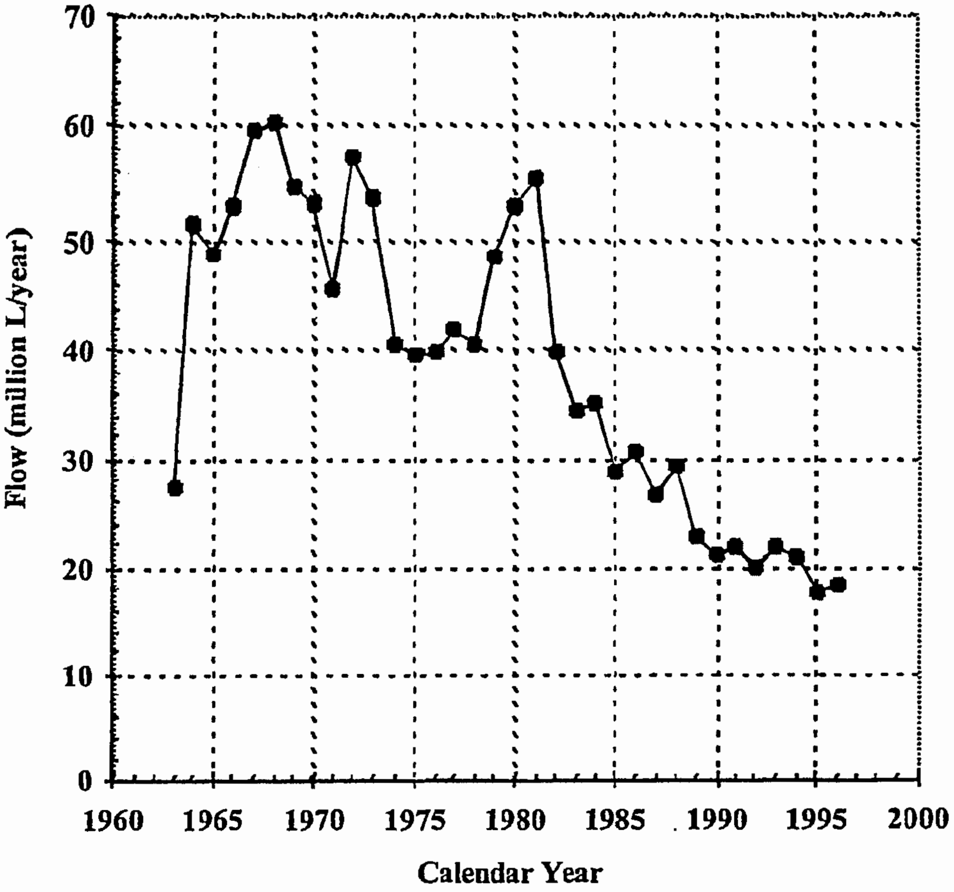

Figure 1. Treated RLWTF effluent to Mortandad Canyon (1963–1996).

Since 1981 the yearly flows have continued to decrease. However, the flows have not decreased significantly during the past five years. The flow is expected to increase, maybe as much as 50%, when the Chemistry, Metallurgy, and Research (CMR) Building becomes fully operational. Flows will also increase when the dual-axis radiographic hydrotest (DARHT) experiments start and when operations at TA-55 increase because of additional mission requirements. The present 20 million L/year influent volume may increase to 30 million L/year over the next few years. Historical data shows that the quantity of waste, as defined in the Influent Design Basis Report (Resource Technologies Group, 1995) is 15.6 million L/year. This is less than the present yearly volume treated at the RLWTF (see Figure 1) and about one-half the estimated level when the CMR Building becomes fully operational. Also, the Influent Design Basis Report does not consider the 20% recirculation rate that may be necessary with the new membrane processes and the additional processes required to obtain zero liquid discharge. The working group would advise that the design influent flow be increased to at least 30 million L/year. This added treatment capacity will accommodate the following factors:

1. seasonal variations (e.g., high flows during the summer when there are many temporary summer workers),
2. the increased flow when the CMR Building becomes fully operational,
3. increased mission requirements at TA-55, and
4. the volume recycled internally as part of new treatment processes

During calendar year 1993, an estimate was made of the relative percentage of radioactive liquid waste influent attributed to various generators at LANL. The result of this estimate is shown in Figure 2. These numbers reveal that in 1993 the four largest generators of radioactive liquid waste accounted for 78% of the volume. These generators are: the CMR Building (TA-3-29), the Plutonium Facility (TA-55), the Radiochemistry Site (TA-48), and the Sigma Building (TA-3-66). The information shown in Figure 2 is not presently valid because the CMR Building has been undergoing renovation and the missions served by the collection system have changed. Figure 2 also shows the large number of facilities served and the Laboratory-wide possible impact that failure of the RLWTF would have on critical LANL defense missions. Although the flow volume from the Plutonium Facility was only 15% during 1993, it was then and is today by far the major source of the actinide activity in the RLWTF influent. The contaminants present in the influent stream to the RLWTF have never been predictable. They fluctuate depending on changes in the Laboratory mission and which generator is discharging to the collection system at any given moment.

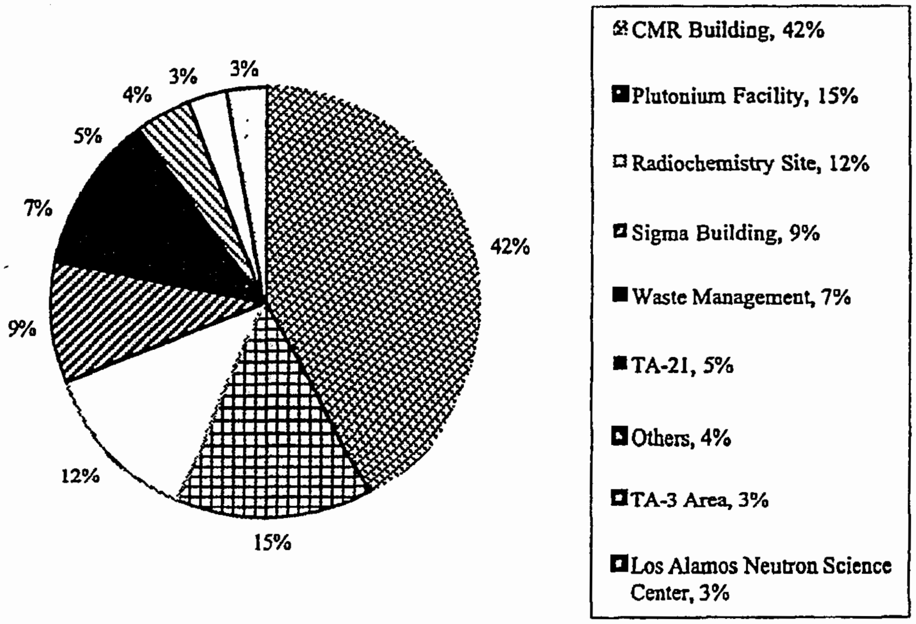

Figure 2. Percentage of liquid waste volume sent to RLWTF by generators in calendar year 1993.

Tritium concentrations in the RLWTF effluent stream are almost equal to the concentration in the RLWTF influent. The concentration in the effluent is less only because of the slightly greater effluent volume; no tritium is removed in the treatment processes. Figure 3 shows the tritium discharges in Curies per year from the RLWTF to Mortandad Canyon from 1980 through 1996. The solid and dashed lines that bound the Curies per year lines represent the discharges calculated to meet the 3.0 μCi/L NPDES limit and the 0.02 μCi/L drinking water limit. During this time period the tritium discharges decreased from a maximum of approximately 100 Ci/year to less than 1 Ci/year . Most tritium-contaminated waste enters the RLWTF from the Tritium Systems Test Assembly (TSTA) Facility through the TA-21 Radioactive Liquid Waste Treatment Plant (RLWTP). The contribution from this source is plotted from 1991 in Figure 3. The data shows that current tritium concentrations in the RLWTF effluent are near the 0.02 µCi/L level. Similar plots of ^{241}Am, ^{238}Pu, ^{239,240}Pu activities in RLWTF effluent from 1980 through 1996 are shown in Figures 4, 5, and 6.

Most radioactive liquid waste is transported to the RLWTF through the radioactive liquidwaste collection system (RLWCS), a gravity flow pipeline. This collection system is shown on Map 1. The main pipeline branches to approximately six technical areas and is eventually connected to over 1 600 sinks and drains within those facilities. The collection system was replaced in 1980 with a double-encased polyethylene pipe to meet waste compatibility and secondary containment issues. The collection system is continuously monitored for breach of containment and consists of conductivity monitors and leak detection devices located within manholes along the collection system. No breach of containment has been detected in the double-encased pipeline.

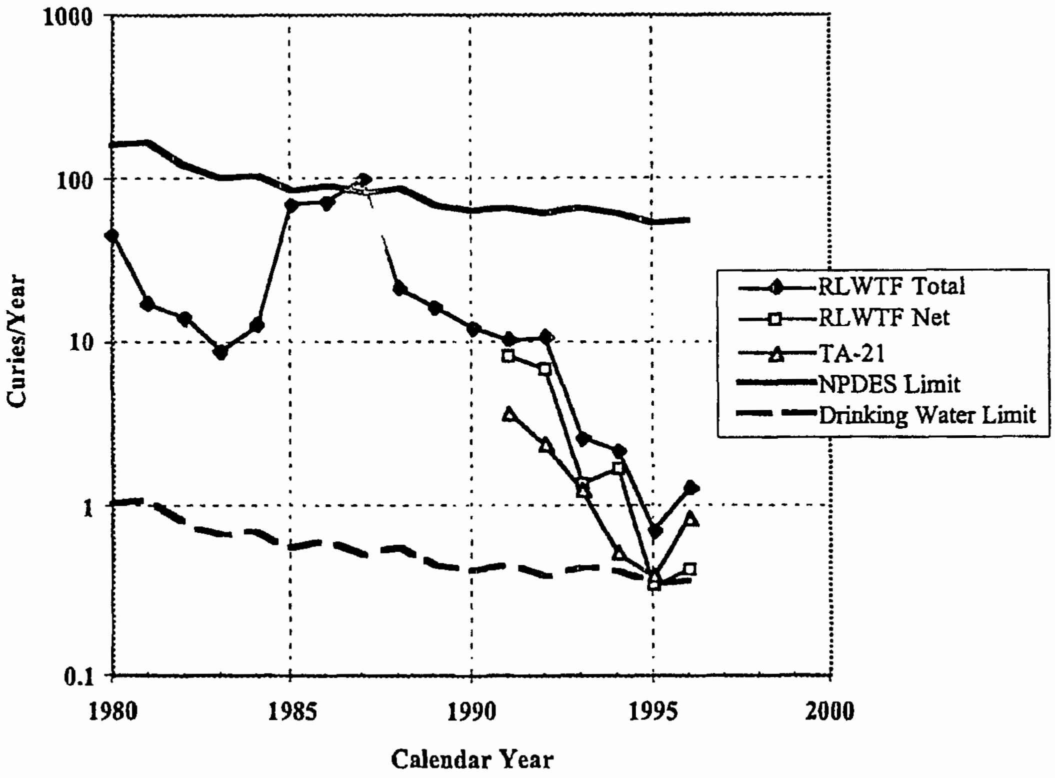

Figure 3. Tritium discharges from the RLWTF, sources and regulatory limits.

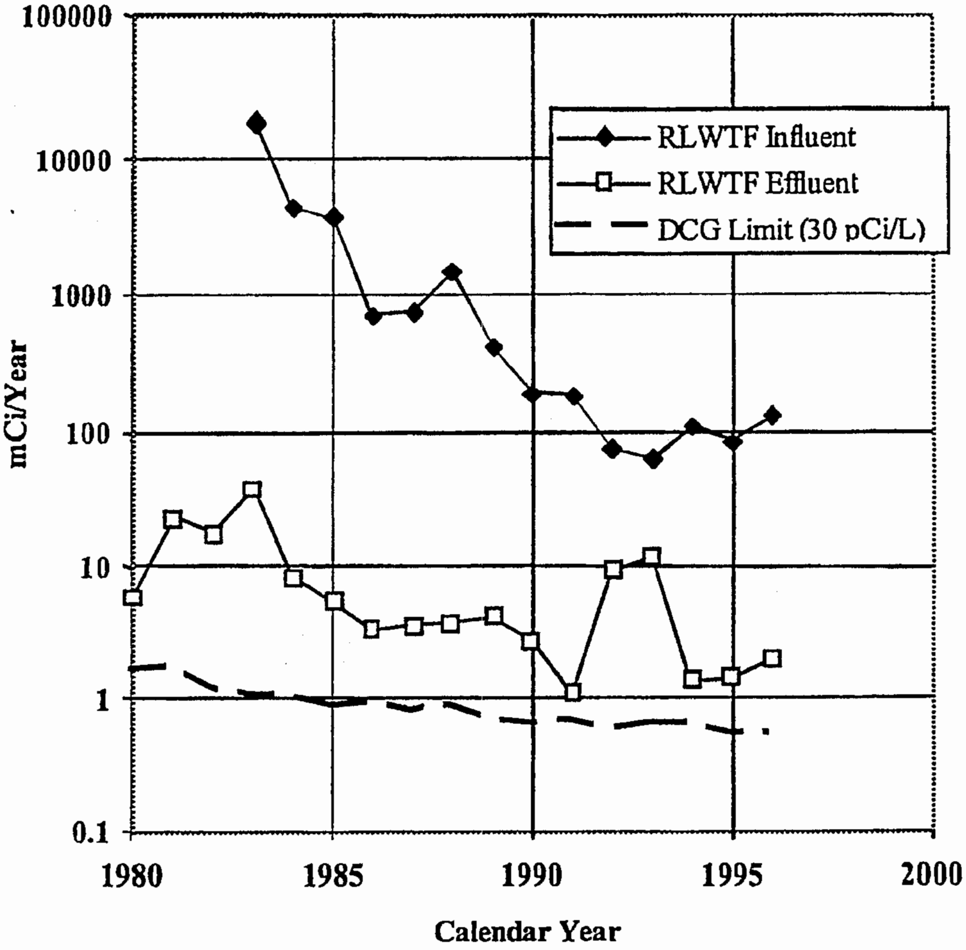

Figure 4. Comparison of ^{241}Am in RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

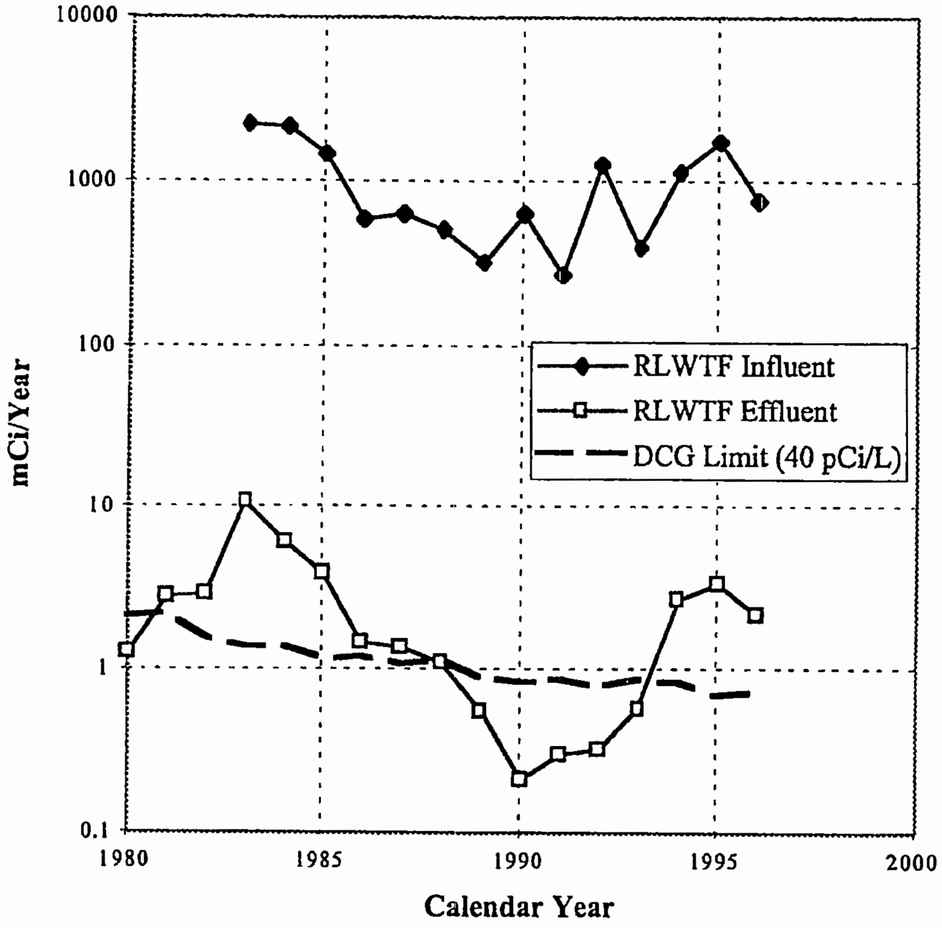

Figure 5. Comparison of ^{238}Pu in RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

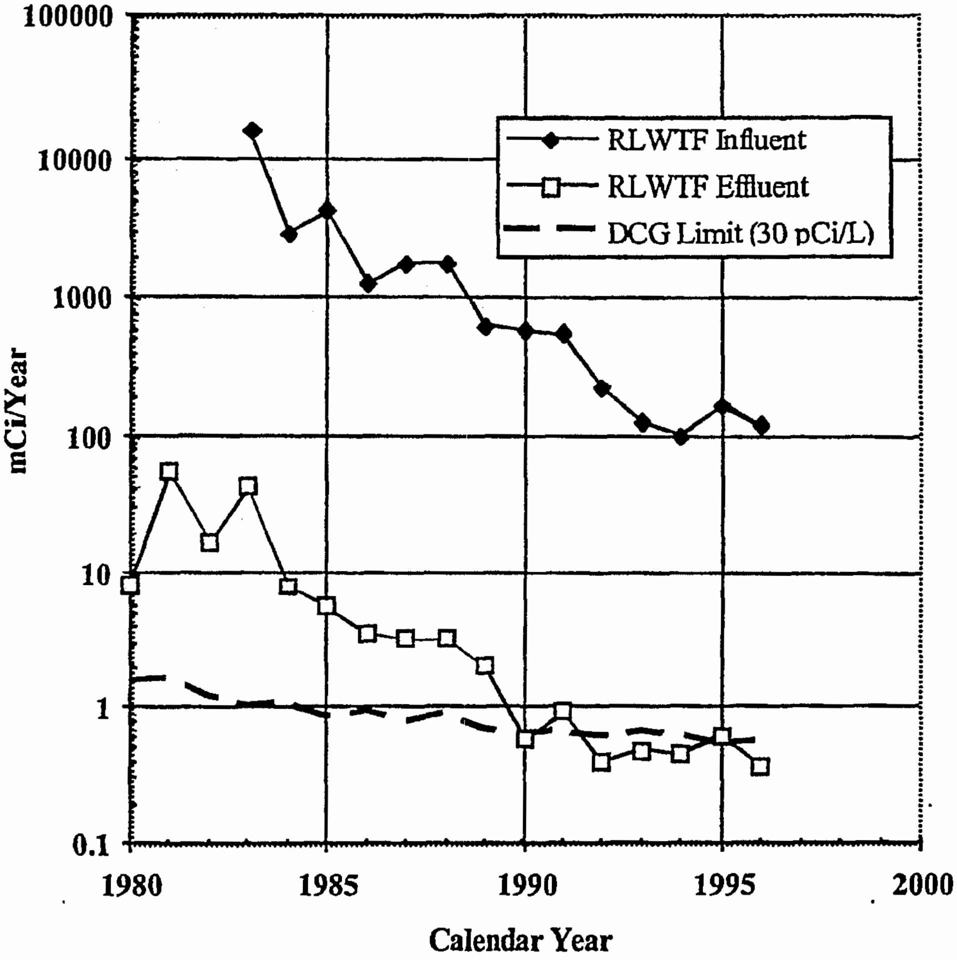

Figure 6. Comparison of ^{239,240}Pu in the RLWTF influent and effluent with DOE Order 5400.5 DCG limits.

Treatment and Disposal

The current main plant treatment operation, which has a capacity of 250 gpm, pumps wastewater from the influent storage tanks to a clariflocculator where ferric sulfate and lime are added to form a ferric hydroxide flocculant. Gravity causes floc particles containing radionuclides to settle at the bottom of the clarifier and form a sludge layer. The supernatant flows over the weir at the top of the clariflocculator. The sludge is transferred to a sludge holding tank in preparation for filtration, which is accomplished by a rotary vacuum filter. The filter cake resulting from this operation is low-level waste (LLW) that is drummed for disposal at TA-54, Area G. Supernatant decanted from the top of the sludge holding tanks and filtrate, and from the rotary vacuum filter are recycled to the influent holding tanks.

The clarifier supernatant is passed through an anthracite gravity filter to remove any unsettled floc. Carbon dioxide is bubbled through the gravity filter plenum to lower the pH below 9 and to reduce scale formation resulting from clarifier operations. The filtered effluent is then collected in effluent holding tanks where pH and gross radioactivity measurements are performed. The contents of the tank are then discharged through NPDES outfall 051 to Mortandad Canyon.

The highly radioactive waste process liquids originating at the Plutonium Facility, TA-55, are transported to the RLWTP in separate double-contained pipelines for monitoring and storage. To concentrate the radionuclides, these wastes are treated in a small, 25 gpm ferric hydroxide precipitation facility at the RLWTP. The concentrated solids are mixed with cement in a double drum–tumbler operation. About thirty 55-gal. drums of the cement paste are produced per year. These drums are TRU waste and are stored at TA-54 for future shipment to the Waste Isolation Pilot Plant (WIPP). Treated liquid from this operation is drained to the influent storage tanks for further treatment in the main plant at the RLWTF.

Phase I and II Upgrades

During the Phase I upgrade, additional treatment process equipment will be installed at the RLWTF. It will include equipment for tubular ultrafiltration (TUF) followed by reverse osmosis (RO). Phase I addresses the concentration levels of radionuclides discharged in waters regulated by DOE Order 5400.5. Because effluent from the current RLWTF treatment processes does not meet these limits, the TUF and RO process equipment is being installed to provide treatment that will meet DOE requirements. A permeate stream (product water with low concentrations of contaminants) and a reject stream (concentrate water with a high concentration of contaminants) are produced by both the TUF and the RO. Nitrates are concentrated in the RO reject stream. A rotary centrifugal ultrafilter is used to further dewater the concentrate that comes from the TUF equipment.

This additional process equipment will enable the RLWTF to:

1. ensure that treated effluent is discharged below the DCGs for radionuclides set forth in DOE Order 5400.5,
2. reduce fluoride concentrations in the treated effluent by reducing its source, the food-grade lime used during flocculation, and
3. concentrate nitrates in the waste stream for removal under Phase II.

The TUF equipment provides enhanced effluent quality by removing suspended solids and most of the radioactive constituents from the waste stream. It provides an effluent free of suspended solids and allows efficient additional treatment through the RO. Filtration capabilities of the RO equipment operate at the molecular level, rejecting dissolved solids from the waste stream at rates greater than 96%. The use of RO has been widely demonstrated in industry and municipalities when high purity product water is required.

The RO equipment is the final treatment process prior to discharge. Permeate from the RO equipment is expected to contain contaminant concentrations below those defined in the NMWQCC ground water standards and DOE Order 5400.5. The reject, or concentrate stream, from the RO equipment will be pumped to the clarifier for further removal of radionuclides and other contaminants. After this treatment step, it will be blended into the RLWTF effluent stream. The significant reduction in the amount of ferric sulfate and lime with the Phase I equipment is expected to reduce fluoride effluent concentration to values below regulated levels.

The objective of the Phase II equipment at the RLWTF is to remove nitrates in the RO concentrate stream to below NMWQCC ground water standards. Biological denitrification, which converts the nitrate ion to nitrogen gas, is the process selected for Phase II equipment. Evaporation and ion exchange resins were also investigated for removal of nitrates from the RO concentrate stream. Evaporation of the high-nitrate RO concentrate stream was ruled out because of safety considerations involving nitrates and unknown concentrations of organic constituents. The ion exchange process for nitrate removal would result in a secondary regenerant waste stream of smaller volume, but of very high nitrate concentration, therefore making the process unacceptable. The biodenitrification process was chosen because it safely destroys the nitrate ion with minimum radiation concerns (at as low as reasonably achievable [ALARA] levels), while producing an effluent that meets the minimum regulatory requirements. Figure 7 is a schematic of the RLWTF treatment process after implementation of the Phase I and Phase II process equipment.

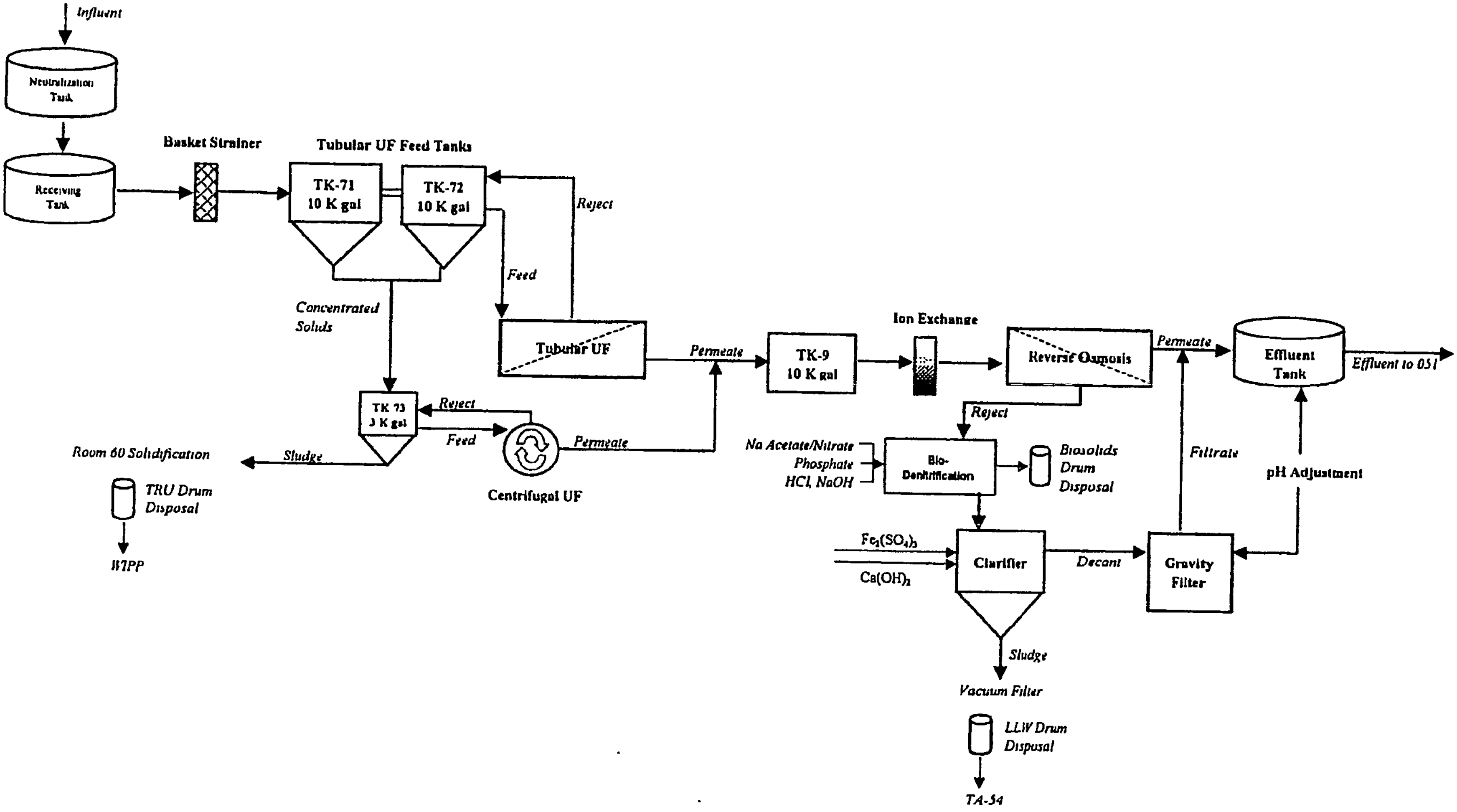

Figure 7. Schematic of the RLWTF treatment process after implementation of the Phase I and II upgrades.

DISCHARGE ALTERNATIVES

The working group has identified three alternatives for the discharge of the treated radioactive liquid waste from the RLWTF:

1. continued discharge to Mortandad Canyon via outfall 051,
2. discharge RO permeate and/or concentrate to SWSC, and
3. zero liquid discharge.

Continued Discharge to Mortandad Canyon via Outfall 051 (Alternative #1)

In this configuration, treated effluent from the RLWTF would continue to be discharged to Mortandad Canyon. Current upgrades, Phases I and II, to the RLWTF treatment process are designed to bring treated effluent into compliance with the DCGs in DOE Order 5400.5 and NMED ground water requirements for all currently monitored constituents. These upgrades, along with the planned construction of a new operations facility are the minimum efforts that must be made toward improvement of the outfall 051 conditions. Further treatment of the RO concentrate stream has the potential for improving the quality of water discharged to outfall 051. Generators improving characterization of waste and reducing some wastes at the source (i.e., tritium, actinides, nitrates, and organics) would also improve the quality of the effluent stream.

Concerns exist regarding the continued use of Mortandad Canyon for RLWTF treated effluent. Contaminants in Mortandad Canyon soils from the RLWTF outfall have been identified. There is concern that contaminants, particularly those in colloidal forms, may be transported farther down the canyon over time. Studies are under way to determine if there is a connection between the shallow perched ground water bodies and the deep regional aquifer that supplies drinking water to Los Alamos County. If such a hydrologic connection exists, there is a possibility that discharges from the RLWTF to Mortandad Canyon may be adding to the movement of contaminants toward the deep aquifer. If this is shown to be true, discharge to outfall 051 would likely be stopped.

Continued discharge of treated effluent to Mortandad Canyon, even with greatly improved water quality, will always retain characteristic "signature" constituents (e.g., plutonium and americium) traceable to the RLWTF. Some stakeholders protest the discharge of any such waste stream to the environment. Additionally, if the effluent cannot meet future regulatory requirements or contaminants are found to be moving off DOE-controlled land, an alternative to discharging to outfall 051 would have to be found.

Table 4 is a summarized compilation of the evaluation criteria that were considered by the working group in evaluating alternative #1, continued discharge to Mortandad Canyon. Both a summary of issues and a qualitative evaluation of each evaluation basis are given. The continued discharge to Mortandad Canyon alternative is based on the assumption that the Phase I and II upgrades at the RLWTF are installed and operating and the RLWTF effluent is in compliance with DOE Order 5400.5 and the NMWQCC ground water standards.

The working group concurs that the potential contaminant transport to the deep aquifer in Mortandad Canyon is a significant concern. Other alternatives for the discharge of the RLWTF effluent should be considered. Also, there is notable public concern regarding this outfall and the discharge of RLWTF effluent to the environment. While it is unquestionably in the best interests of LANL to improve the quality of this effluent to the highest possible level, it appears to be equally important to consider how the discharge of this liquid stream to the environment can be eliminated entirely.

Discharge RO Permeate and/or Concentrate to SWSC (Alternative #2)

In this alternative, RLWTF effluent would be sent to the SWSC Facility at TA-46. The SWSC Facility operates an activated sludge, biological treatment system to remove pollutants from the Laboratory's sanitary liquid waste stream (Royal Crest Trailer Park is also connected to SWSC). The SWSC Facility also performs biodenitrification of the sanitary wastewater.

Section II 3. d of DOE Order 5400.5 permits the discharge of liquid wastes containing radionuclides from DOE activities into publicly owned sanitary sewerage systems as long as the total fractions of the average concentrations for each radionuclide to its respective DCG value is less than five. Liquid wastes with fractions of the average concentrations for each radionuclide to its respective DCG value greater than five may be discharged into a sanitary sewerage system owned by the federal government (Section II 3. d. (3) of DOE Order 5400.5).

Such a federally owned sanitary sewerage system, having effluent concentrations in excess of the DCG levels, must prescribe the best available technology (BAT) level of treatment if the receiving surface waters contain radioactive material at concentrations greater than the DCG values (Section II 3. a. (1) of DOE Order 5400.5). Implementation of the BAT process for liquid radioactive wastes is not required when radionuclides are already at a low level, i.e., the annual average concentration is less than DCG level. In that case the cost consideration component of BAT analysis precludes the need for additional treatment because any additional treatment would be unjustifiable on a cost–benefit basis. Therefore, additional treatment will not be required for waste streams that contain radionuclide concentrations of not more than the DCG values (Section II 3. a. (2) of DOE Order 5400.5).

DOE Order 5400.5 clearly states that radioactive waste streams containing radionuclide concentrations of not more than the DCG reference values at the point of discharge to a surface waterway normally will not require treatment to further reduce the concentration (Section I 5. b. of DOE Order 5400.5). The working group's interpretation of DOE Order 5400.5 is that it is allowable to send radioactive liquid waste from the RLWTF to SWSC at concentrations greater than 5 times the DCG level because SWSC is owned by the federal government. Also, it would be allowable to continue discharging SWSC effluent into Sandia Canyon as long as the effluent is below the DCG level.

There are three configurations of this alternative for the RLWTF effluent:

1. RO concentrate stream sent to SWSC,
2. RO permeate and concentrate streams sent to SWSC, and
3. RO permeate stream sent to SWSC.

Configuration #1 RO Concentrate Stream Sent to SWSC

The SWSC plant has the ability to treat the RO concentrate stream for nitrates. This configuration would eliminate the need for biodenitrification at the RLWTF and would increase the average daily influent volume to SWSC by 1%. The RO concentrate stream (≈2 000 gpd) would combine with the much larger SWSC influent stream (≈200 000 gpd). This dilution ratio would reduce the 150 pCi/L of alpha activity in the RO concentrate stream to 1.5 pCi/L in the SWSC plant influent. Additional removal of some radionuclides would likely occur by interaction with biosolids at SWSC.

Tritium could be reduced at its sources if generators improved their characterization of wastes sent to the RLWTF. This alternative would allow the RLWTF to discharge only the very clean RO permeate stream (≈18 000 gpd) to the environment through outfall 051.

Configuration #2 RO Permeate and Concentrate Streams Sent to SWSC

In this configuration both the RO permeate (≈18 000 gpd) and RO concentrate (≈2 000 gpd) streams would be sent to SWSC. Biodenitrification at the RLWTF would not be needed. This configuration would increase the average daily influent to SWSC by 10%. The RLWTF could then discontinue the use of outfall 051.

Table 4. Evaluation Matrix of Continued Discharge to Mortandad Canyon Alternative

Evaluation Basis	**Summary of Issues**	**Qualitative Evaluation**
Long-term protection of the environment	It is suspected that a hydrologic connection exists between the surficial alluvial ground water in Mortandad Canyon and the deep regional aquifer hundreds of feet below ground surface. Continuing to release the RLWTF effluent to this canyon contributes to the migration of colloidal and dissolved contaminants through the alluvial ground water and also deeper into the tuff.	Radionuclides remaining in the treated effluent will not be disposed of as solids, their most environmentally stable form.
Present regulatory compliance and future legal liability	The implementation of Phase I and II upgrades at the RLWTF will bring the effluent into compliance with present DOE and NMWQCC regulations. More stringent future regulations would require further water treatment. The potential exists that the perched underground waters in Mortandad Canyon may require abatement and the soil may need remediation. The treated liquid waste is regulated by a NPDES permit that allows the RLWTF to operate with a RCRA exemption.	The implementation of Phase I and II upgrades will bring the RLWTF into minimal compliance with the DCGs and NM ground water standards. LANL has a unique geographic relationship to pueblo lands that may impact regulatory requirements.
Satisfaction of public concerns and perceptions	The State of New Mexico, the Los Alamos community, the DOE, and San Ildefonso Pueblo are very concerned about the environmental impact of discharging the treated radioactive liquid waste into Mortandad Canyon.	Continued discharge to Mortandad Canyon manifests to LANL stakeholders that LANL will only make the minimal effort required to handle radioactive liquid waste.
Minimal impact on LANL institutional requirements	No new impact.	LANL remains vulnerable to regulatory challenges.
Supportive of corporate excellence and sustainability goals	The Phase I and II upgrades at the RLWTF will enable LANL to continue to carry out its current mission capability with minimal environmental compliance. The Phase I and II upgrades are a "band-aid" fix until a new facility and treatment equipment are provided. Sustainability goals may be compromised by continued discharges from the RLWTF to the environment.	LANL's concern for present neighbors and future generations is called into question by continuing discharge to Mortandad Canyon.
Technical feasibility	Phase I and Phase II processes are included in the CDR which will provide treatment capability and redundancy for this standard of operation.	Pilot plant tests suggest the full-scale implementation of Phase I and II upgrades are likely to be successful.
Economic feasibility	Requires DOE and congressional funding of a new process building and equipment.	The Phase I and II upgrades are a temporary fix for RLWTF compliance requirements. A long-term, funding commitment is required to procure a new radioactive liquid waste process facility and process equipment.

Configuration #3 RO Permeate Stream Sent to SWSC

Only the RO permeate stream (≈18 000 gpd) would be sent to SWSC. Daily flows to SWSC would increase by 9%. The RO concentrate stream at the RLWTF would be treated with additional technology to an endpoint where the contaminants in that stream would be solidified, requiring additional treatment beyond the scopes of Phase I, Phase II, and the conceptual design report (CDR). The RLWTF could discontinue the use of outfall 051.

The discharge of RLWTF effluents to SWSC raises five major concerns.

Concern #1 Fate of constituents with RLWTF "signature"

Presently, SWSC effluent is pumped to TA-3 where a small portion is used for industrial cooling operations at the Power Plant and the remainder is discharged to Sandia Canyon. A plan currently exists, the Ground Water Discharge Plan DP-857, for the SWSC effluent to also be discharged to Cañada del Buey (1992). If this plan is implemented, SWSC effluent would cross San Ildefonso Pueblo land. During storm events, there is a possibility of surface flow in this arroyo through White Rock to the Rio Grande.

The impact of the RLWTF contributing water to these areas must be considered. Contaminants with the RLWTF "signature" would be discharged to either Sandia Canyon or Cañada del Buey, or to both canyons. The working group felt that significant public concern about this practice would persist even if radionuclides, such as tritium and the actinides, were discharged at concentrations well below their DCG values. Sandia Canyon already has detectable PCB contamination and the alluvium is difficult to monitor due primarily to the location of the Los Alamos County landfill. Flows beyond LANL boundaries and onto San Ildefonso land occur during wet weather in Sandia Canyon due to its large watershed, high volumes of effluent flows, and high percentage of impervious area. Transport of contaminated water and sediments is a significant issue for Sandia Canyon. Neither Cañada del Buey nor Sandia Canyon is, therefore, not a desirable choice for discharge of liquids containing detectable quantities of LANL "signature" constituents. On the other hand, Mortandad Canyon, due to its small watershed area and smaller effluent discharge, has essentially no off-site surface or subsurface flow.

The discharge of treated RLWTF effluent to SWSC would eliminate input of pollutants to Mortandad Canyon. A subsequent improvement in alluvial ground water quality would be expected. Reduced input of water to the contaminated Mortandad Canyon alluvial ground water would reduce the hydraulic head that drives contaminants deeper into the tuff. Also, any downstream transport of contaminated colloids and sediments in Mortandad Canyon would be reduced.

Concern #2 Additional monitoring for radiological parameters

NMED has indicated they would incorporate internal outfall requirements on the RLWTF if the Laboratory connected the discharge to any other NPDES treatment facility. Additionally, NMED would require a permit modification for the disposal of sludge. EPA may also require the Laboratory to develop and implement pretreatment programs as special conditions of the NPDES permit. Pretreatment programs are developed to control significant industrial discharges for the following reasons: ensure the permittee meets effluent standards, prevent pass-through of contaminants, prevent interference, including interferences with its use or disposal of sludge, and improve opportunities to recycle and reclaim sanitary and industrial wastewater and sludge. Pretreatment requirements may require additional treatment and sampling at the sources of discharge for facilities connected to the RLWTF (i.e., TA-55, CMR Building, Sigma Building, etc.).

Additional regulatory compliance monitoring for radiological parameters would also likely be required at all potential sanitary effluent discharge locations. These locations include the SWSC Plant (outfall 13S), the Central Computing Facility (CCF) cooling tower (outfall 03A-027), the Power Plant (outfall 01A-001), and any future reclaimed water reuse sites. Additionally, administrative requirement (AR) AR 9-6 and the SWSC waste acceptance criteria, which state that no radiological waste may be sent to SWSC, would be violated. The potential contamination of the SWSC plant and all reuse facilities (i.e., tanks, cooling loops, and cooling towers) would have to be taken into consideration.

Concern #3 Modifications to SWSC Regulatory Requirements

Sanitary spills from the SWSC collection system downstream from the RLWTF could be considered reportable radioactive waste releases. SWSC sludge is presently managed as Toxic Substances Control Act (TSCA) waste due to the presence of detectable PCB concentrations. The introduction of RLWTF waters to SWSC may require the sludge be handled as a mixed low-level radioactive waste (MLLW). Because the RLWTF is a RCRA treatment, storage, and disposal facility subject to RCRA hazardous waste material regulations, regulatory permits required at SWSC could be affected. NPDES permits would have to be modified to allow SWSC to accept an industrial waste stream. Industrial waste stream acceptance at SWSC would likely mandate start-up of an industrial pretreatment program or monitoring program for the RLWTF. Thus, discharge of effluent from the RLWTF to the SWSC plant would probably not decrease the required monitoring at the TA-50 RLWTF, but simply move the monitoring location. The NMED would also likely require the preparation of a ground water discharge plan for Sandia Canyon, modification of the current Ground Water Discharge Plan (LANL, 1992), and modification of Ground Water Discharge Plan Application for Sanitary Sewage Sludge Land Application Sites (LANL, 1995). Modification of these regulatory documents is usually a very time-consuming process.

Concern #4 Increased cost of doing business for LANL

A major increase in capital and operations and maintenance (O&M) costs at SWSC would be expected for influent radiological monitoring equipment, new procedures, additional analyses, and extra reporting for waters and for sanitary sludge, grit, and screenings. Additional radiological training, equipment, and hazard analyses for SWSC operators would be required. The SWSC plant and reuse system administration might need to be moved from Facilities Engineering (FE) Division to Environmental (EM) Division to properly manage a radioactive waste.

Costs at the RLWTF would be reduced by sending the RO concentrate stream to SWSC. The need for biodenitrification and salt removal from the RO concentrate stream at the RLWTF would be eliminated.

Concern #5 Operational considerations at SWSC

Addition of RLWTF waters, particularly the configurations that include the RO permeate stream, would add to the hydraulic loading of the SWSC plant. The SWSC plant nitrification and denitrification treatment process is vulnerable to hydraulic overloading of the reaction basins. RLWTF effluents to SWSC may need to have nutrients added to maintain a particular food to microorganism ratio in order to achieve the desired denitrification. Addition of excess amounts of water without appreciable biodegradable material adversely affects the process.

The working group recognizes there would be immediate benefits to the RLWTF should alternative #2 (discharge of RO permeate and/or concentrate to SWSC) be adopted. These benefits are: denitrification of the RO concentrate stream could be performed at SWSC, there would be no need to mix the high TDS RO concentrate stream with the RO permeate stream, and no treated radioactive liquid waste would be discharged from outfall 051. However, the costs (economic, regulatory, legal, public perception) far outweigh the immediate benefits. Changes in future regulatory and environmental policy could render this alternative unfeasible, making it at best a temporary solution.

Table 5 is a summary of the factors that were considered by the working group in evaluating alternative #2. This alternative may be shown to be within the limits set by DOE Order 5400.5, but long-term relations with stakeholders and any environmental impact preclude its implementation.

Zero liquid discharge (Alternative #3)

Zero liquid discharge from the RLWTF means that no treated liquid radioactive waste will be discharged to the environment. The working group considered the following three methods to eliminate the RLWTF liquid discharge to outfall 051.

1. Redirect the treated liquid flow to another discharge point. This option merely exports the environmental problem to another location.
2. Totally recycle the RLWTF effluent. This is the ideal option. Contaminants and salts would be removed and solidified and the water would be reused in Laboratory facilities.
3. Totally evaporate the treated liquid waste stream following the removal of contaminants and salts.

Options two and three are zero liquid discharge options. In these options the RLWTF influent would be treated as currently planned in the Phase I and Phase II upgrades. In addition, the biodenitrified RO concentrate stream would be evaporated to a highly concentrated salt solution that can be solidified. RO permeate water would be reused or recycled in LANL facilities or evaporated. Various methods to evaporate the treated RLWTF effluent are being considered: cooling towers, mechanical evaporators, land application, evaporation ponds, and constructed wetlands. There would be no liquid discharges to the environment from the RLWTF.

An important consideration in this alternative would be loss of the RCRA exemption currently provided to the RLWTF due to its oversight by the EPA through the NPDES permitting process. Loss of this exemption would mean that the RLWTF would be required to meet additional RCRA regulatory guidelines regarding waste treatment practices. RCRA guidelines regarding waste treatment at the RLWTF would focus on concentrations of metals and organics in the RO concentrate stream and sludges produced at the RLWTF. Additional sampling procedures would likely be needed at the RLWTF. The RLWTF would need to manage the constituents in the waste stream and so have much better knowledge of, and control over, wastes discharged to it for treatment.

Table 5. Evaluation Matrix of Discharge RO Permeate and/or Concentrate to SWSC Alternative

Evaluation Basis	**Summary of Issues**	**Qualitative Evaluation**
Long-term protection of the environment	Discharge of treated radioactive liquid waste to SWSC increases the possibility of contamination at the SWSC Facility, Sandia Canyon, and TA-3 facilities with the following radionuclides: ^{238,239,240}Pu, ^{241}Am, ^{3}H, ^{137}Cs, and ^{90}Sr. Issues regarding approval of SWSC effluent discharges to Cañada del Buey will be complicated.	The area contaminated by LANL signature constituents will be increased. The present and future exposure of humans to radionuclides is increased.
Present regulatory compliance and future legal liability	The SWSC WAC would need to be changed to accept radionuclides. Monitoring of constituents and regulatory oversight would increase.	The potential exists for legal, technical, environmental, and economic liabilities.
Satisfaction of public concerns and perceptions	The area of radioactive contamination will be enlarged and the potential exposure of humans to radioactivity will increase.	LANL will be perceived as not caring if it contaminates additional facilities, canyons, and noncontaminated environments.
Minimal impact on LANL institutional requirements	This alternative would reverse the current policy to separate the radioactive and nonradioactive liquid waste streams at LANL. There would be major impacts on monitoring and operations at SWSC. The SWSC NPDES permit would need to be modified to allow industrial inputs to the facility. Also, permitting and disposal of solids may be impacted.	This alternative would eliminate the biodenitrification process at the RLWTF. Increased hydraulic loading at SWSC and demand on the SWSC biodenitrification process will result.
Supportive of corporate excellence and sustainability goals	This alternative may produce a new environmental legacy problem. Because of changing environmental regulations and concerns, this may not be a long-term solution.	This alternative may be shown to be within the limits set by DOE Order 5400.5. Long-term relations with stakeholders and environmental impact preclude its implementation.
Technical feasibility	Mixing a small volume of contaminated water (treated RO concentrate) into a much larger waste stream (SWSC influent) is not considered technically sound. Additional water from the RLWTF could adversely affect denitrification at SWSC.	Significant alterations of the SWSC plant operation would be required.
Economic feasibility	Requires DOE and congressional funding of new process building and equipment. Operational costs would decrease for the RLWTP, but would increase at the SWSC. Monitoring costs at SWSC would greatly increase. This alternative would eliminate the 051 outfall with minimal capital cost.	Decreased costs at the RLWTF would likely be counterbalanced by increased costs at SWSC.

Table 6 is a summarized compilation of the factors that were considered by the working group in evaluating alternative # 3, zero liquid discharge. The working group recommends implementation of this alternative at LANL because it would: protect the environment long-term, meet future regulatory standards, satisfy stakeholder concerns, support corporate excellence and sustainability goals, and have minimal impact on LANL institutional requirements.

Table 6. Evaluation Matrix of Zero Liquid Discharge Alternative

Evaluation Basis	**Summary of Issues**	**Qualitative Evaluation**
Long-term protection of the environment	Offers the best long-term environmental protection solution. The maximum amount of radionuclides will be solidified for long-term disposal. The majority of tritium will be isolated from the RLWTF. Tritium that does reach the RLWTF will be released to the atmosphere, its most environmentally benign state.	This alternative will dispose of the radioactivity in its most environmentally stable form, decrease the area contaminated, and reduce present and future exposure of humans to radionuclides.
Present regulatory compliance and future legal liability	This alternative would comply with all current regulatory standards and is expected to comply with future regulations governing radioactive liquid waste management.	The minimal amount of radionuclides will be discharged to the environment.
Satisfaction of public concerns and perceptions	San Ildefonso Pueblo and other stakeholders would likely favor the implementation of zero liquid discharge of treated radioactive liquid waste. Concern regarding air emissions could increase.	This alternative will show the RLWTF as being the best steward possible of its solid, liquid, and atmospheric emissions.
Minimal impact on LANL institutional requirements	The loss of the NPDES permit at the RLWTF will cause the loss of the RCRA exemption for the RLWTF. RCRA regulatory oversight will increase at the RLWTF. NPDES regulatory oversight will decrease.	Increased identification and quantification of the RLWTF influent stream will be required.
Supportive of corporate excellence and sustainability goals	This alternative is certainly in line with corporate excellence standard. Zero liquid discharge puts contaminants in their most environmentally benign state.	This alternative best exhibits the goals of corporate excellence and environmental sustainability.
Technical feasibility	This alternative would be the most technically challenging. Additional research and testing of possible treatment equipment will be required. These efforts would place the contaminants in their most benign environmental states.	Major technical efforts in data collection and process testing would be required to implement Phases III, IV, and V.
Economic feasibility	Requires DOE and congressional funding of new process building and equipment. Additional funding required for Phases III, IV, and V.	Substantial funding of design efforts would be required to implement Phases III, IV, and V.

ZERO LIQUID DISCHARGE IMPLEMENTATION

Setting a course toward zero liquid discharge of treated radioactive liquid waste is the recommendation of this working group. Attaining zero liquid discharge of radioactive wastewater will require a stable funding source, competent engineering, concern for the environment, and perseverance over a 5–10-year period. Three additional phases are proposed to take LANL from the Phase I and II RLWTF upgrades to zero liquid discharge of treated radioactive wastewater.

Phase III Upgrade: Minimization and Source Identification of Radioactive Liquid Waste

Phase III involves the identification and minimization of wastes at their sources. This includes an aggressive program of metering, controlling the volume of flow to the RLWTF, and characterization and minimization of actinides, organics, and nitrates when feasible. Phase III also involves the isolation and evaporation of tritiated wastewaters at the several facilities discharging tritium in their radioactive liquid waste.

Flow Metering and Identification

The RLWTF currently monitors and maintains the collection system for radioactive liquid waste. This includes the main underground collection system, as well as waste holding tanks and telemetry units (primarily level gauges and flow meters) within several buildings feeding into the collection system. Aside from the data collected by the flow meters in the field, the earliest data collection point for RLWTF raw influent is the headworks of the plant. At this location flow and pH are measured. Also, a 24-hour composite sample is collected continuously. Analytical information derived from these composite samples reflects the blended waste received from all generator sources that feed into the collection system.

The RLWTF relies on the generators to supply information regarding waste constituents. The RLWTF WAC require a waste profile be completed and approved prior to any discharges. It has been difficult to monitor and enforce compliance with this method of waste identification, and only a small percentage of the flow received at the RLWTF can be accounted for by waste profiles. Many generators do not file the required waste profiles. Some flows are not considered RLWTF influent and therefore not profiled, such as duct wash water or mop water. The waste profile management system is housed at TA-54 and was primarily designed for solid waste tracking and handling.

As regulatory requirements become more stringent and as the possibility of eliminating outfall 051 progresses, it will be important to have complete characterization of wastes discharged to the RLWTF. This is particularly true regarding RCRA-regulated constituents. If the outfall 051 NPDES permit is allowed to be deleted, operation of the RLWTF will fall under RCRA guidelines. Management of waste at the source, including management of the waste generators' WAC and management of facility connections to the collection system, is a necessary part of this process. Specific monitoring regimes will be required by the RLWTF.

The following recommendations should be considered.

1. Begin a deliberate, coordinated effort to bring all LANL RLW generators into compliance with the current RLWTF WAC guidelines and criteria. Establish a method to ensure that complete compliance is maintained. Also, the RLWTF needs direct access to the waste profile management system to procure the required degree and nature of data.
2. Evaluate and designate responsibility for collection system upkeep before connecting to the main RLWTF collection system (at first manhole outside the building, or where the pipe leaves the building).
3. Develop contractual criteria for the condition of connections at facilities connected to the RLWTF collection system. Also, contractual agreements should be formed for any new connections.

Waste Minimization of Actinides and Nitrates

There are several waste minimization and pollution prevention technologies currently under investigation at LANL. The following technologies are being developed and implemented at the Plutonium Facility and in the CMR Building. These are the two major generators of RLW that is treated at the RLWTF.

Historically, aqueous nitrate operations at the Plutonium Facility have processed acid waste streams through a single-stage distillation process in an evaporator. That process concentrated the salts, which were immobilized and disposed at TA-54, and generated an approximately 5 M acid waste stream that was discharged to the RLWTF for treatment. A fractional distillation column has been designed for concentrating the nitric acid to the 12–15 M range. This process recovers 99.99% of the acid, removes most of the radioactivity, and reduces the nitrate concentration to approximately 45 ppm in the liquid waste stream going to the RLWTF. Implementation of this technology at TA-55 and the biodenitrification process at the RLWTF will ensure that nitrate concentrations will not exceed NPDES permitted levels.

The aqueous chloride operation processes material in a series of steps that ends with hydroxide precipitation that produces a TRU solid hydroxide cake and a liquid waste stream discharged to the RLWTF for subsequent treatment. The hydrochloric acid liquid waste stream is a relatively minor waste stream by volume (approximately 10–15% of the volume of the nitric acid waste stream); however it contains approximately 80% of the total inventory of radionuclides discharged to the RLWTF from TA-55. Electrochemical ion exchange is a process that is currently being tested for use in the chloride recovery operations. Preliminary results indicate that this process is expected to eliminate 99% of the plutonium, americium, and dissolved solids from the effluent stream and thus will significantly reduce the radionuclide activity sent to the RLWTF.

In addition to these efforts, better precipitation reagents and improved ion exchange resins that would more completely and more efficiently remove the actinides from the aqueous stream are being investigated to help further reduce the activity burden on the RLWTF.

Volume Reduction in Flow to RLWTF

The CMR Building is the major contributor of radioactive liquid waste volume to the RLWTF. Sources of liquid waste include numerous programmatic activities that generate small volumes of liquid waste, including wash water from custodial activities in radiation control areas (RCAs), duct washdown system water, and effluent from the chilled-water system. Approximately 60% of the liquid waste is from the duct wash-down systems, approximately 30% from the chilled-water system, and the remaining 10% from programmatic and custodial activities. The duct washdown system has not been utilized for months, although it will be reactivated in several wings. It is anticipated that after normal operations are resumed in the CMR Building, the volume of water from duct washdown may increase to historical volumes.

Replacement of the chilled-water system could have a significant impact on the volume of radioactive liquid waste sent to the RLWTF. The chilled-water system was designated for replacement as a part of the CMR upgrades, but replacement has been postponed. The chilled-water system is a series of evaporative-type coolers that provide chilled water to equipment, processes, boilers, and laboratories in the building. The water in the chiller needs to be blown down occasionally and make-up water is added to the system. The blow-down is collected and routed to the RLWTF for treatment. Because the chilled water travels through plumbing in radiologically controlled areas, there is the possibility for contamination and, in the past, low levels of contamination have been found.

The alternative technology to the current chilled-water system is a refrigerated system. A refrigerated system would dramatically reduce the volume of liquid waste generated because compressors and refrigerant would cool the water in contrast to evaporative cooling. Thus, the chilled-water system blow-down would be eliminated.

Satellite treatment of wastes that are presently sent to the RLWTF would also decrease the volume of liquid flow to the facility. Satellite treatment requires a high ratio of effort and expense to volume of waste treated. In some cases, however, satellite treatment of a specific contaminant in a small waste stream can be more cost-effective than treatment of a much larger waste stream with mixed contaminants.

Tritiated Liquid Waste Minimization and Evaporation

Tritium is a naturally occurring isotope of hydrogen produced by the interaction of cosmic rays with the atmosphere. Man-made sources of tritium are produced by nuclear accelerators and nuclear reactors. Natural and man-made tritium are chemically identical. In addition, the chemical properties of tritiated water and regular water are very similar. Thus, to remove tritium from water is very much like trying to remove water from water.

Removal of tritium from aqueous wastewater to near-drinking-water standards (20 000 pCi/L) is currently uneconomical. As a result, tritiated waste streams must be discharged either as a liquid via a permitted outfall or as water vapor to the atmosphere. The tritiated effluent from the RLWTF is currently discharged to Mortandad Canyon outfall 051. From a health physics perspective, the risk associated with discharging tritium to the atmosphere is several orders of magnitude less than the risk associated with discharging tritium in aqueous form. The malfunction at the Three Mile Island nuclear power station in 1979 resulted in a large volume of tritiated water. Rather than dilute the tritiated water by slowly feeding it into the Susquehanna River, evaporation ponds were built to disperse the tritium into the atmosphere. Dispersion of tritium into the atmosphere is environmentally preferable to release of tritium into ground water. As a result, the options listed in this section recommend waste minimization followed by the use of evaporative technologies to discharge the tritium to the atmosphere.

For calendar year 1996, the major generators of tritium in the RLWTF influent are given in Figure 8. In 1996 the RLWTF discharged 1.30 Ci of tritium with 16 537 000 L of effluent. The average tritium concentration in this discharge was 78 612 pCi/L, nearly four times the drinking water standard of 20 000 pCi/L. However, this is far less than the outfall 051 NPDES permit limit of 3 000 000 pCi/L. The working group has recommended that the Laboratory voluntarily adopt the lower drinking water limit. To meet the 20 000 pCi/L drinking water standard, only 0.33 Ci of tritium should have been discharged during that period.

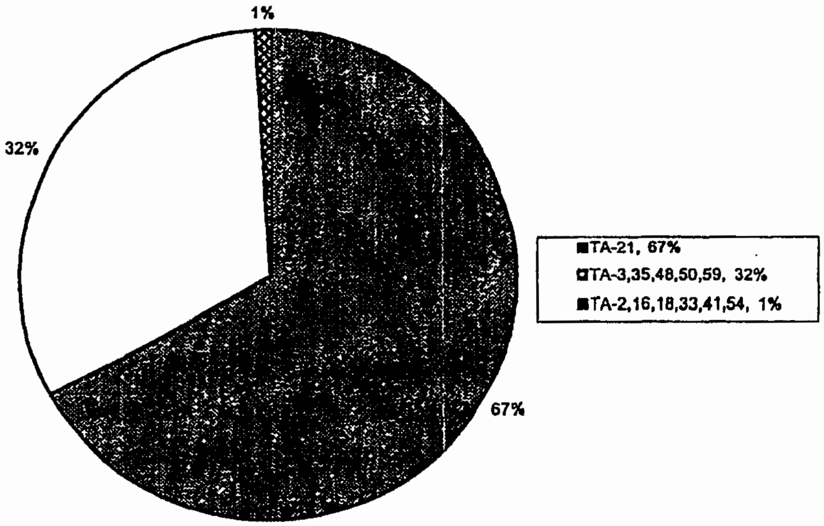

Figure 8. Major generators of tritium to the RLWTF by technical area (calendar year 1996).

As shown in Figure 8, the TSTA Facility and the Tritium Science Fabrication Facility (TSFF) at TA-21 are the largest contributors of tritium activity sent to the RLWTF. The TSTA Facility is dedicated to developing, demonstrating, and integrating technologies related to the deuterium-tritium fuel cycle for large-scale fusion reactor systems. The TSFF Facility provides support for tritium-related experiments. Presently, the TSTA and TSFF Facilities discharge an average of 2500 L/day with an activity of approximately 1.2 µCi/L. The sources include primary coolant loop flushing, component washing, hand washing, cooling tower blow-down, and custodial activities. The fidelity of these numbers is somewhat unclear because a faulty blow-down controller for an aging cooling tower and heat exchanger at the TSTA Facility intermittently sends 20 000 L of tritiated water to the RLWTF. A replacement cooling tower has been purchased and is ready for installation. With the installation of the new cooling tower and heat exchanger, there will be no contamination crossover from the primary to the secondary cooling loop. Therefore the blow-down will no longer be contaminated with tritium. Upon completion of this work the tritium activity discharged by TSTA to the RLWTF will be greatly reduced.

The next largest contributor of tritium to the RLWTF is 0.41 Ci/year from the collection system that includes sources from TA-3, 35, 48, 50, and 59. Waste profiles from the tritium generators at these sites are presently incomplete: therefore, it is not possible to distribute the 0.41 Ci/year among the various sources.

In addition, tritium-contaminated wastewater is trucked to the RLWTF from TA-2, 16, 18, 33, 41, and 54. These sources combined contribute only 1% of the total tritium activity sent to the RLWTF.

Tritium reduction in the RLWTF effluent must be accomplished by eliminating tritium in the RLWTF influent because there is no practical treatment option for tritium. Isolating tritiated wastewater from the RLWCS is essential to the RLWTF discharging an effluent that meets the drinking water standards for tritium. Historically, programmatic activities produced tens to hundreds of Curies of tritium per year that have been released to the environment through outfall 051. Future mission needs at LANL may once again yield highly tritiated waste streams. The collection and handling of these streams apart from the RLWTF is advised.

As stated above, the TSTA and TSFF Facilities are the largest contributors to the tritium activity discharged to the RLWTF. By demonstrating that this waste stream can be eliminated from the RLWTF influent, it is possible to reduce the tritium concentration in the RLWTF liquid effluent to nearly 20 000 pCi/L. The recommendations listed below focus on this waste stream with the intent that a more detailed effort may determine that other generators can benefit from the same disposition. Further reductions can be realized by addressing upstream segregation and minimization at the source generator.

Current Tritiated Wastewater Disposition at TA-21

Tritiated wastewater from the TSTA and TSFF Facilities are currently pumped to a tank at TA-21-257 (the TA-21 Radioactive Liquid Waste Treatment Facility). The waste is transferred to the RLWTF through the cross-country line. This is shown schematically in Figure 9. The cross-country line emanates from TA-21-257 and follows DP Road west toward the Los Alamos townsite. Approximately one-quarter mile west of the TA-21 front gate, the line turns south and crosses Los Alamos, Sandia, and Mortandad Canyons before it terminates at TA-50 (see Map 1). Presently the TSTA and TSFF wastewater are the only influent to the TA-21- 257 treatment facility. If this wastewater source is re-routed, then the cross-country line could be removed. This would enable the DOE to release this land to Los Alamos County.

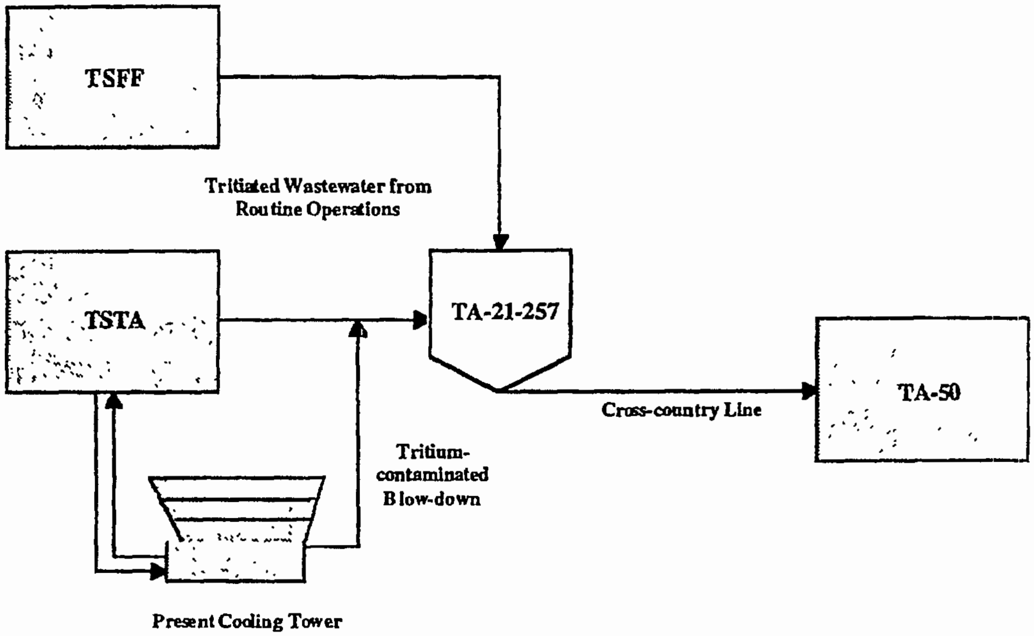

Figure 9. Current TA-21 to TA-50 radioactive wastewater flow sheet.

The two options listed below operate with the underlying assumption that the new cooling tower at the TSTA Facility will be installed, therefore providing a reduction in the volume of tritiated wastewater from approximately 2500 L/day to approximately 275 L/day. With this smaller volume, several options become available for the elimination of this influent stream to TA-50.

Option 1 Transfer of tritiated wastewater to TA-53

Tritiated wastewater from TSTA and TSFF operations will be collected in a 5000-gal. storage tank. The storage tank will be pumped down once per month and the wastewater will be trucked to the radioactive wastewater lagoon at TA-53 for evaporation. Figure 10 shows the proposed radioactive wastewater flow sheet for this option. The LANSCE Facility at TA-53 routinely produces tritiated water from programmatic activities. Currently this water is sent to a lagoon where the short-lived activation products decay and the tritium evaporates by natural convection to the atmosphere. In 1995 the lagoon at TA-53 released approximately 95 Ci with a total annual dose to the nearest off-site residence of 6.8 x 10^{-3} mrem. The effluent from TSTA will introduce approximately 0.25 Ci per year. At this level, the radiation dose to the public at the lagoon will still be well below the applicable health physics limits.

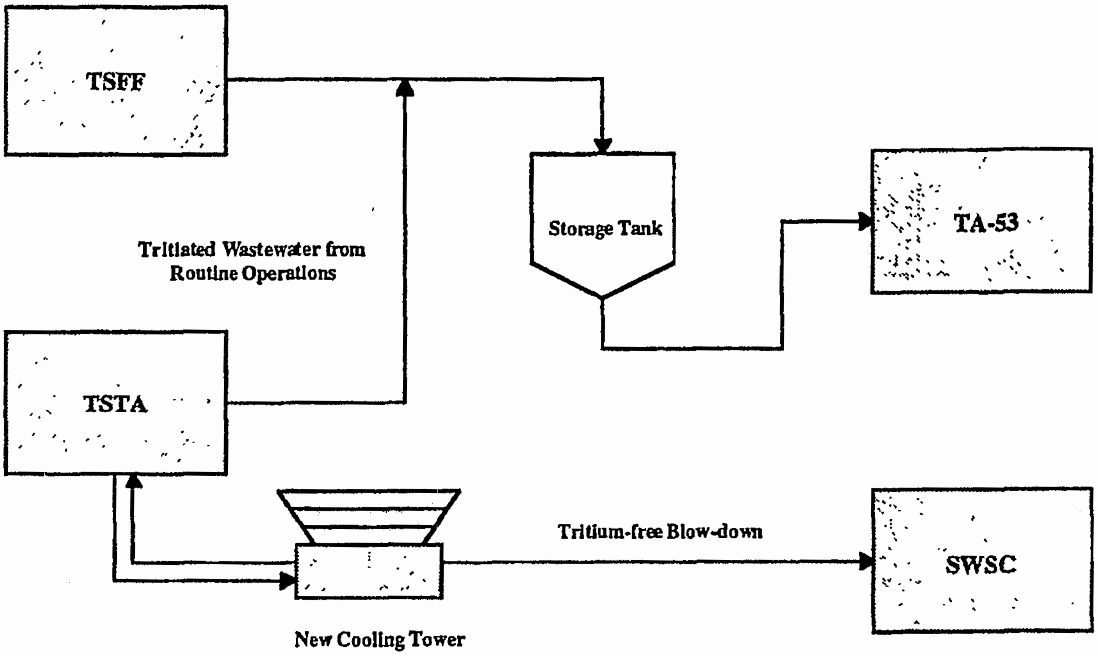

Figure 10. Proposed TA-21 to TA-53 radioactive wastewater flow sheet.

There is presently a project underway to eliminate the radioactive wastewater evaporative lagoons at TA-53. This new RLW treatment system and solar evaporative unit is expected to be operational in 1999. TA-53 is not a source of wastewater influent for the TA-50 RLWTF. However, to reduce the burden on the RLWTF, the TA-53 treatment system may be a sink for the tritiated wastewater generated at TSTA and other facilities.

Once the new wastewater treatment system has been implemented at TA-53, the tritiated wastewater from TSTA can be treated by this system. A preliminary engineering analysis has concluded that this system can accommodate the tritiated wastewater streams from the TSTA Facility and other generators as long as analysis of the influent is sufficient to ensure compatibility of the constituents. Before the implementation of this scenario, a WAC and waste profile must be established for the TA-21 waste stream to provide administrative controls. In addition, to ensure compliance with Clean Air Act (CAA) and RCRA regulations, the waste stream will have to be monitored periodically for any listed or characteristic hazardous constituents. The TA-53 air release permit must also be modified.

Benefits of option 1 include:

1. collection of the wastewater in a temporary storage tank and trucking the waste to TA-53 will allow the elimination of the cross-country line,
2. the major tritium source to the RLWTF will be eliminated,
3. risk associated with the release of tritium into the atmosphere is several orders of magnitude less than for liquid discharge, and
4. the TA-53 radioactive wastewater treatment and evaporation system is already planned for construction and operation by 1999.

Option 2 Install a dedicated evaporator

Under this option, tritiated wastewater from TSTA and TSFF operations would be collected in a 5000 gal. storage tank. As shown in Figure 11, the waste would be fed into a continuously operated open-air evaporator. With an open-air evaporator, the wastewater is boiled off and discharged to the atmosphere as water vapor. There is no secondary distillate stream and only a small amount of residue must be drummed for disposal.

The proposed unit will have the capacity to evaporate 5 times the volume estimated from TSTA and TSFF and therefore has the potential to accommodate other tritiated wastewater sources. For example, radioactive liquid waste that is currently trucked from TA-16 to the RLWTF may instead be transferred to this unit for evaporation. The introduction of a new point source for radionuclide air emissions will require CAA permitting. A WAC and a waste profile must be established for this waste stream to provide administrative controls. In addition, to ensure compliance with the RCRA regulations, the waste stream will have to be monitored periodically for any listed or characteristic hazardous constituents.

An analysis of the radioactive air emission limits has estimated the evaporation of the 0.8 mCi/day estimated for TSTA and TSFF will result in a dose of 1.5×10^{-5} mrem/yr to the nearest off-site residence. This is several orders of magnitude below the specific evaluation limit.

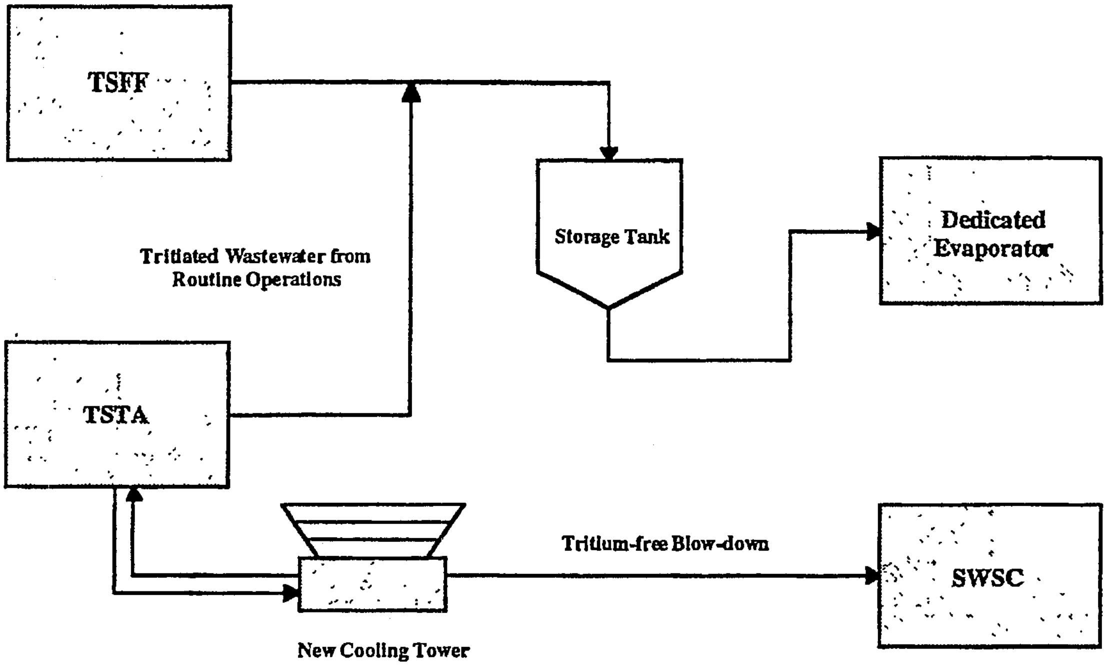

Figure 11. Proposed TA-21 to a dedicated evaporator radioactive wastewater flow sheet.

Benefits of option 2 include:

1. evaporation of the liquid waste stream will allow elimination of the cross-country line,
2. the evaporator can be used to eliminate tritiated wastewater from other generators,
3. there will be no dependence on the TA-53 new treatment and evaporation system,
4. the major tritium source to the RLWTF will be eliminated, and
5. the risk associated with release of tritium into the atmosphere is several orders of magnitude less than for liquid discharge.

In an effort to put these additional releases of tritium to the atmosphere into perspective, the following facts and calculations are presented. During 1996, 680 Ci of tritium were discharged into the atmosphere through monitored stacks at LANL (Environmental Surveillance at Los Alamos, 1996). During calendar year 1996, the RLWTF discharged only 1.3 Ci of tritium to Mortandad Canyon. If all this tritium were atomized and discharged to the atmosphere, it would increase the LANL-wide total emission of tritium by less than 0.2% based on 1996 numbers. If released to the atmosphere, the 0.87 Ci of tritium from the TSTA and TSFF Facilities would be an even smaller fraction of the LANL-wide emissions.

Phase IV Upgrade: Treatment of Reverse Osmosis Concentrate to Allow Reuse

Once the Phase III waste minimization and monitoring programs are in place and excess tritium is removed, the next logical step toward zero discharge is to prepare the water for productive reuse as a supply of industrial makeup water. To meet practical requirements for an industrial water supply, the effluent would need further treatment to be near drinking-water quality.

Ideally, industrial reuse would occur near TA-50 to minimize the cost of piping the water. Potentially attractive uses in the vicinity of TA-50 include washing the containment vessels from the DARHT Facility, water for plutonium processing at TA-55, and augmenting potable water makeup in an existing heating, ventilation, and air conditioning (HVAC) cooling tower.

The quality of water required for reuse is determined by the particular use and protection of public health and the environment. Recirculating cooling water systems are subject to problems such as scaling, corrosion, biological growth, fouling, and foaming if makeup water quality is poor. The limits recommended by the EPA for cooling water makeup for conventional (nonradioactive) contaminants are shown in Table 7.

As a matter of policy, the working group feels that industrial reuse water at LANL should also meet DOE's DCGs for drinking water for radioactive constituents (see Table 2). This is prudent to minimize user concerns and to protect the public health in the event of an accidental cross connection between the industrial reuse system and the potable water supply system.

Table 7. Conventional (nonradioactive) Contaminant EPA Limits for Cooling Water Makeup

Parameter	Recommended Limit (ppm)
Chloride	500
TDS	500
Hardness	650
Alkalinity	350
pH	6.9–9.0 units
Chemical oxygen demand	75
Total suspended solids	100
Turbidity	50
Biochemical oxygen demand (BOD)	25
Organics	1.0
NH_4-N	1.0
PO_4	4
SiO_2	50
Al	0.1
Fe	0.5
Mn	0.5
Ca	50
Mg	0.5
HCO_3	24
SO_4	200

In order to meet the proposed industrial water quality limits and implement a closed loop recycle scheme, it is necessary to have some kind of a "sink" to remove dissolved contaminants from the recycle system. Otherwise, dissolved contaminant levels would rise with each reuse of the water, leading to unmanageable concentration increases with scaling, corrosion, and contamination concerns. In the new RLWTF process the RO concentrate stream will contain the majority of the contaminants remaining in the plant effluent at the completion of Phase II. To satisfy industrial water quality requirements with a recycled water supply, it will be necessary to divert the RO concentrate stream from the product water. To do this without discharging liquid waste to the environment, the RO concentrate stream will need further treatment to reduce its volume, allowing disposal of its contaminants as dry solids.

RO Concentrate Disposal Options

Option IV-1

RO concentrate ⇒ solar evaporation

An option considered for removing the salts from the RO concentrate stream is the use of a solar evaporation pond. A double-lined pond with a leak detection system would be required to protect ground water from leakage. Based upon annual rainfall data and evaporation rates in the Los Alamos area, a pond with a surface area of 1 acre should evaporate 2 000 gpd of water. Evaporation ponds at Public Service Company of New Mexico's San Juan Power Generating Facility near Farmington, NM, were designed for 1.25 gpm of evaporation per acre. To evaporate 2 000 gpd, 1.11 acre of pond surface would be required. The San Juan Power Generating Facility is actually measuring more than 3 gpm of evaporation per acre.

An evaporation pond would have the advantage of not requiring electrical energy to evaporate the RO concentrate stream. In contrast, it would present several disadvantages. There could be concerns of wind dispersion of concentrated radioactive materials in aerosols generated from wave action. Radioactive salts would accumulate in the pond and require periodic removal. Management of these solid residues in the pond could be more difficult than with a mechanical evaporator. The land area required for a pond and buffer zone is also considered a disadvantage for this technology given the scarcity of flat terrain near TA-50.

Option IV-2

RO concentrate ⇒ mechanical evaporator

Another option for reducing the volume of the RO concentrate stream is use of a mechanical evaporator. A vapor-compression brine concentrator evaporator was considered. This equipment would use electric energy to distill the concentrate. The cost of energy is minimized by recondensing the distillate vapor to a liquid for heat recovery. After heat recovery, the high quality distillate would be combined with the RO product water for reuse.

At the 2 000 gpd flow estimated for the RO concentrate, the estimated annual energy cost of approximately $3 800 is moderate. A conceptual-level budget estimate for a skid-mounted brine concentrator evaporation system is $850 000, exclusive of design costs, installation, or housing. The evaporator column itself is well insulated and may be located inside a building or outdoors. Some peripheral components and controls would best be installed inside a building for weather protection and ease of maintenance.

The evaporator bottom blow-down, estimated at approximately 40 gpd would amount to approximately 2% of the original concentrate volume. The blow-down, containing virtually all of the dissolved contaminants remaining after ultra-filtration, would then be solidified with Portland cement for disposal at TA-54, Area G. A number of engineering issues associated with heat evaporation of the Laboratory's radioactive liquid waste concentrate will need to be evaluated during the Phase I through III operational period. A detailed characterization will be required of the concentrate stream's chemistry under actual operating conditions. This characterization must address potential safety concerns associated with heating concentrated mixtures of organic and inorganic constituents. The working group considers the proposed Phase III programs to characterize and limit potentially hazardous constituents in the influent streams essential precursors to any program involving industrial reuse of the treated RLW.

Phase V Upgrade: Eliminate Treated Radioactive Liquid Waste Discharge to the Environment

Eliminating liquid discharge of the treated radioactive liquid waste will occur in the Phase V upgrade. Four options are presented. The liquid discharge will be eliminated by evaporation.

Elimination of Liquid Discharge

Option V-1

Effluent ⇒ land application

One evaporative alternative involves land application of the treated effluent. The irrigation field would be large enough, and designed and operated in such a way so that no runoff is produced and no water percolates into ground water. On an annual net basis, all applied water would be evaporated directly or transpired by vegetation.

As long as effluent is not discharged to a watercourse, an NPDES point source permit is not needed. It is possible, however, that the EPA would choose to regulate land application of nonradioactive constituents under the Laboratory's storm water NPDES permit. NMED approval of a ground water discharge plan would still be required, as it is for the current RLWTF discharge to Mortandad Canyon, to demonstrate that the system did not adversely impact ground water. Residual contaminants discharged with the effluent would accumulate slowly over time in the land application area soil. This accumulation would not represent a major environmental risk because in Phase IV the effluent would have been pre-treated to near-drinking-water quality before land application.

Land application of treated radioactive liquid waste would require an irrigated area of approximately 6.9 acres. A large storage volume would be required to hold the effluent during cold months when the soil is frozen and irrigation is not possible. A winter storage reservoir of approximately 2.65 million gal. would be required, assuming a very conservative six-month storage requirement. This storage reservoir could be either an aboveground steel tank or a lined pond approximately 1.4 acres in area with a 6-ft depth.

A relatively flat irrigation site would be required to avoid surface runoff. Spray irrigation would maximize evaporation and a dedicated buffer area surrounding the irrigation field would be needed to avoid wind drift of spray onto other areas. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

The principal advantages of land application are the ability to dispose of liquid without surface water or ground water contamination or evaporative energy costs. On the other hand, land application systems involve liquid discharge to the environment and cannot properly be described as a zero liquid discharge system. A prominent disadvantage of land application is the relatively large area of flat land required. Another disadvantage is that the effluent would not be recycled for industrial purposes and subsequent savings of potable water.

Option V-2

Effluent ⇒ pond/wetlands

An evaporation pond sized to handle 20 000 gpd of treated radioactive liquid waste would need to be approximately 10 acres in surface area. A combined evaporation pond/wetlands would also require about 10 acres of land area. The advantages and disadvantages of either the evaporation pond or the evaporation pond/wetlands are the same as those mentioned in Scenario IV-1. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Option V-3

Effluent ⇒ cooling tower

Evaporating the RO permeate in a dedicated cooling tower or in a tower at a LANL facility is possible. Several small cooling towers exist near TA-50. The evaporation rate from LANL cooling towers is about 1% of the recirculation rate per 10^0F temperature change. Using this assumption, a recirculation rate of 1 400 gpm is estimated to evaporate the 20 000 gpd of RO permeate from treatment operation at the RLWTF.

Because the TDS in the RLWTF effluent water will be quite low, concentration factors higher than those normally found in cooling towers could be obtained. It is reasonable to expect that a concentration factor of 10 could be obtained prior to blow-down. This would require about 2 000 gpd of blow-down to be recirculated to the RLWTF influent holding tanks for treatment.

Any tritium remaining in the effluent after Phase III would be released to the atmosphere while the nonvolatile constituents would be returned to the RLWTF in the cooling tower blow-down. Drift, the fine droplets of liquid dispersed from a cooling tower, would contain low concentrations of actinides. This activity could be as high as 12 pCi/L, assuming the cooling tower was operated at 10 cycles of concentration and the makeup water had 1.2 pCi/L of plutonium and americium. Discharge of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Option V-4

Effluent ⇒ mechanical evaporator

A mechanical evaporator that could evaporate the entire 20 000 gpd RO permeate would likely be a scaled-up version of the mechanical evaporator suggested in alternative IV-2. A significant difference is that the evaporated water will not be recondensed and therefore, energy from recondensation will not be available to help evaporate more water. This would result in a very energy-inefficient evaporator, but would result in zero liquid discharge of the liquid effluent. Discharges of contaminants by evaporation and drift would have to be below applicable DOE limits for doses to the public and workers.

Figure 12 illustrates the course this working group proposes LANL follow to achieve the goal of zero liquid discharge of treated radioactive liquid waste.

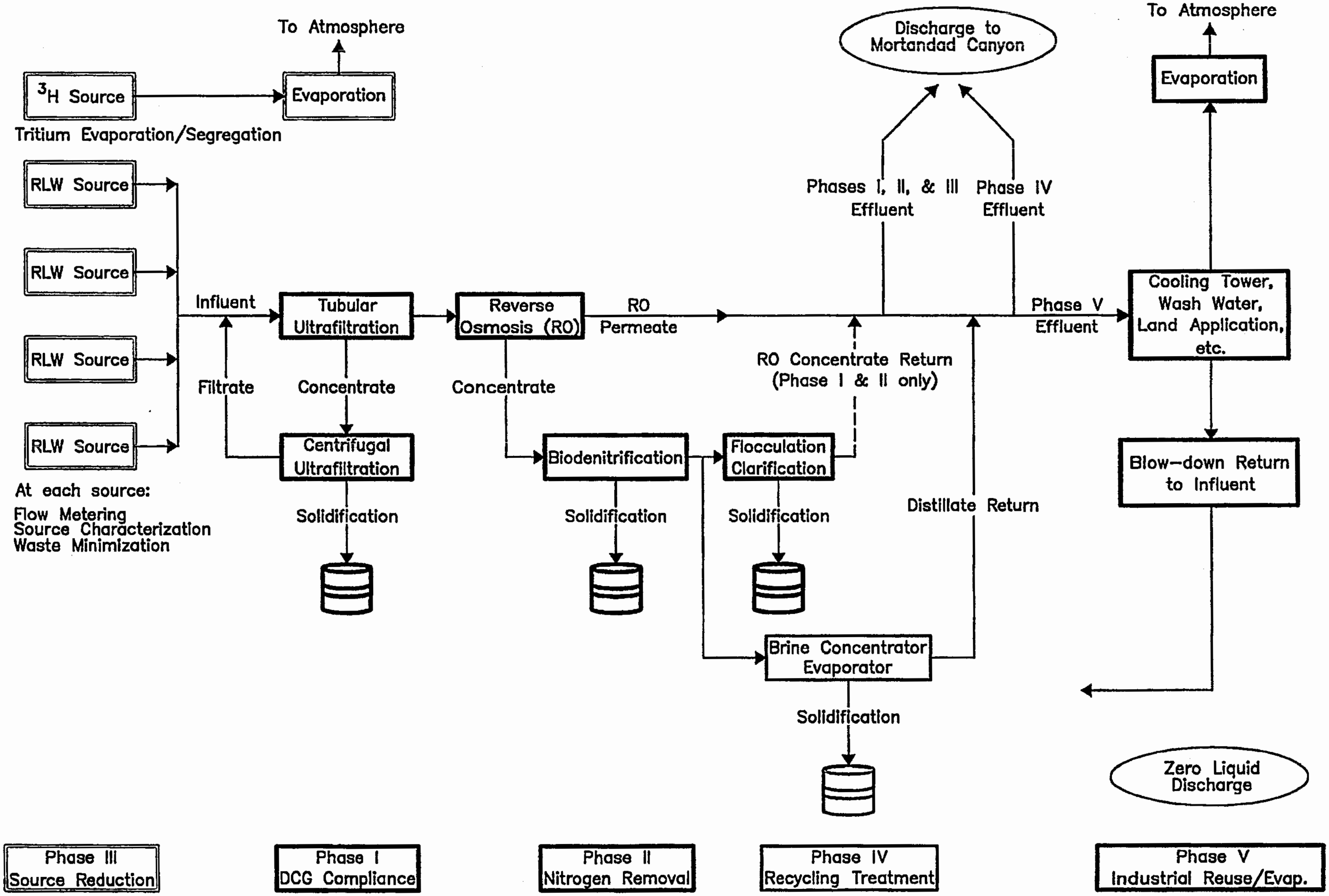

Figure 12. Conceptual phases for implementation of zero liquid discharge at the RLWTF.

SUMMARY OF RECOMMENDATIONS

This report defines the steps that LANL must follow to achieve zero liquid discharge of treated radioactive liquid waste from outfall 051. These recommendations encompass a broad spectrum of radioactive liquid waste management efforts involving waste characterization, liquid waste volume reduction, source minimization of regulated constituents, reuse and recycle, evaporation technologies, and placing of constituents in their most environmentally benign state.

Recommendations Pertaining to Phase I and Phase II Upgrades

1. Newly installed Phase I and II upgrades at the RLWTF should be run as a full-scale pilot project to develop engineering design parameters that would be used to design a new radioactive liquid waste treatment facility.
2. Treated radioactive liquid waste effluent from the RLWTF should not be discharged to the SWSC plant
3. The proposed Phase II biodenitrification facilities should be constructed as planned.

Recommendation Pertaining to Construction of a New RLWTF

1. Design, fund, and construct a modern treatment facility that has redundant process equipment with capability to treat LANL's radioactive liquid waste for the next 30 years.

Recommendations Pertaining to Phase III

1. Tritium sources should be identified and isolated from the RLWTF collection system. The Laboratory should voluntarily construct facilities to evaporate tritiated wastewaters. Isolating the tritiated TSTA and TSFF waste streams from the influent to the RLWTF would make it possible to remove the cross-country radioactive liquid waste pipeline from TA-21 to TA-50.
2. The Laboratory should aggressively minimize the mass of pollutants at their sources, strengthen enforcement of the RLWTF WAC, and improve monitoring of the RLWTF influent at the sources.

Phase IV Recommendations

1. The Laboratory should design and construct facilities to further improve the quality of the RLWTF effluent by removing the pollutants contained in the RO concentrate stream from the effluent discharged to Mortandad Canyon. This will result in discharge of water of near-drinking-water quality
2. Evaporation processes, such as solar ponds and mechanical evaporation, should be investigated as a method of removing dissolved solids from the liquid phase.
3. Solidification technologies should be studied.

4. Minimization of waste stream volume by electrodialysis reversal and ion exchange should be studied.
5. Liquid effluent should continue to be discharged to Mortandad Canyon until zero discharge is implemented. The outfall 051 NPDES permit should be kept for the RLWTF in the event of potential need resulting from operational upsets or dramatic changes in the Laboratory's mission.

Phase V Recommendations

1. The Laboratory should eliminate all discharges of treated liquid radioactive waste to the environment.
2. Radioactive wastewater should be treated to near-drinking-water quality and recycled for reuse in industrial processes or evaporated. Reuse and recycle options for the treated radioactive liquid waste should be identified. Evaporation methods for the treated radioactive liquid waste (evaporation ponds, constructed wetlands, land application, cooling towers, and mechanical evaporators) should be compared.

REFERENCES

"Environmental Surveillance and Compliance at Los Alamos During 1996," Los Alamos National Laboratory report LA-13343-ENV (1996).

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Ground Water Discharge Plan DP-857 for LANL Sanitary Wastewater Treatment Plan TA-46, Los Alamos National Laboratory (July 1992).

Longmire, P., et al., "Workplan for Mortandad Canyon: Environmental Restoration Project," Los Alamos National Laboratory report LA-UR-97-3291 (September 1997).

Merrick & Company, "Conceptual Design Report Radioactive Liquid Waste Treatment Facility at the Los Alamos National Laboratory, Project Identification Number 10411, 95% CDR Submittal," (March 8, 1996).

Purtymun, W. D., J. R. Bucholz, and T. E. Hakonson, "Chemical Quality of Effluents and Their Influence on Water Quality in a Shallow Aquifer," *Journal of Environmental Quality* 6 no. 1, 29-32 (1977).

Purtymun, W. D., R. W. Ferenbaugh, and M. Maes, "Quality of Surface and Ground Water at and Adjacent to the Los Alamos National Laboratory: Reference Organic Compounds," Los Alamos National Laboratory report LA-11332-MS (1988).

Resource Technologies Group, Inc., "Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation, Final Report," (January 4, 1996).

Resource Technologies Group, Inc., "Los Alamos National Laboratory RLWTF Conceptual Design Best Demonstrated Available Technology Evaluation, Technical Memorandum and General Reference Documents" (February 15, 1995).

Stoker, A. K., W. D. Purtymun, S. G. Mc Lin, and M. N. Maes, "Extent of Saturation in Mortandad Canyon," Los Alamos National Laboratory report LA-UR-91-1660 (1991).

US Department of Energy, "Radiation Protection of the Public and the Environment," DOE Order 5400.5 (February 8, 1990), Change 2 (January 7, 1993).

Water Quality Code for the Pueblo of San Ildefonso (1991).

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☒ Telephone ☐ Meeting

Time 9:30

Date Aug. 10, 98

Individuals Involved

Bob Beers

P. Bustamante

Subject TA-50

Discussion Had talked to Bob last week and gave him a heads up that we would be sending a letter on compliance for the discharge because ~~to~~ of the operational problems at TA-50 and the discharge still causing standards to be exceeded. Bob called ~~to~~ because they are having a meeting this afternoon - LANL & DOE to discuss treatment options. He wanted to get an idea of what the letter would say. Told him I wasn't sure what form it would go out in but that it would probably have dates and that if dates weren't met, we would ~~pro~~ probably

Conclusions move more towards enforcement. Told him that 5-10 years to get to ~~zero~~ discharge would not be acceptable.

Distribution

Initialed PAB

8/89

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: August 25, 1998
In Reply Refer To: ESH-18/WQ&H:98-0289
Mail Stop: K497
Telephone: (505) 667-7969

RECEIVED
AUG 25 1998
ROUND WATER BUREA

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION, GROUND WATER DISCHARGE PLAN APPLICATION FOR THE RADIOACTIVE LIQUID WASTE TREATMENT FACILITY, DP-1132

Dear Ms. Bustamante:

In your August 6, 1998, letter (copy enclosed) you requested additional information on the Laboratory's Ground Water Discharge Plan Application for the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50 (DP-1132). Specifically, you asked for all effluent quality data and ground water monitor well data for 1997 and 1998.

Please find enclosed the following attachments:

- Attachment A – a copy of the RLWTF's 1997 draft Annual Report;
- Attachment B – a copy of the 1997 draft Environmental Surveillance Report data tables for Mortandad Canyon ground water monitor wells;
- Attachment C – summary tables of 1997 and 1998 NPDES monitoring data for Outfall 051; and
- Attachment D – summary tables of 1997 SVOC and VOC analytical results for RLWTF influent.

Please note that 1998 data for both RLWTF operational monitoring and Mortandad Canyon ground water monitoring are currently not available. This information will be forwarded to your agency at the earliest possible date.

Please contact me at 667-7969 if you have questions regarding this submittal.

Sincerely,

Bob Beers

Bob Beers
Water Quality and Hydrology Group

BB/mv

Enclosures a/s:

Cy: G. Saums, NMED SWQB, Santa Fe, New Mexico, w/enc.
B. Koch, DOE/LAAO, w/enc., MS A316
D. Woitte, LC/GL, w/enc., MS A187
S. Rae, ESH-18, w/enc., MS K497
K. Hargis, EM/WM, w/enc., MS J591
S. Hanson, EM-RLW, w/enc., MS E518
N. Williams, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

ATTACHMENT C

Data Tables

NPDES Monitoring

Outfall 051

January, 1997 – June, 1997

July, 1997 – December, 1997

January , 1998 – June, 1998

NPDES Monitoring Data for Outfall 051
January, 1997 -- June, 1997
(all units mg/L unless noted)

	January-97			February-97			March-97			April-97			May-97			June-97		
CONSTITUENT	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**
pH (standard units)	6.2		8.2	6.4		7.6	6.2		8.9	5.9		8.4	6.4		7.7	6.6		9.0
Total Nitrogen		35.2	35.2		16.2	16.2		22.0	22.0		67.3	67.3		32.4	32.4		19.2	19.2
NH3-N		1.1	1.1		2.5	2.5		2.0	2.0		8.2	8.2		6.5	6.5		2.0	2.0
NO2-N, NO3-N		32.4	32.4		11.8	11.8		18.2	18.2		57.4	57.4		25.6	25.6		15.1	15.1
Cd		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	0.1		<ldl	<ldl		<ldl	<ldl
Cr		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Cu		0.1	0.2		0.1	0.1		0.1	0.1		0.1	0.2		0.1	0.1		0.1	0.3
Pb		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Ni		<ldl	<ldl		<ldl	<ldl		<ldl	0.1		<ldl	<ldl		0.1	0.1		0.1	0.1
Zn		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1
Ra 226 & 228 (pCi/L)		0.3	0.3		2.8	2.8		0.2	0.2		1.9	1.9		16.0	16.0		2.3	2.3
Hg		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
TTO		U	U		U	U		U	U		U	U		U	U		U	U

Notes:

TTO=Total Toxic Organics (40 CFR 433.11)

U=No compounds detected above the laboratory's quantitation limit.

ldl=laboratory detection limit

All units, excluding pH and Ra 226 & 228, are in mg/L.

NPDES Monitoring Data for Outfall 051
July, 1997 -- December, 1997
(all units mg/L unless noted)

	July-97			August-97			September-97			October-97			November-97			December-97		
CONSTITUENT	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**	**MIN**	**AVG**	**MAX**
pH (standard units)	6.7		8.5	6.5		8.7	6.4		8.0	6.2		7.7	6.2		8.3	6.6		8.5
Total Nitrogen		49.4	49.4		23.9	23.9		175.0	175.0		45.9	45.9		42.4	42.4		33.3	33.3
NH3-N		4.9	4.9		3.8	3.8		5.1	5.1		6.0	6.0		7.2	7.2		5.5	5.5
NO2-N, NO3-N		43.3	43.3		18.3	18.3		169.0	169.0		35.3	35.3		34.8	34.8		24.0	24.0
Cd		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Cr		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Cu		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.2		0.1	0.1		0.1	0.1
Pb		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Ni		0.1	0.1		<ldl	0.1		<ldl	<ldl		<ldl	0.1		0.1	0.1		0.1	0.1
Zn		0.1	0.2		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1
Ra 226 & 228 (pCi/L)		11.6	11.6		2.4	2.4		14.4	14.4		<ldl	<ldl		0.1	0.1		0.2	0.2
Hg		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	0.01		<ldl	<ldl		<ldl	<ldl
TTO		U	U		U	U		U	U		U	U		U	U		U	U

Notes:

TTO=Total Toxic Organics (40 CFR 433.11)

U=No compounds detected above the laboratory's quantitation limit.

ldl=laboratory detection limit

All units, excluding pH and Ra 226 & 228, are in mg/L.

NPDES Monitoring Data for Outfall 051
January, 1998 - - June, 1998
(all units mg/L unless noted)

	January-98			February-98			March-98			April-98			May-98			June-98		
CONSTITUENT	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX
pH (standard units)	6.3		8.7	6.0		8.7	6.4		8.7	6.5		8.8	6.3		8.4	6.4		8.9
Total Nitrogen		8.8	8.8		21.7	37.5		28.4	28.4		28.6	28.6		29.9	29.9		38.1	38.1
NH3-N		1.6	1.6		5.4	8.6		2.7	2.7		2.7	2.7		2.5	2.5		4.5	4.5
NO2-N, NO3-N		5.9	5.9		17.0	22.6		23.1	23.1		24.4	24.4		26.2	26.2		33.6	33.6
Cd		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Cr		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		0.1	0.1
Cu		<ldl	0.1		<ldl	<ldl		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.2
Pb		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
Ni		0.1	0.1		<ldl	<ldl		<ldl	<ldl		<ldl	0.1		<ldl	<ldl		<ldl	0.1
Zn		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1		0.1	0.1		0.2	0.2
Ra 226 & 228 (pCi/L)		6.8	6.8		9.9	9.9		0.1	0.1		13.4	13.4		4.3	4.3		2.5	2.5
Hg		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl		<ldl	<ldl
TTO		U	U		U	U		U	U		U	U		U	U		0.1	0.1

Notes:
TTO=Total Toxic Organics (40 CFR 433.11)
U=No compounds detected above the laboratory's quantitation limit.
ldl=laboratory detection limit
All units, excluding pH and Ra 226 & 228, are in mg/L.

ATTACHMENT D

Data Tables

RLWTF Influent Monitoring

Semivolatile Organic Compounds (SVOC)

Volatile Organic Compounds (VOC)

January, 1997 – December, 1997

RADIOACTIVE LIQUID WASTE
TREATMENT FACILITY

SVOC analysis results

01-JAN-1997 - 31-DEC-1997

Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
03-JAN-1997	I0197.03	BIS(2-ETHYLHEXYL)PHTHALATE		0.14	0.042
03-JAN-1997	I0197.03	DI-N-BUTYLPHTHALATE		0.1	0.03
03-JAN-1997	P0197.03	DI-N-BUTYLPHTHALATE		0.074	0.022
08-JAN-1997	I0197.08	BIS(2-ETHYLHEXYL)PHTHALATE		0.11	0.033
08-JAN-1997	I0197.08	DI-N-BUTYLPHTHALATE		0.048	0.014
08-JAN-1997	P0197.08	DI-N-BUTYLPHTHALATE		0.077	0.023
14-JAN-1997	DP2570197.14	BIS(2-ETHYLHEXYL)PHTHALATE		0.11	0.033
14-JAN-1997	DP2570197.14	DI-N-BUTYLPHTHALATE		0.24	0.072
14-JAN-1997	I0197.14	BIS(2-ETHYLHEXYL)PHTHALATE		0.16	0.048
14-JAN-1997	I0197.14	DI-N-BUTYLPHTHALATE		0.11	0.033
14-JAN-1997	I0197.14	DI-N-OCTYLPHTHALATE		0.049	0.015
14-JAN-1997	P0197.14	BIS(2-ETHYLHEXYL)PHTHALATE		0.053	0.016
14-JAN-1997	P0197.14	DI-N-BUTYLPHTHALATE		0.14	0.042
22-JAN-1997	I0197.22	BIS(2-ETHYLHEXYL)PHTHALATE		0.11	0.033
22-JAN-1997	P0197.22	BIS(2-ETHYLHEXYL)PHTHALATE		0.043	0.013
22-JAN-1997	P0197.22	DI-N-BUTYLPHTHALATE		0.22	0.066
28-JAN-1997	I0197.28	BIS(2-ETHYLHEXYL)PHTHALATE		0.19	0.057
28-JAN-1997	I0197.28	DI-N-BUTYLPHTHALATE		0.1	0.03
28-JAN-1997	I0197.28	DI-N-OCTYLPHTHALATE		0.048	0.014
04-FEB-1997	I0297.04	BIS(2-ETHYLHEXYL)PHTHALATE		0.18	0.054
11-FEB-1997	I0297.11	BIS(2-ETHYLHEXYL)PHTHALATE		0.097	0.029
11-FEB-1997	P0297.11	BIS(2-ETHYLHEXYL)PHTHALATE		0.081	0.024
11-FEB-1997	P0297.11	DI-N-BUTYLPHTHALATE		0.23	0.069
11-FEB-1997	P0297.11	DI-N-OCTYLPHTHALATE		0.086	0.026
13-FEB-1997	DP2570297.13	BIS(2-ETHYLHEXYL)PHTHALATE		0.073	0.022
13-FEB-1997	DP2570297.13	DI-N-BUTYLPHTHALATE		0.13	0.039
19-FEB-1997	I0297.19	BIS(2-ETHYLHEXYL)PHTHALATE		0.08	0.024
19-FEB-1997	I0297.19	DI-N-BUTYLPHTHALATE		0.066	0.02
19-FEB-1997	P0297.19	BIS(2-ETHYLHEXYL)PHTHALATE		0.087	0.026
19-FEB-1997	P0297.19	DI-N-BUTYLPHTHALATE		0.18	0.054
19-FEB-1997	P0297.19	DI-N-OCTYLPHTHALATE		0.094	0.028
25-FEB-1997	I0297.25	BIS(2-ETHYLHEXYL)PHTHALATE		0.18	0.054
25-FEB-1997	I0297.25	DI-N-OCTYLPHTHALATE		0.06	0.018
25-FEB-1997	P0297.25	BIS(2-ETHYLHEXYL)PHTHALATE		0.053	0.016
25-FEB-1997	P0297.25	DI-N-BUTYLPHTHALATE		0.11	0.033
04-MAR-1997	I0397.04	BIS(2-ETHYLHEXYL)PHTHALATE		0.12	0.036
04-MAR-1997	I0397.04	DI-N-BUTYLPHTHALATE		0.1	0.03
04-MAR-1997	I0397.04	O-CHLOROPHENOL		0.044	0.013
04-MAR-1997	P0397.04	DI-N-BUTYLPHTHALATE		0.53	0.159
10-MAR-1997	I0397.10	BIS(2-ETHYLHEXYL)PHTHALATE		0.14	0.042
10-MAR-1997	P0397.10	DI-N-BUTYLPHTHALATE		0.32	0.096
11-MAR-1997	DP2570397.11	BIS(2-ETHYLHEXYL)PHTHALATE		0.095	0.028
11-MAR-1997	DP2570397.11	DI-N-BUTYLPHTHALATE		0.12	0.036
11-MAR-1997	DP2570397.11	PYRIDINE		0.061	0.018
18-MAR-1997	I0397.18	BIS(2-ETHYLHEXYL)PHTHALATE		0.13	0.039
18-MAR-1997	P0397.18	DI-N-BUTYLPHTHALATE		0.065	0.02
24-MAR-1997	DP2570397.24	BIS(2-ETHYLHEXYL)PHTHALATE		0.13	0.039
24-MAR-1997	DP2570397.24	DI-N-BUTYLPHTHALATE		0.26	0.078
25-MAR-1997	I0397.25	BIS(2-ETHYLHEXYL)PHTHALATE		0.14	0.042
25-MAR-1997	I0397.25	DI-N-BUTYLPHTHALATE		0.26	0.078

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Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
25-MAR-1997	P0397.25	BIS(2-ETHYLHEXYL)PHTHALATE		0.041	0.012
25-MAR-1997	P0397.25	BUTYLBENZYLPHTHALATE		0.048	0.014
25-MAR-1997	P0397.25	DI-N-BUTYLPHTHALATE		0.18	0.054
01-APR-1997	I0497.01	BIS(2-ETHYLHEXYL)PHTHALATE		0.16	0.048
01-APR-1997	P0497.01	BIS(2-ETHYLHEXYL)PHTHALATE		0.064	0.019
01-APR-1997	P0497.01	DI-N-BUTYLPHTHALATE		0.17	0.051
01-APR-1997	P0497.01	DI-N-OCTYLPHTHALATE		0.047	0.014
08-APR-1997	I0497.08	BIS(2-ETHYLHEXYL)PHTHALATE		0.1	0.03
08-APR-1997	P0497.08	BIS(2-ETHYLHEXYL)PHTHALATE		0.1	0.03
08-APR-1997	P0497.08	DI-N-BUTYLPHTHALATE		0.077	0.023
14-APR-1997	DP2570497.14	BIS(2-ETHYLHEXYL)PHTHALATE		0.12	0.036
14-APR-1997	DP2570497.14	DI-N-BUTYLPHTHALATE		0.05	0.015
01-MAY-1997	DP2570597.01	BIS(2-ETHYLHEXYL)PHTHALATE		0.026	0.008
01-MAY-1997	DP2570597.01	DI-N-BUTYLPHTHALATE		0.71	0.213
01-MAY-1997	DP2570597.01	DI-N-OCTYLPHTHALATE		0.012	0.004
01-MAY-1997	DP2570597.01	DIETHYLPHTHALATE		0.014	0.004
06-MAY-1997	I0597.06	BIS(2-ETHYLHEXYL)PHTHALATE		0.11	0.033
06-MAY-1997	I0597.06	BUTYLBENZYLPHTHALATE		0.008	0.002
06-MAY-1997	I0597.06	DI-N-BUTYLPHTHALATE		0.31	0.093
06-MAY-1997	I0597.06	DIETHYLPHTHALATE		0.023	0.007
06-MAY-1997	P0597.06	BIS(2-ETHYLHEXYL)PHTHALATE		0.038	0.011
06-MAY-1997	P0597.06	DI-N-BUTYLPHTHALATE		0.44	0.132
06-MAY-1997	P0597.06	DI-N-OCTYLPHTHALATE		0.012	0.004
06-MAY-1997	P0597.06	DIETHYLPHTHALATE		0.01	0.003
13-MAY-1997	I0597.13	BIS(2-ETHYLHEXYL)PHTHALATE		0.092	0.028
13-MAY-1997	I0597.13	DI-N-BUTYLPHTHALATE		1.1	0.33
13-MAY-1997	I0597.13	DI-N-OCTYLPHTHALATE		0.013	0.004
13-MAY-1997	I0597.13	DIETHYLPHTHALATE		0.011	0.003
13-MAY-1997	P0597.13	BIS(2-ETHYLHEXYL)PHTHALATE		0.031	0.009
13-MAY-1997	P0597.13	DI-N-BUTYLPHTHALATE		0.15	0.045
14-MAY-1997	DP2570597.14	BIS(2-ETHYLHEXYL)PHTHALATE		0.033	0.01
14-MAY-1997	DP2570597.14	DI-N-BUTYLPHTHALATE		0.34	0.102
14-MAY-1997	DP2570597.14	DI-N-OCTYLPHTHALATE		0.018	0.005
14-MAY-1997	DP2570597.14	DIETHYLPHTHALATE		0.017	0.005
20-MAY-1997	I0597.20	BIS(2-ETHYLHEXYL)PHTHALATE		0.071	0.021
20-MAY-1997	I0597.20	DI-N-BUTYLPHTHALATE		0.16	0.048
20-MAY-1997	I0597.20	DIETHYLPHTHALATE		0.007	0.002
20-MAY-1997	P0597.20	BIS(2-ETHYLHEXYL)PHTHALATE		0.015	0.005
20-MAY-1997	P0597.20	DI-N-BUTYLPHTHALATE		0.21	0.063
20-MAY-1997	P0597.20	DIETHYLPHTHALATE		0.015	0.005
29-MAY-1997	I0597.29	BIS(2-ETHYLHEXYL)PHTHALATE		0.11	0.033
29-MAY-1997	I0597.29	DI-N-BUTYLPHTHALATE		0.039	0.012
29-MAY-1997	P0597.29	BIS(2-ETHYLHEXYL)PHTHALATE		0.019	0.006
29-MAY-1997	P0597.29	DI-N-BUTYLPHTHALATE		0.039	0.012
29-MAY-1997	P0597.29	DI-N-OCTYLPHTHALATE		0.014	0.004
03-JUN-1997	I0697.03	BENZOIC ACID		0.012	0.004
03-JUN-1997	I0697.03	BIS(2-ETHYLHEXYL)PHTHALATE		0.13	0.039
03-JUN-1997	I0697.03	DI-N-BUTYLPHTHALATE		0.065	0.02
03-JUN-1997	P0697.03	BIS(2-ETHYLHEXYL)PHTHALATE		0.021	0.006
03-JUN-1997	P0697.03	DI-N-BUTYLPHTHALATE		0.034	0.01

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09-JUN-1997	I0697.09	BIS(2-ETHYLHEXYL)PHTHALATE		0.15	0.045
09-JUN-1997	I0697.09	DI-N-BUTYLPHTHALATE		0.038	0.011
09-JUN-1997	I0697.09	DI-N-OCTYLPHTHALATE		0.014	0.004
09-JUN-1997	P0697.09	BIS(2-ETHYLHEXYL)PHTHALATE		0.025	0.008
09-JUN-1997	P0697.09	DI-N-BUTYLPHTHALATE		0.042	0.013
09-JUN-1997	P0697.09	DI-N-OCTYLPHTHALATE		0.02	0.006
17-JUN-1997	I0697.17	BIS(2-ETHYLHEXYL)PHTHALATE		0.098	0.029
17-JUN-1997	I0697.17	DI-N-BUTYLPHTHALATE		0.04	0.012
17-JUN-1997	P0697.17	BIS(2-ETHYLHEXYL)PHTHALATE		0.02	0.006
17-JUN-1997	P0697.17	DI-N-BUTYLPHTHALATE		0.039	0.012
24-JUN-1997	I0697.24	BIS(2-ETHYLHEXYL)PHTHALATE		0.12	0.036
24-JUN-1997	I0697.24	DI-N-BUTYLPHTHALATE		0.023	0.007
24-JUN-1997	P0697.24	BIS(2-ETHYLHEXYL)PHTHALATE		0.037	0.011
24-JUN-1997	P0697.24	BUTYLBENZYLPHTHALATE		0.01	0.003
24-JUN-1997	P0697.24	DI-N-BUTYLPHTHALATE		0.036	0.011
30-JUN-1997	I0697.30	BIS(2-ETHYLHEXYL)PHTHALATE		0.15	0.045
30-JUN-1997	P0697.30	BENZOIC ACID		0.018	0.005
30-JUN-1997	P0697.30	BIS(2-ETHYLHEXYL)PHTHALATE		0.02	0.006
30-JUN-1997	P0697.30	DI-N-BUTYLPHTHALATE		0.025	0.008
02-JUL-1997	DP2570797.02	BIS(2-ETHYLHEXYL)PHTHALATE		0.009	0.003
02-JUL-1997	DP2570797.02	DI-N-BUTYLPHTHALATE		0.017	0.005
09-JUL-1997	DP2570797.09	BIS(2-ETHYLHEXYL)PHTHALATE		20.0	6.0
09-JUL-1997	DP2570797.09	DI-N-BUTYLPHTHALATE		0.89	0.267
14-JUL-1997	50S0797.14	BIS(2-ETHYLHEXYL)PHTHALATE		13.0	10.0
16-JUL-1997	P0797.16	BIS(2-ETHYLHEXYL)PHTHALATE		0.018	0.005
16-JUL-1997	P0797.16	DI-N-BUTYLPHTHALATE		0.013	0.004
22-JUL-1997	I0797.22	BIS(2-ETHYLHEXYL)PHTHALATE		0.1	0.03
22-JUL-1997	I0797.22	DI-N-BUTYLPHTHALATE		0.023	0.007
22-JUL-1997	P0797.22	BIS(2-ETHYLHEXYL)PHTHALATE		0.029	0.009
22-JUL-1997	P0797.22	DI-N-BUTYLPHTHALATE		0.026	0.008
22-JUL-1997	P0797.22	DI-N-OCTYLPHTHALATE		0.009	0.003
24-JUL-1997	DP2570797.24	BIS(2-ETHYLHEXYL)PHTHALATE		0.023	0.007
24-JUL-1997	DP2570797.24	DI-N-BUTYLPHTHALATE		0.03	0.009
16-AUG-1997	50S0897.16	BIS(2-ETHYLHEXYL)PHTHALATE	<	21.0	21.0
19-AUG-1997	257S0897.19	BIS(2-ETHYLHEXYL)PHTHALATE		41.0	9.0
19-AUG-1997	257S0897.19	BUTYLBENZYLPHTHALATE	<	3.2	3.2
19-AUG-1997	257S0897.19	FLUORANTHENE	<	2.1	2.1
19-AUG-1997	257S0897.19	PYRENE	<	1.8	1.8
19-AUG-1997	P0897.19	BIS(2-ETHYLHEXYL)PHTHALATE		0.014	0.014
29-AUG-1997	P0897.29	BIS(2-ETHYLHEXYL)PHTHALATE		0.024	0.024
09-SEP-1997	P0997.09	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.005	0.005
17-SEP-1997	P0997,17	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.007	0.007
17-SEP-1997	P0997.17	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.05	0.05
25-SEP-1997	P0997.25	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.017	0.017
25-SEP-1997	P0997.25	N-NITROSODIPHENYLAMINE		0.06	0.05
02-OCT-1997	P1097.02	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.005	0.005
09-OCT-1997	P1097.09	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.014	0.014
15-OCT-1997	P1097.15	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.008	0.008
21-OCT-1997	P1097.21	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.007	0.007
07-NOV-1997	P1197.07	BIS(2-ETHYLHEXYL)PHTHALATE		0.015	0.01

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Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
12-NOV-1997	P1197.12	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.015	0.015
12-NOV-1997	P1197.12	ISOPHORONE	<	0.007	0.007
18-NOV-1997	P1197.18	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.008	0.008
18-NOV-1997	P1197.18	DIETHYLPHTHALATE	<	0.004	0.004
25-NOV-1997	P1197.25	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.006	0.006
04-DEC-1997	P1297.04	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.008	0.008
08-DEC-1997	P1297.08	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.031	0.031
16-DEC-1997	P1297.16	BIS(2-ETHYLHEXYL)PHTHALATE	<	0.014	0.014
22-DEC-1997	P1297.22	PHENOL	<	0.028	0.028

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Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
03-JAN-1997	I0197.03	ACETONE		0.78	0.234
03-JAN-1997	P0197.03	ACETONE		0.35	0.105
08-JAN-1997	I0197.08	ACETONE		1.3	0.39
08-JAN-1997	P0197.08	ACETONE		0.87	0.261
08-JAN-1997	P0197.08	CARBON TETRACHLORIDE		0.005	0.002
14-JAN-1997	DP2570197.14	ACETONE		1.4	0.42
14-JAN-1997	DP2570197.14	METHYLENE CHLORIDE		0.15	0.045
14-JAN-1997	I0197.14	4-METHYL-2-PENTANONE		0.13	0.039
14-JAN-1997	I0197.14	ACETONE		1.5	0.45
14-JAN-1997	P0197.14	1,1,1-TRICHLOROETHANE		0.26	0.078
14-JAN-1997	P0197.14	1,1-DICHLOROETHANE		0.035	0.01
14-JAN-1997	P0197.14	4-METHYL-2-PENTANONE		0.043	0.013
14-JAN-1997	P0197.14	ACETONE		1.0	0.3
22-JAN-1997	I0197.22	4-METHYL-2-PENTANONE		0.12	0.036
22-JAN-1997	I0197.22	ACETONE		2.4	0.72
22-JAN-1997	P0197.22	4-METHYL-2-PENTANONE		0.047	0.014
22-JAN-1997	P0197.22	ACETONE		3.7	1.11
28-JAN-1997	I0197.28	ACETONE		0.75	0.225
28-JAN-1997	P0197.28	ACETONE		1.3	0.39
04-FEB-1997	I0297.04	ACETONE		3.1	0.93
04-FEB-1997	P0297.04	ACETONE		0.49	0.147
11-FEB-1997	I0297.11	ACETONE		2.1	0.63
11-FEB-1997	I0297.11	BROMOETHANE		0.016	0.005
11-FEB-1997	I0297.11	METHYL IODIDE		0.02	0.006
11-FEB-1997	P0297.11	ACETONE		0.83	0.249
13-FEB-1997	DP2570297.13	ACETONE		0.54	0.162
13-FEB-1997	DP2570297.13	METHYLENE CHLORIDE		0.19	0.057
19-FEB-1997	I0297.19	ACETONE		2.2	0.66
19-FEB-1997	I0297.19	CHLOROFORM		0.012	0.004
19-FEB-1997	P0297.19	ACETONE		0.67	0.201
19-FEB-1997	P0297.19	BENZENE		0.005	0.002
19-FEB-1997	P0297.19	CHLOROFORM		0.015	0.005
25-FEB-1997	I0297.25	ACETONE		1.6	0.48
25-FEB-1997	P0297.25	ACETONE		0.36	0.108
04-MAR-1997	I0397.04	ACETONE		4.0	1.2
04-MAR-1997	P0397.04	ACETONE		1.7	0.51
10-MAR-1997	I0397.10	ACETONE		0.097	0.029
11-MAR-1997	DP2570397.11	ACETONE		0.11	0.033
11-MAR-1997	DP2570397.11	METHYLENE CHLORIDE		0.067	0.02
18-MAR-1997	I0397.18	ACETONE		2.0	0.6
18-MAR-1997	I0397.18	METHYLENE CHLORIDE		0.007	0.002
18-MAR-1997	P0397.18	ACETONE		1.3	0.39
18-MAR-1997	P0397.18	METHYLENE CHLORIDE		0.033	0.01
24-MAR-1997	DP2570397.24	ACETONE		0.31	0.093
24-MAR-1997	DP2570397.24	METHYLENE CHLORIDE		0.092	0.028
25-MAR-1997	I0397.25	ACETONE		1.4	0.42
25-MAR-1997	P0397.25	2-BUTANONE		0.028	0.008
25-MAR-1997	P0397.25	ACETONE		2.5	0.75
01-APR-1997	I0497.01	2-BUTANONE		0.027	0.008
01-APR-1997	I0497.01	ACETONE		1.5	0.45

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Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
01-APR-1997	P0497.01	ACETONE		0.98	0.294
01-APR-1997	P0497.01	CHLOROBENZENE		0.006	0.002
08-APR-1997	I0497.08	1,2,4-TRIMETHYLBENZENE		0.011	0.003
08-APR-1997	I0497.08	ACETONE		3.0	0.9
08-APR-1997	I0497.08	METHYLENE CHLORIDE		0.009	0.003
08-APR-1997	P0497.08	1,2,4-TRIMETHYLBENZENE		0.008	0.002
08-APR-1997	P0497.08	ACETONE		3.2	0.96
08-APR-1997	P0497.08	METHYLENE CHLORIDE		0.006	0.002
09-APR-1997	50S0497.09	2-BUTANONE		0.011	0.003
09-APR-1997	50S0497.09	ACETONE		0.2	0.06
09-APR-1997	50S0497.09	METHYLENE CHLORIDE		0.003	9.0e-4
09-APR-1997	50S0497.09	O,M,P-XYLENE(MIXED)		0.006	0.002
09-APR-1997	50S0497.09	TOLUENE		0.01	0.003
14-APR-1997	DP2570497.14	METHYLENE CHLORIDE		0.077	0.023
14-APR-1997	DP2570497.14	TOLUENE		0.007	0.002
15-APR-1997	I0497.15	ACETONE		0.77	0.231
15-APR-1997	P0497.15	ACETONE		1.1	0.33
29-APR-1997	I0497.29	ACETONE		0.92	0.276
29-APR-1997	I0497.29	STYRENE		0.005	0.002
29-APR-1997	P0497.29	ACETONE		1.4	0.42
29-APR-1997	P0497.29	STYRENE		0.025	0.008
01-MAY-1997	DP2570597.01	ACETONE		0.097	0.029
01-MAY-1997	DP2570597.01	METHYLENE CHLORIDE		0.097	0.017
01-MAY-1997	DP2570597.01	N-BUTYLBENZENE		0.004	0.001
06-MAY-1997	I0597.06	1,1,1-TRICHLOROETHANE		0.003	9.0e-4
06-MAY-1997	I0597.06	ACETONE		2.4	0.72
06-MAY-1997	P0597.06	1,1,1-TRICHLOROETHANE		0.003	9.0e-4
06-MAY-1997	P0597.06	ACETONE		2.2	0.66
06-MAY-1997	P0597.06	N-BUTYLBENZENE		0.003	9.0e-4
14-MAY-1997	DP2570597.14	ACETONE		0.065	0.02
14-MAY-1997	DP2570597.14	CHLOROFORM		0.006	0.002
14-MAY-1997	DP2570597.14	METHYLENE CHLORIDE		0.14	0.042
17-JUN-1997	DP2570697.17	ACETONE		0.23	0.069
17-JUN-1997	DP2570697.17	METHYLENE CHLORIDE		0.024	0.007
17-JUN-1997	DP2570697.17	TOLUENE		0.004	0.001
09-JUL-1997	DP2570797.09	1,1-DICHLOROETHANE		0.004	0.001
09-JUL-1997	DP2570797.09	1,2-DICHLOROBENZENE		0.011	0.003
09-JUL-1997	DP2570797.09	1,3,5-TRIMETHYLBENZENE		0.037	0.011
09-JUL-1997	DP2570797.09	ACETONE		0.024	0.007
09-JUL-1997	DP2570797.09	CARBON TETRACHLORIDE		0.004	0.001
09-JUL-1997	DP2570797.09	O,M,P-XYLENE(MIXED)		0.058	0.017
09-JUL-1997	DP2570797.09	TETRACHLOROETHENE		0.025	0.008
09-JUL-1997	DP2570797.09	TOLUENE		0.009	0.003
14-JUL-1997	50S0797.14	ACETONE		9.2	7.6
14-JUL-1997	50S0797.14	METHYLENE CHLORIDE		5.6	1.9
19-AUG-1997	P0897.19	ACETONE		0.49	0.08
19-AUG-1997	P0897.19	METHYLENE CHLORIDE		0.027	0.02
29-AUG-1997	P0897.29	ACETONE		1.1	0.2
29-AUG-1997	P0897.29	METHYLENE CHLORIDE		0.093	0.05
09-SEP-1997	P0997.09	ACETONE		0.58	0.08

RADIOACTIVE LIQUID WASTE TREATMENT FACILITY

VOC analysis results

01-JAN-1997 - 31-DEC-1997

Sample Date	Sample Number	Species		Concentration (mg/l)	Uncertainty (mg/l)
09-SEP-1997	P0997.09	METHYLENE CHLORIDE		0.03	0.02
17-SEP-1997	P0997.17	ACETONE		0.35	0.08
17-SEP-1997	P0997.17	METHYLENE CHLORIDE		0.027	0.02
25-SEP-1997	P0997.25	ACETONE		0.046	0.02
25-SEP-1997	P0997.25	METHYLENE CHLORIDE	<	0.004	0.004
02-OCT-1997	P1097.02	1,2-DICHLOROETHANE		0.022	0.02
02-OCT-1997	P1097.02	ACETONE		0.35	0.08
02-OCT-1997	P1097.02	METHYLENE CHLORIDE		0.035	0.02
09-OCT-1997	P1097.09	ACETONE	<	0.015	0.015
09-OCT-1997	P1097.09	METHYLENE CHLORIDE	<	0.005	0.005
15-OCT-1997	P1097.15	ACETONE		0.22	0.08
15-OCT-1997	P1097.15	METHYLENE CHLORIDE		0.028	0.02
16-OCT-1997	50S1097.16	METHYLENE CHLORIDE		0.26	0.063
21-OCT-1997	P1097.21	ACETONE		1.6	0.2
21-OCT-1997	P1097.21	METHYLENE CHLORIDE		0.087	0.05
28-OCT-1997	P1097.28	ACETONE		2.0	0.4
28-OCT-1997	P1097.28	METHYLENE CHLORIDE		0.18	0.1
07-NOV-1997	P1197.07	ACETONE		2.0	0.4
07-NOV-1997	P1197.07	METHYLENE CHLORIDE		0.17	0.1
12-NOV-1997	P1197.12	METHYLENE CHLORIDE	<	0.004	0.004
18-NOV-1997	P1197.18	ACETONE		0.75	0.2
18-NOV-1997	P1197.18	METHYLENE CHLORIDE		0.083	0.05
04-DEC-1997	P1297.04	ACETONE		0.66	0.1
04-DEC-1997	P1297.04	METHYLENE CHLORIDE		0.037	0.025
08-DEC-1997	P1297.08	ACETONE		0.32	0.1
08-DEC-1997	P1297.08	METHYLENE CHLORIDE		0.081	0.025
16-DEC-1997	P1297.16	ACETONE		0.8	0.4
16-DEC-1997	P1297.16	METHYLENE CHLORIDE		0.37	0.1
22-DEC-1997	P1297.22	ACETONE		0.63	0.4
22-DEC-1997	P1297.22	METHYLENE CHLORIDE		0.33	0.1

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: September 3, 1998
In Reply Refer To: ESH-18/WQ&H:98-0286
Mail Stop: K497
Telephone: (505) 667-7969

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: SUMMARY OF JULY 31, 1998, MEETING AT LANL AND STATUS REPORT ON RLWTF UPGRADES

Dear Ms. Bustmante:

We would like to take this opportunity to review for you the key points from the July 31, 1998, meeting which you and Mr. John Gillentine (NMED) attended at Los Alamos National Laboratory.

The principal items on the agenda at the July 31, 1998, meeting were the presentations by David Rogers (ESH-18) on the hydrogeology of Mortandad Canyon, and by David Broxton (EES-1) and Pat Longmire (CST-7) on the recent findings from the drilling of wells R-9 and R-12. Plans for the proposed drilling of well R-15 (Mortandad Canyon) were also reviewed. Under the current schedule, drilling at R-15 will begin in September 1998. Please direct any additional questions you may have regarding these presentations to Bob Beers and he will forward them to the appropriate presenter.

Following the above presentations, Neil Williams (ESH-18) described for you and Mr. Gillentine the problems which the Laboratory is currently encountering with SKF, Inc., the vendor for the Phase II biodenitrification equipment. SKF, Inc. is unable to meet its contractual obligations and deliver the required equipment. As a result, due to circumstances beyond the Laboratory's control, completion of the Phase II upgrades has been delayed despite substantial expenditures and the Laboratory's efforts to remain on schedule.

Neil Williams also provided you with a copy of the Laboratory's recent report, "Elimination of Liquid Discharge to the Environment from the TA-50 Radioactive Liquid Waste Treatment Facility" (Moss, D., Williams, N., et al., LA-13452-MS, LANL, June 1998). The report presents conceptual level recommendations for future upgrades to the Radioactive Liquid Waste Treatment Facility (RLWTF) and at the generating sites which would allow the Laboratory to implement a complete reuse or evaporation of the treated radioactive liquid waste (RLW) resulting in a zero liquid discharge of RLW effluent.

The Phase I process upgrades (ultrafiltration and reverse osmosis) to the RLWTF have been installed. Recently, several safety concerns have been identified by the plant's operators which can be corrected through modifications to the Phase I equipment. The Laboratory has determined that in order to minimize potential exposure to radioactive liquids, these modifications should be completed and tested before the Phase I upgrades are placed into services with RLW. As a result, the Phase I upgrades will not be treating RLW until January 1999.

Over the past weeks, DOE and Laboratory management have met to address the Phase II upgrades (nitrate removal) and compliance with state ground water standards. Both DOE and Laboratory management are in agreement that due to the recommendations made in the report, alternatives to biodenitrification should be considered for nitrate removal if they will enable the Laboratory to pursue zero liquid discharge in the near future. As a result, the Laboratory has initiated an engineering study to evaluate the alternatives available to reach both the short-term objective of nitrate compliance and the ultimate goal of zero liquid discharge. The completion date for the Phase II upgrades cannot be projected until this engineering study is completed. Preparation of the study is expected to take six to eight weeks. Most importantly, senior DOE and Laboratory management have made commitments to allocate the resources necessary to provide implementation of nitrate removal at the RLWTF at the earliest possible date.

In closing, we have been asked by senior management at DOE and the Laboratory to request a meeting with management from the NMED Ground Water Bureau. The objective of the meeting would be to discuss the issues presented in this letter and to communicate the Laboratory's commitment to accelerate the completion date for the Phase II upgrades.

Please contact Bob Beers of the Water Quality and Hydrology Group at 667-7969 if you would like further information on these matters.

Sincerely,

Steve Hanson

Steve Hanson
Radioactive Liquid Waste Operations

Sincerely,

Steve Rae

Steven Rae
Water Quality and Hydrology Group

BB/md

Cy: M. Leavitt, NMED/GWQB, Santa Fe, New Mexico
D. Doremus, NMED/GWQB, Santa Fe, New Mexico
J. Davis, NMED/SWQB, Santa Fe, New Mexico
J. Vozella, DOE/LAAO, MS A316
B. Koch, DOE/LAAO, MS A316
T. Baca, EM-DO, MS J591
D. Erickson, ESH-DO, MS K491
K. Hargis, EM/WM, MS J591
N. Williams, ESH-18, MS K497
B. Beers, ESH-18, MS K497
D. Moss, EM/RLW, MS E518
P. Worland, EM/RLW, MS E518
D. Woitte, LC/GL, MS A187
WQ&H File, MS K497
CIC-10, MS A150

P 181 647 999

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Mr. David Gurule, Area Manager
Street & Number
Department of Energy
Post Office, State, & ZIP Code
528 35th Street
Los Alamos, New Mexico 87544
Postage $

State of New Mexico
VIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

PETER MAGGIORE
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 17, 1998

Mr. David Gurule, Area Manager
Department of Energy
528 35th Street
Los Alamos, New Mexico 87544

RE: Letter of Non-Compliance, Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility (RLWTF), DP-1132

Dear Mr. Gurule:

The New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) has determined that the Los Alamos National Laboratory (LANL) Radioactive Liquid Waste Treatment Facility (RLWTF) is not operating in compliance with the Water Quality Control Commission (WQCC) Regulations. Based on the WQCC discharge plan application that was submitted by LANL, August 16, 1996 and subsequent correspondence between LANL and the GWQB, NMED has determined that the RLWTF is in violation of WQCC Regulations 3104, 3106.A, and 3106.C. The violations and corrective actions required by LANL are described below.

1. In accordance with WQCC Regulation 3106.A, NMED notified LANL, April 3, 1996, that a ground water discharge plan was required for discharges from the RLWTF and allowed LANL to discharge without an approved discharge plan for 240 days. A discharge plan was submitted on August 16, 1996 and NMED has allowed LANL to continue discharging without an approved plan based on requests for extensions to conduct pilot studies and implement proposed upgrades. LANL's letter dated September 3, 1998 indicates that they cannot meet previous extension deadlines and has requested that further engineering studies be conducted before a completion date is proposed. WQCC Regulations 3104 and 3106.A have been violated by LANL's discharge from the RLWTF beyond the allowed time frames without an approved WQCC discharge plan.

   In order to comply with WQCC regulations 3104 and 3106.A, LANL must submit within 60 days of receipt of this letter, an operational plan for the discharges from RLWTF which demonstrates that WQCC Regulation 3103 standards will be met. A final extension for LANL to discharge without an approved discharge plan will be granted for 180 days from your receipt of this letter. The only extension to this deadline will be made if a public hearing on DP-1132 is granted by the secretary.

2. WQCC Regulation 3106.C, requires that discharge plans set forth in detail the methods and or techniques the discharge proposes to use or processes expected to naturally occur which will ensure compliance with these regulations. WQCC Regulation 3106.C has been violated by LANL's withdrawal, in its September 3, 1998 letter, of its selection of a biodenitrification unit as the method to ensure compliance with WQCC Regulation 3103. Because LANL has not set forth in detail an operational plan for discharges from the RLWTF, NMED does not have a complete discharge plan application to consider for approval.

   In order to comply with WQCC regulation 3106.C, LANL must submit within 60 days an operational plan that sets forth in detail the methods or techniques which will ensure that the the discharges from RLWTF will meet WQCC Regulation 3103 standards.

Failure to comply with this letter and any other WQCC Regulation may result in the issuance of a formal notice of violation, fines, a compliance order, or the filing of an action in district court.

This letter is NMED's attempt to gain your voluntary compliance. If you have any questions regarding this letter, please call me at (505) 827-2945 or Phyllis Bustamante at 827-0166.

Sincerely,

Dale M Doremus

Dale M. Doremus, Program Manager
Ground Water Pollution Prevention Section

DMD:PAB/pab

cc: James Bearzi, District Manager, NMED District II
Glen Saums, SWQB
John Kieling, HRMB
DOE, Oversight Bureau

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: October 8, 1998
In Reply Refer To: ESH-18/WQ&H:98-0356
Mail Stop: K497
Telephone: (505) 665-1859

RECEIVED
OCT 13 1998
OUND WATER BUR

Ms. Dale M. Doremus
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: LETTER OF NON-COMPLIANCE, LOS ALAMOS NATIONAL LABORATORY, RADIOACTIVE LIQUID WASTE TREATMENT FACILITY (RLWTF), DP-1132

Dear Ms. Doremus:

The Laboratory is in receipt of your September 17, 1998, letter to Mr. David Gurule (DOE) in which you determined that the Laboratory's Radioactive Liquid Waste Treatment Facility (RLWTF) is not operating in compliance with the N.M. Water Quality Control Commission Regulations. The DOE officially received this letter on September 22, 1998.

In response to this determination, technical staff members from the RLWTF and the Laboratory's Water Quality and Hydrology Group met with Ms. Phyllis Bustamante of your staff. During this meeting, Ms. Bustamante outlined the specific requirements of the operational plan which you have requested. In addition, Laboratory personnel provided Ms. Bustamante with a progress report on the engineering study that is currently underway to evaluate the alternatives available to reach the short-term objective of nitrate compliance and the long-term objective of zero discharge.

Presently, the Laboratory is in the process of preparing the revised operational plan that you have requested. You may expect receipt of this plan on or before November 23, 1998, in accordance with your request. Please contact me at 665-1859 or Bob Beers of our group at 667-7969 if you need any additional information on the RLWTF at this time.

Sincerely,

Steven Rae

Steven Rae
Group Leader
Water Quality and Hydrology Group

SR/em

Cy: P. Bustamante, NMED/GWQB, Santa Fe, New Mexico
J. Vozella, DOE/LAAO, MS A316
B. Koch, DOE/LAAO, MS A316
T. Baca, EM-DO, MS J591
K. Hargis, EM/WM, MS J591
S. Hanson, EM/RLW, MS E518
P. Worland, EM/RLW, MS E518
B. Matthews, NMT-DO, MS E500
S. Schrieber, NMT-2, MS E511
S. Yarbro, NMT-2, MS E511
D. Erickson, ESH-DO, MS K491
N. Williams, ESH-18, MS K497
B. Beers, ESH-18, MS K497
WQ&H File, MS K497
CIC-10, MS A150

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 17, 1998

Mr. David Gurule, Area Manager
Department of Energy
528 35th Street
Los Alamos, New Mexico 87544

RE: Letter of Non-Compliance, Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility (RLWTF), DP-1132

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This letter is NMED's attempt to gain your voluntary compliance. If you have any questions regarding this letter, please call me at (505) 827-2945 or Phyllis Bustamante at 827-0166.

Sincerely,

Dale M Doremus

Dale M. Doremus, Program Manager
Ground Water Pollution Prevention Section

DMD:PAB/pab

cc: James Bearzi, District Manager, NMED District II
Glen Saums, SWQB
John Kieling, HRMB
DOE, Oversight Bureau

EM/RLW Environmental Management Radioactive Liquid Waste Group

1997 RLWTF Annual Report

DRAFT

Prepared By:
Rich Hassman — Date

And
Robert Harris — Date

Reviewed By:
Debra Hall — Date

Wm. David Moss — Date

Amy MacDonald — Date

Approved By:
Steven W. Hanson — Date

Table of Contents

Appendices

Appendix A

Appendix B

Chapter 1

Flow Summary

DRAFT

TA-50 WM-1

FLOW SUMMARY (megaliters)

JAN-1997 through DEC-1997

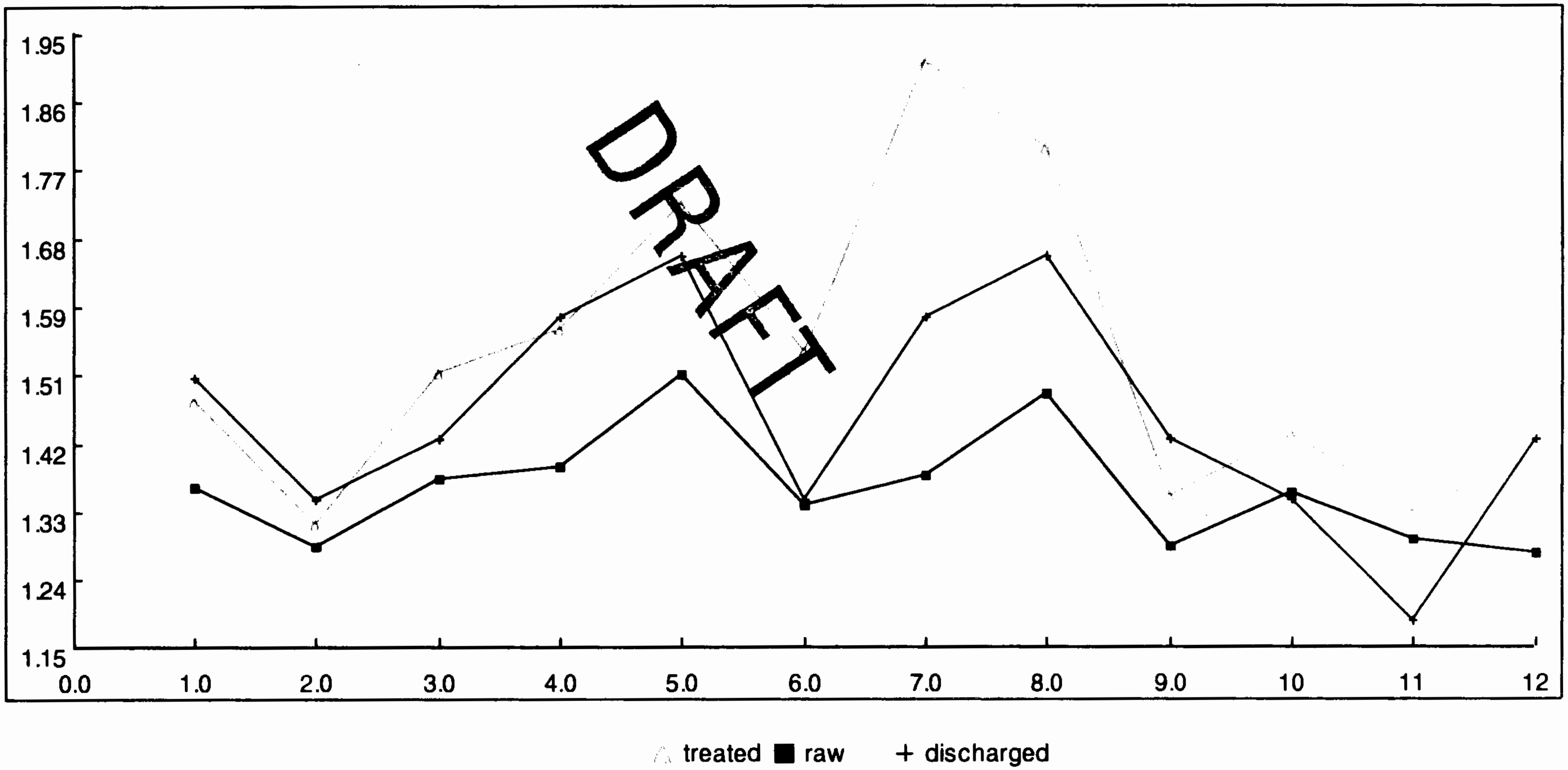
DRAFT

Date	Influent	TA-21 Transfer	Room 60 caustic	Room 60 acid	Discharged
JAN-1997	1.358	0.036			1.502
FEB-1997	1.283	0.082			1.344
MAR-1997	1.371	0.082	0.001	0.013	1.423
APR-1997	1.387	0.16			1.581
MAY-1997	1.505	0.167			1.66
JUN-1997	1.337	0.073	0.002		1.344
JUL-1997	1.376	0.172			1.581
AUG-1997	1.481	0.16		0.004	1.66
SEP-1997	1.283	0.089		0.007	1.423
OCT-1997	1.351	0.0		0.012	1.344
NOV-1997	1.[illegible]92	0.007			1.186
DEC-1997	1.27[illegible]	0.015			1.423
TOTAL	16.299	1.045	0.003	0.036	17.472

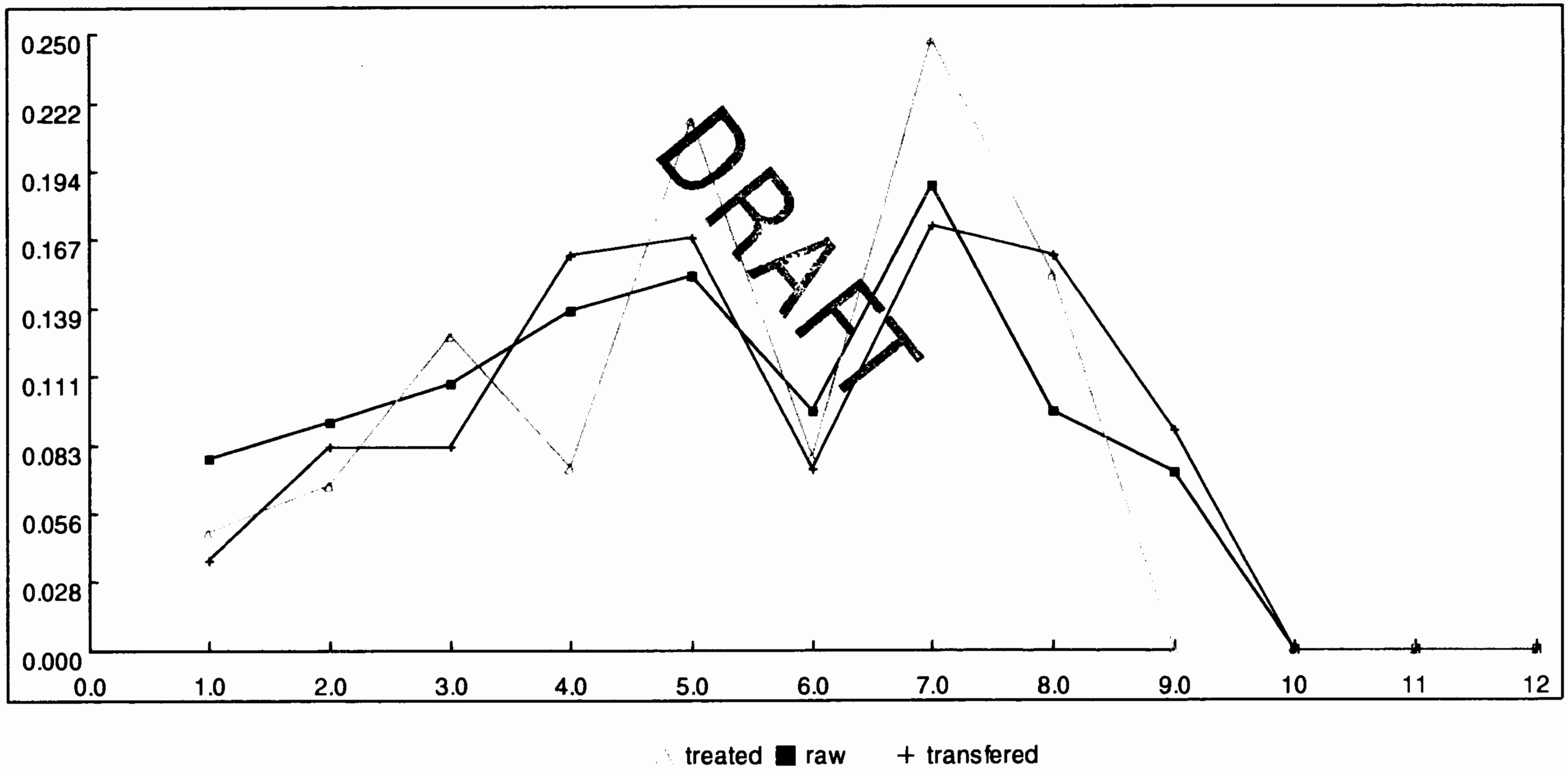
Chapter 2

Flow Charts

TA50 monthly flows in megaliters.
JAN-1997 through DEC-1997



TA21 monthly flows in megaliters.
JAN-1997 through DEC-1997



Chapter

3

Gross Alpha Removal

TA-50 WM-1

Gross Alpha Removal

DATE	RAW (Ci)	RAW (gigaBq)	FINAL (Ci)	FINAL (gigaBq)	REMOVAL FACTOR 100x(INF - EFF)/INF
JAN-1997	0.058	2.136	3.785e-4	0.014	99.344
FEB-1997	0.009	0.349	4.278e-4	0.016	95.361
MAR-1997	0.035	1.305	4.77[illegible]e-4	0.018	98.645
APR-1997	0.06	2.204	4.07[illegible]-4	0.015	99.317
MAY-1997	0.313	11.583	4.686e-4	0.017	99.85
JUN-1997	0.141	5.229	7.435e-4	0.028	99.474
JUL-1997	0.099	3.657	6.2e-4	0.023	99.373
AUG-1997	0.056	2.08	5.397e-4	0.02	99.04
SEP-1997	0.018	0.667	2.178e-4	0.008	98.792
OCT-1997	0.002	0.09	2.378e-4	0.009	90.263
NOV-1997	0.008	0.29	2.346e-4	0.009	97.007
DEC-1997	0.02	0.751	3.378e-4	0.012	98.336
TOTAL	0.82	30.343	0.005	0.189	99.378

Volume of Flow:

Treated = 18334133.0 liters

Final = 17471848.0 liters

Chapter 4

Radionuclide Summary

DRAFT

TA-50 WM-1

RADIONUCLIDE SUMMARY

JAN-1997 through DEC-1997

	RAW Average	Maximum	Minimum	Count	Total (Ci)		FINAL Average	Maximum	Minimum	Count	Total (Ci)
ALPHA	6.2e-8	2.7e-7	5.8e-9	12.0	1.011		3.27e-10	6.2e-10	1.6e-10	12.0	0.006
Am-241	1.584e-8	6.7e-8	9.9e-10	12.0	0.258		1.309e-10	2.3e-10	5.8e-11	12.0	0.002
BETA	2.828e-9	7.6e-9	3.2e-11	12.0	0.046		4.927e-10	1.4e-9	7.0e-11	12.0	0.009
Cs-137	1.262e-10	7.0e-10	3.0e-10	12.0	0.002		1.52e-10	8.0e-10	3.0e-10	12.0	0.003
GAMMA	1.491e-9	1.0e-8	3.0e-9	12.0	0.024		6.516e-10	4.0e-9	3.0e-9	12.0	0.011
Na-22	No Data			0.0			7.24e-11	8.0e-10	8.0e-10	1.0	0.001
Pu-238	1.263e-8	2.4e-8	2.9e-10	12.0	0.206		7.663e-11	1.3e-10	2.1e-11	12.0	0.001
Pu-239	2.135e-8	9.0e-8	3.7e-10	12.0	0.348		4.576e-11	1.2e-10	2.0e-11	12.0	7.994e-4
Sr-89	1.316e-10	9.0e-10	1.0e-11	12.0	0.002		5.34e-11	3.0e-10	1.0e-11	12.0	9.33e-4
Sr-90	4.796e-11	1.4e-10	4.0e-12	12.0	7.81[illegible]e-4		2.712e-11	6.0e-11	2.0e-12	12.0	4.739e-4
TOTAL_PLUTONIUM	3.398e-8	1.14e-7	6.6e-10	12.0	0.554		1.224e-10	2.5e-10	6.0e-11	12.0	0.002
TRITIUM	No Data			0.0			8.103e-8	2.4e-7	1.1e-10	12.0	1.416
U-234	4.094e-10	2.1e-9	4.7e-12	12.0	0.00[illegible]		3.524e-12	1.2e-11	2.5e-12	12.0	6.157e-5
U-235	9.104e-11	2.0e-10	2.6e-11	12.0	0.001		3.64e-13	1.6e-12	2.0e-13	12.0	6.359e-6

Volume of Flow: Influent = 1[illegible]298612.0 liters Final = 17471848.0 liters

Chapter 5

Mineral Summary

TA-50 WM-1

MINERAL SUMMARY

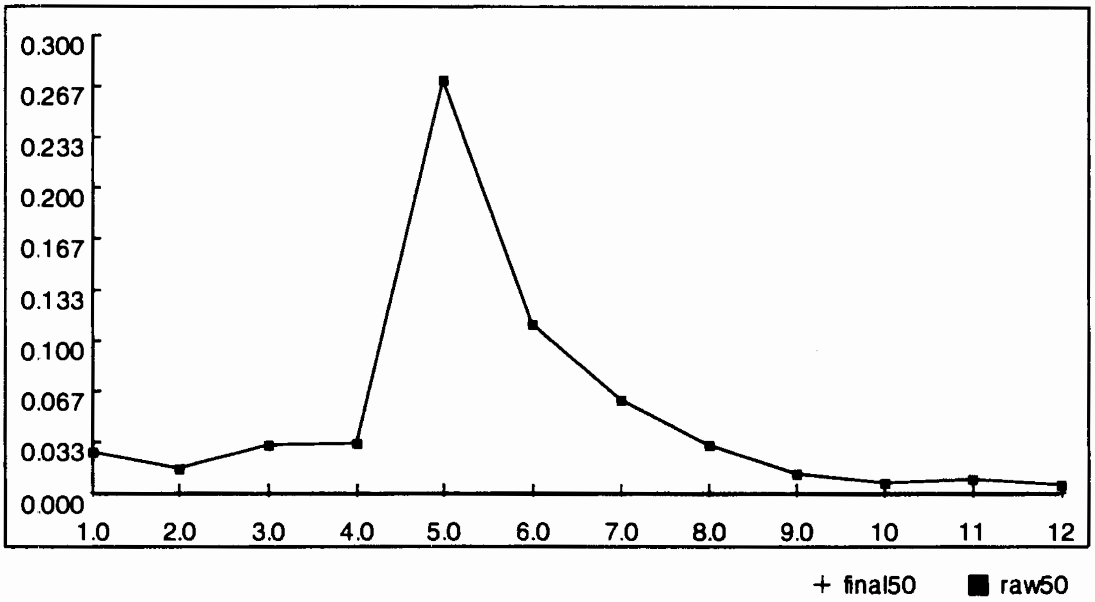
JAN-1997 through DEC-1997

	RAW Average	Maximum	Minimum	Count	Total (KG)	FINAL Average	Maximum	Minimum	Count	Total (KG)
ALKALINITY-MO	33.781	52.0	16.0	12.0	550.581	285.149	520.0	144.0	12.0	4982.085
ALKALINITY-P	ldl	ldl	ldl	12.0	ldl	ldl	ldl	ldl	12.0	ldl
ALUMINUM	0.77	2.33	0.29	12.0	12.543	0.181	0.5	0.05	12.0	3.17
AMMONIA-N	3.866	7.32	2.46	12.0	63.018	3.779	7.26	1.05	12.0	66.032
ARSENIC	0.002	0.007	1.0e-6	11.0	0.031	8.96e-4	0.002	1.0e-6	11.0	0.016
BARIUM	0.065	0.23	0.033	12.0	1.058	0.015	0.024	0.008	12.0	0.261
BERYLLIUM	0.002	0.008	0.006	12.0	0.026	5.566e-4	0.003	0.003	12.0	0.01
BORON	0.24	0.49	0.095	12.0	3.918	0.181	0.39	0.084	12.0	3.163
CADMIUM	0.001	0.003	0.002	12.0	0.022	0.003	0.021	0.002	12.0	0.049
CALCIUM	17.864	45.0	10.0	12.0	291.161	117.454	208.0	71.0	12.0	2052.135
CHLORIDE	30.016	45.0	15.7	12.0	489.226	51.986	101.0	21.8	12.0	908.291
COBALT	0.002	0.007	0.003	12.0	0.038	0.001	0.005	0.003	12.0	0.025
COD	58.361	71.0	30.0	12.0	951.195	30.778	38.0	24.0	12.0	537.753
CONDUCTIVITY	420.726	479.0	290.0	12.0		1325.919	2500.0	860.0	12.0	
COPPER	0.258	0.36	0.047	12.0	4.209	0.101	0.14	0.076	12.0	1.763
CYANIDE	9.425e-4	0.01	0.01	11.0	0.015	0.003	0.03	0.01	12.0	0.056
FLUORIDE	1.019	1.66	0.69	12.0	16.615	2.026	3.47	1.28	12.0	35.396
HARDNESS	61.784	132.543	35.265	12.0	1006.996	295.651	520.611	182.64	12.0	5165.574
IRON	1.71	5.6	0.4	12.0	27.867	0.08	0.15	0.04	12.0	1.392
LEAD	0.06	0.12	0.03	12.0	0.982	0.02	0.022	0.02	12.0	0.352
MAGNESIUM	4.171	4.9	2.5	12.0	67.986	0.575	1.3	0.21	12.0	10.051
MERCURY	0.405	3.8	0.001	10.0	6.60[illegible]	0.046	0.3	2.0e-4	10.0	0.81
NICKEL	0.263	1.1	0.043	12.0	4.28	0.041	0.082	0.02	12.0	0.724
NITRATE-N	23.149	26.5	15.6	12.0	377.304	70.178	172.0	18.9	12.0	1226.136
NITRITE-N	0.07	0.46	0.03	12.0	1.135	0.479	1.75	0.05	12.0	8.376
PHOSPHORUS	2.436	3.49	1.[illegible]	12.0	39.705	0.355	0.69	0.12	12.0	6.197
POTASSIUM	6.028	12.0	2.7	12.0	98.251	28.173	92.0	4.9	12.0	492.232
SELENIUM	1.653e-4	0.002	0.002	11.0	0.003	1.629e-4	0.002	0.002	11.0	0.003
SI	ldl	ldl	ldl	0.0	ldl	ldl	ldl	ldl	0.0	ldl
SILICA_DIOXIDE	87.129	83.0	72.0	12.0	1420.089	50.887	73.0	25.0	12.0	889.088
SILVER	0.021	0.049	0.008	12.0	0.339	0.003	0.004	0.004	12.0	0.059
SODIUM	49.455	66.0	30.1	12.0	806.042	150.674	370.0	45.0	12.0	2632.557
SULFATE	36.37	97.0	9.0	12.0	592.773	54.406	87.0	30.9	12.0	950.571
TDS	330.691	642.0	120.0	11.0	5389.804	765.086	1650.0	586.0	11.0	13367.463
THALLIUM	0.009	0.1	0.1	12.0	0.147	0.009	0.1	0.1	12.0	0.15
TOTAL_CATIONS	3.689	4.28	2.3	12.0		12.669	23.8	1.08	12.0	
TOTAL_CHROMIUM	0.066	0.12	0.008	12.0	1.083	0.006	0.009	0.003	12.0	0.101
TSS	31.469	280.0	3.0	12.0	512.897	3.362	16.0	1.0	9.0	58.74
URANIUM	19.155	90.0	1.0e-4	12.0	312.205	1.465	7.8	1.3e-5	12.0	25.602
VANADIUM	0.011	0.011	0.006	12.0	0.176	0.007	0.012	0.004	12.0	0.129
ZINC	0.19	0.37	0.096	12.0	3.094	0.053	0.09	0.05	12.0	0.934
pH	7.763	7.5	6.28	12.0		7.77	10.1	6.8	12.0	

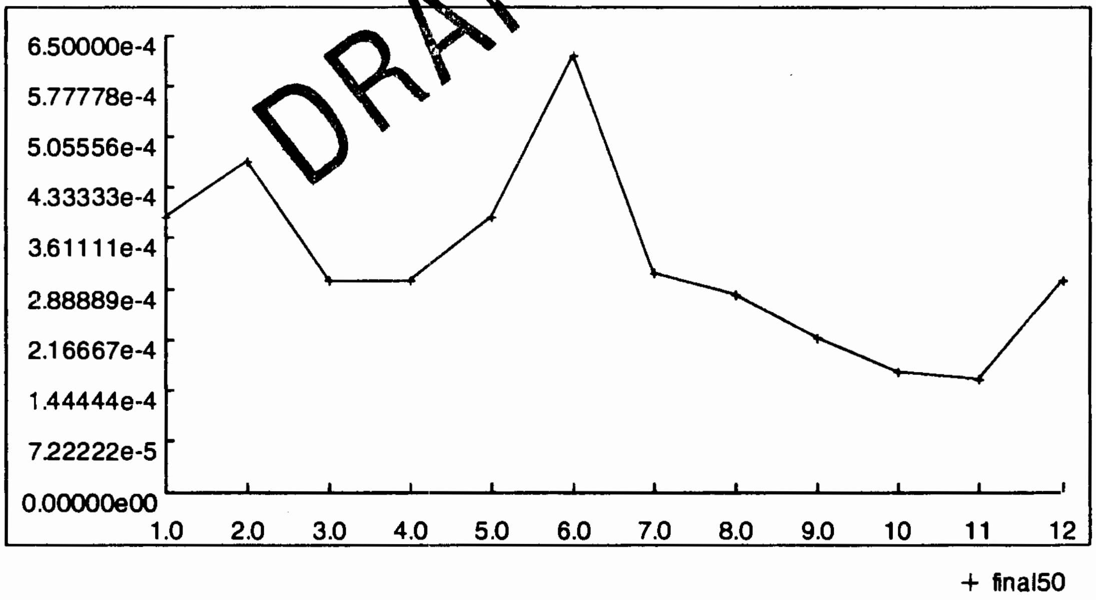
Volume of Flow: Influent = 16298612.0 liters Final = 17471848.0 liters

Chapter 6

Concentration Charts

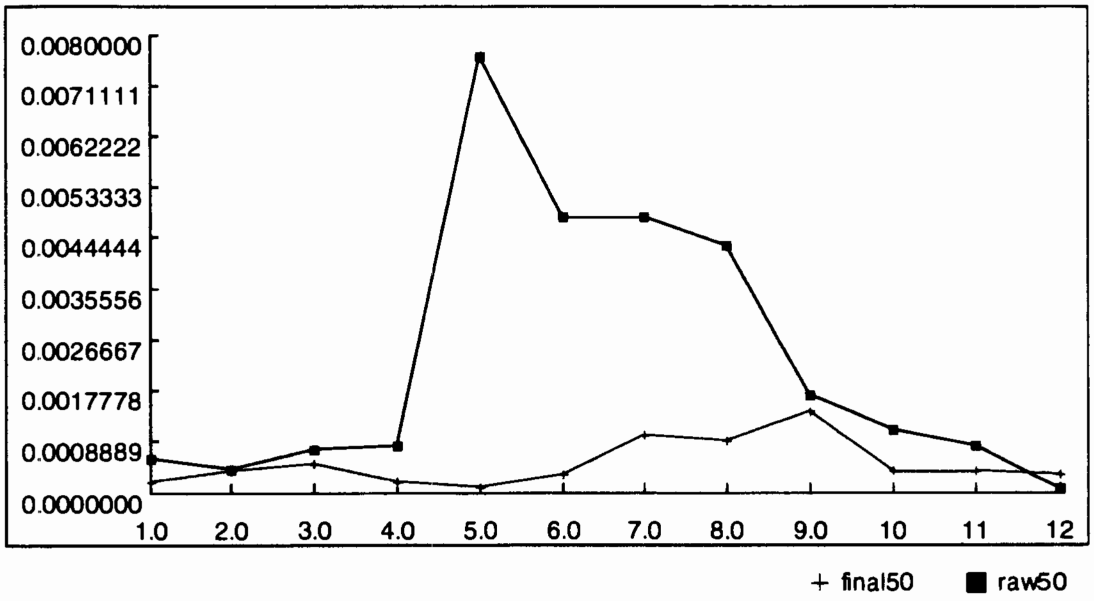


ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997

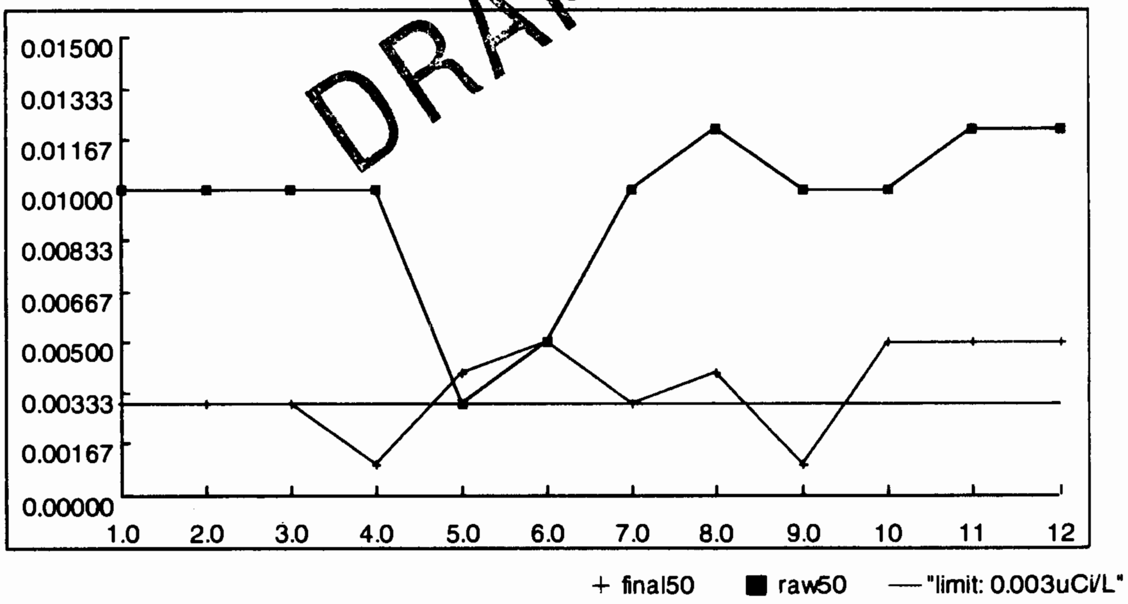


ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997

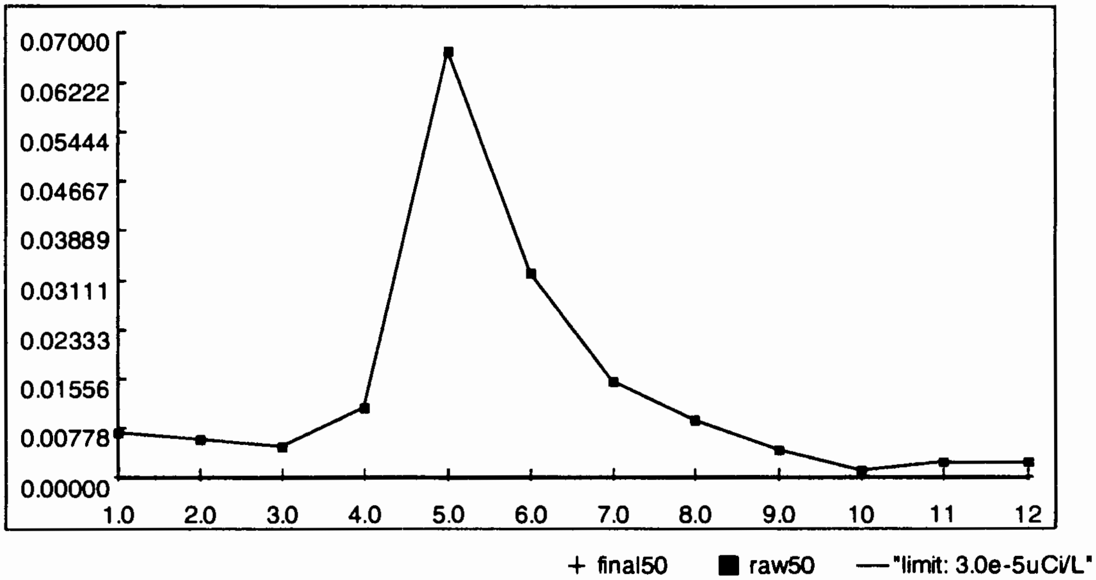
BETA concentration (uCi/L).
JAN-1997 through DEC-1997



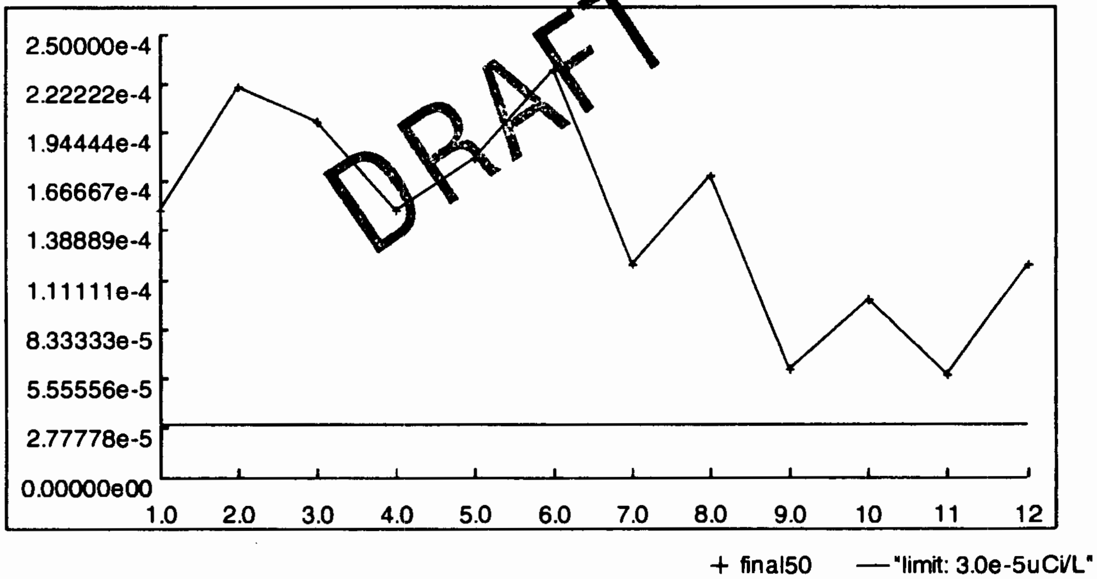
GAMMA concentration (uCi/L).
JAN-1997 through DEC-1997

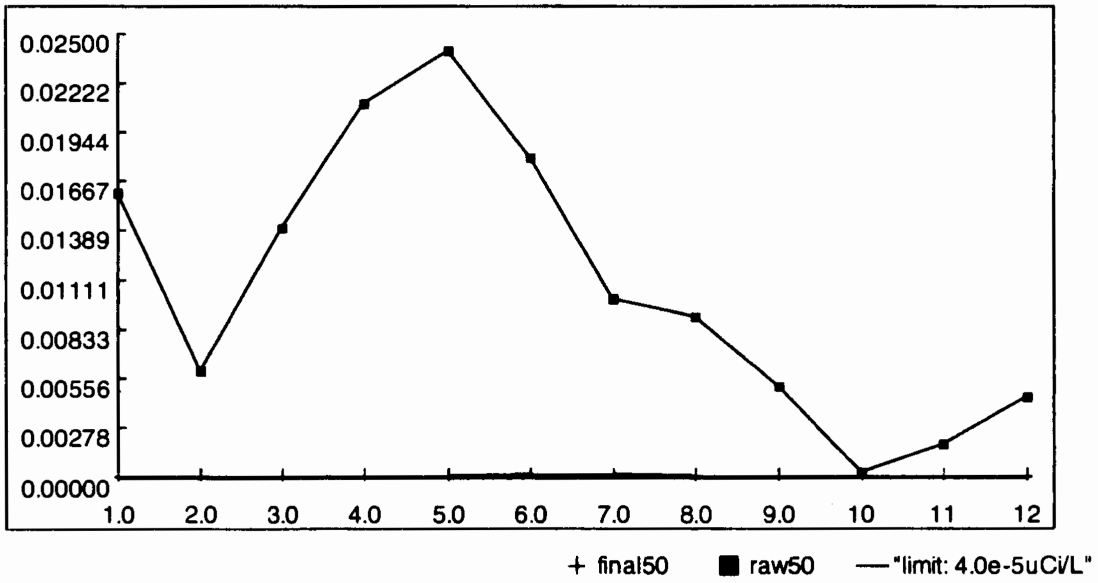


Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997

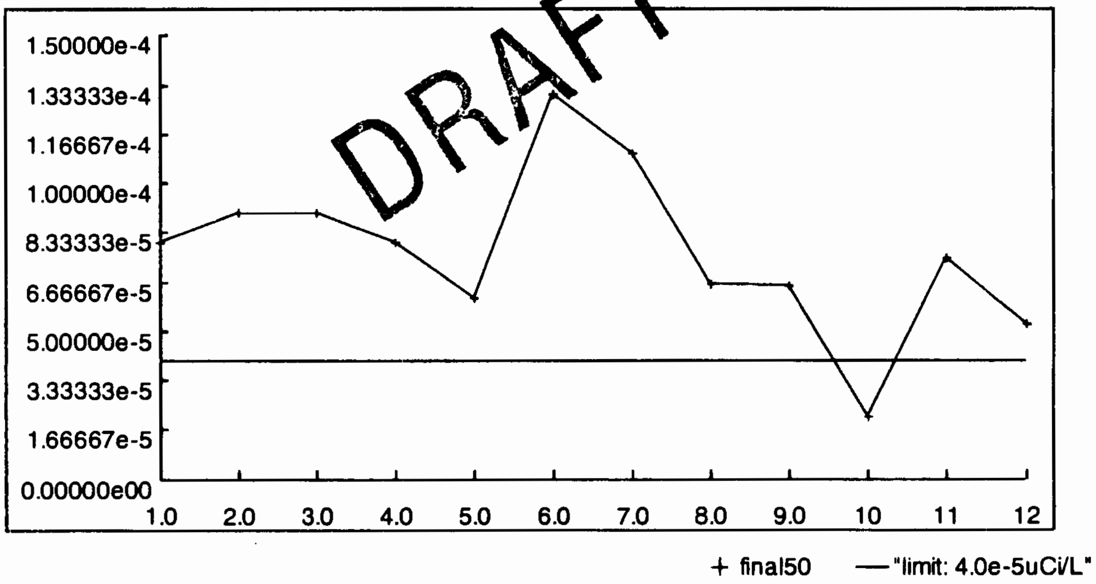


Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997

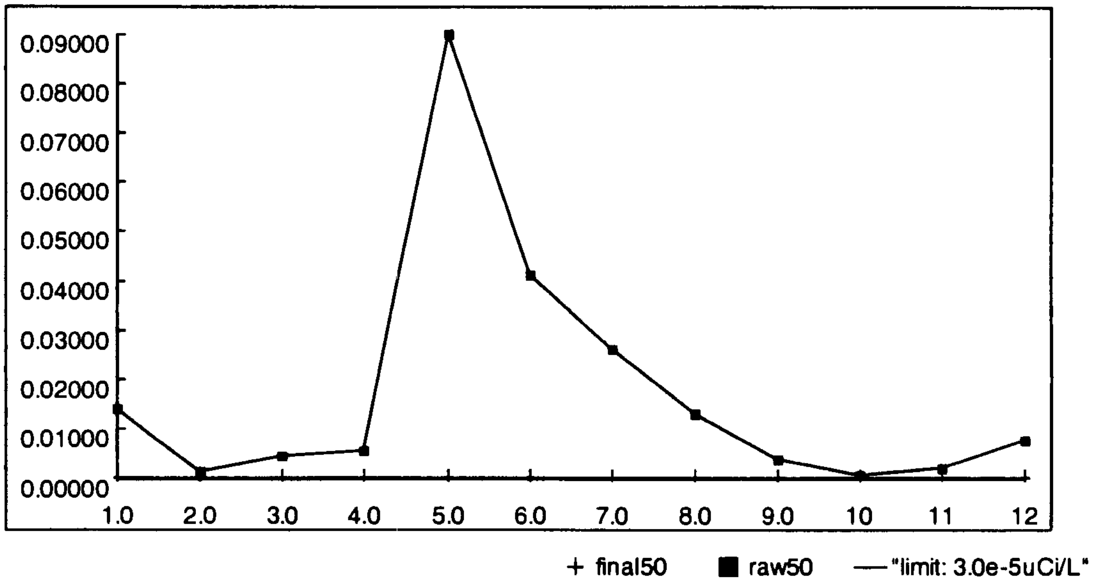




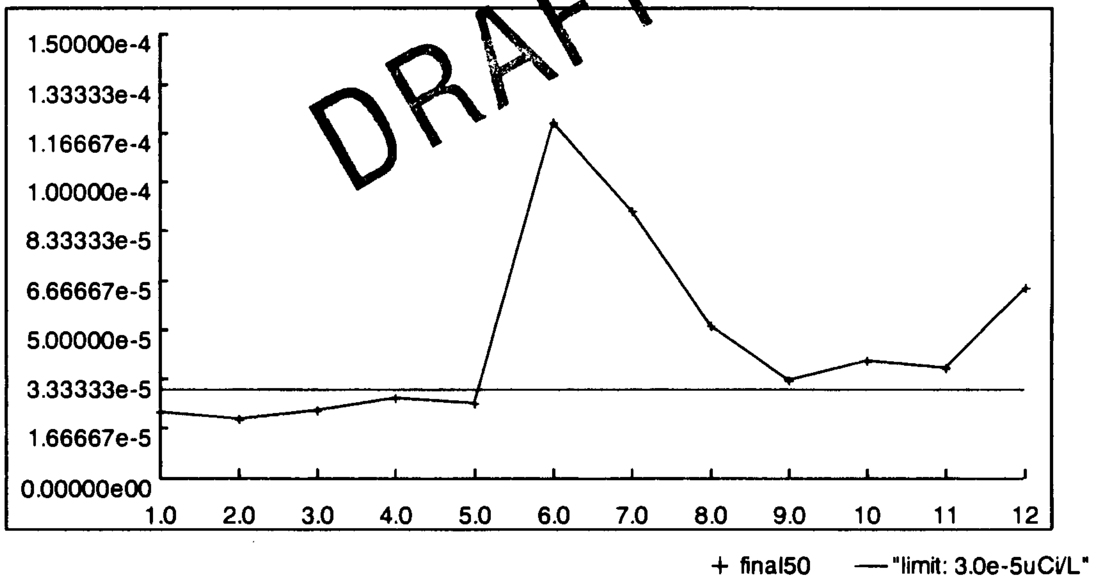
Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997



Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997

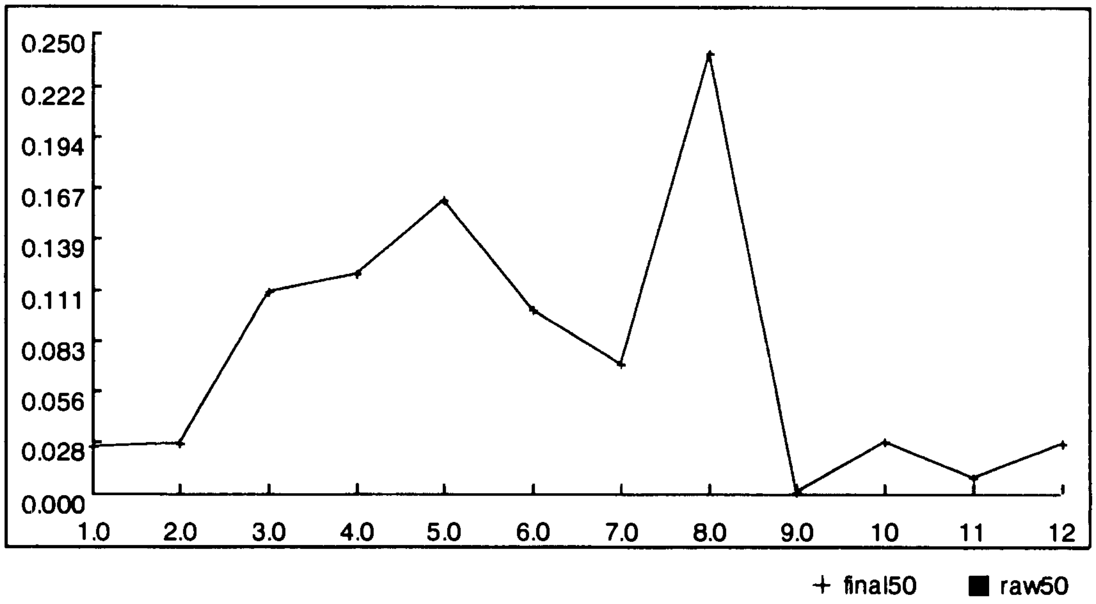


Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997

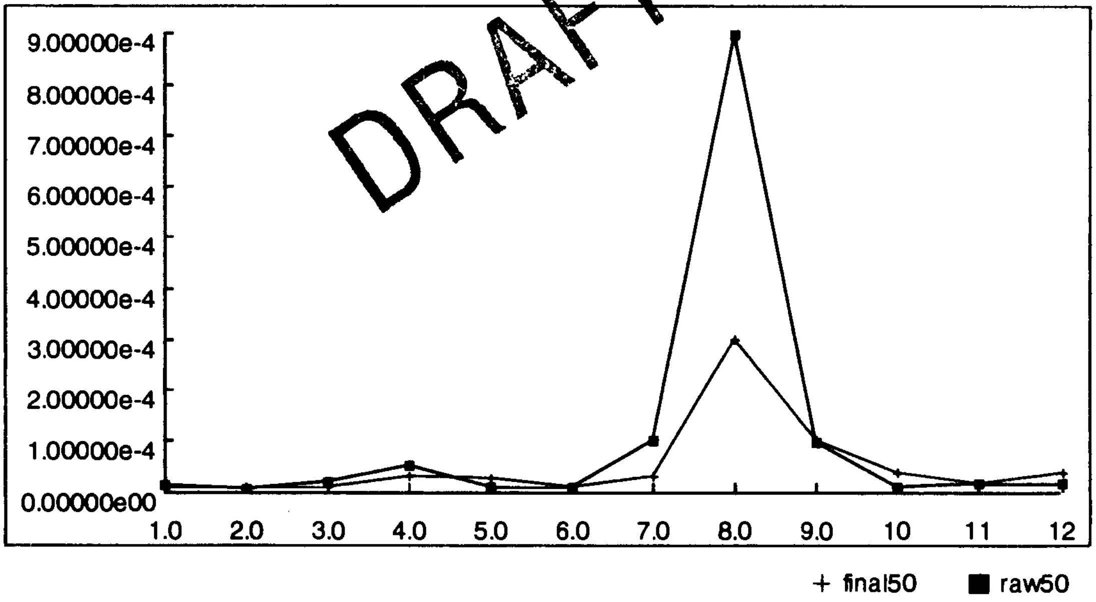


Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997

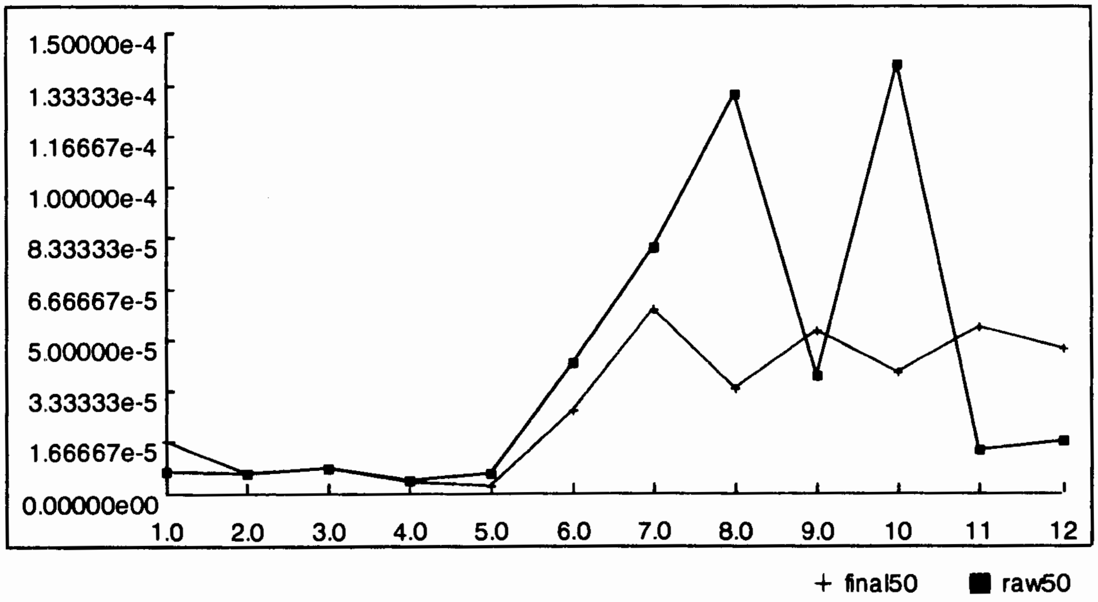
TRITIUM concentration (uCi/L).
JAN-1997 through DEC-1997



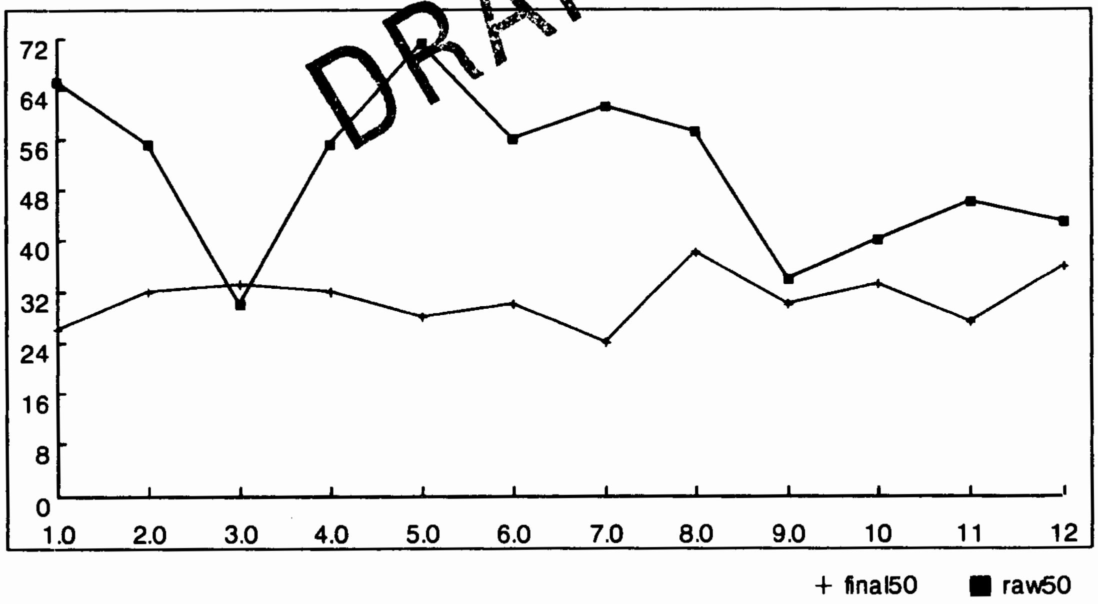
Sr-89 concentration (uCi/L).
JAN-1997 through DEC-1997



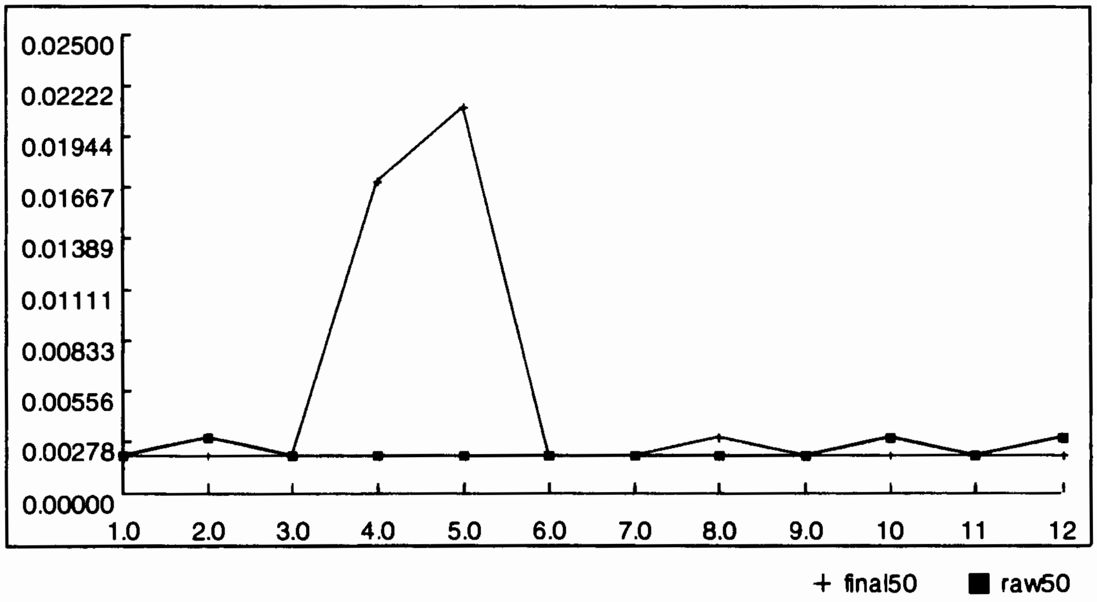
Sr-90 concentration (uCi/L).
JAN-1997 through DEC-1997



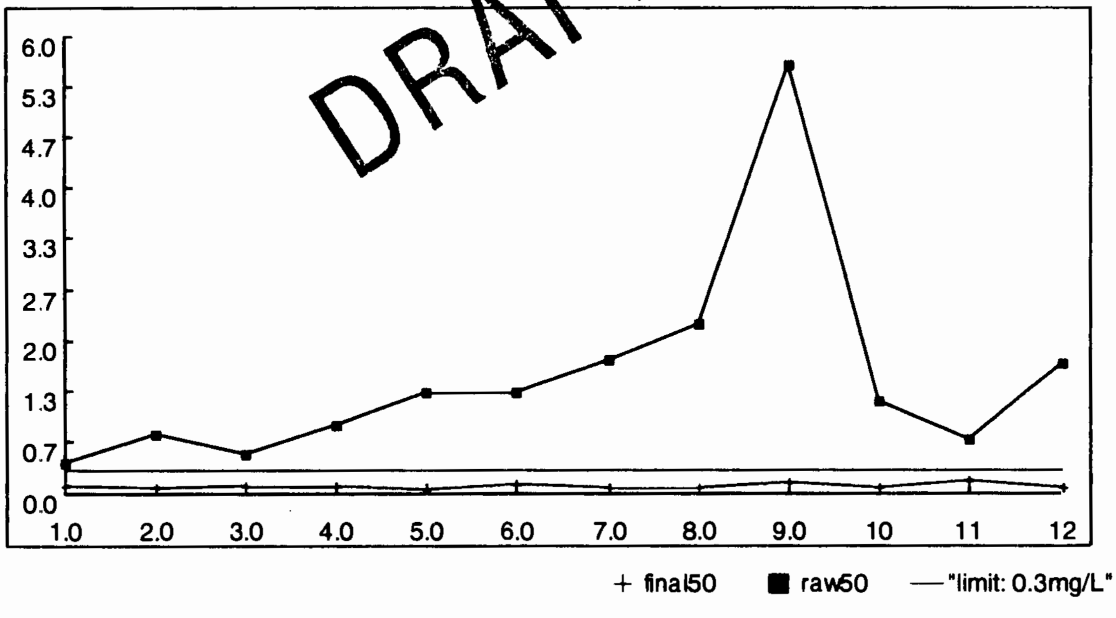
COD concentration (mg/L).
JAN-1997 through DEC-1997



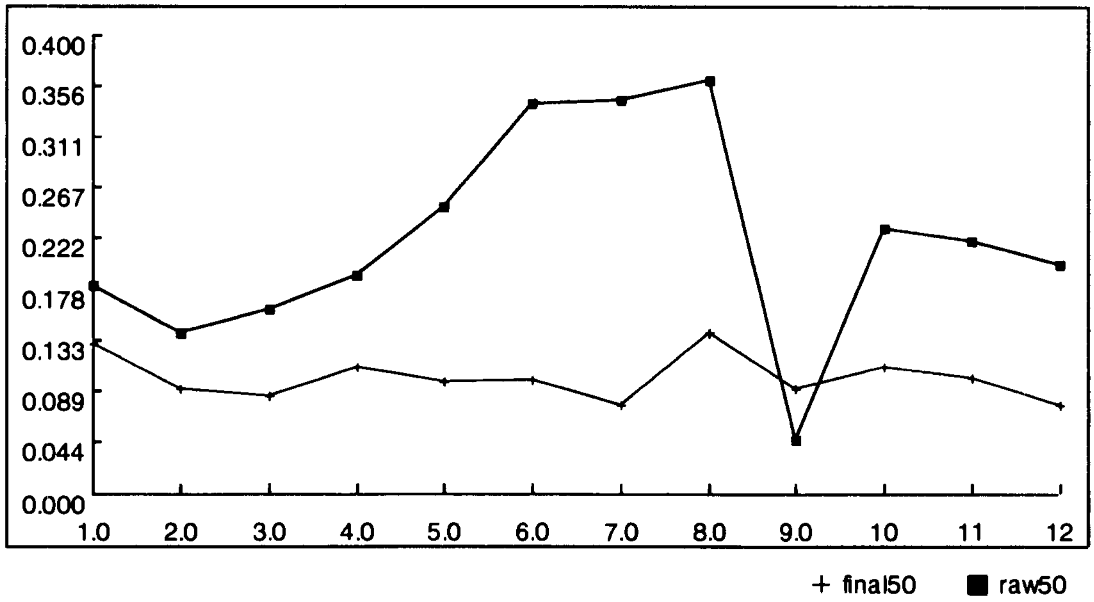
CADMIUM concentration (mg/L).
JAN-1997 through DEC-1997



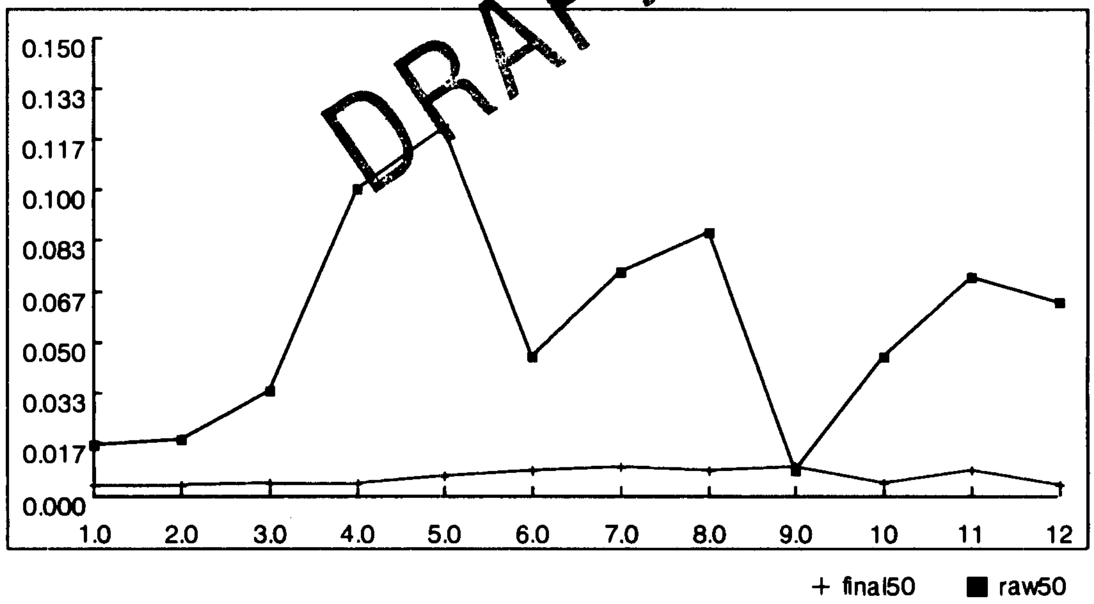
IRON concentration (mg/L).
JAN-1997 through DEC-1997



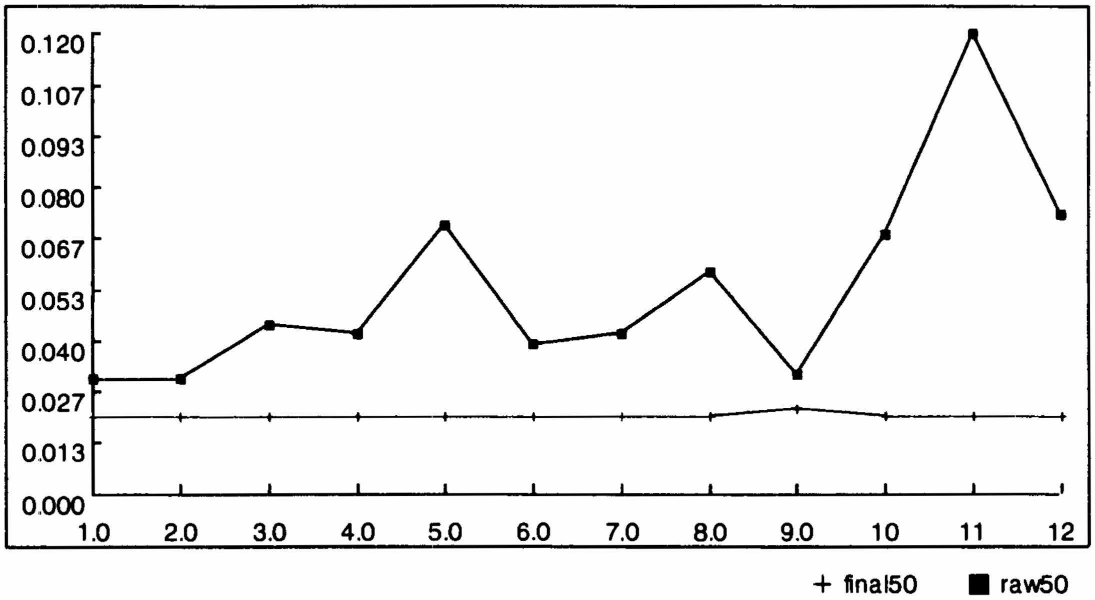
COPPER concentration (mg/L).
JAN-1997 through DEC-1997



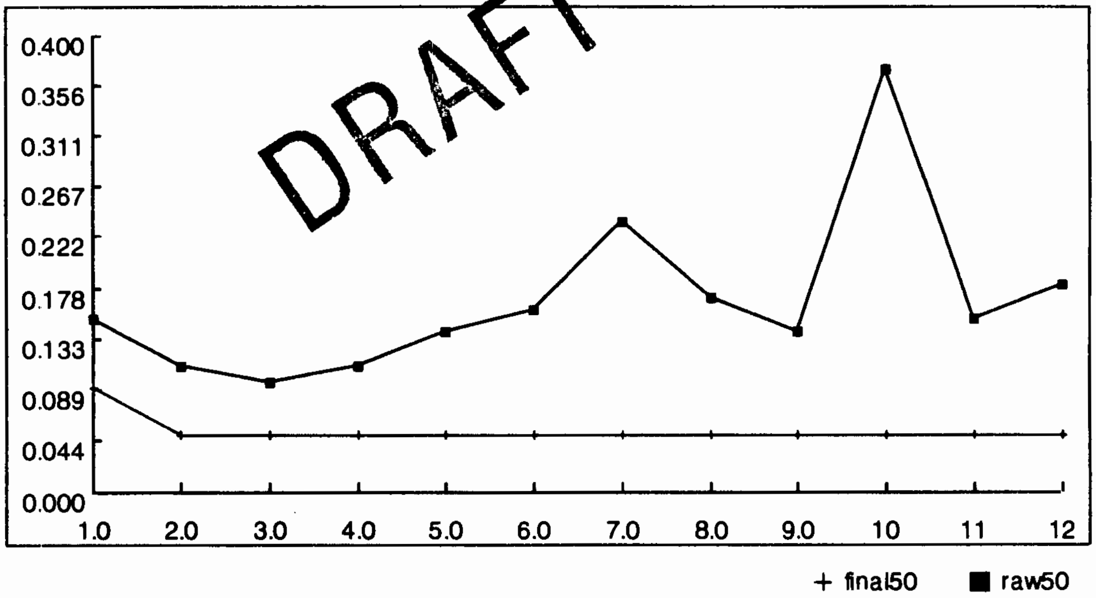
TOTAL_CHROMIUM concentration (mg/L).
JAN-1997 through DEC-1997



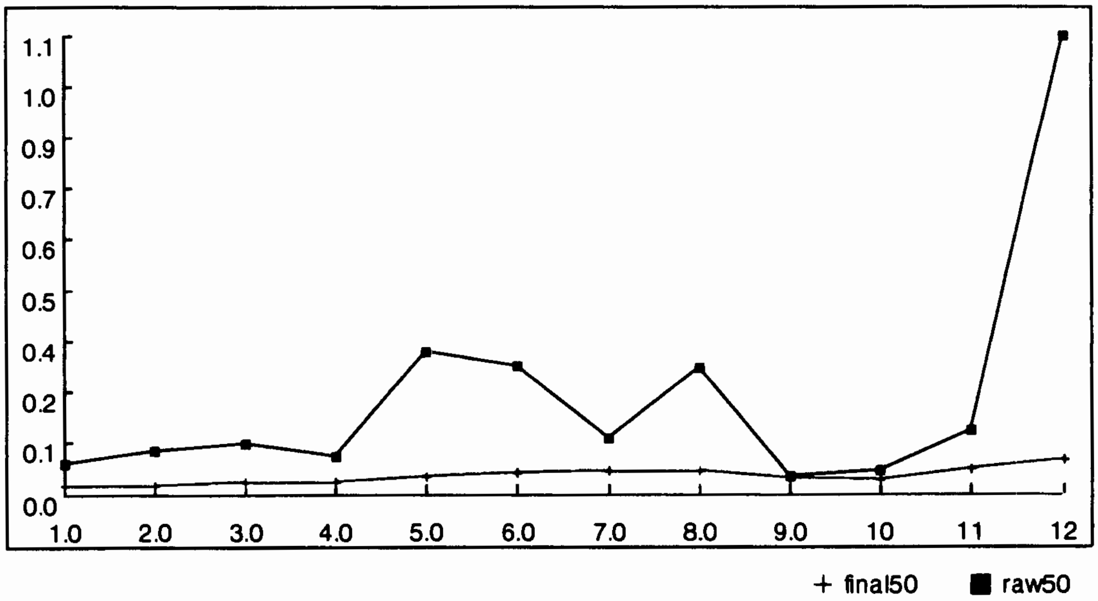
LEAD concentration (mg/L).
JAN-1997 through DEC-1997



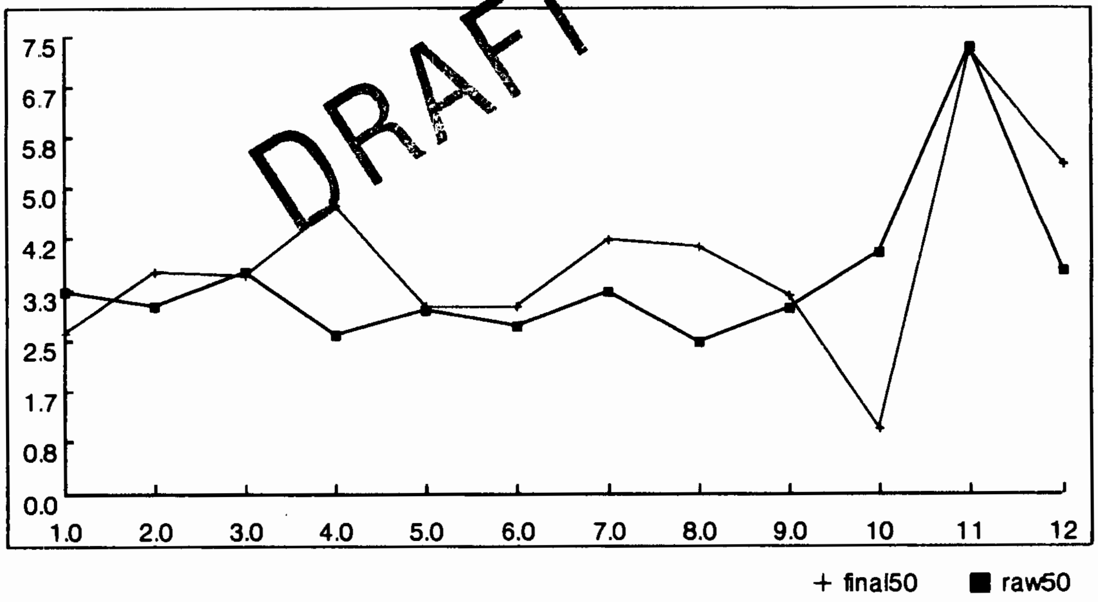
ZINC concentration (mg/L).
JAN-1997 through DEC-1997



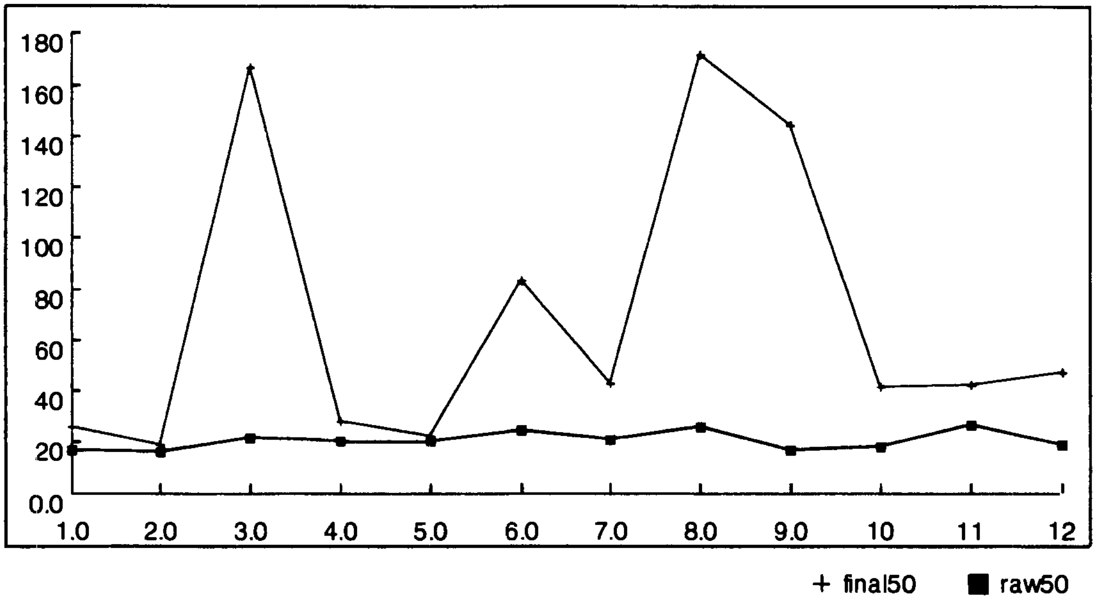
NICKEL concentration (mg/L).
JAN-1997 through DEC-1997



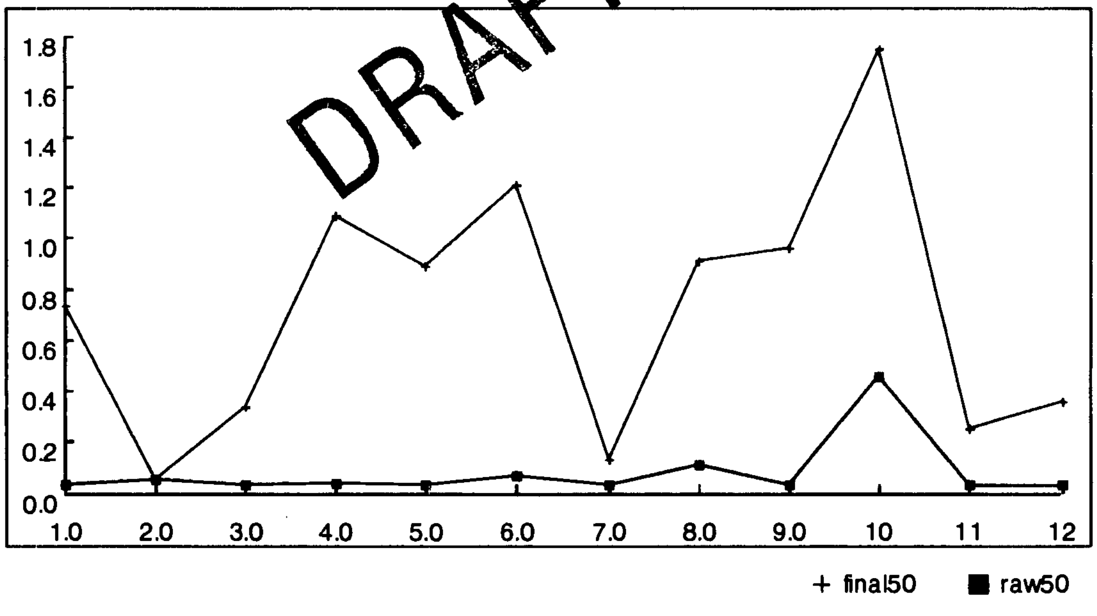
AMMONIA-N concentration (mg/L).
JAN-1997 through DEC-1997



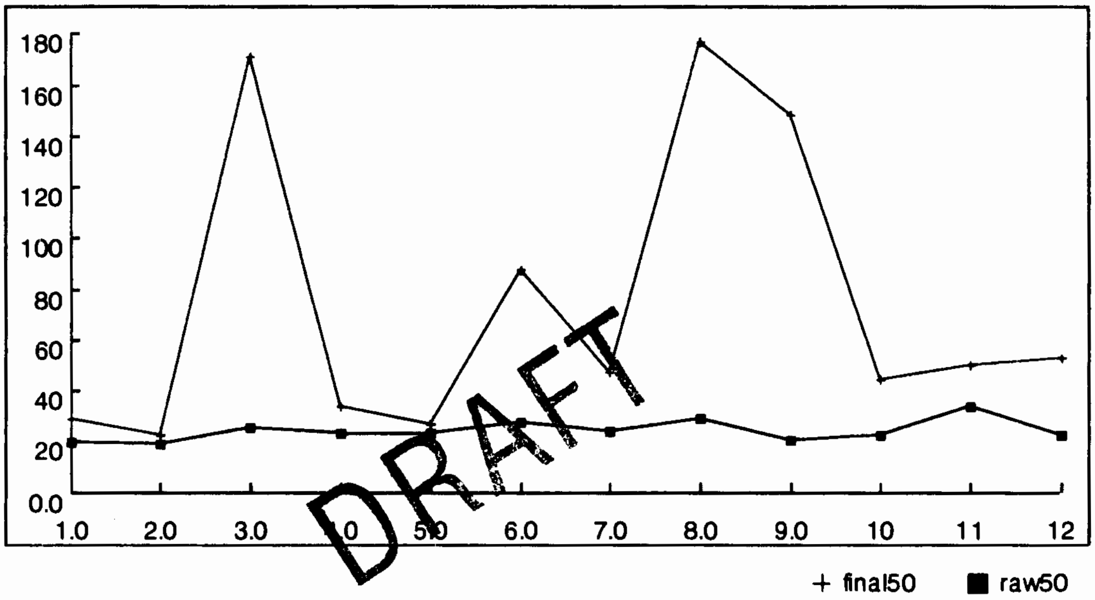
NITRATE-N concentration (mg/L).
JAN-1997 through DEC-1997



NITRITE-N concentration (mg/L).
JAN-1997 through DEC-1997



TOTAL_NITROGEN concentration (mg/L).
JAN-1997 through DEC-1997



Chapter 7

Kilograms Discharged

Average Kilograms per Discharge

DATE	COD (limit = 42.73 kg)	IRON (limit = 0.45 kg)	TSS (limit = 8.55 kg)	CADMIUM (limit = 0.027 kg)	TOTAL_CHROMIUM (limit = 0.086 kg)	COPPER (limit = 0.286 kg)	LEAD (limit = 0.027 kg)	MERCURY (limit = 0.001 kg)	ZINC (limit = 0.282 kg)
JAN-1997	2.441	0.008	0.188	ldl	ldl	0.012	ldl	No Data	ldl
FEB-1997	2.688	0.005	0.0	ldl	ldl	0.008	ldl	ldl	ldl
MAR-1997	2.762	0.006	0.335	ldl	3.348e-4	0.007	ldl	3.348e-5	ldl
APR-1997	2.811	0.007	0.088	0.001	3.514e-4	0.01	0.002	0.026	0.004
MAY-1997	2.583	ldl	0.184	0.002	5.534e-4	0.009	ldl	ldl	ldl
JUN-1997	2.88	0.01	ldl	ldl	7.68e-4	0.01	ldl	No Data	ldl
JUL-1997	2.53	0.006	0.422	ldl	9.487e-4	0.008	ldl	2.741e-5	ldl
AUG-1997	3.943	0.007	ldl	3.113e-4	8.301e-4	0.015	ldl	ldl	ldl
SEP-1997	2.668	0.012	1.423	ldl	8.005e-4	0.008	0.002	3.024e-5	ldl
OCT-1997	2.957	0.006	0.0	1.792e-4	3.584e-4	0.01	ldl	ldl	ldl
NOV-1997	2.135	0.012	0.316	ldl	6.325e-4	0.008	ldl	3.953e-5	ldl
DEC-1997	3.415	0.006	0.664	ldl	2.846e-4	0.007	ldl	2.524e-5	ldl

Chapter 8

Quality of Effluent Compared with DCG 5400.5

DRAFT

TA-50 WM-1

EFFLUENT COMPARED WITH DCG 5400.5

JAN-1997 through DEC-1997

Radioactive Isotopes	Mean Concentration (microCi/ml)	DCG 5400.5 (microCi/ml)	Conc./DCG Ratio
Am-241	1.466e-7	3.0e-8	4.886
Co-56		1.0e-5	
Co-57		1.0e-4	
Co-58		4.0e-5	
Co-60		5.0e-5	
Cs-137	2.85e-7	3.0e-6	0.095
Mn-54		5.0e-5	
Pu-238	7.667e-8	4.0e-8	1.917
Pu-239	4.592e-8	3.0e-8	1.531
Pu-240		3.0e-8	
Rb-83		2.0e-5	
Rb-84		1.0e-5	
Se-75		2.0e-5	
Sr-85		7.0e-5	
Sr-89	5.15e-8	2.0e-5	0.003
Sr-90	2.917e-8	1.0e-6	0.029
TRITIUM	7.631e-5	0.002	0.038
U-234	4.875e-9	5.0e-7	0.01
Y-88		3.0e-5	

Chapter 9

Room 116B, Vacuum Filter Operations

TA-50-1-ROOM 116B

VACUUM FILTER OPERATIONS

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	11	2288	2675	9.01 ± 3.90 E-5	7.23 ± 0.85 E-2	6.02 ± 0.61 E-2	4.80 ± 0.37 E-2
FEB	0	0	0	0	0	0	0
MAR	13	2704	3816	1.75 ± 0.72 E-5	1.03 ± 0.10 E-1	1.75 ± 0.21 E-2	1.23 ± 0.10 E-2
APR	0	0	0	0	0	0	0
MAY	18	3744	3818	1.34 ± 0.54 E-6	6.80 ± 0.81 E-3	1.43 ± 0.18 E-3	1.52 ± 0.18 E-3
JUN	0	0	0	0	0	0	0
JUL	39	8112	8917	3.20 ± 1.28 E-5	1.62 ± 0.19 E-1	3.42 ± 0.43 E-2	3.63 ± 0.43 E-2
AUG	18	3744	3922	1.40 ± 0.56 E-5	7.07 ± 0.84 E-2	1.49 ± 0.19 E-2	1.58 ± 0.19 E-2
SEP	20	4160	4197	1.48 ± 0.59 E-5	7.52 ± 0.89 E-2	1.58 ± 0.20 E-2	1.68 ± 0.29 E-2
OCT	19	3952	4115	8.35 ± 7.16 E-5	8.11 ± 0.96 E-2	9.07 ± 1.07 E-2	4.30 ± 0.36 E-2
NOV	0	0	0	0	0	0	0
DEC	20	4160	4090	8.30 ± 6.45 E-6	6.38 ± 0.77 E-2	7.29 ± 0.88 E-2	3.40 ± 0.29 E-2
TOTAL	158	32,864	35,550	2.62 ± 1.49 E-4	6.35 ± 0.73 E-1	3.08 ± 0.36 E-1	2.08 ± 0.21 E-1

Chapter 10

TA-21, Vacuum Filter Operations

DRAFT

TA-21-DP-257
VACUUM FILTER OPERATIONS

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0
MAY	0	0	0	0	0	0	0
JUN	20	4160	3379	3.52 ± 0.88 E-5	2.20 ± 0.26 E-3	4.75 ± 0.53 E-3	1.32 ± 0.18 E-2
JUL	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0
SEP	140	29,120	22,202	1.86 ± 0.62 E-4	3.78 ± 0.50 E-2	3.72 ± 0.50 E-2	9.30 ± 0.62 E-2
OCT	20	4160	3103	2.58 ± 0.86 E-5	5.25 ± 0.69 E-3	5.17 ± 0.69 E-3	1.29 ± 0.09 E-2
NOV	40	8320	6489	5.47 ± 1.28 E-5	1.11 ± 0.15 E-2	1.09 ± 0.15 E-2	2.74 ± 0.18 E-2
DEC	20	4160	3094	2.57 ± 0.89 E-5	5.24 ± 0.69 E-3	5.15 ± 0.69 E-3	1.29 ± 0.09 E-2
TOTAL	240	49,920	38,267	3.27 ± 1.01 E-4	6.16 ± 0.81 E-2	6.32 ± 0.84 E-2	1.59 ± 0.12 E-1

Chapter 11

Summary of Solid Wastes Generated

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TA-50-WM-1 & TA-21-DP-257
SUMMARY OF SOLID WASTES GENERATED

****

CALENDAR YEAR, 1997

	TA-50	TA-21-DP-257
PLANT SLUDGE	32,864 Liters	49,920 Liters
DRUMS OF SLUDGE (RETRIEVABLE)	0 bbl's	0 bbl's
DRUMS OF SLUDGE (NON-RETRIEVABLE.)	158 bbl's	240 bbl's
CEMENT PASTE	440 Liters	
DRUMS OF CEMENT PASTE (RETRIEVABLE.)	20 bbl's	
MISC. DRUMS (GRIT, ETC.) (RETRIEVABLE.)	0 bbl's	0 bbl's
PLANT SLUDGE ACTIVITY	TOTAL	TOTAL
^{235}U	2.62 ± 1.49 E-4 Ci	3.27 ± 1.01 E-4 Ci
^{238}Pu	6.35 ± 0.73 E-1 Ci	6.16 ± 0.81 E-2 Ci
^{239}Pu	3.08 ± 0.36 E-1 Ci	6.32 ± 0.84 E-2 Ci
^{241}Am	2.08 ± 0.21 E-1 Ci	1.59 ± 0.12 E-1 Ci
CEMENT PASTE ACTIVITY	TOTAL	
^{235}U	2.50 ± 0.58 E-3 Ci	
^{238}Pu	4.28 ± 0.72 E+0 Ci	
^{239}Pu	5.70 ± 0.72 E+0 Ci	
^{241}Am	7.84 ± 0.72 E+0 Ci	

Appendix A

Flows, TA-50

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TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
JAN-1997											
Total	1358342	1472697	122.117		1502105	36439	65488	0	0	0	0
Maximum	110467	101965	7.767	261.95	158117	13303	60756				
Minimum	11916	7398	3.217	38.331	79058	819	4732				
Average	43818	70128	5.815	199.1[illegible]	93882	5206	32744				
FEB-1997											
Total	1282507	1310745	110.433		1343987	82425	5678	0	0	0	0
Maximum	81114	99469	8.867	368.465	158117	44199					
Minimum	24850	46882	3.233	125.88	79058	38226					
Average	45804	68987	5.812	205.181	[illegible]99	41213					
MAR-1997											
Total	1371283	1507636	131.767		1423045	82036	0	0	29682	3277	6895
Maximum	69473	105619	7.917	322.459	158117	52104					
Minimum	19202	32891	1.7	125.413	79058	29932					
Average	44235	68529	5.989	196.128	83709	41018					
APR-1997											
Total	1386580	1563606	134.967		1581162	160217	52238	0	0	0	0
Maximum	67947	104995	8.183	318.153	158117	60154					
Minimum	24285	39663	2.517	126.426	79058	12628					
Average	46219	74458	6.427	197.432	87843	32043					
MAY-1997											
Total	1505378	1727706	149.733		1660221	167061	0	68541	14540	0	0
Maximum	104763	145817	9.617	268.045	158117	82422					
Minimum	21462	49824	4.2	133.463	79058	28775					
Average	48561	78532	6.806	193.995	92235	55687					

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TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
JUN-1997											
Total	1337415	1536163	150.483		1343989	73312	3388	180221	41988	3394	5910
Maximum	65423	122643	9.9	206.46[illegible]	158117			56687		2120	3146
Minimum	20332	51963	4.817	1[illegible]5.552	79058			16222		30	2764
Average	44580	76808	7.524	170.004	95999			36044		1131	2955
JUL-1997											
Total	1375931	1911661	159.65		1581165	172074	76087	263468	0	0	0
Maximum	78817	130665	9.65	343.477	1[illegible]8117	84832		73532			
Minimum	20332	42248	2.05	136.54	790[illegible]	36825		52854			
Average	44385	83116	6.941	202.184	1054[illegible]1	57358		65867			
AUG-1997											
Total	1481193	1800249	143.967		16[illegible]0223	160072	22788	122643	37437	0	8820
Maximum	100533	131288	9.767	298.624	158117	88206					6865
Minimum	10172	46882	3.583	162.926	79058	28486					1955
Average	47780	78272	6.259	211.854	103764	53357					4410
SEP-1997											
Total	1283225	1346933	109.133		1423046	88880	6170	0	0	0	0
Maximum	70302	97686	7.65	287.276	158117						
Minimum	21462	31730	2.333	132.044	79058						
Average	42774	67347	5.457	207.743	88941						
OCT-1997											
Total	1351248	1428934	125.133		1343988	0	58863	0	0	0	0
Maximum	65220	105441	9.7	268.15	158117		53942				
Minimum	25980	34761	2.483	111.57	79058		4921				
Average	43589	68044	5.959	194.103	89599		29432				

TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
NOV-1997											
Total	1291602	1328463	100.067		1185870	7386	1628	72463	50072	0	0
Maximum	87025	122732	8.717	471.909	79058				27041		
Minimum	7272	43406	3.133	126.181	79058				23031		
Average	43053	73804	5.559	232.257	79058				25036		
DEC-1997											
Total	1273908	1399340	103.483		142[illegible]047	14980	59904	0	0	2178	6821
Maximum	74552	104282	8.033	286.614	15811[illegible]	7132	54226				3455
Minimum	12499	30572	2.933	168.904	7905[illegible]	1157	5678				3366
Average	43928	73650	5.446	227.391	94[illegible]0	3745	29952				3411
SUMMARY											
Total	16298612	18334133	1540.933		17471848	10[illegible]882	352232	707336	173719	8849	28446
Maximum	1505378	1911661			1660223	172074	76087	263468	50072	3394	8820
Minimum	1273908	1310745			1185870	7386	1628	68541	14540	2178	5910
Average	1358218	1527844	128.411	198.301	1455987	87074	29353	58945	14477	737	2371

Appendix

A

Analyses of Composite Radiological Samples, TA-50

TA50 RADIOISOTOPES

JAN-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	2.6e-8	0.038		3.9e-10	5.858e-4
Am-241	7.0e-9	0.01		1.5e-10	2.253e-4
BETA	5.9e-10	8.689e-4		1.8e-10	2.704e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	1.6e-8	0.024		8.0e-11	1.202e-4
Pu-239	1.4e-8	0.021		2.2e-11	3.305e-5
Sr-89	1.2e-11	1.767e-5		1.0e-11	1.502e-5
Sr-90	ldl			1.7e-11	2.554e-5
TOTAL_PLUTONIUM	3.0e-8	0.044		1.02e-10	1.532e-4
TRITIUM				2.5e-8	0.038
U-234	2.1e-9	0.003		5.0e-12	7.511e-6
U-235	1.0e-10	1.473e-4		ldl	
Total Alpha		0.058			3.86e-4

Volume of Flow: Treated = 1472697.0 liters Final = 1502105.0 liters

TA50 RADIOISOTOPES

FEB-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	1.6e-8	0.021		4.7e-10	6.317e-4
Am-241	ldl			2.2e-10	2.957e-4
BETA	3.8e-10	4.981e-4		3.5e-10	4.704e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	6.0e-9	0.008		9.0e-11	1.21e-4
Pu-239	1.2e-9	0.002		2.0e-11	2.688e-5
Sr-89	ldl			ldl	
Sr-90	6.0e-12	7.864e-6		6.0e-12	8.064e-6
TOTAL_PLUTONIUM	7.2e-9	0.009		1.1e-10	1.478e-4
TRITIUM				2.7e-8	0.036
U-234	ldl			4.0e-12	5.376e-6
U-235	ldl			ldl	
Total Alpha		0.009			4.489e-4

Volume of Flow: Treated = 1310745.0 liters Final = 1343987.0 liters

TA50 RADIOISOTOPES

MAR-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	3.1e-8	0.047		3.0e-10	4.269e-4
Am-241	4.8e-9	0.007		2.0e-10	2.846e-4
BETA	7.3e-10	0.001		4.8e-10	6.831e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	1.4e-8	0.021		9.0e-11	1.281e-4
Pu-239	4.6e-9	0.007		2.3e-11	3.273e-5
Sr-89	2.0e-11	3.015e-5		ldl	
Sr-90	8.0e-12	1.206e-5		ldl	
TOTAL_PLUTONIUM	1.86e-8	0.028		1.13e-10	1.608e-4
TRITIUM				1.1e-7	0.157
U-234	ldl			4.0e-12	5.692e-6
U-235	ldl			ldl	
Total Alpha		0.035			4.511e-4

Volume of Flow: Treated = 1507636.0 liters Final = 1423045.0 liters

TA50 RADIOISOTOPES

APR-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	3.2e-8	0.05		3.0e-10	4.743e-4
Am-241	1.1e-8	0.017		1.5e-10	2.372e-4
BETA	7.9e-10	0.001		1.7e-10	2.688e-4
Cs-137	ldl			ldl	
GAMMA	ldl			1.0e-9	0.002
Pu-238	2.1e-8	0.033		8.0e-11	1.265e-4
Pu-239	5.5e-9	0.009		2.7e-11	4.269e-5
Sr-89	5.0e-11	7.818e-5		3.0e-11	4.743e-5
Sr-90	4.0e-12	6.254e-6		3.0e-12	4.743e-6
TOTAL_PLUTONIUM	2.65e-8	0.041		1.07e-10	1.692e-4
TRITIUM				1.2e-7	0.19
U-234	4.0e-10	6.254e-4		3.0e-12	4.743e-6
U-235	2.0e-10	3.127e-4		3.0e-13	4.743e-7
Total Alpha		0.06			4.116e-4

Volume of Flow: Treated = 1563606.0 liters Final = 1581162.0 liters

TA50 RADIOISOTOPES

MAY-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	2.7e-7	0.466		3.9e-10	6.475e-4
Am-241	6.7e-8	0.116		1.8e-10	2.988e-4
BETA	7.6e-9	0.013		7.0e-11	1.162e-4
Cs-137	ldl			ldl	
GAMMA	3.0e-9	0.005		ldl	
Pu-238	2.4e-8	0.041		6.1e-11	1.013e-4
Pu-239	9.0e-8	0.155		2.5e-11	4.151e-5
Sr-89	1.0e-11	1.728e-5		2.6e-11	4.317e-5
Sr-90	6.0e-12	1.037e-5		2.0e-12	3.32e-6
TOTAL_PLUTONIUM	1.14e-7	0.197		8.6e-11	1.428e-4
TRITIUM				1.6e-7	0.266
U-234	ldl			5.0e-12	8.301e-6
U-235	2.0e-10	3.455e-4		2.0e-13	3.32e-7
Total Alpha		0.313			4.503e-4

Volume of Flow: Treated = 1727706.0 liters Final = 1660221.0 liters

TA50 RADIOISOTOPES

JUN-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	1.1e-7	0.169		6.2e-10	8.333e-4
Am-241	3.2e-8	0.049		2.3e-10	3.091e-4
BETA	4.8e-9	0.007		2.9e-10	3.898e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	1.8e-8	0.028		1.3e-10	1.747e-4
Pu-239	4.1e-8	0.063		1.2e-10	1.613e-4
Sr-89	ldl			ldl	
Sr-90	4.2e-11	6.452e-5		2.7e-11	3.629e-5
TOTAL_PLUTONIUM	5.9e-8	0.091		2.5e-10	3.36e-4
TRITIUM				1.0e-7	0.134
U-234	9.0e-10	0.00[illegible]		4.0e-12	5.376e-6
U-235	1.0e-10	1.536e-4		ldl	
Total Alpha		0.141			6.505e-4

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Volume of Flow: Treated = 1536163.0 liters Final = 1343989.0 liters

TA50 RADIOISOTOPES

JUL-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	6.1e-8	0.117		3.1e-10	4.902e-4
Am-241	1.5e-8	0.029		1.2e-10	1.897e-4
BETA	4.8e-9	0.009		1.0e-9	0.002
Cs-137	3.0e-10	5.735e-4		3.0e-10	4.743e-4
GAMMA	1.0e-8	0.019		3.0e-9	0.005
Na-22				8.0e-10	0.001
Pu-238	1.0e-8	0.019		1.1e-10	1.739e-4
Pu-239	2.6e-8	0.05		9.0e-11	1.423e-4
Sr-89	1.0e-10	1.912e-4		3.0e-11	4.743e-5
Sr-90	8.0e-11	1.529e-4		6.0e-11	9.487e-5
TOTAL_PLUTONIUM	3.6e-8	0.069		2.0e-10	3.162e-4
TRITIUM				7.0e-8	0.111
U-234	5.0e-10	9.55[illegible]e-4		4.0e-12	6.325e-6
U-235	2.0e-10	3.[illegible]23e-4		3.0e-13	4.743e-7
Total Alpha		0.099			5.128e-4

Volume of Flow: Treated = 1911661.0 liters Final = 1581165.0 liters

TA50 RADIOISOTOPES

AUG-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	3.1e-8	0.056		2.8e-10	4.649e-4
Am-241	9.0e-9	0.016		1.7e-10	2.822e-4
BETA	4.3e-9	0.008		9.1e-10	0.002
Cs-137	3.0e-10	5.401e-4		8.0e-10	0.001
GAMMA	ldl			ldl	
Pu-238	9.0e-9	0.016		6.6e-11	1.096e-4
Pu-239	1.3e-8	0.023		5.1e-11	8.467e-5
Sr-89	9.0e-10	0.002		3.0e-10	4.981e-4
Sr-90	1.3e-10	2.34e-4		3.4e-11	5.645e-5
TOTAL_PLUTONIUM	2.2e-8	0.04		1.17e-10	1.942e-4
TRITIUM				2.4e-7	0.398
U-234	2.0e-10	3.6e-4		1.2e-11	1.992e-5
U-235	3.0e-11	5.401e-5		8.0e-13	1.328e-6
Total Alpha		0.056			4.977e-4

Volume of Flow: Treated = 1800249.0 liters Final = 1660223.0 liters

TA50 RADIOISOTOPES

SEP-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	1.2e-8	0.016		2.2e-10	3.131e-4
Am-241	4.4e-9	0.006		6.1e-11	8.681e-5
BETA	1.7e-9	0.002		1.4e-9	0.002
Cs-137	7.0e-10	9.429e-4		6.0e-10	8.538e-4
GAMMA	ldl			1.0e-9	0.001
Pu-238	5.1e-9	0.007		6.5e-11	9.25e-5
Pu-239	3.7e-9	0.005		3.3e-11	4.696e-5
Sr-89	9.9e-11	1.333e-4		1.0e-10	1.423e-4
Sr-90	3.8e-11	5.118e-5		5.3e-11	7.542e-5
TOTAL_PLUTONIUM	8.8e-9	0.012		9.8e-11	1.395e-4
TRITIUM				1.1e-10	1.565e-4
U-234	1.5e-10	2.02e-[illegible]		2.5e-12	3.558e-6
U-235	3.8e-11	5.118e-5		2.3e-13	3.273e-7
Total Alpha		0.018			2.301e-4

Volume of Flow: Treated = 1346933.0 liters Final = 1423046.0 liters

TA50 RADIOISOTOPES

OCT-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	7.0e-9	0.01		1.7e-10	2.285e-4
Am-241	9.9e-10	0.001		1.0e-10	1.344e-4
BETA	1.1e-9	0.002		3.7e-10	4.973e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	2.9e-10	4.144e-4		2.1e-11	2.822e-5
Pu-239	3.7e-10	5.287e-4		3.9e-11	5.242e-5
Sr-89	1.0e-11	1.429e-5		3.8e-11	5.107e-5
Sr-90	1.4e-10	2.001e-4		3.9e-11	5.242e-5
TOTAL_PLUTONIUM	6.6e-10	9.431e-4		6.0e-11	8.064e-5
TRITIUM				2.8e-8	0.038
U-234	3.3e-11	4.715e-5		4.8e-12	6.451e-6
U-235	2.6e-11	3.715e-5		1.6e-12	2.15e-6
Total Alpha		0.002			2.236e-4

Volume of Flow: Treated = 1428934.0 liters Final = 1343988.0 liters

TA50 RADIOISOTOPES

NOV-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	9.3e-9	0.012		1.6e-10	1.897e-4
Am-241	2.3e-9	0.003		5.8e-11	6.878e-5
BETA	8.0e-10	0.001		3.5e-10	4.151e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	1.8e-9	0.002		7.5e-11	8.894e-5
Pu-239	1.8e-9	0.002		3.7e-11	4.388e-5
Sr-89	1.5e-11	1.993e-5		ldl	
Sr-90	1.4e-11	1.86e-5		5.4e-11	6.404e-5
TOTAL_PLUTONIUM	3.6e-9	0.005		1.12e-10	1.328e-4
TRITIUM				8.6e-9	0.01
U-234	ldl			4.8e-12	5.692e-6
U-235	ldl			1.8e-12	2.135e-6
Total Alpha		0.008			2.094e-4

Volume of Flow: Treated = 1328463.0 liters Final = 1185870.0 liters

TA50 RADIOISOTOPES

DEC-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	5.8e-9	0.008		3.0e-10	4.269e-4
Am-241	2.3e-9	0.003		1.2e-10	1.708e-4
BETA	3.2e-11	4.478e-5		2.9e-10	4.127e-4
Cs-137	ldl			ldl	
GAMMA	ldl			ldl	
Pu-238	4.5e-9	0.006		5.2e-11	7.4e-5
Pu-239	7.7e-9	0.011		6.4e-11	9.108e-5
Sr-89	1.6e-11	2.239e-5		3.8e-11	5.408e-5
Sr-90	1.7e-11	2.379e-5		4.7e-11	6.688e-5
TOTAL_PLUTONIUM	1.22e-8	0.017		1.16e-10	1.651e-4
TRITIUM				2.7e-8	0.038
U-234	4.7e-12	6.57[illegible]e-6		5.4e-12	7.684e-6
U-235	ldl			ldl	
Total Alpha		0.02			3.435e-4

Volume of Flow: Treated = 1399340.0 liters Final = 1423047.0 liters

Appendix A

Analyses of Composite Mineral Samples, TA-50

TA50 MINERALS

JAN-1997

mg/L - does not include TA-55

DRAFT

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	27.0	39.763		3.26e-4	4.897e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.46	0.677		5.0e-7	7.511e5
AMMONIA-N	3.29	4.845		2.6e-6	3.905e6
ARSENIC	0.002	0.003		1.0e-9	1502.105
BARIUM	0.035	0.052		1.2e-8	18025.26
BERYLLIUM	ldl			ldl	
BORON	0.105	0.155		1.39e-7	2.088e5
CADMIUM	ldl			ldl	
CALCIUM	12.9	18.998		1.4e-4	2.103e8
CHLORIDE	18.9	27.834		4.0e-5	6.008e7
COBALT	ldl			ldl	
COD	65.0	95.725		2.6e-5	3.905e7
CONDUCTIVITY	290.0			8.6e-4	
COPPER	0.18	0.265		1.3e-7	1.953e5
CYANIDE	ldl			ldl	
FLUORIDE	1.08	1.591		1.75e-6	2.629e6
HARDNESS	47.036	69.27		3.508e-4	5.27e8
IRON	0.4	0.589		8.0e-8	1.202e5
LEAD	0.03	0.044		ldl	
MAGNESIUM	3.6	5.302		3.0e-7	4.506e5
NICKEL	0.07	0.103		2.0e-8	30042.1
NITRATE-N	16.5	24.3		2.57e-5	3.86e7
NITRITE-N	0.03	0.044		7.3e-7	1.097e6
PHOSPHORUS	1.6	2.356		3.7e-7	5.558e5
POTASSIUM	4.2	6.185		6.7e-6	1.006e7
SELENIUM	ldl			2.0e-9	3004.21
SILICA_DIOXIDE	76.0	111.925		3.7e-5	5.558e7
SILVER	0.011	0.016		ldl	
SODIUM	30.1	44.328		6.1e-5	9.163e7
SULFATE	9.0	13.254		4.3e-5	6.459e7
TDS	120.0	176.724		5.9e-4	8.862e8
THALLIUM	0.1	0.147		1.0e-7	1.502e5
TOTAL_CATIONS	2.3			9.04e-6	
TOTAL_CHROMIUM	0.016	0.024		ldl	
TSS	7.0	10.309		2.0e-6	3.004e6
URANIUM	75.0	110.452		7.8e-6	1.172e7
VANADIUM	0.008	0.012		6.0e-9	9012.63
ZINC	0.15	0.221		ldl	
pH	7.0			7.6e-6	

Volume of Flow: Treated = 1472697.0 liters Final = 1502105.0 liters

* Mercury results not available

TA50 MINERALS

FEB-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	52.0	68.159		5.2e-4	6.989e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.52	0.682		ldl	
AMMONIA-N	3.05	3.998		3.62e-6	4.865e6
ARSENIC	0.002	0.003		2.0e-9	2687.974
BARIUM	0.037	0.048		2.4e-8	32255.688
BERYLLIUM	ldl			ldl	
BORON	0.437	0.573		1.02e-7	1.371e5
CADMIUM	0.003	0.004		ldl	
CALCIUM	15.0	19.661		2.08e-4	2.795e8
CHLORIDE	15.7	20.579		4.4e-5	5.914e7
COBALT	ldl			ldl	
COD	55.0	72.091		3.2e-5	4.301e7
CONDUCTIVITY	320.0			0.001	
COPPER	0.14	0.184		9.0e-8	1.21e5
CYANIDE	ldl			ldl	
FLUORIDE	0.89	1.167		1.28e-6	1.72e6
HARDNESS	57.221	75.003		5.206e-4	6.997e8
IRON	0.77	1.009		6.0e-8	80639.22
LEAD	0.03	0.039		ldl	
MAGNESIUM	4.8	6.292		3.0e-7	4.032e5
MERCURY	0.004	0.005		ldl	
NICKEL	0.1	0.13		2.0e-8	26879.74
NITRATE-N	15.6	20.448		1.89e-5	2.54e7
NITRITE-N	0.05	0.06		5.0e-8	67199.35
PHOSPHORUS	2.4	3.146		6.9e-7	9.274e5
POTASSIUM	5.7	7.471		7.1e-6	9.542e6
SELENIUM	ldl			1.0e-9	1343.987
SILICA_DIOXIDE	77.0	100.927		3.4e-5	4.57e7
SILVER	0.043	0.056		ldl	
SODIUM	32.0	41.944		5.1e-5	6.854e7
SULFATE	21.0	27.526		5.4e-5	7.258e7
TDS	280.0	367.009		7.4e-4	9.946e8
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.22			1.38e-5	
TOTAL_CHROMIUM	0.018	0.024		ldl	
TSS	280.0	367.009			
URANIUM	90.0	117.967		5.0e-6	6.72e6
VANADIUM	0.009	0.012		4.0e-9	5375.948
ZINC	0.11	0.144		ldl	
pH	7.5			7.2e-6	

Volume of Flow: Treated = 1310745.0 liters Final = 1343987.0 liters

TA50 MINERALS

MAR-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	37.0	55.783		3.82e-4	5.436e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.34	0.513		3.4e-7	4.838e5
AMMONIA-N	3.62	5.458		3.57e-6	5.08e6
ARSENIC	0.002	0.003		ldl	
BARIUM	0.039	0.059		1.9e-8	27037.855
BERYLLIUM	ldl			ldl	
BORON	0.095	0.143		8.4e-8	1.195e5
CADMIUM	ldl			ldl	
CALCIUM	14.0	21.107		1.4e-4	1.992e8
CHLORIDE	22.0	33.168		8.0e-5	1.138e8
COBALT	ldl			ldl	
COD	30.0	45.229		3.3e-5	4.696e7
CONDUCTIVITY	350.0			0.002	
COPPER	0.16	0.241		8.5e-8	1.21e5
CYANIDE	ldl			8.0e-8	1.138e5
FLUORIDE	0.75	1.131		2.46e-6	3.501e6
HARDNESS	51.018	76.917		3.505e-4	4.988e8
IRON	0.51	0.769		7.3e-8	1.039e5
LEAD	0.044	0.066		ldl	
MAGNESIUM	3.9	5.88		2.3e-7	3.273e5
MERCURY	0.004	0.006		4.0e-10	569.218
NICKEL	0.12	0.181		2.7e-8	38422.215
NITRATE-N	21.7	32.716		1.67e-4	2.376e8
NITRITE-N	ldl			3.4e-7	4.838e5
PHOSPHORUS	2.49	3.754		3.8e-7	5.408e5
POTASSIUM	4.9	7.387		6.8e-5	9.677e7
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	79.0	119.103		7.3e-5	1.039e8
SILVER	0.009	0.014		ldl	
SODIUM	37.0	55.783		2.9e-4	4.127e8
SULFATE	12.0	18.092		5.2e-5	7.4e7
TDS	296.0	446.26		0.002	2.348e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.46			2.38e-5	
TOTAL_CHROMIUM	0.034	0.051		4.0e-9	5692.18
TSS	5.0	7.538		4.0e-6	5.692e6
URANIUM	55.0	82.92		5.0e-6	7.115e6
VANADIUM	0.009	0.014		8.0e-9	11384.36
ZINC	0.096	0.145		ldl	
pH	7.1			6.8e-6	

Volume of Flow: Treated = 1507636.0 liters Final = 1423045.0 liters

TA50 MINERALS

APR-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	ldl			3.06e-4	4.838e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.58	0.907		1.2e-7	1.897e5
AMMONIA-N	2.58	4.034		4.71e-6	7.447e6
ARSENIC	ldl			ldl	
BARIUM	0.043	0.067		1.8e-8	28460.916
BERYLLIUM	ldl			ldl	
BORON	0.49	0.766		3.9e-7	6.167e5
CADMIUM	ldl			1.7e-8	26879.754
CALCIUM	12.0	18.763		1.4e-4	2.214e8
CHLORIDE	45.0	70.362		4.68e-5	7.4e7
COBALT	ldl			ldl	
COD	55.0	85.998		3.2e-5	5.06e7
CONDUCTIVITY	347.0			9.51e-4	
COPPER	0.19	0.297		1.1e-7	1.739e5
CYANIDE				1.0e-8	15811.62
FLUORIDE	0.73	1.141		1.34e-6	2.119e6
HARDNESS	45.201	70.676		3.511e-4	5.552e8
IRON	0.89	1.392		8.1e-8	1.281e5
LEAD	0.042	0.066		2.0e-8	31623.24
MAGNESIUM	3.7	5.785		3.7e-7	5.85e5
MERCURY	0.005	0.008		3.0e-7	4.743e5
NICKEL	0.09	0.141		2.8e-8	44272.536
NITRATE-N	20.1	31.428		2.78e-5	4.396e7
NITRITE-N	0.04	0.063		1.09e-6	1.723e6
PHOSPHORUS	2.1	3.284		1.9e-7	3.004e5
POTASSIUM	3.6	5.629		7.8e-6	1.233e7
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	76.0	118.834		3.8e-5	6.008e7
SILVER	0.021	0.033		ldl	
SODIUM	45.0	70.362		7.5e-5	1.186e8
SULFATE	36.0	56.29		5.23e-5	8.269e7
TDS	276.0	431.555		5.86e-4	9.266e8
THALLIUM	ldl			ldl	
TOTAL_CATIONS	2.84			9.36e-6	
TOTAL_CHROMIUM	0.1	0.156		4.0e-9	6324.648
TSS	3.0	4.691		1.0e-6	1.581e6
URANIUM	0.069	0.108		2.0e-9	3162.324
VANADIUM	0.01	0.016		5.0e-9	7905.81
ZINC	0.11	0.172		5.0e-8	79058.1
pH	6.41			7.12e-6	

Volume of Flow: Treated = 1563606.0 liters Final = 1581162.0 liters

TA50 MINERALS

MAY-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	28.0	48.376		3.66e-4	6.076e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.39	0.674		2.0e-7	3.32e5
AMMONIA-N	3.01	5.2		3.07e-6	5.097e6
ARSENIC	0.001	0.002		ldl	
BARIUM	0.045	0.078		1.4e-8	23243.094
BERYLLIUM	0.006	0.01		ldl	
BORON	0.26	0.449		2.0e-7	3.32e5
CADMIUM	0.002	0.003		2.1e-8	34864.641
CALCIUM	14.0	24.188		1.4e-4	2.324e8
CHLORIDE	20.1	34.727		2.18e-5	3.619e7
COBALT	ldl			ldl	
COD	71.0	122.667		2.8e-5	4.649e7
CONDUCTIVITY	340.0			9.4e-4	
COPPER	0.25	0.432		9.7e-8	1.61e5
CYANIDE	ldl			ldl	
FLUORIDE	0.77	1.33		1.53e-6	2.54e6
HARDNESS	50.606	87.433		3.504e-4	5.818e8
IRON	1.3	2.246		ldl	
LEAD	0.07	0.121		ldl	
MAGNESIUM	3.8	6.565		2.1e-7	3.486e5
MERCURY	3.8	6.56[illegible]		ldl	
NICKEL	0.34	[illegible].587		4.1e-8	68069.061
NITRATE-N	20.1	34[illegible]27		2.25e-5	3.735e7
NITRITE-N	ldl			8.9e-7	1.478e6
PHOSPHORUS	1.43	2.471		2.9e-7	4.815e5
POTASSIUM	4.2	7.256		4.9e-6	8.135e6
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	82.0	141.672		2.5e-5	4.151e7
SILVER	0.031	0.054		ldl	
SODIUM	34.0	58.742		4.5e-5	7.471e7
SULFATE	18.4	31.79		4.26e-5	7.073e7
TDS	332.0	573.598		6.26e-4	1.039e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.14			1.08e-6	
TOTAL_CHROMIUM	0.12	0.207		6.0e-9	9961.326
TSS	12.0	20.732		2.0e-6	3.32e6
URANIUM	0.084	0.145		5.0e-9	8301.105
VANADIUM	0.011	0.019		7.0e-9	11621.547
ZINC	0.14	0.242		ldl	
pH	6.8			7.5e-6	

Volume of Flow: Treated = 1727706.0 liters Final = 1660221.0 liters

TA50 MINERALS

JUN-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	38.0	58.374		1.44e-4	1.935e8
ALKALINITY-P	ldl			5.8e-5	7.795e7
ALUMINUM	2.33	3.579		1.36e-7	1.828e5
AMMONIA-N	2.73	4.194		3.06e-6	4.113e6
ARSENIC	0.002	0.003		1.0e-9	1343.989
BARIUM	0.033	0.051		8.0e-9	10751.912
BERYLLIUM	ldl			ldl	
BORON	0.143	0.22		1.58e-7	2.124e5
CADMIUM	0.002	0.003		ldl	
CALCIUM	13.3	20.431		7.39e-5	9.932e7
CHLORIDE	22.6	34.717		3.79e-5	5.094e7
COBALT	0.003	0.005		ldl	
COD	56.0	86.025		3.0e-5	4.032e7
CONDUCTIVITY	470.0			0.001	
COPPER	0.34	0.522		9.9e-8	1.331e5
CYANIDE	0.01	0.015		3.0e-8	40319.67
FLUORIDE	0.93	1.429		1.41e-6	1.895e6
HARDNESS	48.982	75.244		1.859e-4	2.498e8
IRON	1.32	2.028		1.03e-7	1.384e5
LEAD	0.039	0.06		ldl	
MAGNESIUM	3.83	5.884		3.3e-7	4.435e5
NICKEL	0.307	0.472		4.9e-8	65855.461
NITRATE-N	24.2	37.175		8.3e-5	1.116e8
NITRITE-N	0.07	0.10		1.21e-6	1.626e6
PHOSPHORUS	2.87	4.409		3.7e-7	4.973e5
POTASSIUM	5.9	9.063		2.54e-5	3.414e7
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	75.0	115.212		5.2e-5	6.989e7
SILVER	ldl			ldl	
SODIUM	64.0	98.314		1.51e-4	2.029e8
SULFATE	45.5	69.895		3.35e-5	4.502e7
TDS	398.0	611.393		8.22e-4	1.105e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	4.28			1.02e-5	
TOTAL_CHROMIUM	0.045	0.069		8.0e-9	10751.912
TSS	10.0	15.362		ldl	
URANIUM	0.06	0.092		3.0e-9	4031.967
VANADIUM	0.011	0.017		1.2e-8	16127.868
ZINC	0.159	0.244		ldl	
pH	6.7			1.0e-5	

Volume of Flow: Treated = 1536163.0 liters Final = 1343989.0 liters

* Mercury results not available

TA50 MINERALS

JUL-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	22.0	42.057		2.38e-4	3.763e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.829	1.585		1.34e-7	2.119e5
AMMONIA-N	3.29	6.289		4.14e-6	6.546e6
ARSENIC	0.002	0.004		ldl	
BARIUM	0.046	0.088		1.4e-8	22136.31
BERYLLIUM	0.008	0.015		ldl	
BORON	0.14	0.268		1.29e-7	2.04e5
CADMIUM	ldl			ldl	
CALCIUM	16.8	32.116		9.78e-5	1.546e8
CHLORIDE	40.6	77.613		4.61e-5	7.289e7
COBALT	0.007	0.013		5.0e-9	7905.825
COD	61.0	116.611		2.4e-5	3.795e7
CONDUCTIVITY	380.0			0.001	
COPPER	0.343	0.656		7.7e-8	1.217e5
CYANIDE	ldl			ldl	
FLUORIDE	0.8	1.529		2.75e-6	4.348e6
HARDNESS	57.927	110.738		2.49e-4	3.937e8
IRON	1.73	3.307		6.0e-8	94869.9
LEAD	0.042	0.08		ldl	
MAGNESIUM	3.88	7.417		1.16e-6	1.834e6
MERCURY	0.004	0.007		2.6e-10	411.103
NICKEL	0.13	0.249		5.2e-8	82220.58
NITRATE-N	20.6	39.38		4.31e-5	6.815e7
NITRITE-N	ldl			1.3e-7	2.056e5
PHOSPHORUS	2.99	5.716		3.5e-7	5.534e5
POTASSIUM	4.7	8.985		1.42e-5	2.245e7
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	78.0	149.11		6.1e-5	9.645e7
SILVER	0.018	0.034		ldl	
SODIUM	40.6	77.613		1.22e-4	1.929e8
SULFATE	35.0	66.908		6.09e-5	9.629e7
TDS	314.0	600.262		7.36e-4	1.164e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.24			1.02e-5	
TOTAL_CHROMIUM	0.073	0.14		9.0e-9	14230.485
TSS	7.0	13.382		4.0e-6	6.325e6
URANIUM	0.061	0.117		4.0e-9	6324.66
VANADIUM	0.011	0.021		1.0e-8	15811.65
ZINC	0.236	0.451		ldl	
pH	6.8			7.2e-6	

Volume of Flow: Treated = 1911661.0 liters Final = 1581165.0 liters

TA50 MINERALS

AUG-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	30.0	54.007		2.6e-4	4.317e8
ALKALINITY-P	ldl			1.06e-4	1.76e8
ALUMINUM	0.71	1.278		2.8e-7	4.649e5
AMMONIA-N	2.46	4.429		4.03e-6	6.691e6
ARSENIC	ldl			ldl	
BARIUM	0.034	0.061		1.0e-8	16602.23
BERYLLIUM	ldl			ldl	
BORON	0.24	0.432		2.2e-7	3.652e5
CADMIUM	ldl			3.0e-9	4980.669
CALCIUM	14.0	25.203		7.1e-5	1.179e8
CHLORIDE	25.9	46.626		9.86e-5	1.637e8
COBALT	0.006	0.011		3.0e-9	4980.669
COD	57.0	102.614		3.8e-5	6.309e7
CONDUCTIVITY	450.0			0.002	
COPPER	0.36	0.648		1.4e-7	2.324e5
CYANIDE	ldl			9.0e-8	1.494e5
FLUORIDE	0.9	1.62		3.47e-6	5.761e6
HARDNESS	49.371	88.88		1.826e-4	3.032e8
IRON	2.2	3.961		6.6e-8	1.096e5
LEAD	0.058	0.104		ldl	
MAGNESIUM	3.5	6.301		1.3e-6	2.158e6
MERCURY	0.001	0.002		ldl	
NICKEL	0.3	0.5[illegible]		5.2e-8	86331.596
NITRATE-N	26.1	46.98		1.72e-4	2.856e8
NITRITE-N	0.11	0.[illegible]8		9.1e-7	1.511e6
PHOSPHORUS	2.51	4.519		4.1e-7	6.807e5
POTASSIUM	12.0	21.603		9.2e-5	1.527e8
SELENIUM	ldl			ldl	
SI	ldl			ldl	
SILICA_DIOXIDE	72.0	129.618		5.7e-5	9.463e7
SILVER	0.01	0.018		ldl	
SODIUM	56.0	100.814		3.7e-4	6.143e8
SULFATE	37.5	67.509		7.8e-5	1.295e8
TDS	ldl			ldl	
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.74			2.33e-5	
TOTAL_CHROMIUM	0.086	0.155		8.0e-9	13281.784
TSS	5.0	9.001		ldl	
URANIUM	1.0e-4	1.8e-4		1.3e-11	21.583
VANADIUM	0.011	0.02		1.1e-8	18262.453
ZINC	0.17	0.306		ldl	
pH	7.0			1.01e-5	

Volume of Flow: Treated = 1800249.0 liters Final = 1660223.0 liters

TA50 MINERALS

SEP-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	44.0	59.265		3.54e-4	5.038e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.3	0.404		1.9e-7	2.704e5
AMMONIA-N	3.04	4.095		3.24e-6	4.611e6
ARSENIC	0.007	0.009		1.0e-9	1423.046
BARIUM	0.05	0.067		1.9e-8	27037.874
BERYLLIUM	ldl			ldl	
BORON	0.11	0.148		1.9e-7	2.704e5
CADMIUM	0.002	0.003		ldl	
CALCIUM	45.0	60.612		1.0e-4	1.423e8
CHLORIDE	34.2	46.065		1.01e-4	1.437e8
COBALT	0.003	0.004		ldl	
COD	34.0	45.796		3.0e-5	4.269e7
CONDUCTIVITY	332.0			0.002	
COPPER	0.047	0.063		9.1e-8	1.295e5
CYANIDE	ldl			1.1e-7	1.565e5
FLUORIDE	0.93	1.253		2.71e-6	3.856e6
HARDNESS	132.543	178.527		2.522e-4	3.589e8
IRON	5.6	7.543		1.4e-7	1.992e5
LEAD	0.031	0.042		2.2e-8	31307.012
MAGNESIUM	4.9	6.6		6.1e-7	8.681e5
MERCURY	0.002	0.002		3.4e-10	483.836
NICKEL	0.043	0.058		3.5e-8	49806.61
NITRATE-N	16.8	22.[illegible]28		1.44e-4	2.049e8
NITRITE-N	ldl			9.6e-7	1.366e6
PHOSPHORUS	1.09	1.468		2.1e-7	2.988e5
POTASSIUM	8.2	11.045		7.4e-5	1.053e8
SELENIUM	0.002	0.003		ldl	
SI	ldl			ldl	
SILICA_DIOXIDE	81.0	109.102		6.1e-5	8.681e7
SILVER	ldl			ldl	
SODIUM	39.0	52.53		3.0e-4	4.269e8
SULFATE	25.5	34.347		6.5e-5	9.25e7
TDS	282.0	379.835		0.001	2.12e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	2.82			1.99e-5	
TOTAL_CHROMIUM	0.008	0.011		9.0e-9	12807.414
TSS	10.0	13.469		1.6e-5	2.277e7
URANIUM	0.034	0.046		2.0e-9	2846.092
VANADIUM	0.006	0.008		6.0e-9	8538.276
ZINC	0.14	0.189		ldl	
pH	7.25			8.02e-6	

Volume of Flow: Treated = 1346933.0 liters Final = 1423046.0 liters

TA50 MINERALS

OCT-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	47.0	67.16		2.76e-4	3.709e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.4	0.572		6.4e-8	86015.232
AMMONIA-N	3.95	5.644		1.05e-6	1.411e6
ARSENIC	1.0e-6	1.429e-6		ldl	
BARIUM	0.037	0.053		1.3e-8	17471.844
BERYLLIUM	ldl			ldl	
BORON	0.18	0.257		1.5e-7	2.016e5
CADMIUM	0.003	0.004		2.0e-9	2687.976
CALCIUM	14.0	20.005		9.9e-5	1.331e8
CHLORIDE	32.5	46.44		4.06e-5	5.457e7
COBALT	ldl			ldl	
COD	40.0	57.157		3.3e-5	4.435e7
CONDUCTIVITY	337.0			8.74e-4	
COPPER	0.23	0.329		1.1e-7	1.478e5
CYANIDE	ldl			4.0e-8	53759.52
FLUORIDE	0.69	0.986		1.66e-6	2.231e6
HARDNESS	49.371	70.548		2.493e-4	3.351e8
IRON	1.2	1.715		6.7e-8	90047.196
LEAD	0.068	0.097		ldl	
MAGNESIUM	3.5	5.001		5.1e-7	6.854e5
MERCURY	0.002	0.003		ldl	
NICKEL	0.056	0.08		3.3e-8	44351.604
NITRATE-N	18.1	25.864		4.14e-5	5.564e7
NITRITE-N	0.46	0.657		1.75e-6	2.352e6
PHOSPHORUS	1.25	1.786		1.2e-7	1.613e5
POTASSIUM	3.5	5.001		1.1e-5	1.478e7
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	83.0	118.602		5.7e-5	7.661e7
SILVER	0.008	0.011		ldl	
SODIUM	43.0	61.444		9.8e-5	1.317e8
SULFATE	26.0	37.152		4.63e-5	6.223e7
TDS	642.0	917.376		6.42e-4	8.628e8
THALLIUM	ldl			ldl	
TOTAL_CATIONS	2.96			1.08e-5	
TOTAL_CHROMIUM	0.045	0.064		4.0e-9	5375.952
TSS	9.0	12.86			
URANIUM	0.066	0.094		4.0e-9	5375.952
VANADIUM	0.01	0.014		8.0e-9	10751.904
ZINC	0.37	0.529		ldl	
pH	7.31			7.14e-6	

DRAFT

Volume of Flow: Treated = 1428934.0 liters Final = 1343988.0 liters

* Final TSS not available

TA50 MINERALS

NOV-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	16.0	21.255		2.62e-4	3.107e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.29	0.385		ldl	
AMMONIA-N	7.32	9.724		7.26e-6	8.609e6
ARSENIC	0.002	0.003		ldl	
BARIUM	0.23	0.306		1.3e-8	15416.31
BERYLLIUM	ldl			ldl	
BORON	0.15	0.199		1.9e-7	2.253e5
CADMIUM	ldl			ldl	
CALCIUM	10.0	13.285		8.9e-5	1.055e8
CHLORIDE	19.5	25.905		2.48e-5	2.941e7
COBALT	0.004	0.005		3.0e-9	3557.61
COD	46.0	61.109		2.7e-5	3.202e7
CONDUCTIVITY	373.0			9.28e-4	
COPPER	0.22	0.292		1.0e-7	1.186e5
CYANIDE	ldl			ldl	
FLUORIDE	0.84	1.116		1.56e-6	1.85e6
HARDNESS	35.265	46.848		2.257e-4	2.677e8
IRON	0.7	0.93		[illegible].5e-7	1.779e5
LEAD	0.12	0.159		ldl	
MAGNESIUM	2.5	3.321		8.5e[illegible]	1.008e6
MERCURY	0.004	0.006		5.0e-10	592.935
NICKEL	0.15	0.199		6.0e-8	71152.2
NITRATE-N	26.5	35.2[illegible]4		4.22e-5	5.004e7
NITRITE-N	ldl			2.5e-7	2.965e5
PHOSPHORUS	1.44	1.913		3.4e-7	4.032e5
POTASSIUM	2.7	3.587		6.3e-6	7.471e6
SELENIUM	ldl			ldl	
SILICA_DIOXIDE	75.0	99.635		6.0e-5	7.115e7
SILVER	0.049	0.065		ldl	
SODIUM	39.0	51.81		9.5e-5	1.127e8
SULFATE	25.8	34.274		3.09e-5	3.664e7
TDS	296.0	393.225		6.48e-4	7.684e8
THALLIUM	ldl			ldl	
TOTAL_CATIONS	3.06			8.96e-6	
TOTAL_CHROMIUM	0.071	0.094		8.0e-9	9486.96
TSS	9.0	11.956		4.0e-6	4.743e6
URANIUM	0.072	0.096		9.0e-9	10672.83
VANADIUM	0.009	0.012		5.0e-9	5929.35
ZINC	0.15	0.199		ldl	
pH	6.28			7.42e-6	

DRAFT

Volume of Flow: Treated = 1328463.0 liters Final = 1185870.0 liters

TA50 MINERALS

DEC-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	26.0	36.383		3.2e-4	4.554e8
ALKALINITY-P	ldl			ldl	
ALUMINUM	0.92	1.287		ldl	
AMMONIA-N	3.65	5.108		5.38e-6	7.656e6
ARSENIC	0.001	0.001		ldl	
BARIUM	0.092	0.129		1.6e-8	22768.752
BERYLLIUM	ldl			ldl	
BORON	0.22	0.308		1.9e-7	2.704e5
CADMIUM	0.003	0.004		ldl	
CALCIUM	12.0	16.792		1.1e-4	1.565e8
CHLORIDE	18.0	25.188		3.5e-5	4.981e7
COBALT	ldl			ldl	
COD	43.0	60.172		3.6e-5	5.123e7
CONDUCTIVITY	479.0			0.001	
COPPER	0.2	0.28		7.6e-8	1.082e5
CYANIDE	ldl			ldl	
FLUORIDE	1.66	2.323		2.07e-6	2.946e6
HARDNESS	40.671	56.912		2.774e-4	3.947e8
IRON	1.7	2.379		5.8e-8	82536.726
LEAD	0.073	0.102		ldl	
MAGNESIUM	2.6	3.638		6.6e-7	9.392e5
MERCURY	0.003	0.004		2.66e-10	378.531
NICKEL	1.1	1.539		8.2e-8	1.167e5
NITRATE-N	18.9	26.448		4.73e-5	6.731e7
NITRITE-N	ldl			3.6e-7	5.123e5
PHOSPHORUS	3.49	4.884		5.6e-7	7.969e5
POTASSIUM	3.6	5.038		1.3e-5	1.85e7
SELENIUM	ldl			ldl	
SI	ldl			ldl	
SILICA_DIOXIDE	76.0	106.35		6.1e-5	8.681e7
SILVER	0.027	0.038		ldl	
SODIUM	66.0	92.356		1.3e-4	1.85e8
SULFATE	97.0	135.736		8.7e-5	1.238e8
TDS	352.0	492.568		8.1e-4	1.153e9
THALLIUM	ldl			ldl	
TOTAL_CATIONS	4.18			1.18e-5	
TOTAL_CHROMIUM	0.063	0.088		3.0e-9	4269.141
TSS	19.0	26.587		7.0e-6	9.961e6
URANIUM	0.12	0.168		7.0e-9	9961.329
VANADIUM	0.009	0.013		6.0e-9	8538.282
ZINC	0.18	0.252		ldl	
pH	6.76			6.94e-6	

DRAFT

Volume of Flow: Treated = 1399340.0 liters Final = 1423047.0 liters

Appendix

B

Flows, TA-21

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TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
JAN-1997									
Total	77261	47762	2.0		1.917		36439	0	0
Maximum	10598						13303		
Minimum	106						819		
Average	2575			398.015		101.298	5206		
FEB-1997									
Total	92419	66493	2.833		2.833		82425	11112	0
Maximum	15579						44199		
Minimum	530						38226		
Average	3554			391.138		95.399	41213		
MAR-1997									
Total	107767	127532	6.717		6.533		82036	0	0
Maximum	11446	73290	4.667	440.995	4.567	1[illegible]2.1[illegible]7	52104		
Minimum	424	54242	2.05	261.75	1.967	65.239	29932		
Average	3716	63766	3.358	351.372	3.267	88.678	41018		
APR-1997									
Total	137668	73766	3.117		3.017		160217	9662	0
Maximum	18123						60154		
Minimum	1060						12628		
Average	4917			394.471		99.402	32043		
MAY-1997									
Total	151606	214978	10.383		10.383		167061	0	0
Maximum	15049	78052	4.967	534.631	4.967	130.398	82422		
Minimum	38	64156	2.0	244.196	2.0	59.56	28775		
Average	4890	71659	3.461	386.523	3.461	94.274	55687		

TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
JUN-1997									
Total	96655	78225	5.5		5.5		73312	0	0
Maximum	12824								
Minimum	636								
Average	3866			237.046		57.816			
JUL-1997									
Total	188217	247856	8.2		7.45		172074	23178	0
Maximum	71938	84935	2.883	592.545	2.883	342.097	84832	15972	
Minimum	530	7013	0.4	292.207	0.[illegible]3	119.745	36825	7206	
Average	7239	49571	1.64	476.398	1.49	177.094	57358	11589	
AUG-1997									
Total	96159	152017	5.483		5.133		160072	53060	0
Maximum	12643	66104	2.233	510.591	2.233	169.8[illegible]	88206	46000	
Minimum	318	38294	1.25	396.825	0.917	9[illegible]6	28486	7060	
Average	3561	50672	1.828	466.909	1.711	129.247	53357	26530	
SEP-1997									
Total	71434	0	0.0		0.0		88880	0	0
Maximum	10174								
Minimum	212								
Average	2857			0.0		0.0			
OCT-1997									
Total	0	0	0.0		0.0		0	0	0
Maximum									
Minimum									
Average				0.0		0.0			

TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
NOV-1997									
Total	0	0	0.0		0.0		0	0	0
Maximum									
Minimum									
Average				0.0		0.0			
DEC-1997									
Total	0	0	0.0		0.0		0	0	0
Maximum									
Minimum									
Average				0.0		0.0			
SUMMARY									
Total	1019186	1008629	44.233		42.767		1022516	97012	0
Maximum	188217	247856					172074	53060	0
Minimum	71434	47762					36439	9662	
Average	84932	84052	3.686	380.041	3.564	95.872	85210	8084	0

Appendix B

Analyses of Composite Radiological Samples, TA-21

TA21 RADIOISOTOPES

JAN-1997

	RAW Ci/l	Total (Ci)
ALPHA	3.2e-9	1.528e-4
Am-241	1.0e-10	4.776e-6
BETA	3.8e-10	1.815e-5
Cs-137	ldl	
GAMMA	ldl	
Pu-238	2.1e-9	1.003e-4
Pu-239	3.0e-10	1.433e-5
Sr-89	ldl	
Sr-90	4.0e-11	1.91e-6
TOTAL_PLUTONIUM	2.4e-9	1.146e-4
TRITIUM	1.5e-6	0.072
U-234	[illegible]0e-11	3.821e-6
U-235	ldl	
Total Alpha		1.232e-4

Volume of Flow: Treated = 47762.0 liters Transfered = 36439.0 liters

TA21 RADIOISOTOPES

FEB-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.6e-10	1.729e-5
Am-241	6.0e-11	3.99e-6
BETA	1.3e-10	8.644e-6
Cs-137	ldl	
GAMMA	ldl	
Pu-238	7.0e-11	4.655e-6
Pu-239	3.2e-11	2.128e-6
Sr-89	1.0e-11	6.649e-7
Sr-90	2.5e-11	1.662e-6
TOTAL_PLUTONIUM	1.02e-10	6.782e-6
TRITIUM	8.4e-7	0.056
U-234	5.0e-11	3.325e-6
U-235	2.0e-12	1.33e-7
Total Alpha		1.423e-5

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Volume of Flow: Treated = 66493.0 liters Transfered = 82425.0 liters

TA21 RADIOISOTOPES

MAR-1997

	RAW Ci/l	Total (Ci)
ALPHA	6.6e-10	8.415e-5
Am-241	5.0e-11	6.375e-6
BETA	3.5e-10	4.463e-5
Cs-137	ldl	
GAMMA	ldl	
Pu-238	4.6e-10	5.865e-5
Pu-239	9.0e-11	1.147e-5
Sr-89	ldl	
Sr-90	3.2e-11	4.08e-6
TOTAL_PLUTONIUM	5.5e-10	7.012e-5
TRITIUM	2.0e-6	0.255
U-234	3.4e-11	4.335e-6
U-235	ldl	
Total Alpha		8.084e-5

Volume of Flow: Treated = 127532.0 liters Transfered = 82036.0 liters

TA21 RADIOISOTOPES

APR-1997

	RAW Ci/l	Total (Ci)
ALPHA	5.8e-10	4.278e-5
Am-241	5.0e-11	3.688e-6
BETA	1.9e-10	1.402e-5
Cs-137	ldl	
GAMMA	ldl	
Pu-238	4.7e-10	3.467e-5
Pu-239	8.0e-11	5.901e-6
Sr-89	1.0e-11	7.377e-7
Sr-90	1.5e-11	1.106e-6
TOTAL_PLUTONIUM	5.5e-10	4.057e-5
TRITIUM	1.3e-6	0.096
U-234	3.0e-11	2.213e-6
U-235	3.0e-12	2.213e-7
Total Alpha		4.669e-5

Volume of Flow: Treated = 73766.0 liters Transfered = 160217.0 liters

TA21 RADIOISOTOPES

MAY-1997

	RAW Ci/l	Total (Ci)
ALPHA	1.3e-8	0.003
Am-241	1.0e-8	0.002
BETA	1.4e-9	3.01e-4
Cs-137	ldl	
GAMMA	ldl	
Pu-238	2.0e-10	4.3e-5
Pu-239	2.0e-10	4.3e-5
Sr-89	8.0e-12	1.72e-6
Sr-90	ldl	
TOTAL_PLUTONIUM	4.0e-10	8.6e-5
TRITIUM	8.5e-7	0.183
U-234	ldl	
U-235	ldl	
Total Alpha		0.002

Volume of Flow: Treated = 214978.0 liters Transfered = 167061.0 liters

TA21 RADIOISOTOPES

JUN-1997

	RAW Ci/l	Total (Ci)
ALPHA	3.1e-8	0.002
Am-241	25000.0	1.956e9
BETA	2.7e-9	2.112e-4
Cs-137	ldl	
GAMMA	ldl	
Pu-238	1.1e-9	8.605e-5
Pu-239	3.0e-10	2.347e-5
Sr-89	ldl	
Sr-90	5.0e-11	3.911e-6
TOTAL_PLUTONIUM	1.4e-9	1.095e-4
TRITIUM	5.5e-7	0.043
U-234	1.1e-10	8.605e-6
U-235	2.0e-11	1.565e-6
Total Alpha		1.956e9

Volume of Flow: Treated = 78225.0 liters Transfered = 73312.0 liters

TA21 RADIOISOTOPES

JUL-1997

	RAW Ci/l	Total (Ci)
No entries.		

Volume of Flow: Treated = 247856.0 liters Transfered = 172074.0 liters

TA21 RADIOISOTOPES

AUG-1997

	RAW Ci/l	Total (Ci)
ALPHA	6.9e-9	0.001
Am-241	3.1e-9	4.712e-4
BETA	1.2e-9	1.824e-4
Cs-137	3.0e-10	4.56e-5
GAMMA	3.0e-9	4.56e-4
Pu-238	1.1e-9	1.672e-4
Pu-239	1.8e-10	2.736e-5
Sr-89	ldl	
Sr-90	1.0e-10	1.52e-5
TOTAL_PLUTONIUM	1.28e-9	1.946e-4
TRITIUM	8.2e-7	0.125
U-234	4.9e-10	7.448e-5
U-235	2.0e-11	3.04e-6
Total Alpha		7.433e-4

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Volume of Flow: Treated = 152017.0 liters Transfered = 160072.0 liters

TA21 RADIOISOTOPES

SEP-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.8e-9	0.0
Am-241	1.1e-9	0.0
BETA	3.6e-9	0.0
Cs-137	6.0e-10	0.0
GAMMA	ldl	
Pu-238	8.5e-11	0.0
Pu-239	3.3e-10	0.0
Sr-89	7.5e-11	0.0
Sr-90	4.8e-11	0.0
TOTAL_PLUTONIUM	4.15e-10	0.0
TRITIUM	9.6e-10	0.0
U-234	6.0e-10	0.0
U-235	2.1e-11	0.0

Volume of Flow: Treated = 0.0 liters Transfered = 88880.0 liters

TA21 RADIOISOTOPES

OCT-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.2e-9	0.0
Am-241	9.3e-10	0.0
BETA	ldl	
Cs-137	ldl	
GAMMA	ldl	
Pu-238	1.3e-9	0.0
Pu-239	1.0e-9	0.0
Sr-89	ldl	
Sr-90	4.5e-11	0.0
TOTAL_PLUTONIUM	2.3e-9	0.0
TRITIUM	6.3e-7	0.0
U-234	2.7e-10	0.0
U-235	ldl	

Volume of Flow: Treated = 0.0 liters Transfered = 0.0 liters

Appendix B

Analyses of Composite Mineral Samples, TA-21

DRAFT

TA21 MINERALS

JAN-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	117.0	5.588
ALKALINITY-P	ldl	
ALUMINUM	0.67	0.032
AMMONIA-N	ldl	
ARSENIC	0.009	4.299e-4
BARIUM	0.066	0.003
BERYLLIUM	ldl	
BORON	0.121	0.006
CADMIUM	0.003	1.433e-4
CALCIUM	32.2	1.538
CHLORIDE	39.0	1.863
COBALT	0.004	1.91e-4
COD	170.0	8.12
CONDUCTIVITY	490.0	
COPPER	0.27	0.013
FLUORIDE	1.58	0.075
HARDNESS	112.524	5.374
IRON	11.8	0.564
LEAD	0.08	0.004
MAGNESIUM	7.8	0.373
NICKEL	0.03	0.001
NITRATE-N	ldl	
NITRITE-N	ldl	
PHOSPHORUS	0.96	0.046
POTASSIUM	6.8	0.325
SELENIUM	0.002	9.552e-5
SILICA_DIOXIDE	76.0	3.63
SILVER	0.027	0.001
SODIUM	49.2	2.35
SULFATE	29.0	1.385
TDS	380.0	18.15
THALLIUM	0.4	0.019
TOTAL_CATIONS	3.44	
TOTAL_CHROMIUM	0.024	0.001
TSS	32.0	1.528
URANIUM	28.0	1.337
VANADIUM	0.018	8.597e-4
ZINC	0.31	0.015
pH	7.5	

DRAFT

Volume of Flow: Treated = 47762.0 liters Transfered = 36439.0 liters

TA21 MINERALS

FEB-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	167.0	11.104
ALKALINITY-P	ldl	
ALUMINUM	0.47	0.031
AMMONIA-N	ldl	
ARSENIC	0.006	3.99e-4
BARIUM	0.065	0.004
BERYLLIUM	ldl	
BORON	0.123	0.008
CADMIUM	0.003	1.995e-4
CALCIUM	37.0	2.46
CHLORIDE	4.5	0.299
COBALT	ldl	
COD	55.0	3.657
CONDUCTIVITY	480.0	
COPPER	0.19	0.013
FLUORIDE	1.07	0.071
HARDNESS	139.746	9.292
IRON	6.76	0.449
LEAD	0.06	0.004
MAGNESIUM	11.5	0.765
MERCURY	0.027	0.002
NICKEL	0.02	0.001
NITRATE-N	0.21	0.014
NITRITE-N	ldl	
PHOSPHORUS	1.5	0.1
POTASSIUM	8.2	0.545
SELENIUM	0.003	1.995e-4
SILICA_DIOXIDE	84.0	5.585
SILVER	0.015	9.974e-4
SODIUM	53.0	3.524
SULFATE	59.0	3.923
TDS	390.0	25.932
THALLIUM	ldl	
TOTAL_CATIONS	5.38	
TOTAL_CHROMIUM	0.018	0.001
TSS	9.0	0.598
URANIUM	14.0	0.931
VANADIUM	0.019	0.001
ZINC	0.23	0.015
pH	7.6	

Volume of Flow: Treated = 66493.0 liters Transfered = 82425.0 liters

TA21 MINERALS

MAR-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	0.0	0.0
ALKALINITY-P	0.0	0.0
ALUMINUM	0.18	0.023
AMMONIA-N	ldl	
ARSENIC	0.01	0.001
BARIUM	0.053	0.007
BERYLLIUM	ldl	
BORON	0.14	0.018
CADMIUM	ldl	
CALCIUM	30.0	3.825
CHLORIDE	44.0	5.61
COBALT	ldl	
COD	80.0	10.2
COPPER	0.12	0.015
FLUORIDE	0.0	0.0
HARDNESS	111.56	14.224
IRON	4.0	0.51
LEAD	0.042	0.005
MAGNESIUM	8.9	1.135
MERCURY	0.009	0.001
NICKEL	ldl	
NITRATE-N	0.0	[illegible]0
NITRITE-N	0.0	0.0
PHOSPHORUS	1.87	[illegible].238
POTASSIUM	6.3	0.803
SELENIUM	0.003	3.825e-4
SILICA_DIOXIDE	0.0	0.0
SILVER	ldl	
SODIUM	44.0	5.61
SULFATE	52.0	6.63
TDS	496.0	63.24
THALLIUM	ldl	
TOTAL_CATIONS	0.0	
TOTAL_CHROMIUM	0.017	0.002
TSS	25.0	3.188
URANIUM	17.0	2.167
VANADIUM	0.02	0.003
ZINC	0.17	0.022
pH	7.5	

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Volume of Flow: Treated = 127532.0 liters Transfered = 82036.0 liters

TA21 MINERALS

APR-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	114.0	8.409
ALKALINITY-P	ldl	
ALUMINUM	0.18	0.013
AMMONIA-N	0.28	0.021
ARSENIC	0.012	8.852e-4
BARIUM	0.055	0.004
BERYLLIUM	ldl	
BORON	0.15	0.011
CADMIUM	ldl	
CALCIUM	26.0	1.918
CHLORIDE	42.0	3.098
COBALT	ldl	
COD	57.0	4.205
CONDUCTIVITY	386.0	
COPPER	0.097	0.007
FLUORIDE	3.22	0.238
HARDNESS	94.572	6.976
IRON	4.8	0.354
LEAD	0.028	0.002
MAGNESIUM	7.2	0.531
MERCURY	0.009	6.713e-4
NICKEL	0.011	8.114e-4
NITRATE-N	0.39	0.[illegible]
NITRITE-N	ldl	
PHOSPHORUS	1.35	0.1
POTASSIUM	5.4	0.398
SELENIUM	0.009	6.639e-4
SILICA_DIOXIDE	86.0	6.344
SILVER	0.009	6.639e-4
SODIUM	42.0	3.098
SULFATE	51.0	3.762
TDS	2.0	0.148
THALLIUM	ldl	
TOTAL_CATIONS	4.08	
TOTAL_CHROMIUM	0.019	0.001
TSS	13.0	0.959
URANIUM	0.078	0.006
VANADIUM	0.019	0.001
ZINC	0.18	0.013
pH	7.28	

Volume of Flow: Treated = 73766.0 liters Transfered = 160217.0 liters

TA21 MINERALS

MAY-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	118.0	25.37
ALKALINITY-P	ldl	
ALUMINUM	0.27	0.058
AMMONIA-N	0.06	0.013
ARSENIC	0.01	0.002
BARIUM	0.046	0.01
BERYLLIUM	ldl	
BORON	0.11	0.024
CADMIUM	0.004	8.6e-4
CALCIUM	27.0	5.805
CHLORIDE	12.9	2.773
COBALT	ldl	
COD	42.0	9.03
CONDUCTIVITY	360.0	
COPPER	0.07	0.015
FLUORIDE	2.61	0.561
HARDNESS	90.068	19.365
IRON	4.4	0.946
LEAD	0.026	0.006
MAGNESIUM	5.5	1.182
MERCURY	4.7	1.01
NICKEL	0.035	0.008
NITRATE-N	2.54	0.[illegible]46
NITRITE-N	ldl	
PHOSPHORUS	0.67	0.144
POTASSIUM	5.2	1.118
SELENIUM	0.003	6.45e-4
SILICA_DIOXIDE	77.0	16.555
SILVER	ldl	
SODIUM	36.0	7.74
SULFATE	31.7	6.816
TDS	304.0	65.36
THALLIUM	ldl	
TOTAL_CATIONS	3.6	
TOTAL_CHROMIUM	0.017	0.004
TSS	37.0	7.955
URANIUM	0.024	0.005
VANADIUM	0.02	0.004
ZINC	0.13	0.028
pH	7.5	

Volume of Flow: Treated = 214978.0 liters Transfered = 167061.0 liters

TA21 MINERALS

JUN-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	110.0	8.605
ALKALINITY-P	ldl	
ALUMINUM	0.22	0.017
AMMONIA-N	0.21	0.016
ARSENIC	0.01	7.822e-4
BARIUM	0.05	0.004
BERYLLIUM	ldl	
BORON	0.116	0.009
CADMIUM	0.002	1.564e-4
CALCIUM	34.1	2.667
CHLORIDE	13.9	1.087
COBALT	0.003	2.347e-4
COD	34.0	2.66
CONDUCTIVITY	410.0	
COPPER	0.075	0.006
FLUORIDE	2.4	0.188
HARDNESS	109.567	8.571
IRON	5.77	0.451
LEAD	ldl	
MAGNESIUM	5.93	0.464
NICKEL	0.012	[illegible].387e-4
NITRATE-N	1.9	[illegible].149
NITRITE-N	ldl	
PHOSPHORUS	0.88	0.069
POTASSIUM	6.11	0.478
SELENIUM	0.003	2.347e-4
SILICA_DIOXIDE	76.0	5.945
SILVER	ldl	
SODIUM	36.6	2.863
SULFATE	64.1	5.014
TDS	344.0	26.909
THALLIUM	0.001	7.822e-5
TOTAL_CATIONS	4.06	
TOTAL_CHROMIUM	0.017	0.001
TSS	49.0	3.833
URANIUM	0.027	0.002
VANADIUM	0.018	0.001
ZINC	0.112	0.009
pH	6.9	

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Volume of Flow: Treated = 78225.0 liters Transfered = 73312.0 liters

TA21 MINERALS

JUL-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	147.0	36.441
ALKALINITY-P	ldl	
ALUMINUM	0.214	0.053
AMMONIA-N	1.53	0.379
ARSENIC	0.007	0.002
BARIUM	0.091	0.023
BERYLLIUM	ldl	
BORON	0.115	0.029
CADMIUM	ldl	
CALCIUM	46.2	11.453
CHLORIDE	30.9	7.66
COBALT	0.006	0.001
COD	45.0	11.155
CONDUCTIVITY	480.0	
COPPER	0.075	0.019
FLUORIDE	2.18	0.54
HARDNESS	146.493	36.316
IRON	3.82	0.947
LEAD	0.048	0.012
MAGNESIUM	7.56	1.874
MERCURY	7.8e-4	1.934[illegible]
NICKEL	0.023	0.006
NITRATE-N	0.37	0.0[illegible]2
NITRITE-N	ldl	
PHOSPHORUS	0.96	0.238
POTASSIUM	7.21	1.787
SELENIUM	0.005	0.001
SILICA_DIOXIDE	83.0	20.576
SILVER	0.016	0.004
SODIUM	42.2	10.461
SULFATE	60.2	14.924
TDS	384.0	95.194
THALLIUM	ldl	
TOTAL_CATIONS	4.84	
TOTAL_CHROMIUM	0.015	0.004
TSS	22.0	5.454
URANIUM	0.04	0.01
VANADIUM	0.014	0.003
ZINC	0.206	0.051
pH	7.5	

Volume of Flow: Treated = 247856.0 liters Transfered = 172074.0 liters

TA21 MINERALS

AUG-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	138.0	20.976
ALKALINITY-P	ldl	
ALUMINUM	0.25	0.038
AMMONIA-N	0.5	0.076
ARSENIC	1.0e-6	1.52e-7
BARIUM	0.06	0.009
BERYLLIUM	ldl	
BORON	0.13	0.02
CADMIUM	0.004	6.08e-4
CALCIUM	48.0	7.296
CHLORIDE	35.9	5.457
COBALT	0.004	6.08e-4
COD	32.0	4.864
CONDUCTIVITY	470.0	
COPPER	0.065	0.01
FLUORIDE	2.27	0.345
HARDNESS	142.093	21.598
IRON	3.5	0.532
LEAD	0.054	0.008
MAGNESIUM	5.4	0.821
MERCURY	ldl	
NICKEL	0.042	0.006
NITRATE-N	0.44	0.067
NITRITE-N	ldl	
PHOSPHORUS	0.3	0.046
POTASSIUM	8.9	1.353
SELENIUM	2.0e-6	3.04e-7
SILICA_DIOXIDE	60.0	9.12
SILVER	0.008	0.001
SODIUM	40.0	6.08
SULFATE	75.2	11.43
TDS	370.0	56.24
THALLIUM	ldl	
TOTAL_CATIONS	4.81	
TOTAL_CHROMIUM	0.013	0.002
TSS	56.0	8.512
URANIUM	3.8e-5	5.776e-6
VANADIUM	0.012	0.002
ZINC	0.24	0.036
pH	7.5	

Volume of Flow: Treated = 152017.0 liters Transfered = 160072.0 liters

TA21 MINERALS

SEP-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	117.0	0.0
ALKALINITY-P	ldl	
ALUMINUM	0.35	0.0
AMMONIA-N	0.94	0.0
ARSENIC	1.0	0.0
BARIUM	0.029	0.0
BERYLLIUM	ldl	
BORON	0.17	0.0
CADMIUM	ldl	
CALCIUM	14.0	0.0
CHLORIDE	29.0	0.0
COBALT	ldl	
COD	42.0	0.0
CONDUCTIVITY	429.0	
COPPER	0.4	0.0
FLUORIDE	2.33	0.0
HARDNESS	50.195	0.0
IRON	1.8	0.0
LEAD	0.13	0.0
MAGNESIUM	3.7	0.0
MERCURY	8.0e-4	0.0
NICKEL	0.13	0.0
NITRATE-N	0.1[illegible]	0.0
NITRITE-N	ldl	
PHOSPHORUS	0.93	0.0
POTASSIUM	6.4	0.0
SELENIUM	2.0	0.0
SILICA_DIOXIDE	54.0	0.0
SILVER	0.02	0.0
SODIUM	37.0	0.0
SULFATE	72.6	0.0
TDS	404.0	0.0
THALLIUM	ldl	
TOTAL_CATIONS	4.29	
TOTAL_CHROMIUM	0.11	0.0
TSS	3.0	0.0
URANIUM	0.09	0.0
VANADIUM	0.01	0.0
ZINC	0.13	0.0
pH	7.62	

Volume of Flow: Treated = 0.0 liters Transfered = 88880.0 liters

TA21 MINERALS

OCT-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	131.0	10.593
ALKALINITY-P	ldl	
ALUMINUM	0.21	0.017
AMMONIA-N	1.76	0.142
ARSENIC	6.0e-6	4.852e-7
BARIUM	0.059	0.005
BERYLLIUM	ldl	
BORON	0.12	0.01
CADMIUM	0.003	2.426e-4
CALCIUM	39.0	3.154
CHLORIDE	27.0	2.183
COBALT	0.003	2.426e-4
COD	33.0	2.669
CONDUCTIVITY	441.0	
COPPER	0.06	0.005
FLUORIDE	2.3	0.186
HARDNESS	117.973	9.54
IRON	5.4	0.437
LEAD	0.029	0.002
MAGNESIUM	5.0	0.404
MERCURY	4.0e-4	3.235e-5
NICKEL	0.038	0.003
NITRATE-N	0.22	0.018
NITRITE-N	ldl	
PHOSPHORUS	ldl	
POTASSIUM	6.5	0.526
SELENIUM	ldl	
SILICA_DIOXIDE	62.0	5.014
SILVER	0.004	3.235e-4
SODIUM	36.0	2.911
SULFATE	72.7	5.879
TDS	310.0	25.068
THALLIUM	ldl	
TOTAL_CATIONS	4.43	
TOTAL_CHROMIUM	0.008	6.469e-4
TSS	51.0	4.124
URANIUM	0.022	0.002
VANADIUM	0.007	5.661e-4
ZINC	0.16	0.013
pH	7.79	

Volume of Flow: Treated = 80866.0 liters Transfered = 0.0 liters

TA21 MINERALS

NOV-1997

	RAW Concentration	Total (KG)
No entries.		

Volume of Flow: Treated = 0.0 liters Transfered = 7386.0 liters

TA21 MINERALS

DEC-1997

	RAW Concentration	Total (KG)
No entries.		

Volume of Flow: Treated = 0.0 liters Transfered = 14980.0 liters

Appendix

C

TA-50-WM-1, Room 60 Operations

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TA-50-WM-1
ROOM 60
PRETREATMENT OPERATIONS

****

CALENDAR YEAR, 1997

MONTH	CAUSTIC TREATED (Liters)	^{238,239,240}Pu (Curies)	^{241}Am (Curies)	GROSS ALPHA (Curies)	ACID TREATED (Liters)	^{238,239,240}Pu (Curies)	^{241}Am (Curies)	GROSS ALPHA (Curies)	Pu in Final (Curies)	Am in Final (Curies)	GROSS ALPHA (Curies)	ALPHA Decon Factor *
JAN												
FEB												
MAR	4766.37	6.756	2.099	8.855	9830.34	2.65E-2	3.79E-2	6.44E-2	0.185	0.136	0.321	96.40
APR	0	0	0	0	0	0						
MAY	0	0	0	0	0	0						
JUN	3717.5	4.892	1.672	6.564	10,645.25	6.44E-2	3.34E-2	9.78E-2	6.0E-2	3.4E-2	9.4E-2	98.59
JUL	0	0	0	0	0	0						
AUG	0	0	0	0	14,735.3	0.393	0.152	0.545	1.6E-2	1.7E-2	3.3E-2	93.94
SEP	0	0	0	0	0	0						
OCT	0	0	0	0	0	0						
NOV	0	0	0	0	0	0						
DEC	2574.25	1.081	2.008	3.089	10,535.5	8.848	0.203	1.051	2.1E-3	1.5E-3	3.6E-3	99.91
TOTAL	11058.12	12.729	5.779	18.508	45,746.39	9.332	0.426	1.758	0.263	0.189	0.452	97.77

* Decon Factor = ($^{\text{Inf. - Eff.}}/_{\text{Inf.}}$) × 100

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TA-50 WM-1-ROOM 60
SLUDGE/CEMENT PASTE

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	SLUDGE SOLIDIFIED (Liters)	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	0	0	0	0				
FEB	0	0	0	0				
MAR	0	0	0	0				
APR	0	0	0	0				
MAY	0	0	0	0				
JUN	0	0	0	0				
JUL	0	0	0	0				
AUG	0	0	0	0				
SEP	0	0	0	0				
OCT	20	440	4160	5273.26	2.50 ± 0.58 E-3	4.28 ± 0.72 E+0	5.70 ± 0.72 E+0	7.84 ± 0.72 E+0
NOV	0	0	0	0				
DEC	0	0	0	0				
TOT	20	440	4160	5273.26	2.50 ± 0.58 E-3	4.28 ± 0.72 E+0	5.70 ± 0.72 E+0	7.84 ± 0.72 E+0

Appendix D

TA-53, Tank Discharges to Lagoons

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TA-53
TANK DISCHARGES TO LAGOONS
****
CALENDAR YEAR, 1997

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Item	**Average**	Maximum	Minimum	Num	**Total(Ci)**

5 3 - L R liters

5 3 - L A N S C E liters

5 3 - W N R liters

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ATTACHMENT B

Draft Data Tables

1997 Environmental Surveillance Report

Table 5.6. Summary of TA-50 Radionuclide and Nitrate Discharges

Table 5-16. Radiochemical Analyses of Groundwater for 1997

Table 5-21. Chemical Quality of Groundwater for 1997

Table 5-22. Total Recoverable Trace Metals in Groundwater for 1997

Table 5-23. Number of Results above the Analytical Limit of Quantitation for Organic Compounds in Groundwater for 1997.

Table 5-6. Summary of TA-50 Radionuclide and Nitrate Discharges[a]

	1963–1977	1995			1996			1997		
Radionuclide	Total Activity Released (mCi)[b]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]	Total Annual Activity (mCi)	Mean Activity (pCi/L)	Ratio of Activity to DCG[c]
^{3}H	25,150	731	41,400	0.02	1,020	61,700	0.03	1,330	76,300	0.04
^{241}Am	7	1.4	79.4	2.65	1.99	120	4.00	2.56	147	4.90
^{137}Cs	848	6.6	375	0.13	2.20	133	0.04	2.48	142	0.05
^{238}Pu	51	3.4	195	4.88	2.25	136	3.40	1.34	76.7	1.92
^{239,240}Pu	39	0.6	35.6	1.19	0.39	23.8	0.79	0.80	45.9	1.53
^{89}Sr	<1	0.1	6.9	0.0003	0.66	40.2	0.002	0.83	47.7	0.002
^{90}Sr	295	0.6	36.9	0.04	0.60	36.1	0.04	0.50	28.5	0.03
^{234}U	NA	0.2	14.3	0.03	0.19	11.7	0.02	0.08	4.88	0.01
^{235}U	2	.009	0.53	0.0009	0.003	0.18	0.0003	0.007	0.44	0.0007
Constituent		Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL	Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL	Total Annual Mass (kg)	Mean Concentration (mg/L)	Ratio of Concentration to MCL
NO_3-N		718	35.6	3.5	1,260	76.4	7.6	1,220	69.6	7.0
Total effluent volume ($\times 10^7$ liters)		1.76			1.65			1.75		

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[a] Compiled from Radioactive Liquid Waste Group (EM-RLW) Annual Reports. Data for 1997 are preliminary.

[b] DOE, 1979; decay corrected through 12/77.

[c] Public dose limit.

Table 5-16. Radiochemical Analyses of Groundwater for 1997 (pCi/L[a])

Station Name	Date	Codes[b]		^{3}H		^{90}Sr		^{137}Cs		U (µg/L)		^{238}Pu		^{239,240}Pu		^{241}Am		Gross Alpha		Gross Beta		Gross Gamma	
Regional Aquifer Wells																							
Test Wells:																							
Test Well 1	08/11	1	UF	468	690[c]	0.1	0.9	0.26	0.29	1.90	0.19	0.008	0.012	0.012	0.012	–0.015	0.013	0.5	1.6	3.0	2.9	–40	47
Test Well 2	12/11	1	UF	–162	670	0.8	1.0	0.74	2.33	0.00	0.01	–0.012	0.017	–0.016	0.023	–0.047	0.017	0.2	0.8	0.7	1.5	52	49
Test Well 3	08/11	1	UF	–2,052	500	1.0	1.3	–0.92	0.36	0.73	0.08	–0.023	0.004	0.009	0.012	0.002	0.029	0.1	0.7	2.2	1.7	–59	47
Test Well 4	08/11	1	UF	–302	640	1.3	1.7	0.21	0.24	0.45	0.05	–0.008	0.009	0.010	0.011	–0.001	0.014	0.2	0.9	1.6	1.6	–11	47
Test Well DT-5A	03/07	1	UF	104	216	–0.07	0.4	0.35	0.53	0.45	0.05	0.001	0.020	–0.009	0.004	–0.016	0.012	0.4	0.6	1.3	0.5	–28	50
Test Well DT-5A	03/07	2	UF	69	188																		
Test Well DT-5A	03/07	R1	UF																			160	50
Test Well DT-5A	05/13	1	UF	185	201	0.8	1.8	0.96	2.67	0.08	0.01	–0.007	0.009	–0.010	0.009	–0.019	0.014	0.4	0.4	–0.2	0.4	–52	47
Test Well DT-5A	10/16	1	UF	–222	700	–1.1	1.3	0.10	1.39	0.49	0.05	0.011	0.013	0.012	0.012	–0.006	0.013	0.3	1.1	0.7	0.5	–115	48
Test Well DT-9	05/13	1	UF	1	166	0.9	1.6	1.10	0.42	0.43	0.05	0.003	0.010	0.000	0.010	–0.014	0.016	0.0	0.2	0.2	0.4	–31	47
Test Well DT-9	10/15	1	UF	–172	700	–1.6	1.5	–0.82	0.80	0.61	0.06	–0.007	0.011	0.004	0.012	–0.015	0.011	0.1	0.7	0.3	1.4	–123	48
Test Well DT-10	05/14	1	UF	–59	148	–0.6	1.2	0.02	0.24	0.46	0.05	–0.025	0.007	–0.020	0.010	–0.005	0.018	–0.2	0.2	–1.3	0.3	–27	47
Test Well DT-10	10/16	1	UF	–232	700	–3.4	2.2	–0.91	0.80	0.74	0.08	0.021	0.014	–0.002	0.010	0.019	0.030	0.9	3.1	1.7	1.6	–28	49
Water Supply Wells:																							
O-1	01/08	1	UF	169	136	0.1	0.4	0.31	0.48	1.72	0.17	0.005	0.018	–0.012	0.011	–0.033	0.014	2.8	1.0	0.6	0.5	62	50
O-1	01/08	D1	UF					0.13	0.18									2.8	1.0	0.3	0.4		
O-1	01/08	R1	UF	–144	133							–0.018	0.010	–0.016	0.009	0.025	0.027						
O-1	04/17	1	UF			0.0	0.3																
O-1	04/19	1	UF			0.0	0.3																
O-1	04/19	D1	UF			0.6	0.3																
O-4	06/25	1	UF	288	710	0.2	2.0	–0.85	0.80	0.85	0.09	–0.014	0.022	–0.014	0.017	0.022	0.021	0.5	4.0	2.5	1.8	–10	47
PM-1	06/25	1	UF	88	700	–0.9	1.8	–0.74	0.12	1.87	0.19	0.018	0.015	0.029	0.019	–0.045	0.022	2.5	6.1	3.8	1.9	1	47
PM-2	06/25	1	UF	368	720	–1.2	1.8	–0.76	0.08	0.47	0.05	–0.006	0.019	–0.005	0.020	–0.003	0.019	0.0	0.7	1.5	0.6	–9	47
PM-3	06/25	1	UF	658	730	0.1	2.2	–0.88	0.80	1.03	0.11	–0.035	0.007	–0.017	0.010	0.000	0.016	–0.3	0.3	2.3	1.8	17	47
PM-4	06/25	1	UF	58	700	–1.2	2.2	–1.08	0.80	0.35	0.04	–0.007	0.011	0.019	0.016	–0.035	0.026	0.5	4.5	1.4	1.6	8	47
PM-5	06/25	1	UF	–2	690	–0.5	2.5	–0.72	0.16	0.55	0.06	–0.026	0.008	0.001	0.014	0.004	0.017	0.1	0.9	1.2	1.6	–6	47
G-1	12/08	1	UF	198	720	5.2	1.4	–0.13	1.03	0.64	0.07	0.005	0.010	0.015	0.012	–0.008	0.020	–0.2	0.1	2.1	1.7	29	49
G-1A	06/25	1	UF	–82	690	–1.1	2.7	–1.00	0.80	0.43	0.05	–0.023	0.007	0.011	0.015	–0.001	0.034	0.0	0.4	1.7	1.7	15	47
G-2	06/25	1	UF	388	720	0.0	1.3	–0.93	0.80	0.92	0.09	–0.029	0.005	0.010	0.013	–0.004	0.017	–0.3	0.2	1.5	1.6	21	47
G-4	06/25	1	UF	–52	690	–0.2	1.0	–0.59	0.36	0.91	0.09	–0.032	0.010	0.006	0.012	–0.015	0.015	0.2	1.5	1.5	1.6	–16	47
G-5	06/25	1	UF	458	720	–0.7	1.4	–0.70	0.18	0.98	0.10	–0.005	0.010	–0.001	0.011	–0.015	0.014	0.5	2.9	0.9	1.5	9	47
G-6	06/25	1	UF	158	700	–4.4	2.7	–1.01	0.80	0.59	0.06	–0.014	0.011	0.012	0.015	–0.003	0.044	–0.4	0.4	1.4	1.6	4	47

Table 5-16. Radiochemical Analyses of Groundwater for 1997 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]	^{3}H	^{90}Sr	^{137}Cs	U (µg/L)	^{238}Pu	^{239,240}Pu	^{241}Am	Gross Alpha	Gross Beta	Gross Gamma
Regional Aquifer Springs												
White Rock Canyon Group I:												
Sandia Spring	08/19	1 UF	118 720	1.8 1.6	–0.82 0.36	1.02 0.11	–0.018 0.053	–0.001 0.011	0.023 0.021	2.8 3.2	3.5 1.8	–39 47
Spring 3	11/18	1 UF	48 710	0.3 1.2	1.06 0.38	1.57 0.16	–0.003 0.009	0.009 0.011	0.029 0.040	1.7 8.3	2.6 1.8	2 49
Spring 3AA	11/18	1 UF	98 710	0.7 1.1	0.40 1.83	1.34 0.14	–0.023 0.002	–0.003 0.008	–0.020 0.012	0.4 2.5	2.7 1.8	21 49
Spring 4A	11/18	1 UF	–292 680	0.4 1.0	–1.69 0.36	1.20 0.12	–0.008 0.008	–0.007 0.008	–0.035 0.011	0.3 2.7	0.3 1.4	–20 48
Spring 5	09/29	1 UF	–432 650	–0.4 1.1	–0.36 0.22	0.55 0.06	–0.008 0.012	0.024 0.014	–0.038 0.014	0.3 1.2	1.1 1.6	–4 49
Ancho Spring	11/19	1 UF	–282 690	1.2 1.2	–0.28 0.81	0.29 0.03	0.029 0.014	0.007 0.012	–0.001 0.030	0.5 2.1	2.5 1.8	17 49
White Rock Canyon Group II:												
Spring 6A	09/29	1 UF	–52 670	–0.3 1.1	0.29 0.32	0.28 0.03	–0.016 0.012	0.006 0.015	0.002 0.019	0.5 2.7	1.6 1.6	–6 49
Spring 7	09/29	1 UF	108 680	–0.1 1.1	–0.50 0.48	1.13 0.12	–0.018 0.004	0.002 0.010	–0.024 0.013	0.8 5.8	1.4 1.6	–26 48
Spring 7	09/29	1 UF	218 690	0.0 1.0	–0.48 0.52	1.15 0.12	0.002 0.010	–0.011 0.008	0.008 0.017	0.8 5.8	1.4 1.6	23 49
Spring 8B	09/30	1 UF	–2 680	–0.6 1.3	–1.24 0.36	0.09 0.01	–0.029 0.002	–0.003 0.009	–0.023 0.014	0.4 2.3	0.6 1.4	–19 49
Spring 9	09/30	1 UF	98 680	–0.2 1.3	–0.92 0.36	0.21 0.02	–0.018 0.006	0.009 0.012	0.020 0.022	0.2 1.0	0.3 1.3	9 49
White Rock Canyon Group III:												
Spring 1	08/19	1 UF	68 720	1.0 1.3	–1.14 0.36	2.59 0.26	0.009 0.011	–0.005 0.008	0.004 0.018	1.4 3.1	2.7 1.7	–24 47
Spring 2	08/19	1 UF	8 710	2.3 1.6	0.19 1.51	2.61 0.26	–0.032 0.013	0.035 0.029	–0.009 0.030	3.0 5.6	4.3 0.8	–29 47
White Rock Canyon Group IV:												
La Mesita Spring	12/08	1 UF	–312 680	0.2 0.9	1.96 0.53	12.13 1.22	–0.025 0.002	0.025 0.014	–0.023 0.013	12.8 3.0	14.0 5.0	–30 48
Other Springs:												
Sacred Spring	07/08	1 UF	–372 750	0.0 2.0	0.48 1.95	0.32 0.04	–0.024 0.002	–0.006 0.008	0.000 0.020	0.8 40.3	1.6 0.6	13 47
Canyon Alluvial Groundwater Systems												
Acid/Pueblo Canyons:												
APCO-1	12/10	1 UF	288 690	2.3 2.5	0.00 0.23	0.59 0.06	–0.008 0.013	0.036 0.016	0.030 0.026	0.1 0.8	15.0 5.0	–1 48
Cañada del Buey:												
CDBO-6	06/16	1 UF	98 710	1.1 1.1	–0.34 0.71	0.65 0.07	–0.026 0.011	0.012 0.016	0.004 0.020	16.6 7.3	18.4 5.8	30 47
CDBO-7	06/16	1 UF	–112 700	5.2 1.8	–0.22 0.27	2.11 0.21	–0.014 0.010	–0.012 0.010	0.011 0.023	50.4 20.5	57.1 21.2	3 47

Table 5-16. Radiochemical Analyses of Groundwater for 1997 (pCi/L^{a}) (Cont.)

Station Name	Date	Codes^{b}	^{3}H	^{90}Sr	^{137}Cs	U (µg/L)	^{238}Pu	^{239,240}Pu	^{241}Am	Gross Alpha	Gross Beta	Gross Gamma
Canyon Alluvial Groundwater Systems (Cont.)												
DP/Los Alamos Canyons:												
LAO-C	06/17	1 UF	168 710	0.8 1.0	−0.54 0.42	0.07 0.01	−0.026 0.009	0.005 0.013	-0.010 0.016	1.4 10.2	2.2 1.7	−4 47
LAO-0.7	06/18	1 UF	−142 690	0.5 1.4	−0.38 0.67	0.23 0.03	−0.023 0.007	0.261 0.038	0.002 0.021	4.2 4.4	5.3 2.0	−5 47
LAO-1	06/18	1 UF	468 730	7.1 1.8	0.16 1.47	0.13 0.02	−0.026 0.006	0.105 0.024	−0.043 0.015	0.3 0.7	13.9 2.5	−16 47
LAO-2	08/04	1 UF	98 680	15.6 2.5	−0.78 0.07	0.24 0.03	−0.006 0.012	0.002 0.013	0.015 0.017	−1.6 1.5	33.0 4.0	−11 47
LAO-3A	08/04	1 UF	188 680	34.8 3.5	−0.02 0.30	0.20 0.02	−0.004 0.010	0.028 0.015	0.002 0.021	−2.1 0.4	83.0 6.0	−32 47
LAO-4	08/04	1 UF	378 690	4.4 1.4	2.36 0.66	0.11 0.01	−0.001 0.010	0.006 0.011	0.048 0.023	−0.8 3.2	12.8 1.5	283 49
LAO-4.5C	08/04	1 UF	88 670	3.2 1.7	−0.21 0.92	−0.03 0.01	−0.004 0.009	0.001 0.011	0.005 0.016	0.2 9.7	6.8 2.1	639 69
LAO-6A	08/04	1 UF	248 680	1.7 1.3	−0.44 0.57	0.09 0.01	−0.008 0.010	0.013 0.014	−0.053 0.012	0.3 5.3	5.6 2.0	34 47
Mortandad Canyon:												
MCO-3	08/07	1 UF	11,428 1,300	20.2 3.4	0.55 0.36	1.85 0.19	16.202 0.756	12.522 0.594	14.093 0.697	18.8 12.0	136.0 22.0	140 48
MCO-4B	08/05	1 UF	20,128 1,600	38.3 4.3	7.65 1.14	1.96 0.20	−0.012 0.010	0.013 0.015	0.591 0.054	5.8 4.9	131.0 11.0	−5 47
MCO-5	08/05	1 UF	17,728 1,500	32.3 3.2	0.88 0.39	1.78 0.18	0.019 0.013	0.076 0.021	0.485 0.050	7.6 10.0	131.0 16.0	−19 47
MCO-6	08/05	1 UF	18,328 1,500	32.4 3.5	0.54 0.36	2.45 0.25	0.008 0.014	0.014 0.013	0.416 0.045	5.9 7.8	132.9 13.8	1 48
MCO-7A	06/13	1 UF	15,928 1,500	1.4 1.6	−0.39 0.19	2.81 0.28	−0.017 0.006	0.002 0.011	0.053 0.029	10.8 7.8	48.9 10.1	19 47
MCO-7.5	06/13	1 UF	18,428 1,600	1.1 1.8	−0.33 0.73	1.86 0.19	0.007 0.012	−0.009 0.012	0.185 0.037	26.5 10.4	80.5 12.0	25 47
Pajarito Canyon:												
PCO-1	06/16	1 UF	318 720	0.9 1.2	0.67 0.33	0.07 0.01	0.002 0.011	0.007 0.014	−0.082 0.021	0.6 4.6	2.1 0.7	21 47
Intermediate Perched Groundwater Systems												
Pueblo/Los Alamos Canyon Area:												
Test Well 1A	08/11	1 UF	−272 640	1.2 1.3	0.61 0.33	0.24 0.03	0.001 0.010	0.003 0.011	−0.014 0.013	−0.7 0.7	3.2 3.0	−75 47
Test Well 2A	12/11	1 UF	1,778 790	0.4 1.0	1.33 0.48	0.00 0.01	−0.009 0.007	0.013 0.011	−0.004 0.013	0.0 0.3	1.0 1.5	74 49
Basalt Spring	08/14	1 UF	18 710	2.6 2.4	−0.83 0.36	2.22 0.23	−0.014 0.006	0.476 0.050	−0.007 0.015	8.4 7.6	22.1 4.1	−55 47

Table 5-16. Radiochemical Analyses of Groundwater for 1997 (pCi/L[a]) (Cont.)

Station Name	Date	Codes[b]		^{3}H		^{90}Sr		^{137}Cs		U (µg/L)		^{238}Pu		$^{239,240}Pu$		^{241}Am		Gross Alpha		Gross Beta		Gross Gamma	
Perched Groundwater System in Volcanics:																							
Water Canyon Gallery	12/01	1	UF	38	670	−0.2	1.0	−0.75	0.10	0.19	0.02	−0.025	0.007	−0.017	0.009	0.039	0.029	−0.3	0.2	0.7	1.5	−7	48
Pueblo of San Ildefonso																							
LA-1B	10/06	1	UF	408	680	−0.2	1.0	1.29	0.42	0.00	0.01	−0.020	0.007	−0.014	0.008	−0.046	0.013	4.6	1.0	6.1	0.7	22	48
LA-5	07/07	1	UF	−492	740	−0.2	1.7	−0.63	0.29	1.10	0.11	−0.006	0.009	−0.009	0.007	0.015	0.045	1.2	3.2	2.3	1.7	−8	47
Eastside Artesian Well	10/06	1	UF	248	670	−0.4	1.0	−0.10	0.28	−0.01	0.01	−0.025	0.006	−0.012	0.010	−0.011	0.014	1.0	0.4	0.2	0.1	54	48
Halladay House Well	08/13	1	UF	−292	690	0.8	1.5	−1.21	0.36	1.48	0.15	0.025	0.014	−0.002	0.009	−0.016	0.015	1.2	3.4	0.8	1.5	−60	47
Pajarito Well (Pump 1)	07/08	1	UF	−142	770	0.7	1.9	−0.36	0.69	11.01	1.10	−0.020	0.001	0.001	0.010	−0.006	0.044	1.3	1.4	2.6	1.7	45	47
Don Juan Playhouse Well	10/06	1	UF	778	710	0.3	1.0	−0.31	0.21	6.97	0.70	−0.001	0.009	0.012	0.012	−0.001	0.015	6.5	1.0	2.4	0.3	46	48
Otowi House Well	10/06	1	UF	288	680	0.2	0.9	0.88	0.40	1.41	0.14	−0.001	0.014	0.006	0.014	−0.025	0.016	5.5	1.1	2.2	0.3	12	48
New Community Well	07/07	1	UF	368	800	0.0	1.5	−0.28	0.18	22.49	2.25	−0.012	0.006	0.029	0.013	−0.002	0.018	11.6	4.0	10.3	2.2	16	47
Sanchez House Well	07/08	1	UF	−242	760	−0.3	2.1	−0.28	0.81	13.18	1.32	−0.018	0.006	0.019	0.014	−0.022	0.014	1.7	1.3	6.4	1.9	−34	47
Limits of Detection					700		3		4	0.1		0.04		0.04		0.04		3		3		120	
Water Quality Standards[d]																							
DOE DCG for Public Dose					2,000,000		1,000		3,000	800		40		30		30		30		1,000			
DOE Drinking Water System DCG					80,000		40		120	30		1.6		1.2		1.2		1.2		40			
EPA Primary Drinking Water Standard					20,000		8			20								15					
EPA Screening Level																				50			
NMWQCC Groundwater Limit										5,000													

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[a] Except where noted.

[b] Codes: UF–unfiltered, F–filtered, 1–primary analysis, 2–second analysis, R1–lab replicate, D1–lab duplicate.

[c] Two columns are listed: the first is the value; the second is the radioactive counting uncertainty (1 std dev). Radioactivity counting uncertainties may be less than analytical method uncertainties.

[d] Standards given here for comparison only, see Appendix A.

Table 5-21. Chemical Quality of Groundwater for 1997 (mg/L[a])

Station Name	Date	Codes[b]	SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3-N	CN	TDS[c]	TSS[d]	Hardness as $CaCO_3$	pH[e]	Conductance (µS/cm)
Regional Aquifer Wells																				
Test Wells:																				
Test Well 1	08/11	1 UF	44	43.3	9.0	2.4	15.2	31.8	21.0	<5[f]	110	0.45	<0.02	5.52	<0.01	253		145	8.0	405
Test Well 2	12/11	1 UF	6	7.4	1.9	1.6	20.7	3.8	1.4	<5	89	0.45	0.02	<0.02	<0.01	64	<1	26	7.9	139
Test Well 3	08/11	1 UF	80	14.9	4.8	1.3	10.5	4.6	4.0	<5	84	0.48	<0.02	0.69	<0.01	159		57	7.6	173
Test Well 4	08/11	1 UF	36	9.9	5.4	1.5	9.4	3.6	2.0	<5	72	0.25	<0.02	0.16	<0.01	108		47	8.1	144
Test Well DT-5A	03/07	1 UF	73	7.2	2.2	1.0	9.8	3.5	3.0	<5	52	0.22	<0.02	0.33	<0.01	130	<1	27	7.9	113
Test Well DT-5A	03/07	R1 UF		7.2	2.2	1.2	9.8	3.6	2.8		53		<0.02	0.34	<0.01	144		27		
Test Well DT-5A	05/13	1 UF	48	7.0	2.2	<1.0	10.2	4.0	3.0	<5	47	0.24	<0.02	<0.02	<0.01	100	2	26	7.9	102
Test Well DT-5A	10/16	1 UF	67	6.6	1.9	1.6	8.5	2.7	2.7	<5	59	0.22	<0.02	0.12	0.01	162	<1	25	8.0	110
Test Well DT-9	05/13	1 UF	72	9.1	2.6	<1.0	10.0	4.1	3.3	<5	56	0.31	0.05	0.37	<0.01	142	1	34	8.2	115
Test Well DT-9	10/15	1 UF	77	11.8	3.4	<1.0	10.3	2.7	2.7	<5	53	0.29	<0.02	0.37	0.01	175	<1	44	7.6	116
Test Well DT-10	05/14	1 UF	72	8.6	2.5	<1.0	9.3	4.0	3.0	<5	53	0.31	0.02	0.41	<0.01	108	3	32	8.2	115
Test Well DT-10	10/16	1 UF	70	11.3	3.5	1.3	11.1	2.7	2.6	<5	64	0.26	<0.02	0.23	0.01	176	<1	43	7.4	131
Water Supply Wells:																				
O-1	01/08	1 UF	38	3.5	0.8	<1.0	63.8	6.0	6.0	5	144	0.35			<0.01	224	17	12	8.7	285
O-1	01/08	R1 UF	39	3.0	0.3	<1.0	63.9					0.37			<0.01	218	19	9		
O-4	06/25	1 UF	97	21.4	8.1	3.8	19.5	8.1	6.2	<5	113	0.30	0.08	0.72	<0.01	190		87	7.9	256
PM-1	06/25	1 UF	79	26.3	6.4	3.9	19.7	8.8	9.0	<5	<5	0.23	0.04	0.48	<0.01	280		92	1.7	12,000
PM-2	06/25	1 UF	83	9.0	2.7	1.5	9.4	3.4	2.8	<5	49	0.22	0.05	0.32	<0.01	84		34	8.0	111
PM-3	06/25	1 UF	92	23.9	7.7	3.6	16.9	7.5	5.9	<5	116	0.34	0.04	0.45	<0.01	138		91	8.3	254
PM-4	06/25	1 UF	90	11.4	3.9	2.9	12.5	3.9	3.5	<5	66	0.29	0.06	0.34	<0.01	72		45	8.1	143
PM-5	06/25	1 UF	94	11.1	3.6	2.7	12.5	3.6	3.1	<5	61	0.26	0.04	0.35	<0.01	64		42	8.1	131
G-1	12/08	1 UF	79	12.5	0.5	2.5	20.9	3.6	4.4	<5	74	0.40	<0.02	0.48	<0.01	136	<1	33	7.3	164
G-1A	06/25	1 UF	75	9.9	0.4	2.9	30.8	4.8	5.3	<5	84	0.63	0.04	0.45	<0.01	74		27	8.5	188
G-2	06/25	1 UF	76	10.3	0.5	3.0	34.0	4.2	4.9	<5	92	0.81	0.02	0.46	<0.01	150		28	8.5	205
G-4	06/25	1 UF	63	18.2	3.7	2.3	11.5	4.2	4.4	<5	76	0.28	<0.02	0.63	<0.01	84		61	8.3	168
G-5	06/25	1 UF	63	17.2	3.7	2.9	11.3	4.2	4.5	<5	75	0.31	<0.02	0.64	<0.01	86		58	8.3	164
G-6	06/25	1 UF	62	17.5	2.9	2.7	14.8	4.0	4.2	<5	68	0.27	<0.02	0.47	<0.01	110		56	8.3	162

Table 5-21. Chemical Quality of Groundwater for 1997 (mg/L^a) (Cont.)

Station Name	Date	Codes^b		SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3-N	CN	TDS^c	TSS^d	Hardness as $CaCO_3$	pH^e	Conductance (µS/cm)
Regional Aquifer Springs																					
White Rock Canyon Group I:																					
Sandia Spring	08/19	1	UF	49	27.6	1.7	2.1	16.3	4.5	5.7	<5	108	0.63	<0.02	0.11	<0.01	316	<1	76	7.7	229
Spring 3	11/18	1	F	53	22.2	1.8	<1.0	15.1	5.5	6.0	<5	85	0.45	<0.02	1.35	<0.01	132		63	7.9	199
Spring 3	11/18	1	UF															1			
Spring 3AA	11/18	1	F	44	16.9	0.3	1.6	14.3	4.1	4.0	<5	82	0.44	<0.02	0.61	<0.01	60		43	8.2	167
Spring 3AA	11/18	1	UF															121			
Spring 4A	11/18	1	F	70	21.2	4.5	<1.0	11.1	6.2	6.0	<5	81	0.53	<0.02	1.01	<0.01	170		71	8.1	193
Spring 4A	11/18	1	UF															1			
Spring 5	09/29	1	F	73	16.4	4.3	1.8	11.2	5.3	6.0	<5	76	0.42	<0.02	0.77	0.01	178		59	8.4	176
Spring 5	09/29	1	UF															5			
Ancho Spring	11/19	1	F	77	12.1	2.8	<1.4	9.2	3.9	3.0	<5	57	0.30	0.10	0.40	<0.01	162		42	7.8	130
Ancho Spring	11/19	1	UF															5			
White Rock Canyon Group II:																					
Spring 6A	09/29	1	F	77	11.3	3.3	1.5	9.8	3.4	3.8	<5	63	0.35	0.02	1.76	0.01	164		42	7.8	141
Spring 6A	09/29	1	UF															3			
Spring 7	09/29	1	F	81	15.8	3.4	2.4	18.8	3.8	7.7	<5	98	0.38	<0.02	0.46	0.01	212		53	7.6	691
Spring 7	09/29	1	F	81	16.1	3.3	2.4	18.6	3.9	7.8	<5	85	0.38	0.06	0.48	0.01	183		54	7.9	197
Spring 7	09/29	1	UF															59			
Spring 7	09/29	1	UF															39			
Spring 8B	09/30	1	F	89	10.9	3.0	1.8	11.7	3.2	4.0	<5	63	0.43	0.03	0.02	0.01	158		39	8.2	139
Spring 8B	09/30	1	UF															<1			
Spring 9	09/30	1	F	80	9.5	2.7	1.3	10.9	3.3	3.5	<5	61	0.44	<0.02	0.12	0.01	151		35	8.2	444
Spring 9	09/30	1	UF															18			
White Rock Canyon Group III:																					
Spring 1	08/19	1	UF	34	14.4	1.0	2.0	29.7	4.4	8.2	<5	98	0.53	<0.02	0.41	<0.01	54	3	40	8.1	224
Spring 2	08/19	1	UF	33	13.0	0.6	1.3	35.8	4.3	5.6	<5	104	0.59	<0.02	0.04	<0.01	1,214	<1	35	8.2	229
White Rock Canyon Group IV:																					
La Mesita Spring	12/08	1	F	30	35.8	0.9	2.3	26.3	7.4	13.6	5	123	0.22	0.11	1.96	<0.01	204		93	8.2	313
La Mesita Spring	12/08	1	UF															222			
Other Springs:																					
Sacred Spring	07/08	1	UF	28	20.2	0.5	<1.0	21.0	3.5	5.9	<5	101	0.50	0.03	0.39	<0.01	182		52	7.5	213

Table 5-21. Chemical Quality of Groundwater for 1997 (mg/L^{a}) (Cont.)

Station Name	Date	Codes^{b}	SiO$_2$	Ca	Mg	K	Na	Cl	SO$_4$	CO$_3$ Alkalinity	Total Alkalinity	F	PO$_4$-P	NO$_3$-N	CN	TDS^{c}	TSS^{d}	Hardness as CaCO$_3$	pH^{e}	Conductance (µS/cm)
Canyon Alluvial Groundwater Systems																				
Acid/Pueblo Canyons:																				
APCO-1	12/10	1 UF	76	22.7	5.9	13.3	60.5	42.3	22.3	6	93	0.98	4.14	6.29	<0.01	376	8	81	7.1	556
Cañada del Buey:																				
CDBO-6	06/16	1 UF	60	16.5	4.2	3.2	19.9	11.6	8.8	<5	61	0.15	0.45	0.08	<0.01	322	660	59	7.2	186
CDBO-6	06/16	1 UF												0.12						
CDBO-6	09/13	1 UF												0.11						
CDBO-6	12/03	1 UF												0.23						
CDBO-7	06/16	1 UF	69	17.9	4.1	3.1	20.9	8.7	7.4	<5	81	0.12	0.32	0.02	<0.01	220	742	62	7.3	195
CDBO-7	06/16	1 UF												0.04						
CDBO-7	09/13	1 UF												0.11						
CDBO-7	12/03	1 UF												0.10						
DP/Los Alamos Canyons:																				
LAO-C	06/17	1 UF	37	11.3	2.8	3.4	23.6	26.6	6.1	<5	41	0.10	0.10	0.05	<0.01	170	<1	40	7.4	194
LAO-0.7	06/18	1 UF	36	12.6	2.6	3.7	31.0	38.1	6.6	<5	37	0.17	0.09	0.08	<0.01	182	14	42	7.0	237
LAO-1	06/18	1 UF	38	11.9	2.5	3.1	32.4	37.5	6.7	<5	44	0.25	0.08	0.04	<0.01	182	2	40	7.1	242
LAO-2	08/04	1 UF	61	21.2	6.1	4.5	31.5	32.0	10.0	<5	104	0.59	0.10	0.46	<0.01	186		78	7.1	340
LAO-3A	08/04	1 UF	55	17.7	3.9	6.0	30.0	24.0	14.0	<5	93	0.88	<0.02	0.66	<0.01	223		60	7.4	303
LAO-4	08/04	1 UF	45	14.1	4.1	4.4	27.4	26.0	10.0	<5	80	0.64	<0.02	0.03	<0.01	168		52	6.9	269
LAO-4.5C	08/04	1 UF	43	12.2	3.9	3.6	27.6	32.0	9.0	<5	67	0.72	0.10	0.03	<0.01	167		46	7.0	260
LAO-6A	08/04	1 UF	46	13.0	4.4	2.6	29.6	40.0	9.0	<5	66	0.47	<0.02	0.07	<0.01	202		50	6.9	279
Mortandad Canyon:																				
MCO-3	08/07	1 UF	46	22.1	2.8	7.9	40.0	8.0	12.0	<5	105	1.08	0.22	3.86	<0.01	274		67	7.5	288
MCO-4B	08/05	1 UF	34	27.3	2.5	14.3	79.1	19.5	14.0	<5	172	1.49	<0.02	19.10	<0.01	429		78	7.4	583
MCO-5	08/05	1 UF	35	26.6	2.8	15.4	75.3	20.1	15.0	<5	167	1.54	0.02	19.90	<0.01	441		78	7.4	584
MCO-6	08/05	1 UF	36	29.4	3.1	18.8	83.6	22.0	15.0	<5	184	1.69	0.06	23.50	<0.01	443		86	7.3	641
MCO-7A	06/13	1 UF	37	24.8	6.1	19.9	89.7	19.5	19.2	<5	165	1.74	0.34	22.00	<0.01	412	2	87	7.3	599
MCO-7.5	06/13	1 UF	40	25.6	6.2	13.7	99.9	18.2	19.0	<5	166	1.71	0.08	24.10	<0.01	460	4	89	7.8	619
Pajarito Canyon:																				
PCO-1	06/16	1 UF	38	16.5	4.6	3.9	26.1	26.1	12.4	<5	61	0.14	0.05	0.17	<0.01	212	2	60	7.2	237

Table 5-21. Chemical Quality of Groundwater for 1997 (mg/L[a]) (Cont.)

Station Name	Date	Codes[b]		SiO_2	Ca	Mg	K	Na	Cl	SO_4	CO_3 Alkalinity	Total Alkalinity	F	PO_4-P	NO_3-N	CN	TDS[c]	TSS[d]	Hardness as $CaCO_3$	pH[e]	Conductance (µS/cm)
Intermediate Perched Groundwater Systems																					
Pueblo/Los Alamos Canyon Area:																					
Test Well 1A	08/11	1	UF	1	11.0	3.2	3.6	40.4	66.6	5.0	<5	50	0.98	0.42	<0.02	<0.01	196		40	8.8	330
Test Well 2A	12/11	1	UF	16	2.1	0.4	<1.0	1.1	45.8	10.9	<5	82	0.19	0.07	<0.02	<0.01	196	<1	7	8.0	337
Basalt Spring	08/14	1	UF	65	16.0	4.0	8.1	44.6	27.7	22.0	<5	92	0.47	<0.02	2.36	<0.01	306	<1	57	7.3	353
Perched Groundwater System in Volcanics:																					
Water Canyon Gallery	12/01	1	UF	47	6.7	3.1	<1.0	5.4	3.4	2.0	<5	43	0.06	<0.02	0.24	<0.01	70	<1	30	7.6	89
Pueblo of San Ildefonso:																					
LA-1B	10/06	1	UF	2	2.3	<0.1	1.6	134.7	23.4	29.2	50	278	3.24	<0.02	0.05	0.01	354		6	9.5	650
LA-5	07/07	1	UF	42	18.6	0.8	1.1	14.4	4.2	6.2	<5	79	0.35	<0.02	0.60	<0.01	162		50	8.3	175
Eastside Artesian Well	10/06	1	UF	1	3.0	0.1	<1.0	83.6	4.6	18.4	27	191	0.81	<0.02	0.02	0.01	228		8	9.5	405
Halladay House Well	08/13	1	UF	28	4.0	<0.1	<1.0	42.6	5.4	13.1	<5	88	0.56	<0.02	0.54	<0.01	160	<1	10	8.9	201
Pajarito Well (Pump 1)	07/08	1	UF	39	53.3	5.6	3.2	306.1	197.0	51.5	<5	554	0.34	<0.02	0.22	<0.01	1,082		156	7.7	1,710
Don Juan Playhouse Well	10/06	1	UF	24	6.4	0.4	<1.0	62.5	4.5	17.8	12	122	0.60	<0.02	2.06	0.01	184		18	8.8	325
Otowi House Well	10/06	1	UF	62	77.2	5.6	2.7	40.4	56.3	33.5	<5	204	0.37	<0.02	1.20	0.01	344		216	7.1	607
New Community Well	07/07	1	UF	27	15.3	1.0	<1.0	74.7	8.8	33.6	<5	166	0.14	<0.02	1.47	<0.01	296		42	8.4	437
Sanchez House Well	07/08	1	UF	42	31.6	2.3	<1.0	97.4	52.5	47.5	<5	194	1.18	0.02	1.76	<0.01	440		88	7.9	636
Water Quality Standards[g]																					
EPA Primary Drinking Water Standard										500			4		10	0.2					
EPA Secondary Drinking Water Standard									250	250							500			6.8–8.5	
EPA Health Advisory								20													
NMWQCC Groundwater Limit									250	600			1.6		10	0.2	1,000			6–9	

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[a] Except where noted.

[b] Codes: UF–unfiltered, F–filtered, 1–primary analysis, R1–lab replicate, D1–lab duplicate.

[c] Total dissolved solids.

[d] Total suspended solids.

[e] Standard units.

[f] Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.

[g] Standards given here for comparison only, see Appendix A.

Table 5-22. Total Recoverable Trace Metals in Groundwater for 1997 (μg/L)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Aquifer Wells															
Test Wells:															
Test Well 1	08/11	1	UF	<10[b]	243	<2	51	84	<3	<7	<8	<7	11	1,340	<0.2
Test Well 2	12/11	1	UF	<10	96	<2	<20	16	<3	<7	<8	<7	<10	4,783	<0.2
Test Well 3	08/11	1	UF	<10	107	2	41	28	<3	<7	<8	<7	15	708	<0.2
Test Well 4	08/11	1	UF	<10	163	<2	<20	79	<3	<7	<8	12	73	9,120	<0.2
Test Well DT-5A	03/07	1	UF	<10	<50	<5	<20	21	<3	<7	<8	<7	13	293	<0.4
Test Well DT-5A	03/07	R1	UF	<10	<50	<4	<20	21	<3	<7	<8	<7	13	67	<0.4
Test Well DT-5A	05/13	1	UF	<10	103	<2	21	16	<3	<7	<8	<7	<10	1,437	<0.3
Test Well DT-5A	10/16	1	UF	<10	<50	<6	26	16	<3	<7	<8	<7	<10	52	<0.2
Test Well DT-9	05/13	1	UF	<10	<50	<2	<20	15	<3	<7	<8	<7	<10	206	<0.3
Test Well DT-9	10/15	1	UF	<10	<50	<6	<20	6	<3	<7	<8	<7	<10	207	<0.2
Test Well DT-10	05/14	1	UF	<10	<50	<2	<20	14	<3	<7	<8	<7	<10	55	<0.3
Test Well DT-10	10/16	1	UF	<10	<50	<2	34	8	<3	<7	<8	<7	<10	502	<0.2
Water Supply Wells:															
O-1	01/08	1	UF	<10	1,000	6	71	34	<3	<7	<8	16	<10	4,483	<0.3
O-1	01/08	R1	UF	<10	<500	6	71	30	<3	<7	<8	15	<10	4,104	<0.3
O-4	06/25	1	?	<10	61	<2	55	48	<3	<7	<8	<8	<10	<40	<0.2
PM-1	06/25	1	UF	<10	101	<2	63	78	<3	<7	<8	<7	<10	<40	<0.2
PM-2	06/25	1	UF	<10	<50	<2	<20	32	<3	<7	<8	10	313	7,418	<0.2
PM-3	06/25	1	UF	11	131	2	47	53	<3	<7	<8	<7	<10	57	<0.2
PM-4	06/25	1	UF	<10	<50	2	<20	31	<3	<7	<8	7	<10	<40	<0.2
PM-5	06/25	1	UF	<10	359	<2	46	33	<3	<7	<10	28	<10	252	<0.2
G-1A	06/25	1	UF	<10	<50	14	32	40	<3	<7	<8	9	<10	<40	<0.2
G-2	06/25	1	UF	<10	<50	35	36	68	<3	<7	<8	10	<10	<40	<0.2
G-4	06/25	1	UF	<10	<50	2	<33	20	<3	<7	<8	<7	<10	<40	<0.2
G-5	06/25	1	UF	<10	<50	2	<20	15	<3	<7	<8	<7	<10	<40	<0.2
G-6	06/25	1	UF	<10	59	3	<34	14	<3	<7	<8	<7	<10	58	<0.2
Regional Aquifer Springs															
White Rock Canyon Group I:															
Sandia Spring	08/19	1	UF	<10	137	<6	50	91	<3	<7	<8	<7	<10	170	<0.2
Spring 5	09/29	1	F	113	<50	<2	29	45	<3	<7	<11	<7	<10	<40	

Table 5-22. Total Recoverable Trace Metals in Groundwater for 1997 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Regional Aquifer Springs (Cont.)															
White Rock Canyon Group II:															
Spring 6A	09/29	1	F	<10	<50	<2	26	25	<3	<9	<8	<7	<10	<40	
Spring 7	09/29	1	F	<10	<50	<2	32	51	<3	<7	<8	<7	<10	<40	
Spring 7	09/29	1	F	174	<50	<2	35	40	<3	<7	<8	<7	<10	40	
Spring 8B	09/30	1	F	<10	<50	<2	29	25	<3	<7	<8	<7	<10	<40	
Spring 9	09/30	1	F	<10	<50	<2	30	16	<3	<7	<8	<7	<10	<40	
White Rock Canyon Group III:															
Spring 1	08/19	1	UF	<10	<50	<6	46	22	<3	<7	<8	<7	<10	<40	<0.2
Spring 2	08/19	1	UF	<10	<50	<6	51	20	<3	<7	<8	<7	<10	<40	<0.2
White Rock Canyon Group IV:															
La Mesita Spring	12/08	1	F	<10	<50		80	127	<3	<7	<20	<7	<10	112	
Other Springs:															
Sacred Spring	07/08	1	UF	<10	<50	<2	42	96	<3	<7	<8	<7	<10	104	<0.2
Canyon Alluvial Groundwater Systems															
Acid/Pueblo Canyons:															
APCO-1	12/10	1	UF	<10	832	7	233	19	<3	<7	<8	<7	<10	579	<0.2
Cañada del Buey:															
CDBO-6	06/16	1	UF	<10	8,157	2	38	134	<3	<7	<8	<7	<10	4,571	<0.2
CDBO-7	06/16	1	UF	<10	5,432	2	41	182	<3	<7	<8	<7	<10	2,377	<0.2
DP/Los Alamos Canyons:															
LAO-C	06/17	1	UF	<10	1,896	<2	<20	45	<3	<7	<8	<7	<10	838	<0.2
LAO-0.7	06/18	1	UF	<10	3,466	2	<20	58	<3	<7	<8	<7	<10	1,478	<0.2
LAO-1	06/18	1	UF	<10	2,272	2	<28	36	<3	<7	<8	11	<10	964	<0.2
LAO-2	08/04	1	UF	<10	356	<2	42	56	<3	<7	<8	<7	<10	179	<0.2
LAO-3A	08/04	1	UF	<10	444	<2	34	56	<3	<7	<8	<7	<10	177	<0.2
LAO-4	08/04	1	UF	<10	292	<3	27	52	<3	<7	<8	<7	<10	119	<0.2
LAO-4.5C	08/04	1	UF	<10	386	<2	26	42	<3	<7	<8	<7	<10	193	<0.2
LAO-6A	08/04	1	UF	<10	228	<2	38	36	<3	<7	<8	<7	<10	100	<0.2

Table 5-22. Total Recoverable Trace Metals in Groundwater for 1997 (µg/L) (Cont.)

Station Name	Date	Codes[a]		Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Canyon Alluvial Groundwater Systems (Cont.)															
Mortandad Canyon:															
MCO-3	08/07	1	UF	<10	14,662	2	88	81	<3	<7	<8	19	44	8,471	<0.2
MCO-4B	08/05	1	UF	<10	423	<2	62	85	<3	<7	<8	<7	14	234	<0.2
MCO-5	08/05	1	UF	<10	248	<2	57	91	<3	<7	<8	<7	11	98	<0.2
MCO-6	08/05	1	UF	<10	76	<2	62	99	<3	<7	<8	<7	11	<40	<0.2
MCO-7A	06/13	1	UF	<10	399	<2	76	221	<3	<7	<8	<7	<10	219	<0.2
MCO-7.5	06/13	1	UF	<10	183	<2	78	209	<3	<7	<8	<7	<10	104	<0.2
Pajarito Canyon:															
PCO-1	06/16	1	UF	<10	990	<2	34	93	<3	<11	<8	<7	<10	501	<0.2
Intermediate Perched Groundwater Systems															
Pueblo/Los Alamos Canyon Area:															
Test Well 1A	08/11	1	UF	<10	<50	<2	140	68	<3	<7	<8	<7	10	3,032	<0.2
Test Well 2A	12/11	1	UF	<10	<50	<2	<20	2	<3	<7	<8	<7	<10	54	<0.2
Basalt Spring	08/14	1	UF	<10	<50	<6	186	61	<3	<7	<8	<7	<10	42	<0.2
Perched Groundwater System in Volcanics:															
Water Canyon Gallery	12/01	1	UF	<10	100	<6	<20	11	<3	<7	<8	<7	<10	51	<0.2
Pueblo of San Ildefonso:															
LA-1B	10/06	1	UF	<10	<50	7	272	23	<3	<7	<8	<7	<10	103	<0.2
LA-5	07/07	1	UF	<10	<50	<2	<20	65	<3	<7	<8	<7	<10	119	<0.2
Eastside Artesian Well	10/06	1	UF	<10	<50	<2	152	2	<3	<7	<8	<7	<10	107	0.2
Halladay House Well	08/13	1	UF	105	63	6	67	41	<3	<7	<8	10	<10	148	<0.2
Pajarito Well (Pump 1)	07/08	1	UF	<10	<50	5	1,388	94	<3	<7	<8	<7	<11	188	<0.2
Don Juan Playhouse Well	10/06	1	UF	<10	<50	6	98	2	<3	<7	<8	9	<10	<40	<0.2
Otowi House Well	10/06	1	UF	<10	<50	<2	99	336	<3	<7	<8	<7	12	<40	<0.2
New Community Well	07/07	1	UF	<10	<50	<2	39	16	<3	<7	<8	<7	<10	<40	<0.2
Sanchez House Well	07/08	1	UF	<10	<50	10	244	111	<3	<7	<8	<7	15	<40	<0.2

Table 5-22. Total Recoverable Trace Metals in Groundwater for 1997 (μg/L) (Cont.)

Station Name	Date	Codes[a]	Ag	Al	As	B	Ba	Be	Cd	Co	Cr	Cu	Fe	Hg
Water Quality Standards[c]														
EPA Primary Drinking Water Standard					50		2,000	4	5		100			2
EPA Secondary Drinking Water Standard				50–200									300	
EPA Action Level												1,300		
EPA Health Advisory														
NMWQCC Livestock Watering Standard				5,000	200	5,000			50	1,000	1,000	500		10
NMWQCC Groundwater Limit			50	5,000	100	750	1,000		10	50	50	1,000	1,000	2

[a] Codes: UF–unfiltered, F–filtered, 1–primary analysis, R1–lab replicate, D1–lab duplicate.

[b] Less than symbol (<) means measurement was below the specified limit of detection of the analytical method.

[c] Standards given here for comparison only, see Appendix A. Note that New Mexico Livestock Watering and Groundwater limits are based on dissolved concentrations, while many of these analyses are of unfiltered samples—thus concentrations may include suspended sediment quantities.

Table 5-23. Number of Results above the Analytical Limit of Quantitation for Organic Compounds in Groundwater for 1997

		Type of Organic Compound[a]			
Station Name	**Date**	**Volatile**	**Semivolatile**	**PCB**	**HE**
Number of Compounds Analyzed		66	71	8	13
Test Well 1	08/11	0	0	0	
Test Well 3	08/11	0	0	0	
Test Well 4	08/11	0	0	1	
Test Well DT-5A	03/07	0	0	0	0
Test Well DT-5A	05/13	0	0	0	0
Test Well DT-5A	10/16	0	0	0	0
Test Well DT-9	05/13	0	0	0	0
Test Well DT-9	10/15	0	0	0	0
Test Well DT-10	05/14	0	0	0	0
Test Well DT-10	10/16	0	0	0	0
Spring 3	11/18	0	0	0	
Spring 3AA	11/18	0	0	0	0
Spring 4A	11/18				0
Spring 5	09/29	0	0	0	0
Ancho Spring	11/19				0
Ancho Spring	11/19				0
Spring 6A	09/29	0	0	0	0
Spring 7	09/29	0	0	0	0
Spring 7	09/29	0	0	0	0
Spring 8B	09/30	0	0	0	0
Spring 9	09/30	0	0	0	0
APCO-1	12/10	0	0	0	
CDBO-6	06/16	0	0	0	
CDBO-7	06/16	0	0	0	
LAO-C	06/17	0	0	0	
LAO-0.7	06/18	0	0	0	
LAO-1	06/18	0	0	0	
LAO-2	08/04	0	0	0	
LAO-3A	08/04	0	0	0	
LAO-4	08/04	0	0	0	
LAO-4.5C	08/04	0	0	0	
LAO-6A	08/04	0	0	0	
MCO-3	08/07	0	0	0	
PCO-1	06/16	0	0	0	
Test Well 1A	08/11	0	0	0	
Test Well 2A	12/11	0	0	0	
Basalt Spring	08/14	0	0	0	
Water Canyon Gallery	12/01	0	0	0	

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[a] Volatiles, semivolatiles, polychlorinated biphenyls, high explosives.

EM/RLW Environmental Management Radioactive Liquid Waste Group

1997 RLWTF Annual Report

Prepared By: Hassman — 22 Oct 98
Rich Hassman — Date

And

Robert T. Harris — 23 Oct 98
Robert Harris — Date

Reviewed By: Debora Hall — 11/17/98
Debora Hall — Date

Wm David Moss — 11-17-98
Wm. David Moss — Date

Mark Gardner — 12-9-98
Mark Gardner — Date

Approved By: Steven W. Hanson — 12-9-98
Steven W. Hanson — Date

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Appendices

Appendix C

Chapter

Flow Summary

TA-50 WM-1

FLOW SUMMARY (megaliters)

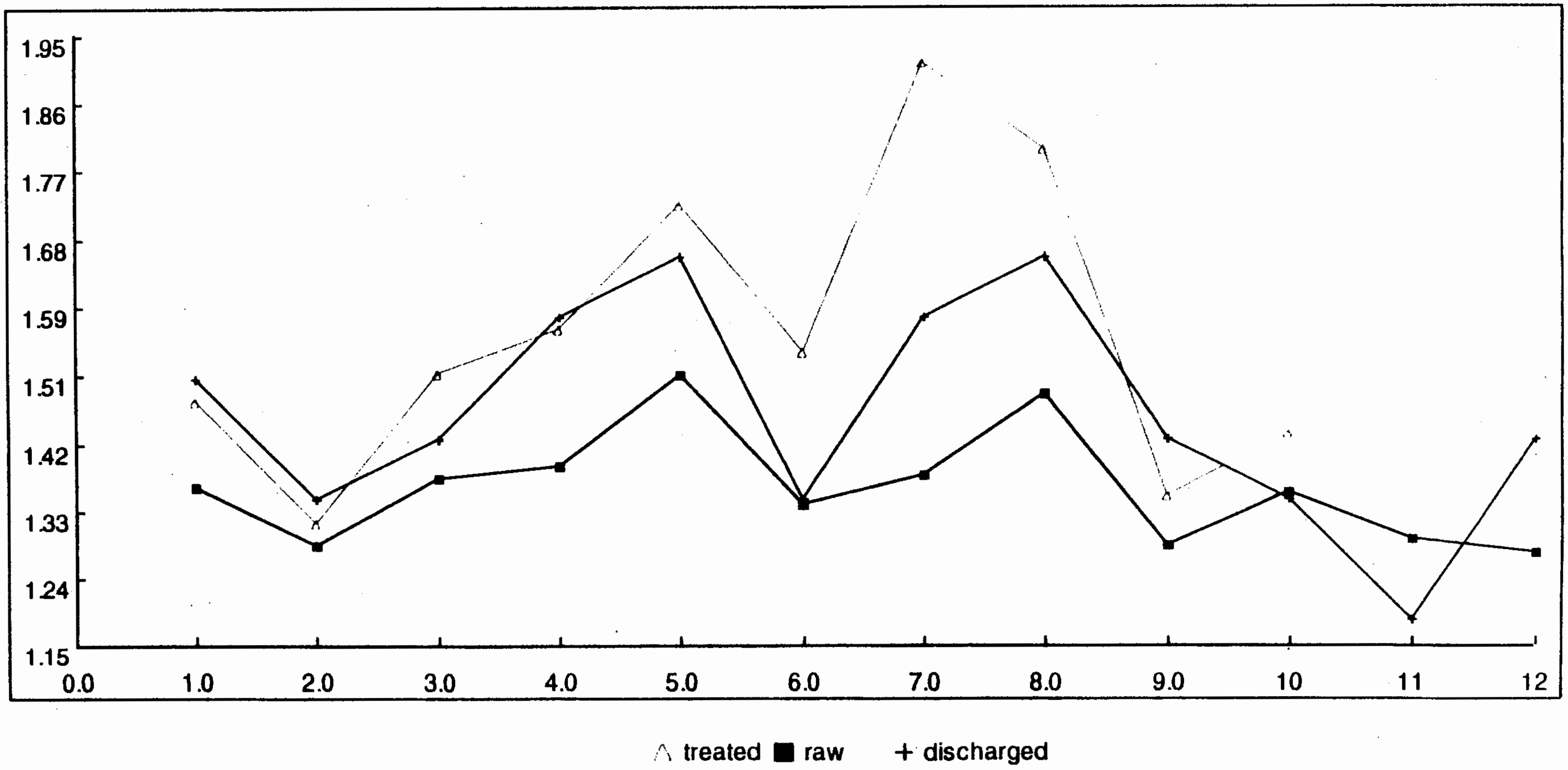
JAN-1997 through DEC-1997

Date	Influent	TA-21 Transfer	Room 60 caustic	Room 60 acid	Discharged
JAN-1997	1.358	0.036			1.502
FEB-1997	1.283	0.082			1.344
MAR-1997	1.371	0.082	0.001	0.013	1.423
APR-1997	1.387	0.16			1.581
MAY-1997	1.505	0.167			1.66
JUN-1997	1.337	0.073	0.002		1.344
JUL-1997	1.376	0.172			1.581
AUG-1997	1.481	0.16		0.004	1.66
SEP-1997	1.283	0.089		0.007	1.423
OCT-1997	1.351	0.0		0.012	1.344
NOV-1997	1.292	0.007			1.186
DEC-1997	1.274	0.015			1.423
TOTAL	16.299	1.045	0.003	0.036	17.472

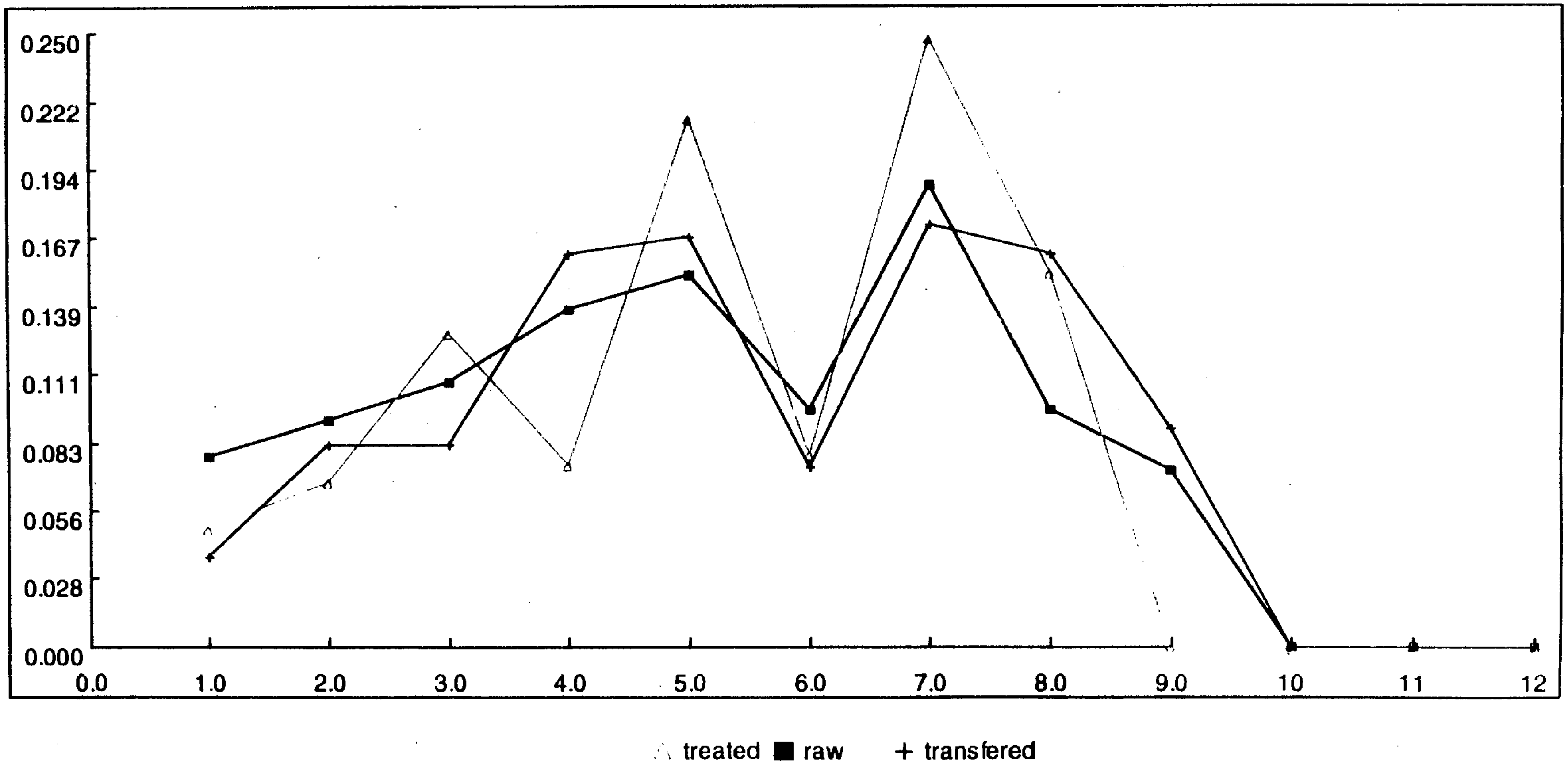
Chapter

Flow Charts

TA50 monthly flows in megaliters.
JAN-1997 through DEC-1997



TA21 monthly flows in megaliters.
JAN-1997 through DEC-1997



Chapter

Gross Alpha Removal

TA-50 WM-1

Gross Alpha Removal

DATE	RAW (Ci)	RAW (gigaBq)	FINAL (Ci)	FINAL (gigaBq)	REMOVAL FACTOR 100x(INF - EFF)/INF
JAN-1997	0.058	2.136	3.785e-4	0.014	99.344
FEB-1997	0.009	0.349	4.378e-4	0.016	95.361
MAR-1997	0.035	1.305	4.779e-4	0.018	98.645
APR-1997	0.06	2.204	4.07e-4	0.015	99.317
MAY-1997	0.313	11.583	4.686e-4	0.017	99.85
JUN-1997	0.141	5.229	7.435e-4	0.028	99.474
JUL-1997	0.099	3.657	6.2e-4	0.023	99.373
AUG-1997	0.056	2.08	5.397e-4	0.02	99.04
SEP-1997	0.018	0.667	2.178e-4	0.008	98.792
OCT-1997	0.002	0.09	2.378e-4	0.009	90.263
NOV-1997	0.008	0.29	2.346e-4	0.009	97.007
DEC-1997	0.02	0.751	3.378e-4	0.012	98.336
TOTAL	0.82	30.343	0.005	0.189	99.378

Volume of Flow:

Treated = 18334133.0 liters

Final = 17471848.0 liters

Chapter
2

Radionuclide Summary

TA-50 WM-1

RADIONUCLIDE SUMMARY

JAN, 1997 through DEC, 1997

	RAW Average	Maximum	Minimum	Count	Total (Ci)	FINAL Average	Maximum	Minimum	Count	Total (Ci)
ALPHA	6.2e-8	2.7e-7	5.8e-9	12.0	1.011	3.27e-10	6.2e-10	1.6e-10	12.0	0.006
Am-241	1.584e-8	6.7e-8	9.9e-10	12.0	0.258	1.309e-10	2.3e-10	5.8e-11	12.0	0.002
BETA	2.828e-9	7.6e-9	3.2e-11	12.0	0.046	4.927e-10	1.4e-9	7.0e-11	12.0	0.009
Cs-137	1.262e-10	7.0e-10	3.0e-10	12.0	0.002	1.52e-10	8.0e-10	3.0e-10	12.0	0.003
GAMMA	1.491e-9	1.0e-8	3.0e-9	12.0	0.024	6.516e-10	4.0e-9	3.0e-9	12.0	0.011
Na-22	No Data			0.0		7.24e-11	8.0e-10	8.0e-10	1.0	0.001
Pu-238	1.263e-8	2.4e-8	2.9e-10	12.0	0.206	7.663e-11	1.3e-10	2.1e-11	12.0	0.001
Pu-239	2.135e-8	9.0e-8	3.7e-10	12.0	0.348	4.576e-11	1.2e-10	2.0e-11	12.0	7.994e-4
Sr-89	1.316e-10	9.0e-10	1.0e-11	12.0	0.002	5.34e-11	3.0e-10	1.0e-11	12.0	9.33e-4
Sr-90	4.796e-11	1.4e-10	4.0e-12	12.0	7.817e-4	2.712e-11	6.0e-11	2.0e-12	12.0	4.739e-4
TOTAL_PLUTONIUM	3.398e-8	1.14e-7	6.6e-10	12.0	0.554	1.224e-10	2.5e-10	6.0e-11	12.0	0.002
TRITIUM	No Data			0.0		8.103e-8	2.4e-7	1.1e-10	12.0	1.416
U-234	4.094e-10	2.1e-9	4.7e-12	12.0	0.007	3.524e-12	1.2e-11	2.5e-12	12.0	6.157e-5
U-235	9.104e-11	2.0e-10	2.6e-11	12.0	0.001	3.64e-13	1.6e-12	2.0e-13	12.0	6.359e-6

Volume of Flow: Influent = 16,298,612.0 liters Final = 17,471,848.0 liters

Chapter

Mineral Summary

TA-50 WM-1

MINERAL SUMMARY

JAN, 1997 through DEC, 1997

	RAW Average	Maximum	Minimum	Count	Total (KG)	FINAL Average	Maximum	Minimum	Count	Total (KG)
ALKALINITY-MO*	33.781	52.0	16.0	12.0	550.581	285.149	520.0	144.0	12.0	4982.085
ALKALINITY-P*	LDL*	LDL*	LDL*	12.0	LDL*	LDL*	LDL*	LDL*	12.0	LDL*
ALUMINUM	0.77	2.33	0.29	12.0	12.543	0.181	0.5	0.05	12.0	3.17
AMMONIA-N	3.866	7.32	2.46	12.0	63.018	3.779	7.26	1.05	12.0	66.032
ARSENIC	0.002	0.007	1.0e-6	11.0	0.031	8.96e-4	0.002	1.0e-6	11.0	0.016
BARIUM	0.065	0.23	0.033	12.0	1.058	0.015	0.024	0.008	12.0	0.261
BERYLLIUM	0.002	0.008	0.006	12.0	0.026	5.566e-4	0.003	0.003	12.0	0.01
BORON	0.24	0.49	0.095	12.0	3.918	0.181	0.39	0.084	12.0	3.163
CADMIUM	0.001	0.003	0.002	12.0	0.022	0.003	0.021	0.002	12.0	0.049
CALCIUM	17.864	45.0	10.0	12.0	291.161	117.454	208.0	71.0	12.0	2052.135
CHLORIDE	30.016	45.0	15.7	12.0	489.226	51.986	101.0	21.8	12.0	908.291
COBALT	0.002	0.007	0.003	12.0	0.038	0.001	0.005	0.003	12.0	0.025
COD	58.361	71.0	30.0	12.0	951.195	30.778	38.0	24.0	12.0	537.753
CONDUCTIVITY*	420.726	479.0	290.0	12.0		1325.919	2500.0	860.0	12.0	
COPPER	0.258	0.36	0.047	12.0	4.209	0.101	0.14	0.076	12.0	1.763
CYANIDE	9.425e-4	0.01	0.01	11.0	0.015	0.003	0.03	0.01	12.0	0.056
FLUORIDE	1.019	1.66	0.69	12.0	16.615	2.026	3.47	1.28	12.0	35.396
HARDNESS*	61.784	132.543	35.265	12.0	1006.996	295.651	520.611	182.64	12.0	5165.574
IRON	1.71	5.6	0.4	12.0	27.867	0.08	0.15	0.04	12.0	1.392
LEAD	0.06	0.12	0.03	12.0	0.982	0.02	0.022	0.02	12.0	0.352
MAGNESIUM	4.171	4.9	2.5	12.0	67.986	0.575	1.3	0.21	12.0	10.051
MERCURY	0.405	3.8	0.001	10.0	6.608	0.046	0.3	2.0e-4	10.0	0.81
NICKEL	0.263	1.1	0.043	12.0	4.28	0.041	0.082	0.02	12.0	0.724
NITRATE-N	23.149	26.5	15.6	12.0	377.304	70.178	172.0	18.9	12.0	1226.136
NITRITE-N	0.07	0.46	0.03	12.0	1.135	0.479	1.75	0.05	12.0	8.376
PHOSPHORUS	2.436	3.49	1.09	12.0	39.705	0.355	0.69	0.12	12.0	6.197
POTASSIUM	6.028	12.0	2.7	12.0	98.251	28.173	92.0	4.9	12.0	492.232
SELENIUM	1.653e-4	0.002	0.002	11.0	0.003	1.629e-4	0.002	0.002	11.0	0.003
SILICA_DIOXIDE	87.129	83.0	72.0	12.0	1420.089	50.887	73.0	25.0	12.0	889.088
SILVER	0.021	0.049	0.008	12.0	0.339	0.003	0.004	0.004	12.0	0.059
SODIUM	49.455	66.0	30.1	12.0	806.042	150.674	370.0	45.0	12.0	2632.557
SULFATE	36.37	97.0	9.0	12.0	592.773	54.406	87.0	30.9	12.0	950.571
Si	LDL*	LDL*	LDL*	0.0	LDL*	LDL*	LDL*	LDL*	0.0	LDL*
TDS	330.691	642.0	120.0	11.0	5389.804	765.086	1650.0	586.0	11.0	13367.463
THALLIUM	0.009	0.1	0.1	12.0	0.147	0.009	0.1	0.1	12.0	0.15
TOTAL_CATIONS*	3.689	4.28	2.3	12.0		12.669	23.8	1.08	12.0	
TOTAL_CHROMIUM	0.066	0.12	0.008	12.0	1.083	0.006	0.009	0.003	12.0	0.101
TSS	31.469	280.0	3.0	12.0	512.897	3.439	16.0	1.0	10.0	60.084
URANIUM	19.155	90.0	1.0e-4	12.0	312.205	1.465	7.8	1.3e-5	12.0	25.602
VANADIUM	0.011	0.011	0.006	12.0	0.176	0.007	0.012	0.004	12.0	0.129
ZINC	0.19	0.37	0.096	12.0	3.094	0.053	0.09	0.05	12.0	0.934
pH	7.763	7.5	6.28	12.0		7.77	10.1	6.8	12.0	

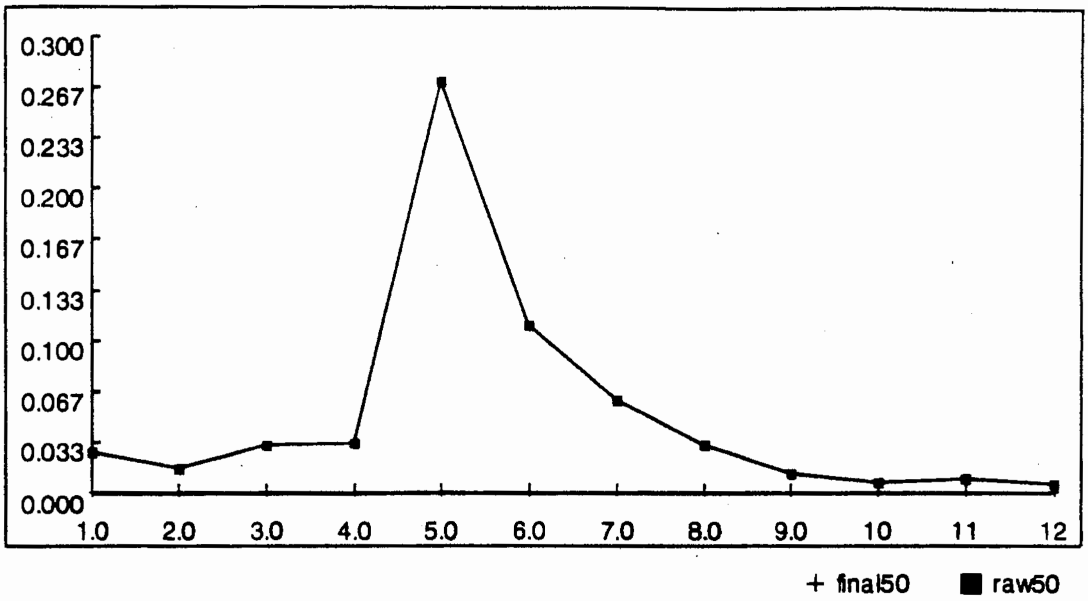
Volume of Flow: Influent = 16,298,612.0 liters Final = 17,471,848.0 liters

*Alkalinities and hardness as mg CaC03/l. *Conductivity as uS/cm. *Total Cations as meq/l. *LDL: Less than Detection Limit.

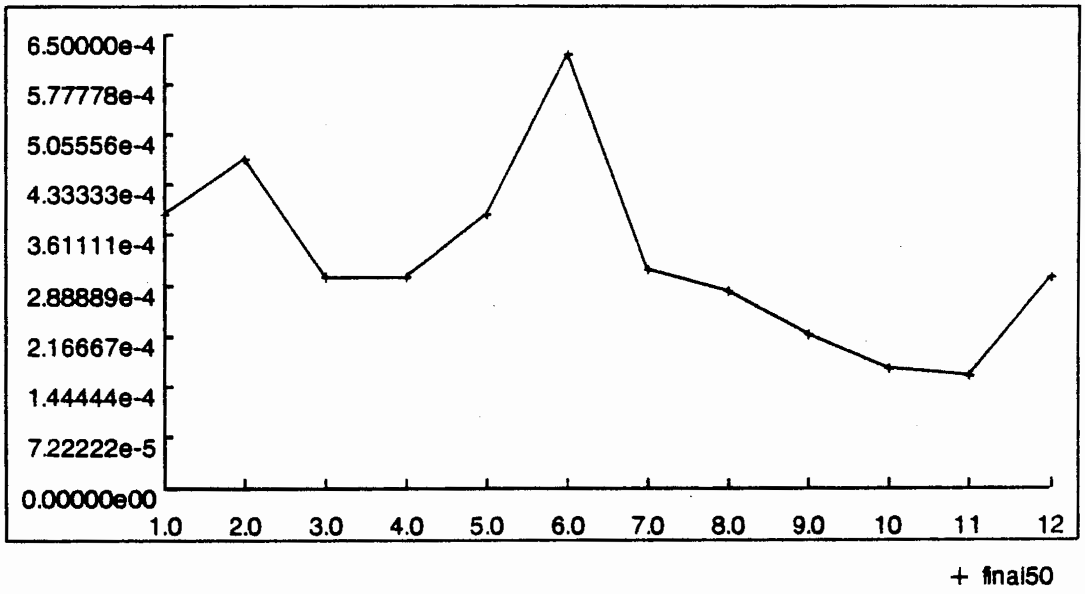
Chapter

Concentration Charts

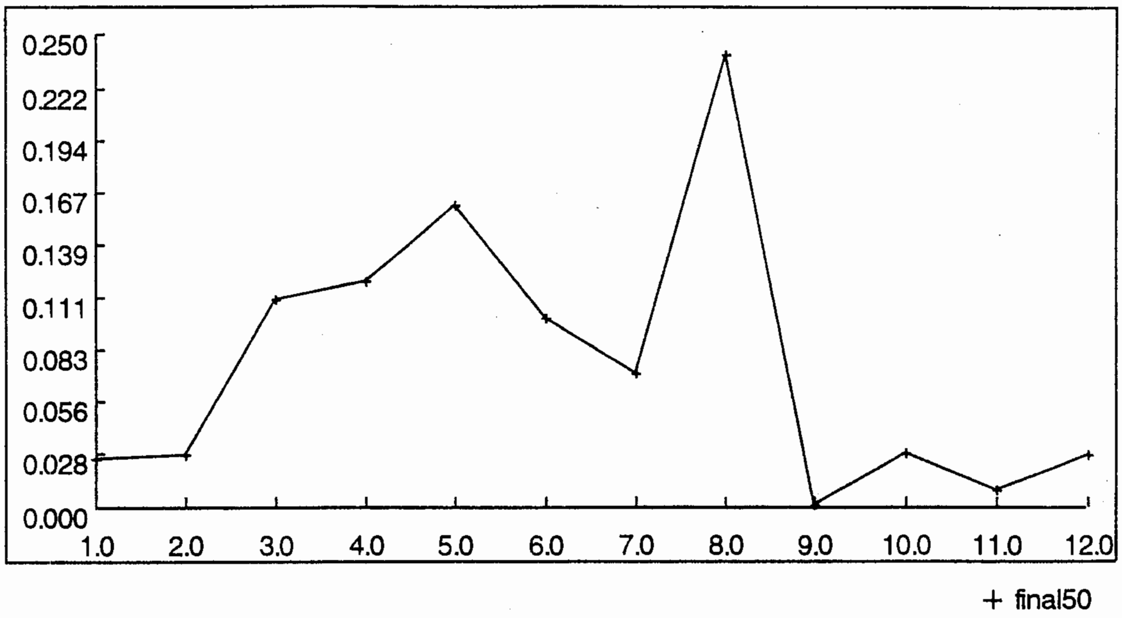
ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997



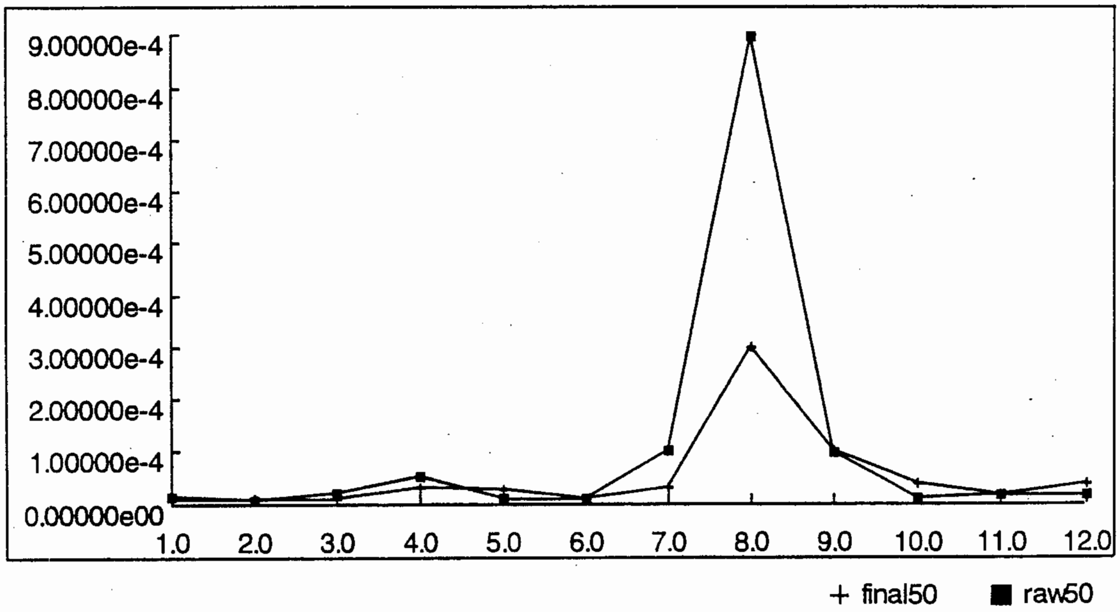
ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997



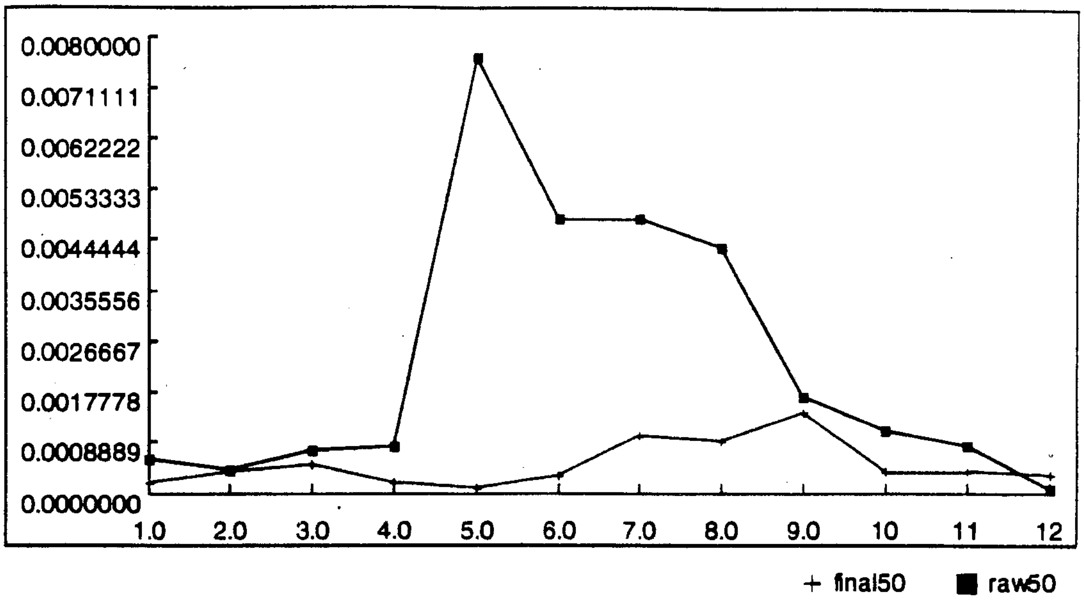
TRITIUM concentration (uCi/L).
JAN-1997 through DEC-1997



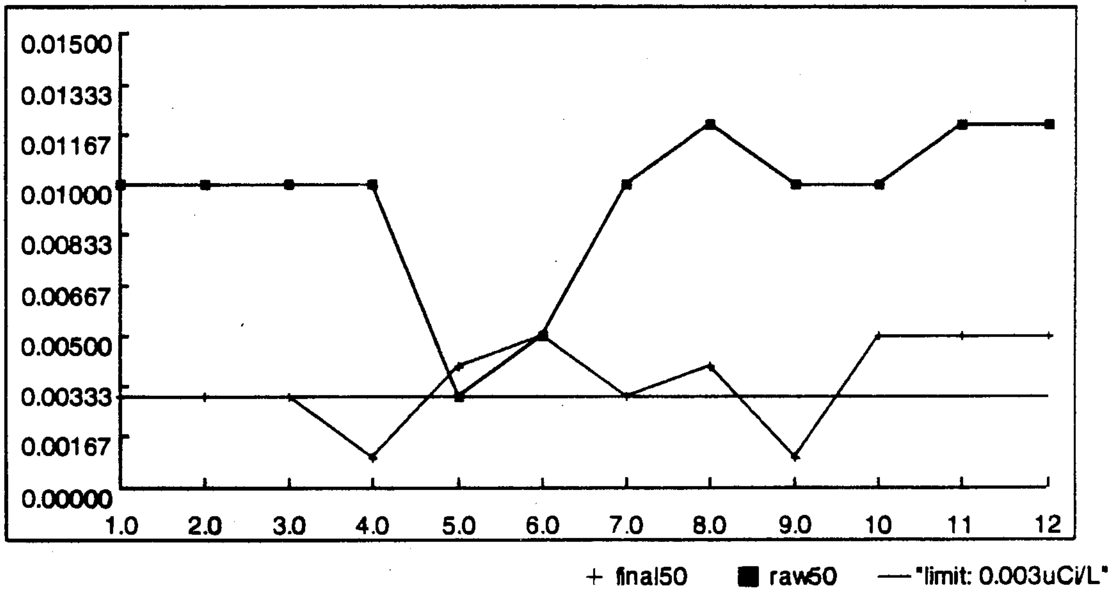
Sr-89 concentration (uCi/L).
JAN-1997 through DEC-1997



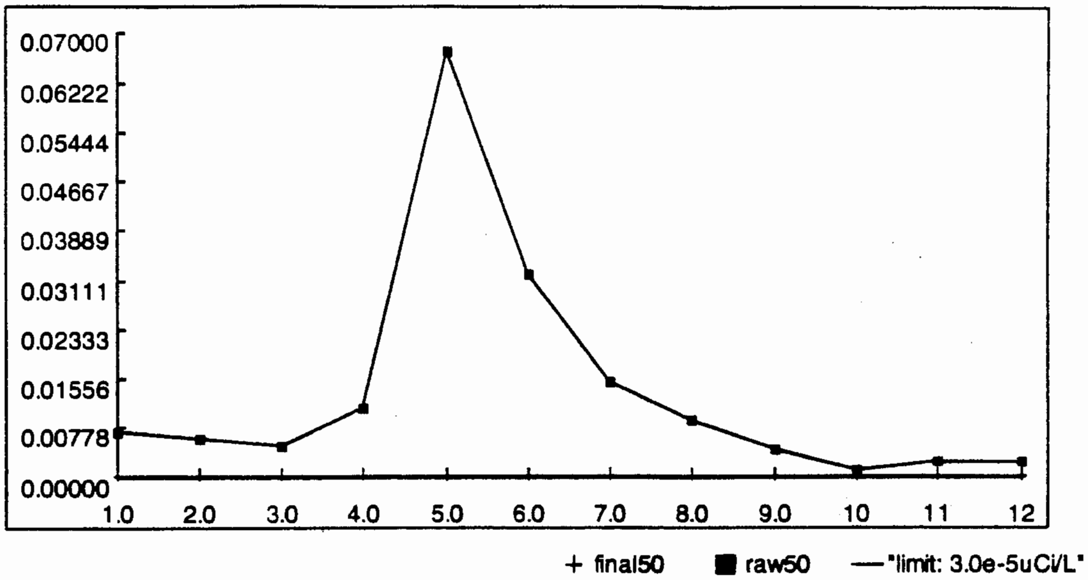
BETA concentration (uCi/L).
JAN-1997 through DEC-1997



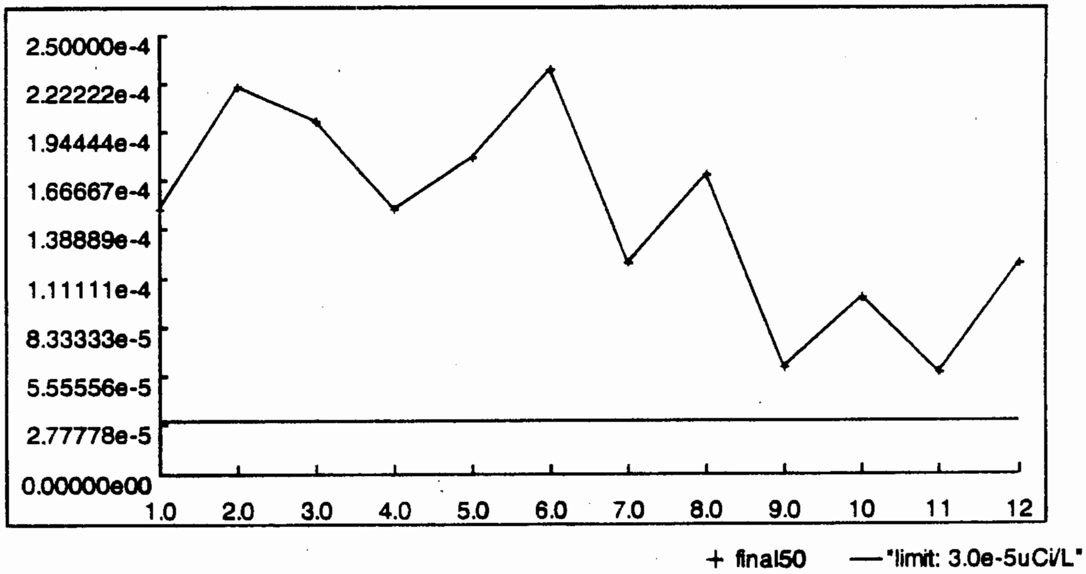
GAMMA concentration (uCi/L).
JAN-1997 through DEC-1997

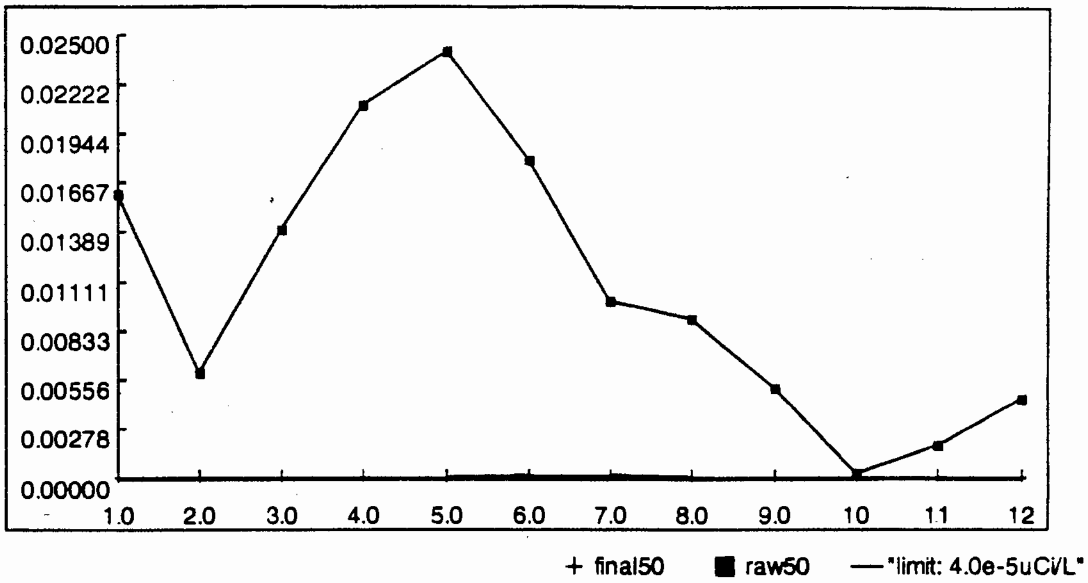


Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997

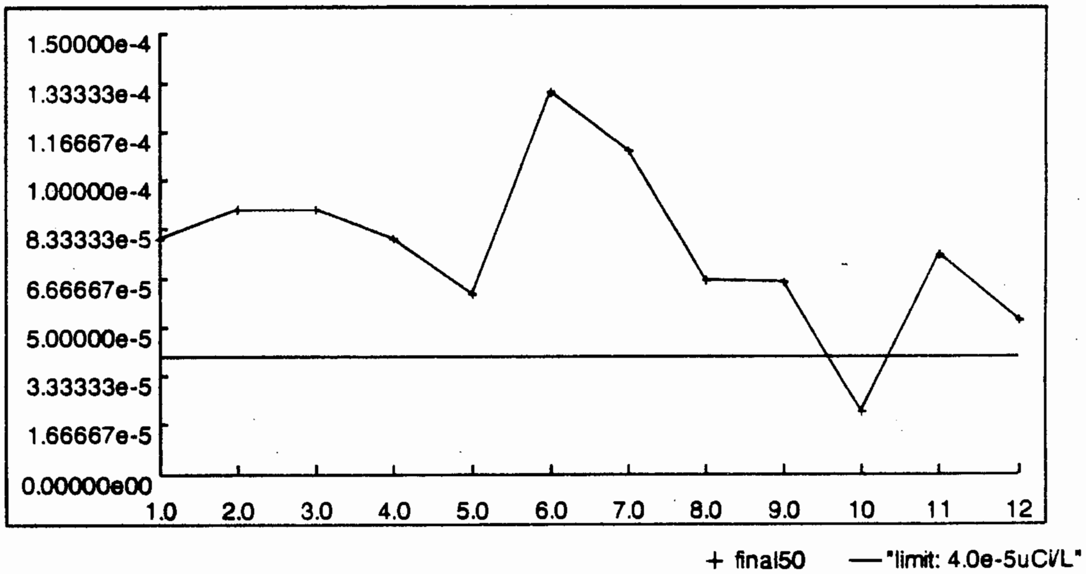


Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997

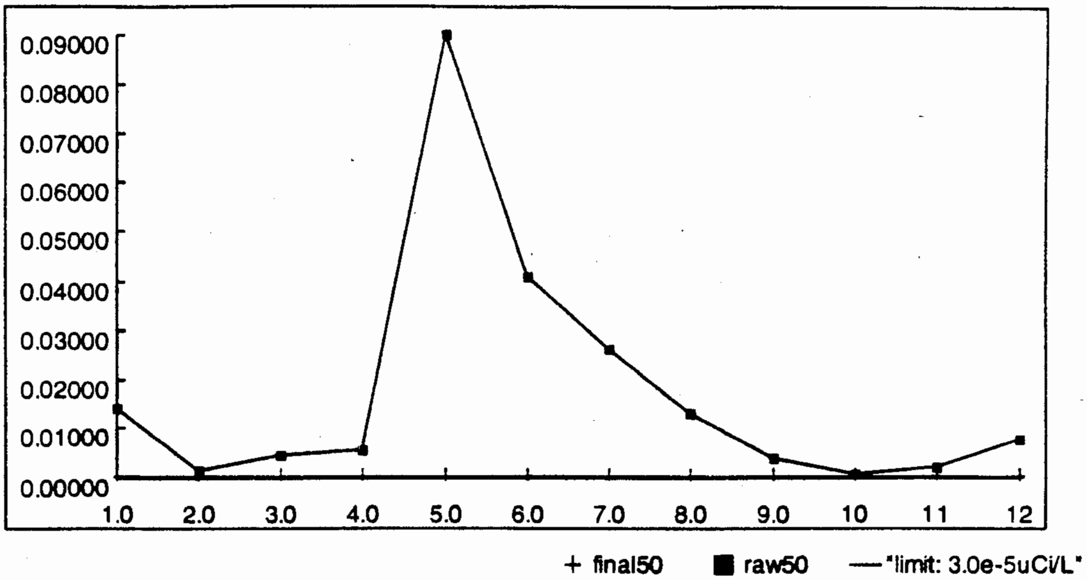




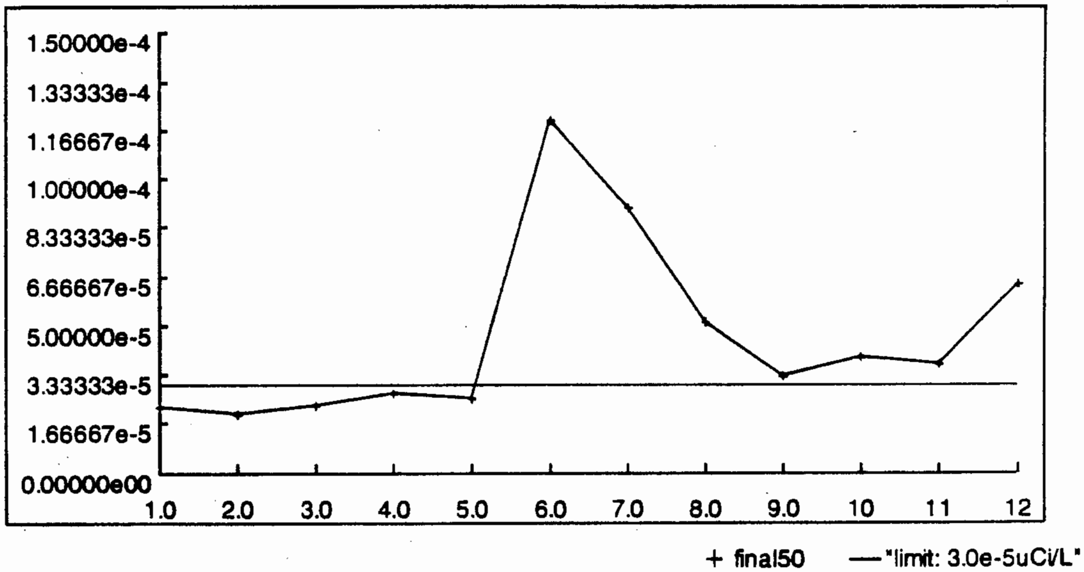
Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997



Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997

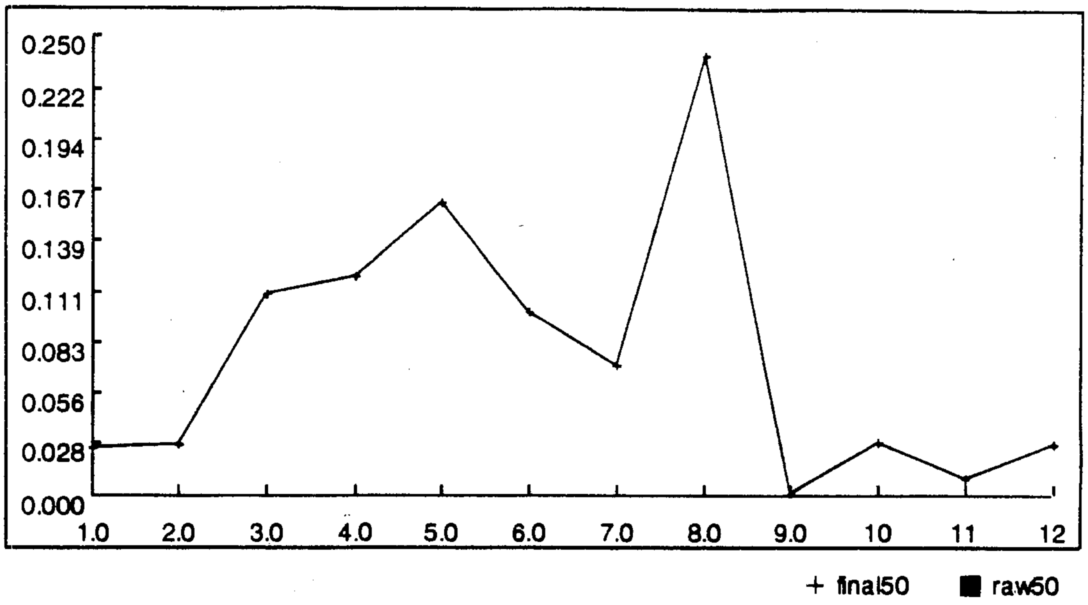


Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997

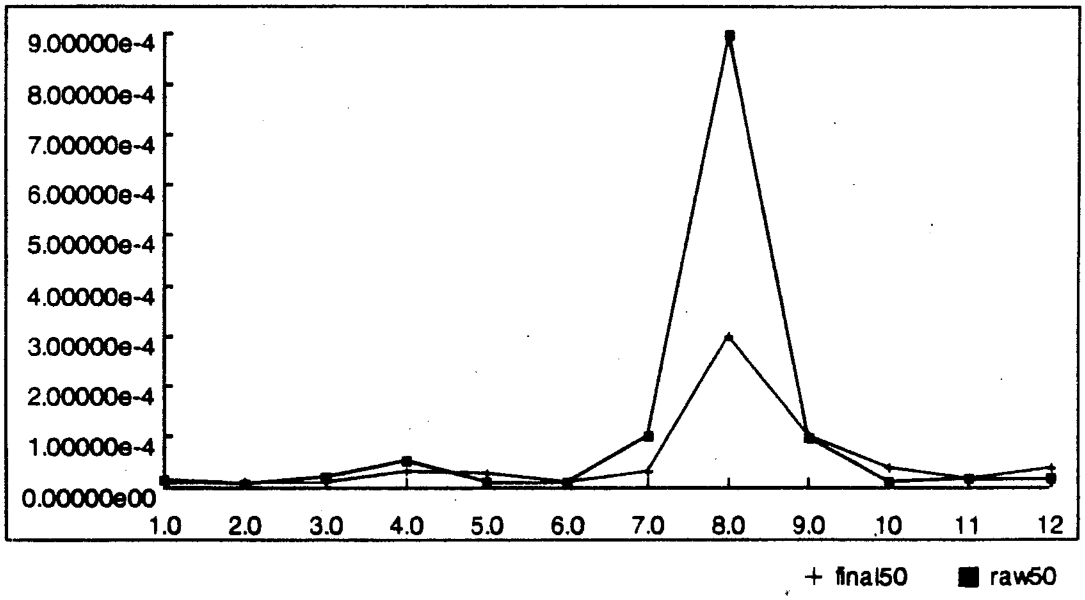


Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997

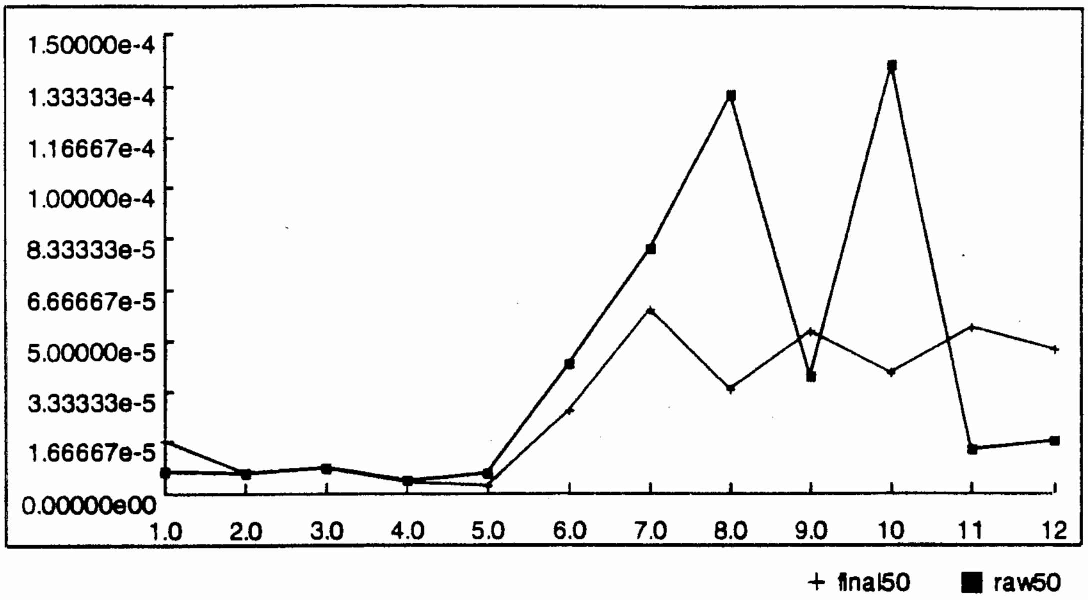
TRITIUM concentration (uCi/L).
JAN-1997 through DEC-1997



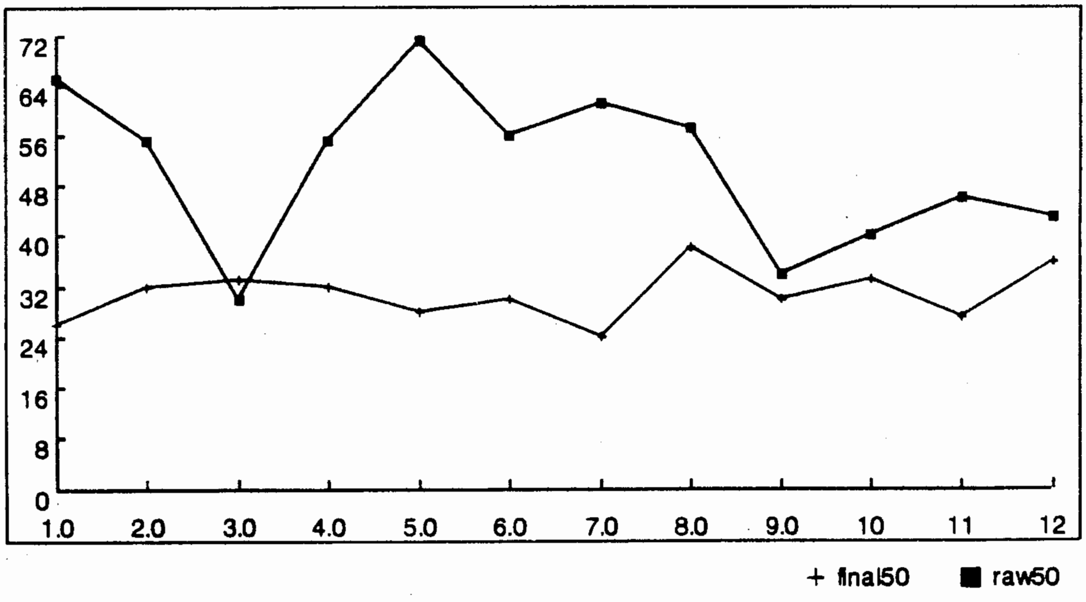
Sr-89 concentration (uCi/L).
JAN-1997 through DEC-1997



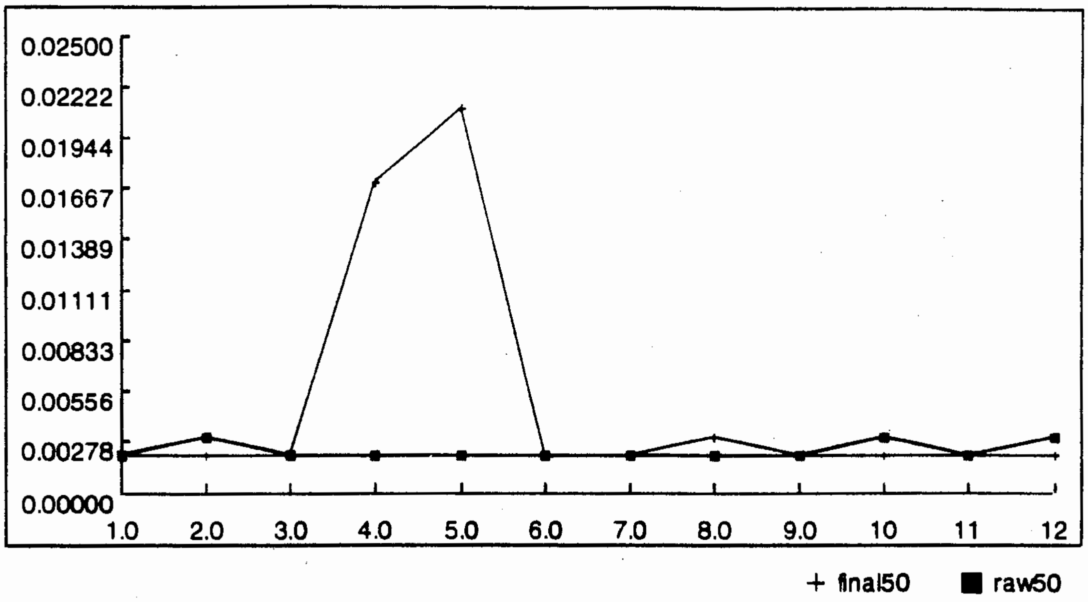
Sr-90 concentration (uCi/L).
JAN-1997 through DEC-1997



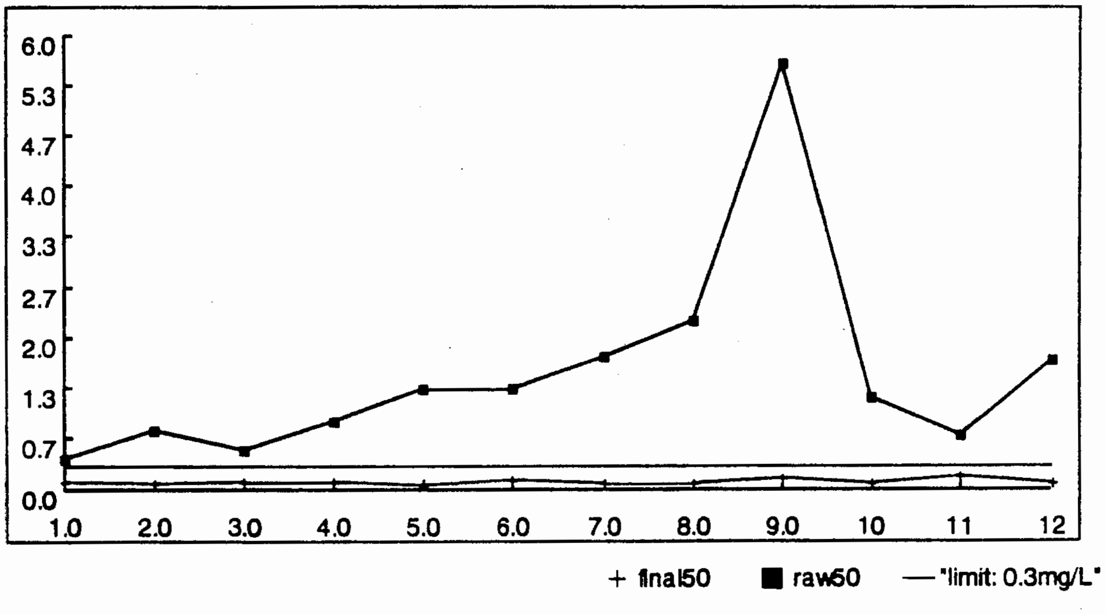
COD concentration (mg/L).
JAN-1997 through DEC-1997



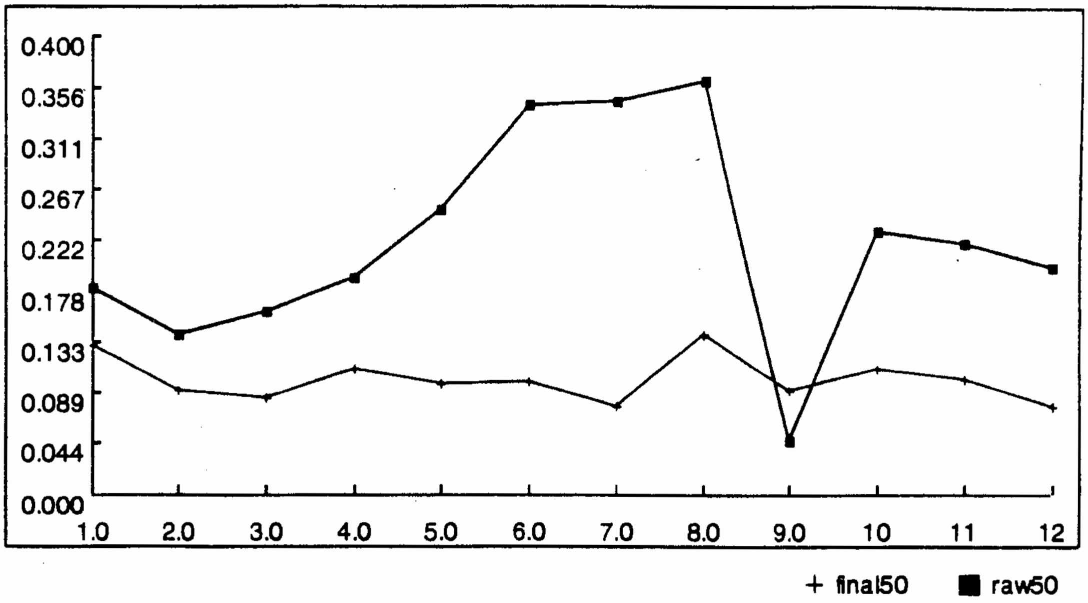
CADMIUM concentration (mg/L).
JAN-1997 through DEC-1997



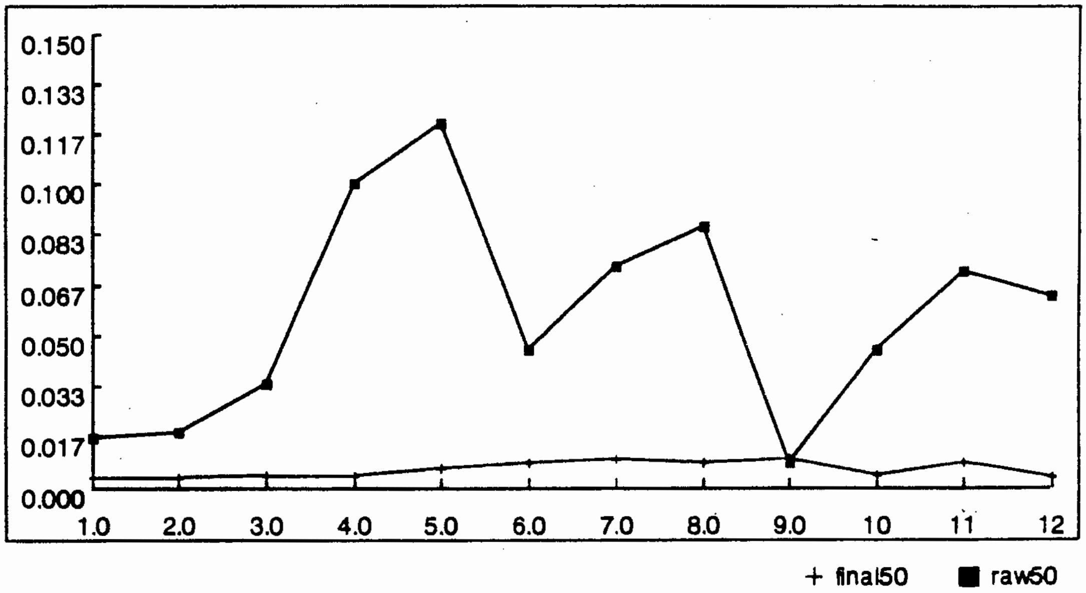
IRON concentration (mg/L).
JAN-1997 through DEC-1997



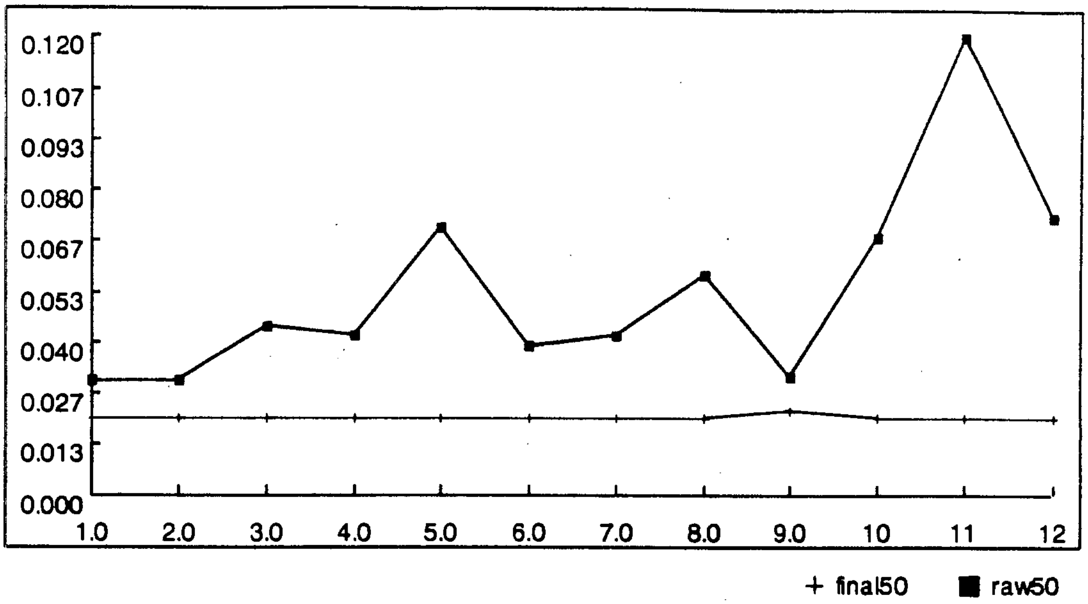
COPPER concentration (mg/L).
JAN-1997 through DEC-1997



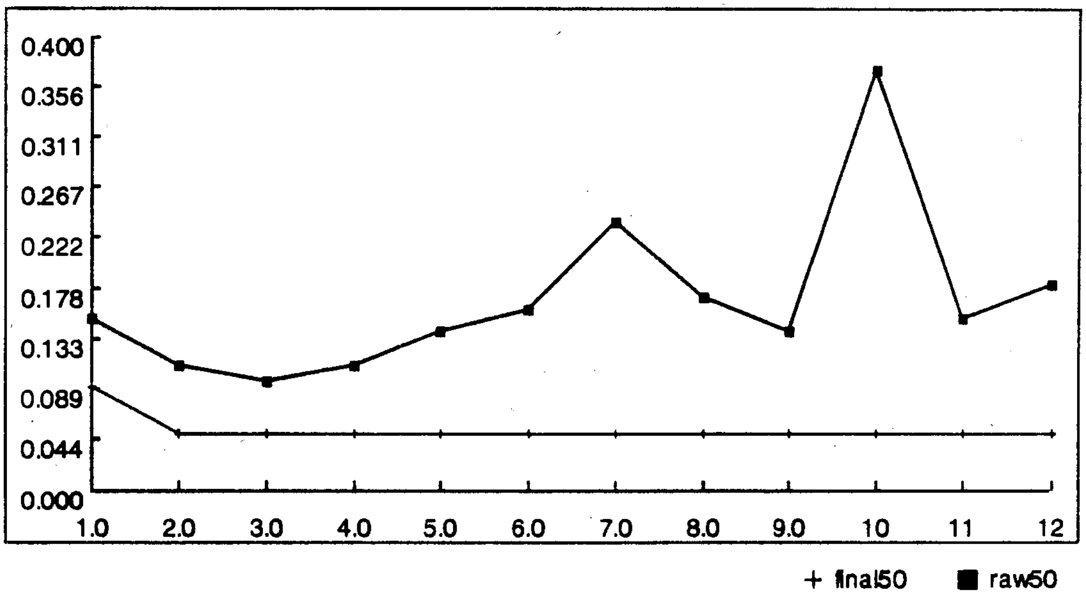
TOTAL_CHROMIUM concentration (mg/L).
JAN-1997 through DEC-1997



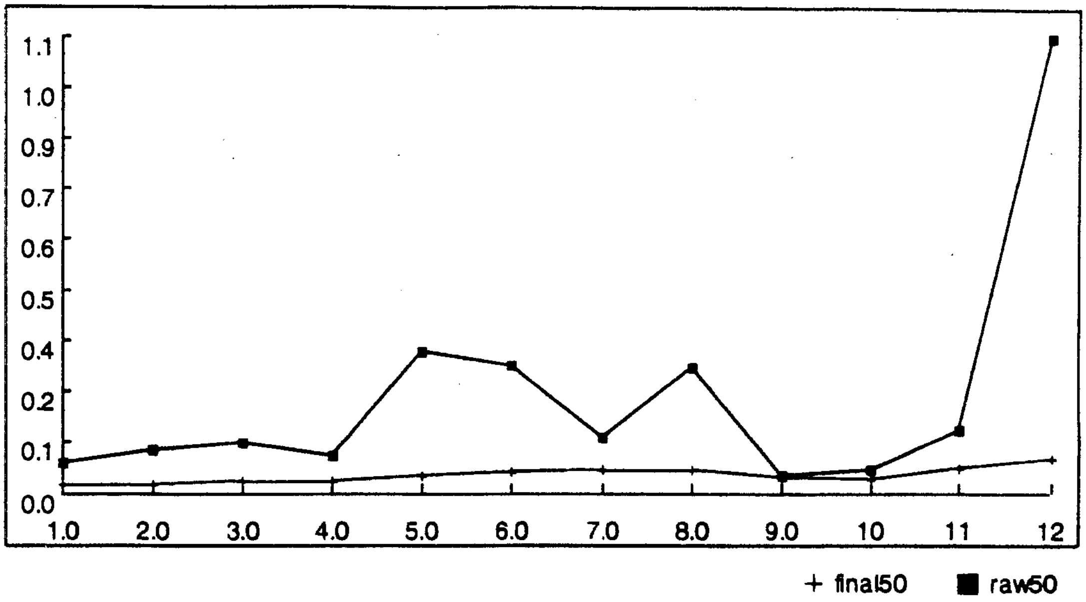
LEAD concentration (mg/L).
JAN-1997 through DEC-1997



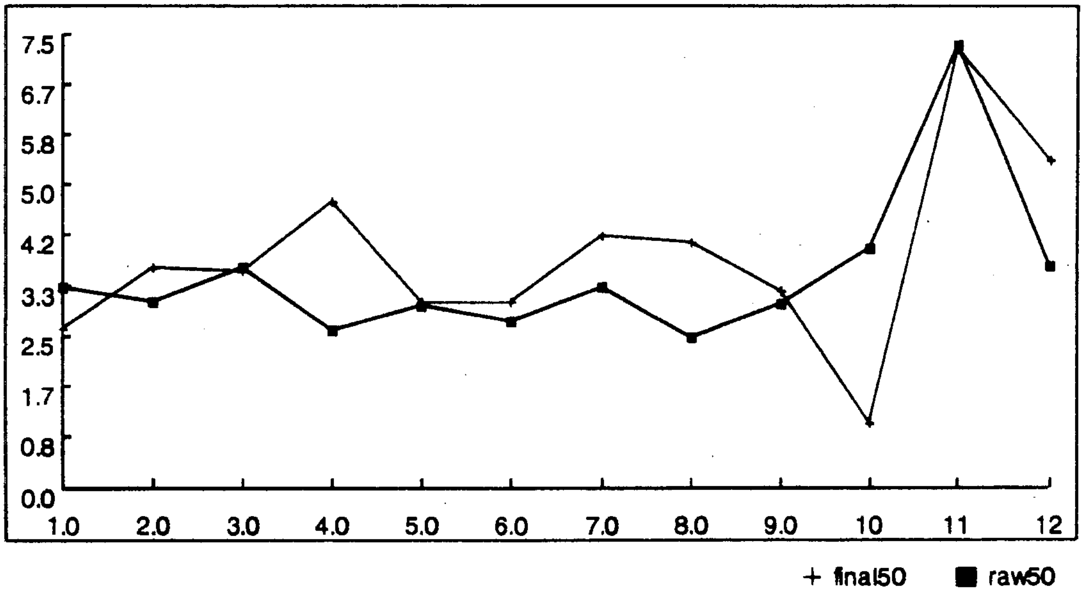
ZINC concentration (mg/L).
JAN-1997 through DEC-1997



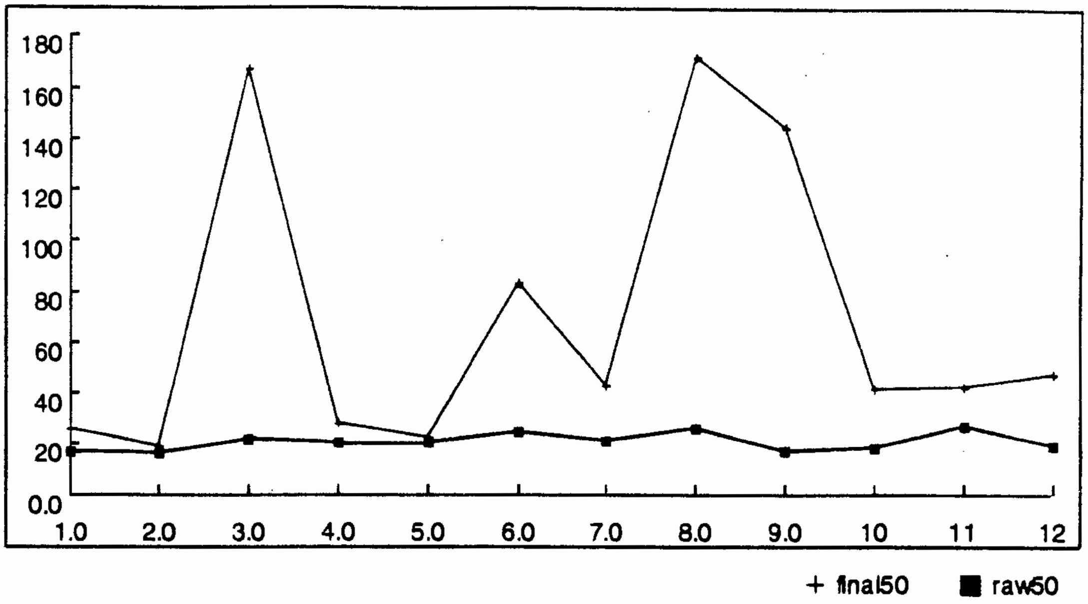
NICKEL concentration (mg/L).
JAN-1997 through DEC-1997



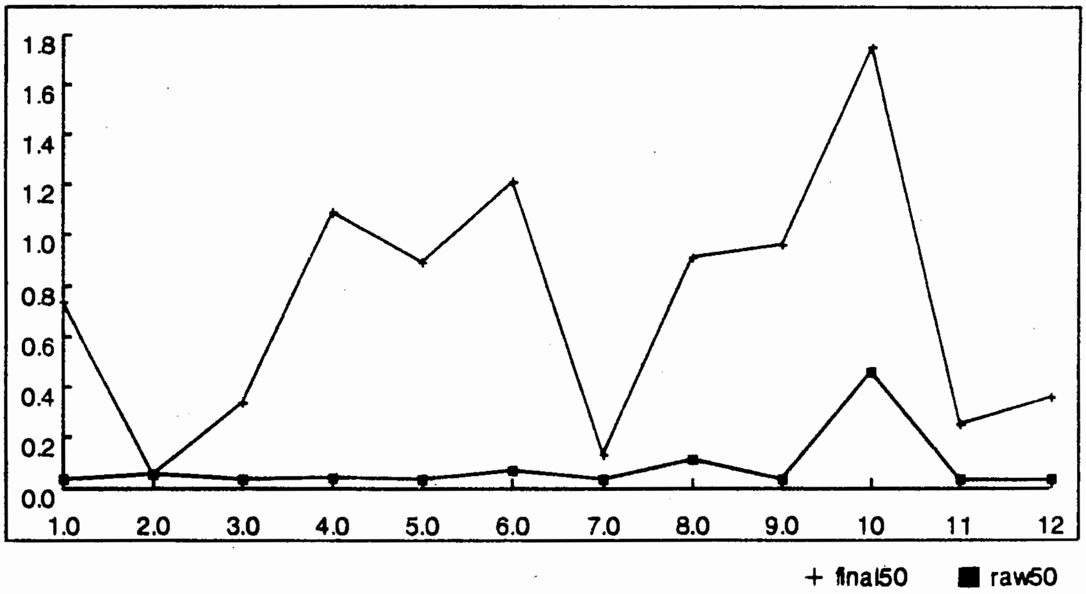
AMMONIA-N concentration (mg/L).
JAN-1997 through DEC-1997



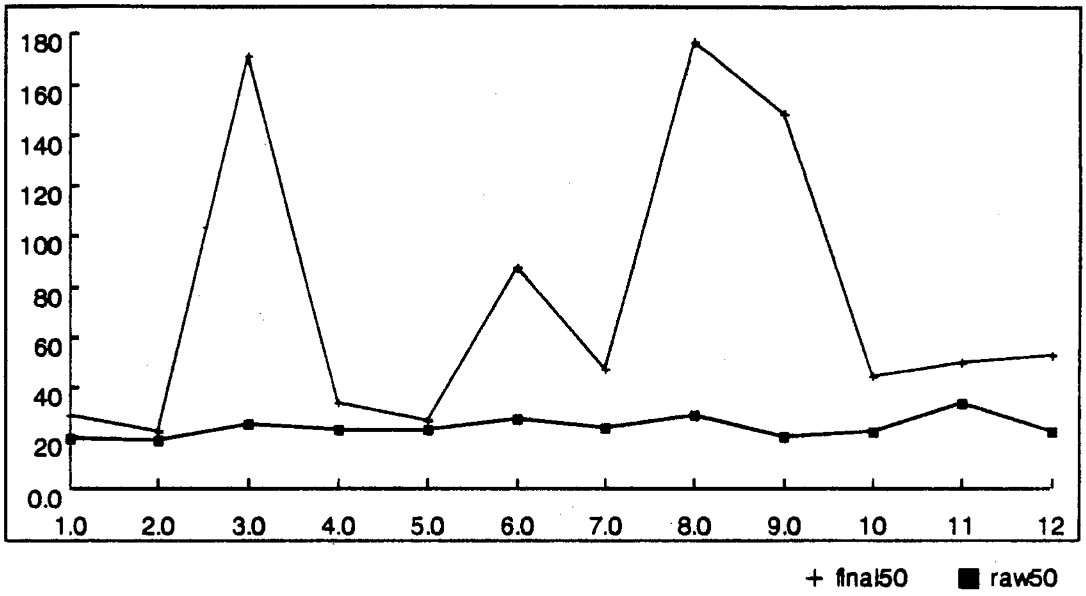
NITRATE-N concentration (mg/L).
JAN-1997 through DEC-1997



NITRITE-N concentration (mg/L).
JAN-1997 through DEC-1997



TOTAL_NITROGEN concentration (mg/L).
JAN-1997 through DEC-1997



Chapter

Kilograms Discharged

Average Kilograms per Discharge

DATE	COD (limit = 42.73 kg)	IRON (limit = 0.45 kg)	TSS (limit = 8.55 kg)	CADMIUM (limit = 0.027 kg)	TOTAL_CHROMIUM (limit = 0.086 kg)	COPPER (limit = 0.286 kg)	LEAD (limit = 0.027 kg)	MERCURY (limit = 0.001 kg)	ZINC (limit = 0.282 kg)
JAN-1997	2.441	0.008	0.188	ldl	ldl	0.012	ldl	No Data	ldl
FEB-1997	2.688	0.005	0.0	ldl	ldl	0.008	ldl	ldl	ldl
MAR-1997	2.762	0.006	0.335	ldl	3.348e-4	0.007	ldl	3.348e-5	ldl
APR-1997	2.811	0.007	0.088	0.001	3.514e-4	0.01	0.002	0.026	0.004
MAY-1997	2.583	ldl	0.184	0.002	5.534e-4	0.009	ldl	ldl	ldl
JUN-1997	2.88	0.01	ldl	ldl	7.68e-4	0.01	ldl	No Data	ldl
JUL-1997	2.53	0.006	0.422	ldl	9.487e-4	0.008	ldl	2.741e-5	ldl
AUG-1997	3.943	0.007	ldl	3.113e-4	8.301e-4	0.015	ldl	ldl	ldl
SEP-1997	2.668	0.012	1.423	ldl	8.005e-4	0.008	0.002	3.024e-5	ldl
OCT-1997	2.957	0.006	0.0	1.792e-4	3.584e-4	0.01	ldl	ldl	ldl
NOV-1997	2.135	0.012	0.316	ldl	6.325e-4	0.008	ldl	3.953e-5	ldl
DEC-1997	3.415	0.006	0.664	ldl	2.846e-4	0.007	ldl	2.524e-5	ldl

Average Kilograms per Discharge

DATE	COD (limit = 42.73 kg)	IRON (limit = 0.45 kg)	TSS (limit = 8.55 kg)	CADMIUM (limit = 0.027 kg)	TOTAL_CHROMIUM (limit = 0.086 kg)	COPPER (limit = 0.286 kg)	LEAD (limit = 0.027 kg)	MERCURY (limit = 0.001 kg)	ZINC (limit = 0.282 kg)
JAN-1997	2.441	0.008	0.188	LDL	LDL	0.012	LDL	No Data	LDL
FEB-1997	2.688	0.005	LDL	LDL	LDL	0.008	LDL	LDL	LDL
MAR-1997	2.762	0.006	0.335	LDL	3.348e-4	0.007	LDL	3.348e-5	LDL
APR-1997	2.811	0.007	0.088	0.001	3.514e-4	0.01	0.002	0.026	0.004
MAY-1997	2.583	LDL	0.184	0.002	5.534e-4	0.009	LDL	LDL	LDL
JUN-1997	2.88	0.01	LDL	LDL	7.68e-4	0.01	LDL	No Data	LDL
JUL-1997	2.53	0.006	0.422	LDL	9.487e-4	0.008	LDL	2.741e-5	LDL
AUG-1997	3.943	0.007	LDL	3.113e-4	8.301e-4	0.015	LDL	LDL	LDL
SEP-1997	2.668	0.012	1.423	LDL	8.005e-4	0.008	0.002	3.024e-5	LDL
OCT-1997	2.957	0.006	0.0	1.792e-4	3.584e-4	0.01	LDL	LDL	LDL
NOV-1997	2.135	0.012	0.316	LDL	6.325e-4	0.008	LDL	3.953e-5	LDL
DEC-1997	3.415	0.008	0.664	LDL	2.846e-4	0.007	LDL	2.524e-5	LDL

Chapter 8

Quality of Effluent Compared with DCG 5400.5

TA-50 WM-1

EFFLUENT COMPARED WITH DCG 5400.5

JAN-1997 through DEC-1997

Radioactive Isotopes	Mean Concentration (microCi/ml)	DCG 5400.5 (microCi/ml)	Conc./DCG Ratio
Am-241	1.466e-7	3.0e-8	4.886
Co-56		1.0e-5	
Co-57		1.0e-4	
Co-58		4.0e-5	
Co-60		5.0e-5	
Cs-137	2.85e-7	3.0e-6	0.095
Mn-54		5.0e-5	
Pu-238	7.667e-8	4.0e-8	1.917
Pu-239	4.592e-8	3.0e-8	1.531
Pu-240		3.0e-8	
Rb-83		2.0e-5	
Rb-84		1.0e-5	
Se-75		2.0e-5	
Sr-85		7.0e-5	
Sr-89	5.15e-8	2.0e-5	0.003
Sr-90	2.917e-8	1.0e-6	0.029
TRITIUM	7.631e-5	0.002	0.038
U-234	4.875e-9	5.0e-7	0.01
Y-88		3.0e-5	

Chapter

9

Room 116B, Vacuum Filter Operations

TA-50-1-ROOM 116B

VACUUM FILTER OPERATIONS

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	11	2288	2675	9.01 ± 3.90 E-5	7.23 ± 0.85 E-2	6.02 ± 0.61 E-2	4.80 ± 0.37 E-2
FEB	0	0	0	0	0	0	0
MAR	13	2704	3816	1.75 ± 0.72 E-5	1.03 ± 0.10 E-1	1.75 ± 0.21 E-2	1.23 ± 0.10 E-2
APR	0	0	0	0	0	0	0
MAY	18	3744	3818	1.34 ± 0.54 E-6	6.80 ± 0.81 E-3	1.43 ± 0.18 E-3	1.52 ± 0.18 E-3
JUN	0	0	0	0	0	0	0
JUL	39	8112	8917	3.20 ± 1.28 E-5	1.62 ± 0.19 E-1	3.42 ± 0.43 E-2	3.63 ± 0.43 E-2
AUG	18	3744	3922	1.40 ± 0.56 E-5	7.07 ± 0.84 E-2	1.49 ± 0.19 E-2	1.58 ± 0.19 E-2
SEP	20	4160	4197	1.48 ± 0.59 E-5	7.52 ± 0.89 E-2	1.58 ± 0.20 E-2	1.68 ± 0.29 E-2
OCT	19	3952	4115	8.35 ± 7.16 E-5	8.11 ± 0.96 E-2	9.07 ± 1.07 E-2	4.30 ± 0.36 E-2
NOV	0	0	0	0	0	0	0
DEC	20	4160	4090	8.30 ± 6.45 E-6	6.38 ± 0.77 E-2	7.29 ± 0.88 E-2	3.40 ± 0.29 E-2
TOTAL	158	32,864	35,550	2.62 ± 1.49 E-4	6.35 ± 0.73 E-1	3.08 ± 0.36 E-1	2.08 ± 0.21 E-1

Chapter 10

TA-21, Vacuum Filter Operations

TA-21-DP-257
VACUUM FILTER OPERATIONS

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	0	0	0	0	0	0	0
FEB	0	0	0	0	0	0	0
MAR	0	0	0	0	0	0	0
APR	0	0	0	0	0	0	0
MAY	0	0	0	0	0	0	0
JUN	20	4160	3379	3.52 ± 0.88 E-5	2.20 ± 0.26 E-3	4.75 ± 0.53 E-3	1.32 ± 0.18 E-2
JUL	0	0	0	0	0	0	0
AUG	0	0	0	0	0	0	0
SEP	140	29,120	22,202	1.86 ± 0.62 E-4	3.78 ± 0.50 E-2	3.72 ± 0.50 E-2	9.30 ± 0.62 E-2
OCT	20	4160	3103	2.58 ± 0.86 E-5	5.25 ± 0.69 E-3	5.17 ± 0.69 E-3	1.29 ± 0.09 E-2
NOV	40	8320	6489	5.47 ± 1.28 E-5	1.11 ± 0.15 E-2	1.09 ± 0.15 E-2	2.74 ± 0.18 E-2
DEC	20	4160	3094	2.57 ± 0.89 E-5	5.24 ± 0.69 E-3	5.15 ± 0.69 E-3	1.29 ± 0.09 E-2
TOTAL	240	49,920	38,267	3.27 ± 1.01 E-4	6.16 ± 0.81 E-2	6.32 ± 0.84 E-2	1.59 ± 0.12 E-1

Chapter 11

Summary of Solid Wastes Generated

TA-50-WM-1 & TA-21-DP-257
SUMMARY OF SOLID WASTES GENERATED

****

CALENDAR YEAR, 1997

	TA-50	TA-21-DP-257
PLANT SLUDGE	32,864 Liters	49,920 Liters
DRUMS OF SLUDGE (RETRIEVABLE)	0 bbl's	0 bbl's
DRUMS OF SLUDGE (NON-RETRIEVABLE.)	158 bbl's	240 bbl's
CEMENT PASTE	440 Liters	▨
DRUMS OF CEMENT PASTE (RETRIEVABLE.)	20 bbl's	▨
MISC. DRUMS (GRIT, ETC.) (RETRIEVABLE.)	0 bbl's	0 bbl's
PLANT SLUDGE ACTIVITY	TOTAL	TOTAL
^{235}U	2.62 ± 1.49 E-4 Ci	3.27 ± 1.01 E-4 Ci
^{238}Pu	6.35 ± 0.73 E-1 Ci	6.16 ± 0.81 E-2 Ci
^{239}Pu	3.08 ± 0.36 E-1 Ci	6.32 ± 0.84 E-2 Ci
^{241}Am	2.08 ± 0.21 E-1 Ci	1.59 ± 0.12 E-1 Ci
CEMENT PASTE ACTIVITY	TOTAL	▨
^{235}U	2.50 ± 0.58 E-3 Ci	▨
^{238}Pu	4.28 ± 0.72 E+0 Ci	▨
^{239}Pu	5.70 ± 0.72 E+0 Ci	▨
^{241}Am	7.84 ± 0.72 E+0 Ci	▨

Appendix A

Flows, TA-50

TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
JAN-1997											
Total	1,358,342	1,472,697	122.117		1,502,105	36,439	65,488	0	0	0	0
Maximum	110,467	101,965	7.767	261.95	158,117	13,303	60,756				
Minimum	11,916	7,398	3.217	38.331	79,058	819	4,732				
Average	43,818	70,128	5.815	199.146	93,882	5,206	32,744				
FEB-1997											
Total	1,282,507	1,310,745	110.433		1,343,987	82,425	5,678	0	0	0	0
Maximum	81,114	99,469	8.867	368.465	158,117	44,199					
Minimum	24,850	46,882	3.233	125.88	79,058	38,226					
Average	45,804	68,987	5.812	205.181	83,999	41,213					
MAR-1997											
Total	1,371,283	1,507,636	131.767		1,423,045	82,036	0	0	29,682	3,277	6,895
Maximum	69,473	105,619	7.917	322.459	158,117	52,104					
Minimum	19,202	32,891	1.7	125.413	79,058	29,932					
Average	44,235	68,529	5.989	196.128	83,709	41,018					
APR-1997											
Total	1,386,580	1,563,606	134.967		1,581,162	160,217	52,238	0	0	0	0
Maximum	67,947	104,995	8.183	318.153	158,117	60,154					
Minimum	24,285	39,663	2.517	126.426	79,058	12,628					
Average	46,219	74,458	6.427	197.432	87,843	32,043					
MAY-1997											
Total	1,505,378	1,727,706	149.733		1,660,221	167,061	0	68,541	14,540	0	0
Maximum	104,763	145,817	9.617	268.045	158,117	82,422					
Minimum	21,462	49,824	4.2	133.463	79,058	28,775					
Average	48,561	78,532	6.806	193.995	92,235	55,687					

TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
JUN-1997											
Total	1,337,415	1,536,163	150.483		1,343,989	73,312	3,388	180,221	41,988	3,394	5,910
Maximum	65,423	122,643	9.9	206.469	158,117			56,687		2,120	3,146
Minimum	20,332	51,963	4.817	135.552	79,058			16,222		30	2,764
Average	44,580	76,808	7.524	170.004	95,999			36,044		1,131	2,955
JUL-1997											
Total	1,375,931	1,911,661	159.65		1,581,165	172,074	76,087	263,468	0	0	0
Maximum	78,817	130,665	9.65	343.477	158,117	84,832		73,532			
Minimum	20,332	42,248	2.05	136.54	79,058	36,825		52,854			
Average	44,385	83,116	6.941	202.184	105,411	57,358		65,867			
AUG-1997											
Total	1,481,193	1,800,249	143.967		1,660,223	160,072	22,788	122,643	37,437	0	8,820
Maximum	100,533	131,288	9.767	298.624	158,117	88,206					6,865
Minimum	10,172	46,882	3.583	162.926	79,058	28,486					1,955
Average	47,780	78,272	6.259	211.854	103,764	53,357					4,410
SEP-1997											
Total	1,283,225	1,346,933	109.133		1,423,046	88,880	6,170	0	0	0	0
Maximum	70,302	97,686	7.65	287.276	158,117						
Minimum	21,462	31,730	2.333	132.044	79,058						
Average	42,774	67,347	5.457	207.743	88,941						
OCT-1997											
Total	1,351,248	1,428,934	125.133		1,343,988	0	58,863	0	0	0	0
Maximum	65,220	105,441	9.7	268.15	158,117		53,942				
Minimum	25,980	34,761	2.483	111.57	79,058		4,921				
Average	43,589	68,044	5.959	194.103	89,599		29,432				

TA50 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Effluent	DP	Misc	Recirc	Sludge	Caustic	Acid
NOV-1997											
Total	1,291,602	1,328,463	100.067		1,185,870	7,386	1,628	72,463	50,072	0	0
Maximum	87,025	122,732	8.717	471.909	79,058				27,041		
Minimum	7,272	43,406	3.133	126.181	79,058				23,031		
Average	43,053	73,804	5.559	232.257	79,058				25,036		
DEC-1997											
Total	1,273,908	1,399,340	103.483		1,423,047	14,980	59,904	0	0	2,178	6,821
Maximum	74,552	104,282	8.033	286.614	158,117	7,132	54,226				3,455
Minimum	12,499	30,572	2.933	168.904	79,058	1,157	5,678				3,366
Average	43,928	73,650	5.446	227.391	94,870	3,745	29,952				3,411
SUMMARY											
Total	16,298,612	18,334,133	1540.933		17,471,848	1,044,882	352,232	707,336	173,719	8,849	28,446
Maximum	1,505,378	1,911,661			1,660,223	172,074	76,087	263,468	50,072	3,394	8,820
Minimum	1,273,908	1,310,745			1,185,870	7,386	1,628	68,541	14,540	2,178	5,910
Average	1,358,218	1,527,844	128.411	198.301	1,455,987	87,074	29,353	58,945	14,477	737	2,371

Appendix A

Analyses of Composite Radiological Samples, TA-50

TA50 RADIOISOTOPES

JAN-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	2.6e-8	0.038		3.9e-10	5.858e-4
Am-241	7.0e-9	0.01		1.5e-10	2.253e-4
BETA	5.9e-10	8.689e-4		1.8e-10	2.704e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	1.6e-8	0.024		8.0e-11	1.202e-4
Pu-239	1.4e-8	0.021		2.2e-11	3.305e-5
Sr-89	1.2e-11	1.767e-5		1.0e-11	1.502e-5
Sr-90	LDL			1.7e-11	2.554e-5
TOTAL_PLUTONIUM	3.0e-8	0.044		1.02e-10	1.532e-4
TRITIUM				2.5e-8	0.038
U-234	2.1e-9	0.003		5.0e-12	7.511e-6
U-235	1.0e-10	1.473e-4		LDL	
Total Alpha		0.058			3.86e-4

Volume of Flow: Treated = 1,472,697.0 liters Final = 1,502,105.0 liters

TA50 RADIOISOTOPES

FEB-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	1.6e-8	0.021		4.7e-10	6.317e-4
Am-241	LDL			2.2e-10	2.957e-4
BETA	3.8e-10	4.981e-4		3.5e-10	4.704e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	6.0e-9	0.008		9.0e-11	1.21e-4
Pu-239	1.2e-9	0.002		2.0e-11	2.688e-5
Sr-89	LDL			LDL	
Sr-90	6.0e-12	7.864e-6		6.0e-12	8.064e-6
TOTAL_PLUTONIUM	7.2e-9	0.009		1.1e-10	1.478e-4
TRITIUM				2.7e-8	0.036
U-234	LDL			4.0e-12	5.376e-6
U-235	LDL			LDL	
Total Alpha		0.009			4.489e-4

Volume of Flow: Treated = 1,310,745.0 liters Final = 1,343,987.0 liters

TA50 RADIOISOTOPES

MAR-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	3.1e-8	0.047		3.0e-10	4.269e-4
Am-241	4.8e-9	0.007		2.0e-10	2.846e-4
BETA	7.3e-10	0.001		4.8e-10	6.831e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	1.4e-8	0.021		9.0e-11	1.281e-4
Pu-239	4.6e-9	0.007		2.3e-11	3.273e-5
Sr-89	2.0e-11	3.015e-5		LDL	
Sr-90	8.0e-12	1.206e-5		LDL	
TOTAL_PLUTONIUM	1.86e-8	0.028		1.13e-10	1.608e-4
TRITIUM				1.1e-7	0.157
U-234	LDL			4.0e-12	5.692e-6
U-235	LDL			LDL	
Total Alpha		0.035			4.511e-4

Volume of Flow: Treated = 1,507,636.0 liters Final = 1,423,045.0 liters

TA50 RADIOISOTOPES

APR-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	3.2e-8	0.05		3.0e-10	4.743e-4
Am-241	1.1e-8	0.017		1.5e-10	2.372e-4
BETA	7.9e-10	0.001		1.7e-10	2.688e-4
Cs-137	LDL			LDL	
GAMMA	LDL			1.0e-9	0.002
Pu-238	2.1e-8	0.033		8.0e-11	1.265e-4
Pu-239	5.5e-9	0.009		2.7e-11	4.269e-5
Sr-89	5.0e-11	7.818e-5		3.0e-11	4.743e-5
Sr-90	4.0e-12	6.254e-6		3.0e-12	4.743e-6
TOTAL_PLUTONIUM	2.65e-8	0.041		1.07e-10	1.692e-4
TRITIUM				1.2e-7	0.19
U-234	4.0e-10	6.254e-4		3.0e-12	4.743e-6
U-235	2.0e-10	3.127e-4		3.0e-13	4.743e-7
Total Alpha		0.06			4.116e-4

Volume of Flow: Treated = 1,563,606.0 liters Final = 1,581,162.0 liters

TA50 RADIOISOTOPES

MAY-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	2.7e-7	0.466		3.9e-10	6.475e-4
Am-241	6.7e-8	0.116		1.8e-10	2.988e-4
BETA	7.6e-9	0.013		7.0e-11	1.162e-4
Cs-137	LDL			LDL	
GAMMA	3.0e-9	0.005		LDL	
Pu-238	2.4e-8	0.041		6.1e-11	1.013e-4
Pu-239	9.0e-8	0.155		2.5e-11	4.151e-5
Sr-89	1.0e-11	1.728e-5		2.6e-11	4.317e-5
Sr-90	6.0e-12	1.037e-5		2.0e-12	3.32e-6
TOTAL_PLUTONIUM	1.14e-7	0.197		8.6e-11	1.428e-4
TRITIUM				1.6e-7	0.266
U-234	LDL			5.0e-12	8.301e-6
U-235	2.0e-10	3.455e-4		2.0e-13	3.32e-7
Total Alpha		0.313			4.503e-4

Volume of Flow: Treated = 1,727,706.0 liters Final = 1,660,221.0 liters

TA50 RADIOISOTOPES

JUN-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	1.1e-7	0.169		6.2e-10	8.333e-4
Am-241	3.2e-8	0.049		2.3e-10	3.091e-4
BETA	4.8e-9	0.007		2.9e-10	3.898e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	1.8e-8	0.028		1.3e-10	1.747e-4
Pu-239	4.1e-8	0.063		1.2e-10	1.613e-4
Sr-89	LDL			LDL	
Sr-90	4.2e-11	6.452e-5		2.7e-11	3.629e-5
TOTAL_PLUTONIUM	5.9e-8	0.091		2.5e-10	3.36e-4
TRITIUM				1.0e-7	0.134
U-234	9.0e-10	0.001		4.0e-12	5.376e-6
U-235	1.0e-10	1.536e-4		LDL	
Total Alpha		0.141			6.505e-4

Volume of Flow: Treated = 1,536,163.0 liters Final = 1,343,989.0 liters

TA50 RADIOISOTOPES

JUL-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	6.1e-8	0.117		3.1e-10	4.902e-4
Am-241	1.5e-8	0.029		1.2e-10	1.897e-4
BETA	4.8e-9	0.009		1.0e-9	0.002
Cs-137	3.0e-10	5.735e-4		3.0e-10	4.743e-4
GAMMA	1.0e-8	0.019		3.0e-9	0.005
Na-22				8.0e-10	0.001
Pu-238	1.0e-8	0.019		1.1e-10	1.739e-4
Pu-239	2.6e-8	0.05		9.0e-11	1.423e-4
Sr-89	1.0e-10	1.912e-4		3.0e-11	4.743e-5
Sr-90	8.0e-11	1.529e-4		6.0e-11	9.487e-5
TOTAL_PLUTONIUM	3.6e-8	0.069		2.0e-10	3.162e-4
TRITIUM				7.0e-8	0.111
U-234	5.0e-10	9.558e-4		4.0e-12	6.325e-6
U-235	2.0e-10	3.823e-4		3.0e-13	4.743e-7
Total Alpha		0.099			5.128e-4

Volume of Flow: Treated = 1,911,661.0 liters Final = 1,581,165.0 liters

TA50 RADIOISOTOPES

AUG-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	3.1e-8	0.056		2.8e-10	4.649e-4
Am-241	9.0e-9	0.016		1.7e-10	2.822e-4
BETA	4.3e-9	0.008		9.1e-10	0.002
Cs-137	3.0e-10	5.401e-4		8.0e-10	0.001
GAMMA	LDL			LDL	
Pu-238	9.0e-9	0.016		6.6e-11	1.096e-4
Pu-239	1.3e-8	0.023		5.1e-11	8.467e-5
Sr-89	9.0e-10	0.002		3.0e-10	4.981e-4
Sr-90	1.3e-10	2.34e-4		3.4e-11	5.645e-5
TOTAL_PLUTONIUM	2.2e-8	0.04		1.17e-10	1.942e-4
TRITIUM				2.4e-7	0.398
U-234	2.0e-10	3.6e-4		1.2e-11	1.992e-5
U-235	3.0e-11	5.401e-5		8.0e-13	1.328e-6
Total Alpha		0.056			4.977e-4

Volume of Flow: Treated = 1,800,249.0 liters Final = 1,660,223.0 liters

TA50 RADIOISOTOPES

SEP-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	1.2e-8	0.016		2.2e-10	3.131e-4
Am-241	4.4e-9	0.006		6.1e-11	8.681e-5
BETA	1.7e-9	0.002		1.4e-9	0.002
Cs-137	7.0e-10	9.429e-4		6.0e-10	8.538e-4
GAMMA	LDL			1.0e-9	0.001
Pu-238	5.1e-9	0.007		6.5e-11	9.25e-5
Pu-239	3.7e-9	0.005		3.3e-11	4.696e-5
Sr-89	9.9e-11	1.333e-4		1.0e-10	1.423e-4
Sr-90	3.8e-11	5.118e-5		5.3e-11	7.542e-5
TOTAL_PLUTONIUM	8.8e-9	0.012		9.8e-11	1.395e-4
TRITIUM				1.1e-10	1.565e-4
U-234	1.5e-10	2.02e-4		2.5e-12	3.558e-6
U-235	3.8e-11	5.118e-5		2.3e-13	3.273e-7
Total Alpha		0.018			2.301e-4

Volume of Flow: Treated = 1,346,933.0 liters Final = 1,423,046.0 liters

TA50 RADIOISOTOPES

OCT-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	7.0e-9	0.01		1.7e-10	2.285e-4
Am-241	9.9e-10	0.001		1.0e-10	1.344e-4
BETA	1.1e-9	0.002		3.7e-10	4.973e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	2.9e-10	4.144e-4		2.1e-11	2.822e-5
Pu-239	3.7e-10	5.287e-4		3.9e-11	5.242e-5
Sr-89	1.0e-11	1.429e-5		3.8e-11	5.107e-5
Sr-90	1.4e-10	2.001e-4		3.9e-11	5.242e-5
TOTAL_PLUTONIUM	6.6e-10	9.431e-4		6.0e-11	8.064e-5
TRITIUM				2.8e-8	0.038
U-234	3.3e-11	4.715e-5		4.8e-12	6.451e-6
U-235	2.6e-11	3.715e-5		1.6e-12	2.15e-6
Total Alpha		0.002			2.236e-4

Volume of Flow: Treated = 1,428,934.0 liters Final = 1,343,988.0 liters

TA50 RADIOISOTOPES

NOV-1997

	RAW			FINAL	
	Ci/l	Total (Ci)		Ci/l	Total (Ci)
ALPHA	9.3e-9	0.012		1.6e-10	1.897e-4
Am-241	2.3e-9	0.003		5.8e-11	6.878e-5
BETA	8.0e-10	0.001		3.5e-10	4.151e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	1.8e-9	0.002		7.5e-11	8.894e-5
Pu-239	1.8e-9	0.002		3.7e-11	4.388e-5
Sr-89	1.5e-11	1.993e-5		LDL	
Sr-90	1.4e-11	1.86e-5		5.4e-11	6.404e-5
TOTAL_PLUTONIUM	3.6e-9	0.005		1.12e-10	1.328e-4
TRITIUM				8.6e-9	0.01
U-234	LDL			4.8e-12	5.692e-6
U-235	LDL			1.8e-12	2.135e-6
Total Alpha		0.008			2.094e-4

Volume of Flow: Treated = 1,328,463.0 liters Final = 1,185,870.0 liters

TA50 RADIOISOTOPES

DEC-1997

	RAW Ci/l	Total (Ci)		FINAL Ci/l	Total (Ci)
ALPHA	5.8e-9	0.008		3.0e-10	4.269e-4
Am-241	2.3e-9	0.003		1.2e-10	1.708e-4
BETA	3.2e-11	4.478e-5		2.9e-10	4.127e-4
Cs-137	LDL			LDL	
GAMMA	LDL			LDL	
Pu-238	4.5e-9	0.006		5.2e-11	7.4e-5
Pu-239	7.7e-9	0.011		6.4e-11	9.108e-5
Sr-89	1.6e-11	2.239e-5		3.8e-11	5.408e-5
Sr-90	1.7e-11	2.379e-5		4.7e-11	6.688e-5
TOTAL_PLUTONIUM	1.22e-8	0.017		1.16e-10	1.651e-4
TRITIUM				2.7e-8	0.038
U-234	4.7e-12	6.577e-6		5.4e-12	7.684e-6
U-235	LDL			LDL	
Total Alpha		0.02			3.435e-4

Volume of Flow: Treated = 1,399,340.0 liters Final = 1,423,047.0 liters

Appendix

Analyses of Composite Mineral Samples, TA-50

TA50 MINERALS

JAN-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	27.0	39.763		326.0	489.686
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.46	0.677		0.5	0.751
AMMONIA-N	3.29	4.845		2.6	3.905
ARSENIC	0.002	0.003		0.001	0.002
BARIUM	0.035	0.052		0.012	0.018
BERYLLIUM	LDL			LDL	
BORON	0.105	0.155		0.139	0.209
CADMIUM	LDL			LDL	
CALCIUM	12.9	18.998		140.0	210.295
CHLORIDE	18.9	27.834		40.0	60.084
COBALT	LDL			LDL	
COD	65.0	95.725		26.0	39.055
CONDUCTIVITY	290.0			860.0	
COPPER	0.18	0.265		0.13	0.195
CYANIDE	LDL			LDL	
FLUORIDE	1.08	1.591		1.75	2.629
HARDNESS	47.036	69.27		350.815	526.962
IRON	0.4	0.589		0.08	0.12
LEAD	0.03	0.044		LDL	
MAGNESIUM	3.6	5.302		0.3	0.451
NICKEL	0.07	0.103		0.02	0.03
NITRATE-N	16.5	24.3		25.7	38.604
NITRITE-N	0.03	0.044		0.73	1.097
PHOSPHORUS	1.6	2.356		0.37	0.556
POTASSIUM	4.2	6.185		6.7	10.064
SELENIUM	LDL			0.002	0.003
SILICA_DIOXIDE	76.0	111.925		37.0	55.578
SILVER	0.011	0.016		LDL	
SODIUM	30.1	44.328		61.0	91.628
SULFATE	9.0	13.254		43.0	64.591
TDS	120.0	176.724		590.0	886.242
THALLIUM	0.1	0.147		0.1	0.15
TOTAL_CATIONS	2.3			9.04	
TOTAL_CHROMIUM	0.016	0.024		LDL	
TSS	7.0	10.309		2.0	3.004
URANIUM	75.0	110.452		7.8	11.716
VANADIUM	0.008	0.012		0.006	0.009
ZINC	0.15	0.221		LDL	
pH	7.0			7.6	

Volume of Flow: Treated = 1,472,697.0 liters Final = 1,502,105.0 liters

TA50 MINERALS

FEB-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	52.0	68.159		520.0	698.873
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.52	0.682		LDL	
AMMONIA-N	3.05	3.998		3.62	4.865
ARSENIC	0.002	0.003		0.002	0.003
BARIUM	0.037	0.048		0.024	0.032
BERYLLIUM	LDL			LDL	
BORON	0.437	0.573		0.102	0.137
CADMIUM	0.003	0.004		LDL	
CALCIUM	15.0	19.661		208.0	279.549
CHLORIDE	15.7	20.579		44.0	59.135
COBALT	LDL			LDL	
COD	55.0	72.091		32.0	43.008
CONDUCTIVITY	320.0			1080.0	
COPPER	0.14	0.184		0.09	0.121
CYANIDE	LDL			LDL	
FLUORIDE	0.89	1.167		1.28	1.72
HARDNESS	57.221	75.003		520.611	699.695
IRON	0.77	1.009		0.06	0.081
LEAD	0.03	0.039		LDL	
MAGNESIUM	4.8	6.292		0.3	0.403
MERCURY	0.004	0.005		LDL	
NICKEL	0.1	0.131		0.02	0.027
NITRATE-N	15.6	20.448		18.9	25.401
NITRITE-N	0.05	0.066		0.05	0.067
PHOSPHORUS	2.4	3.146		0.69	0.927
POTASSIUM	5.7	7.471		7.1	9.542
SELENIUM	LDL			0.001	0.001
SILICA_DIOXIDE	77.0	100.927		34.0	45.696
SILVER	0.043	0.056		LDL	
SODIUM	32.0	41.944		51.0	68.543
SULFATE	21.0	27.526		54.0	72.575
TDS	280.0	367.009		740.0	994.55
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.22			13.8	
TOTAL_CHROMIUM	0.018	0.024		LDL	
TSS	280.0	367.009		LDL	
URANIUM	90.0	117.967		5.0	6.72
VANADIUM	0.009	0.012		0.004	0.005
ZINC	0.11	0.144		LDL	
pH	7.5			7.2	

Volume of Flow: Treated = 1,310,745.0 liters Final = 1,343,987.0 liters

TA50 MINERALS

MAR-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	37.0	55.783		382.0	543.603
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.34	0.513		0.34	0.484
AMMONIA-N	3.62	5.458		3.57	5.08
ARSENIC	0.002	0.003		LDL	
BARIUM	0.039	0.059		0.019	0.027
BERYLLIUM	LDL			LDL	
BORON	0.095	0.143		0.084	0.12
CADMIUM	LDL			LDL	
CALCIUM	14.0	21.107		140.0	199.226
CHLORIDE	22.0	33.168		80.0	113.844
COBALT	LDL			LDL	
COD	30.0	45.229		33.0	46.96
CONDUCTIVITY	350.0			2260.0	
COPPER	0.16	0.241		0.085	0.121
CYANIDE	LDL			0.08	0.114
FLUORIDE	0.75	1.131		2.46	3.501
HARDNESS	51.018	76.917		350.527	498.816
IRON	0.51	0.769		0.073	0.104
LEAD	0.044	0.066		LDL	
MAGNESIUM	3.9	5.88		0.23	0.327
MERCURY	0.004	0.006		4.0e-4	5.692e-4
NICKEL	0.12	0.181		0.027	0.038
NITRATE-N	21.7	32.716		167.0	237.649
NITRITE-N	LDL			0.34	0.484
PHOSPHORUS	2.49	3.754		0.38	0.541
POTASSIUM	4.9	7.387		68.0	96.767
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	79.0	119.103		73.0	103.882
SILVER	0.009	0.014		LDL	
SODIUM	37.0	55.783		290.0	412.683
SULFATE	12.0	18.092		52.0	73.998
TDS	296.0	446.26		1650.0	2348.024
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.46			23.8	
TOTAL_CHROMIUM	0.034	0.051		0.004	0.006
TSS	5.0	7.538		4.0	5.692
URANIUM	55.0	82.92		5.0	7.115
VANADIUM	0.009	0.014		0.008	0.011
ZINC	0.096	0.145		LDL	
pH	7.1			6.8	

Volume of Flow: Treated = 1,507,636.0 liters Final = 1,423,045.0 liters

TA50 MINERALS

APR-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	LDL			306.0	483.836
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.58	0.907		0.12	0.19
AMMONIA-N	2.58	4.034		4.71	7.447
ARSENIC	LDL			LDL	
BARIUM	0.043	0.067		0.018	0.028
BERYLLIUM	LDL			LDL	
BORON	0.49	0.766		0.39	0.617
CADMIUM	LDL			0.017	0.027
CALCIUM	12.0	18.763		140.0	221.363
CHLORIDE	45.0	70.362		46.8	73.998
COBALT	LDL			LDL	
COD	55.0	85.998		32.0	50.597
CONDUCTIVITY	347.0			951.0	
COPPER	0.19	0.297		0.11	0.174
CYANIDE				0.01	0.016
FLUORIDE	0.73	1.141		1.34	2.119
HARDNESS	45.201	70.676		351.104	555.152
IRON	0.89	1.392		0.081	0.128
LEAD	0.042	0.066		0.02	0.032
MAGNESIUM	3.7	5.785		0.37	0.585
MERCURY	0.005	0.008		0.3	0.474
NICKEL	0.09	0.141		0.028	0.044
NITRATE-N	20.1	31.428		27.8	43.956
NITRITE-N	0.04	0.063		1.09	1.723
PHOSPHORUS	2.1	3.284		0.19	0.3
POTASSIUM	3.6	5.629		7.8	12.333
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	76.0	118.834		38.0	60.084
SILVER	0.021	0.033		LDL	
SODIUM	45.0	70.362		75.0	118.587
SULFATE	36.0	56.29		52.3	82.695
TDS	276.0	431.555		586.0	926.561
THALLIUM	LDL			LDL	
TOTAL_CATIONS	2.84			9.36	
TOTAL_CHROMIUM	0.1	0.156		0.004	0.006
TSS	3.0	4.691		1.0	1.581
URANIUM	0.069	0.108		0.002	0.003
VANADIUM	0.01	0.016		0.005	0.008
ZINC	0.11	0.172		0.05	0.079
pH	6.41			7.12	

Volume of Flow: Treated = 1,563,606.0 liters Final = 1,581,162.0 liters

TA50 MINERALS

MAY-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	28.0	48.376		366.0	607.641
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.39	0.674		0.2	0.332
AMMONIA-N	3.01	5.2		3.07	5.097
ARSENIC	0.001	0.002		LDL	
BARIUM	0.045	0.078		0.014	0.023
BERYLLIUM	0.006	0.01		LDL	
BORON	0.26	0.449		0.2	0.332
CADMIUM	0.002	0.003		0.021	0.035
CALCIUM	14.0	24.188		140.0	232.431
CHLORIDE	20.1	34.727		21.8	36.193
COBALT	LDL			LDL	
COD	71.0	122.667		28.0	46.486
CONDUCTIVITY	340.0			940.0	
COPPER	0.25	0.432		0.097	0.161
CYANIDE	LDL			LDL	
FLUORIDE	0.77	1.33		1.53	2.54
HARDNESS	50.606	87.433		350.445	581.816
IRON	1.3	2.246		LDL	
LEAD	0.07	0.121		LDL	
MAGNESIUM	3.8	6.565		0.21	0.349
MERCURY	3.8	6.565		LDL	
NICKEL	0.34	0.587		0.041	0.068
NITRATE-N	20.1	34.727		22.5	37.355
NITRITE-N	LDL			0.89	1.478
PHOSPHORUS	1.43	2.471		0.29	0.481
POTASSIUM	4.2	7.256		4.9	8.135
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	82.0	141.672		25.0	41.506
SILVER	0.031	0.054		LDL	
SODIUM	34.0	58.742		45.0	74.71
SULFATE	18.4	31.79		42.6	70.725
TDS	332.0	573.598		626.0	1039.298
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.14			1.08	
TOTAL_CHROMIUM	0.12	0.207		0.006	0.01
TSS	12.0	20.732		2.0	3.32
URANIUM	0.084	0.145		0.005	0.008
VANADIUM	0.011	0.019		0.007	0.012
ZINC	0.14	0.242		LDL	
pH	6.8			7.5	

Volume of Flow: Treated = 1,727,706.0 liters Final = 1,660,221.0 liters

TA50 MINERALS

JUN-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	38.0	58.374		144.0	193.534
ALKALINITY-P	LDL			58.0	77.951
ALUMINUM	2.33	3.579		0.136	0.183
AMMONIA-N	2.73	4.194		3.06	4.113
ARSENIC	0.002	0.003		0.001	0.001
BARIUM	0.033	0.051		0.008	0.011
BERYLLIUM	LDL			LDL	
BORON	0.143	0.22		0.158	0.212
CADMIUM	0.002	0.003		LDL	
CALCIUM	13.3	20.431		73.9	99.321
CHLORIDE	22.6	34.717		37.9	50.937
COBALT	0.003	0.005		LDL	
COD	56.0	86.025		30.0	40.32
CONDUCTIVITY	470.0			1090.0	
COPPER	0.34	0.522		0.099	0.133
CYANIDE	0.01	0.015		0.03	0.04
FLUORIDE	0.93	1.429		1.41	1.895
HARDNESS	48.982	75.244		185.887	249.83
IRON	1.32	2.028		0.103	0.138
LEAD	0.039	0.06		LDL	
MAGNESIUM	3.83	5.884		0.33	0.444
NICKEL	0.307	0.472		0.049	0.066
NITRATE-N	24.2	37.175		83.0	111.551
NITRITE-N	0.07	0.108		1.21	1.626
PHOSPHORUS	2.87	4.409		0.37	0.497
POTASSIUM	5.9	9.063		25.4	34.137
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	75.0	115.212		52.0	69.887
SILVER	LDL			LDL	
SODIUM	64.0	98.314		151.0	202.942
SULFATE	45.5	69.895		33.5	45.024
TDS	398.0	611.393		822.0	1104.759
THALLIUM	LDL			LDL	
TOTAL_CATIONS	4.28			10.2	
TOTAL_CHROMIUM	0.045	0.069		0.008	0.011
TSS	10.0	15.362		LDL	
URANIUM	0.06	0.092		0.003	0.004
VANADIUM	0.011	0.017		0.012	0.016
ZINC	0.159	0.244		LDL	
pH	6.7			10.0	

Volume of Flow: Treated = 1,536,163.0 liters Final = 1,343,989.0 liters

TA50 MINERALS

JUL-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	22.0	42.057		238.0	376.317
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.829	1.585		0.134	0.212
AMMONIA-N	3.29	6.289		4.14	6.546
ARSENIC	0.002	0.004		LDL	
BARIUM	0.046	0.088		0.014	0.022
BERYLLIUM	0.008	0.015		LDL	
BORON	0.14	0.268		0.129	0.204
CADMIUM	LDL			LDL	
CALCIUM	16.8	32.116		97.8	154.638
CHLORIDE	40.6	77.613		46.1	72.892
COBALT	0.007	0.013		0.005	0.008
COD	61.0	116.611		24.0	37.948
CONDUCTIVITY	380.0			1020.0	
COPPER	0.343	0.656		0.077	0.122
CYANIDE	LDL			LDL	
FLUORIDE	0.8	1.529		2.75	4.348
HARDNESS	57.927	110.738		248.983	393.684
IRON	1.73	3.307		0.06	0.095
LEAD	0.042	0.08		LDL	
MAGNESIUM	3.88	7.417		1.16	1.834
MERCURY	0.004	0.007		2.6e-4	4.111e-4
NICKEL	0.13	0.249		0.052	0.082
NITRATE-N	20.6	39.38		43.1	68.148
NITRITE-N	LDL			0.13	0.206
PHOSPHORUS	2.99	5.716		0.35	0.553
POTASSIUM	4.7	8.985		14.2	22.453
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	78.0	149.11		61.0	96.451
SILVER	0.018	0.034		LDL	
SODIUM	40.6	77.613		122.0	192.902
SULFATE	35.0	66.908		60.9	96.293
TDS	314.0	600.262		736.0	1163.737
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.24			10.2	
TOTAL_CHROMIUM	0.073	0.14		0.009	0.014
TSS	7.0	13.382		4.0	6.325
URANIUM	0.061	0.117		0.004	0.006
VANADIUM	0.011	0.021		0.01	0.016
ZINC	0.236	0.451		LDL	
pH	6.8			7.2	

Volume of Flow: Treated = 1,911,661.0 liters Final = 1,581,165.0 liters

TA50 MINERALS

AUG-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	30.0	54.007		260.0	431.658
ALKALINITY-P	LDL			106.0	175.984
ALUMINUM	0.71	1.278		0.28	0.465
AMMONIA-N	2.46	4.429		4.03	6.691
ARSENIC	LDL			LDL	
BARIUM	0.034	0.061		0.01	0.017
BERYLLIUM	LDL			LDL	
BORON	0.24	0.432		0.22	0.365
CADMIUM	LDL			0.003	0.005
CALCIUM	14.0	25.203		71.0	117.876
CHLORIDE	25.9	46.626		98.6	163.698
COBALT	0.006	0.011		0.003	0.005
COD	57.0	102.614		38.0	63.088
CONDUCTIVITY	450.0			2500.0	
COPPER	0.36	0.648		0.14	0.232
CYANIDE	LDL			0.09	0.149
FLUORIDE	0.9	1.62		3.47	5.761
HARDNESS	49.371	88.88		182.64	303.224
IRON	2.2	3.961		0.066	0.11
LEAD	0.058	0.104		LDL	
MAGNESIUM	3.5	6.301		1.3	2.158
MERCURY	0.001	0.002		LDL	
NICKEL	0.3	0.54		0.052	0.086
NITRATE-N	26.1	46.986		172.0	285.558
NITRITE-N	0.11	0.198		0.91	1.511
PHOSPHORUS	2.51	4.519		0.41	0.681
POTASSIUM	12.0	21.603		92.0	152.741
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	72.0	129.618		57.0	94.633
SILVER	0.01	0.018		LDL	
SODIUM	56.0	100.814		370.0	614.283
SULFATE	37.5	67.509		78.0	129.497
Si	LDL			LDL	
TDS	LDL			LDL	
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.74			23.3	
TOTAL_CHROMIUM	0.086	0.155		0.008	0.013
TSS	5.0	9.001		LDL	
URANIUM	1.0e-4	1.8e-4		1.3e-5	2.158e-5
VANADIUM	0.011	0.02		0.011	0.018
ZINC	0.17	0.306		LDL	
pH	7.0			10.1	

Volume of Flow: Treated = 1,800,249.0 liters Final = 1,660,223.0 liters

TA50 MINERALS

SEP-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	44.0	59.265		354.0	503.758
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.3	0.404		0.19	0.27
AMMONIA-N	3.04	4.095		3.24	4.611
ARSENIC	0.007	0.009		0.001	0.001
BARIUM	0.05	0.067		0.019	0.027
BERYLLIUM	LDL			LDL	
BORON	0.11	0.148		0.19	0.27
CADMIUM	0.002	0.003		LDL	
CALCIUM	45.0	60.612		100.0	142.305
CHLORIDE	34.2	46.065		101.0	143.728
COBALT	0.003	0.004		LDL	
COD	34.0	45.796		30.0	42.691
CONDUCTIVITY	332.0			2100.0	
COPPER	0.047	0.063		0.091	0.129
CYANIDE	LDL			0.11	0.157
FLUORIDE	0.93	1.253		2.71	3.856
HARDNESS	132.543	178.527		252.212	358.909
IRON	5.6	7.543		0.14	0.199
LEAD	0.031	0.042		0.022	0.031
MAGNESIUM	4.9	6.6		0.61	0.868
MERCURY	0.002	0.002		3.4e-4	4.838e-4
NICKEL	0.043	0.058		0.035	0.05
NITRATE-N	16.8	22.628		144.0	204.919
NITRITE-N	LDL			0.96	1.366
PHOSPHORUS	1.09	1.468		0.21	0.299
POTASSIUM	8.2	11.045		74.0	105.305
SELENIUM	0.002	0.003		LDL	
SILICA_DIOXIDE	81.0	109.102		61.0	86.806
SILVER	LDL			LDL	
SODIUM	39.0	52.53		300.0	426.914
SULFATE	25.5	34.347		65.0	92.498
Si	LDL			LDL	
TDS	282.0	379.835		1490.0	2120.339
THALLIUM	LDL			LDL	
TOTAL_CATIONS	2.82			19.9	
TOTAL_CHROMIUM	0.008	0.011		0.009	0.013
TSS	10.0	13.469		16.0	22.769
URANIUM	0.034	0.046		0.002	0.003
VANADIUM	0.006	0.008		0.006	0.009
ZINC	0.14	0.189		LDL	
pH	7.25			8.02	

Volume of Flow: Treated = 1,346,933.0 liters Final = 1,423,046.0 liters

TA50 MINERALS

OCT-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	47.0	67.16		276.0	370.941
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.4	0.572		0.064	0.086
AMMONIA-N	3.95	5.644		1.05	1.411
ARSENIC	1.0e-6	1.429e-6		LDL	
BARIUM	0.037	0.053		0.013	0.017
BERYLLIUM	LDL			LDL	
BORON	0.18	0.257		0.15	0.202
CADMIUM	0.003	0.004		0.002	0.003
CALCIUM	14.0	20.005		99.0	133.055
CHLORIDE	32.5	46.44		40.6	54.566
COBALT	LDL			LDL	
COD	40.0	57.157		33.0	44.352
CONDUCTIVITY	337.0			874.0	
COPPER	0.23	0.329		0.11	0.148
CYANIDE	LDL			0.04	0.054
FLUORIDE	0.69	0.986		1.66	2.231
HARDNESS	49.371	70.548		249.303	335.06
IRON	1.2	1.715		0.067	0.09
LEAD	0.068	0.097		LDL	
MAGNESIUM	3.5	5.001		0.51	0.685
MERCURY	0.002	0.003		LDL	
NICKEL	0.056	0.08		0.033	0.044
NITRATE-N	18.1	25.864		41.4	55.641
NITRITE-N	0.46	0.657		1.75	2.352
PHOSPHORUS	1.25	1.786		0.12	0.161
POTASSIUM	3.5	5.001		11.0	14.784
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	83.0	118.602		57.0	76.607
SILVER	0.008	0.011		LDL	
SODIUM	43.0	61.444		98.0	131.711
SULFATE	26.0	37.152		46.3	62.227
TDS	642.0	917.376		642.0	862.84
THALLIUM	LDL			LDL	
TOTAL_CATIONS	2.96			10.8	
TOTAL_CHROMIUM	0.045	0.064		0.004	0.005
TSS	9.0	12.86			
URANIUM	0.066	0.094		0.004	0.005
VANADIUM	0.01	0.014		0.008	0.011
ZINC	0.37	0.529		LDL	
pH	7.31			7.14	

Volume of Flow: Treated = 1,428,934.0 liters Final = 1,343,988.0 liters

TA50 MINERALS

NOV-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	16.0	21.255		262.0	310.698
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.29	0.385		LDL	
AMMONIA-N	7.32	9.724		7.26	8.609
ARSENIC	0.002	0.003		LDL	
BARIUM	0.23	0.306		0.013	0.015
BERYLLIUM	LDL			LDL	
BORON	0.15	0.199		0.19	0.225
CADMIUM	LDL			LDL	
CALCIUM	10.0	13.285		89.0	105.542
CHLORIDE	19.5	25.905		24.8	29.41
COBALT	0.004	0.005		0.003	0.004
COD	46.0	61.109		27.0	32.018
CONDUCTIVITY	373.0			928.0	
COPPER	0.22	0.292		0.1	0.119
CYANIDE	LDL			LDL	
FLUORIDE	0.84	1.116		1.56	1.85
HARDNESS	35.265	46.848		225.733	267.69
IRON	0.7	0.93		0.15	0.178
LEAD	0.12	0.159		LDL	
MAGNESIUM	2.5	3.321		0.85	1.008
MERCURY	0.004	0.006		5.0e-4	5.929e-4
NICKEL	0.15	0.199		0.06	0.071
NITRATE-N	26.5	35.204		42.2	50.044
NITRITE-N	LDL			0.25	0.296
PHOSPHORUS	1.44	1.913		0.34	0.403
POTASSIUM	2.7	3.587		6.3	7.471
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	75.0	99.635		60.0	71.152
SILVER	0.049	0.065		LDL	
SODIUM	39.0	51.81		95.0	112.658
SULFATE	25.8	34.274		30.9	36.643
TDS	296.0	393.225		648.0	768.444
THALLIUM	LDL			LDL	
TOTAL_CATIONS	3.06			8.96	
TOTAL_CHROMIUM	0.071	0.094		0.008	0.009
TSS	9.0	11.956		4.0	4.743
URANIUM	0.072	0.096		0.009	0.011
VANADIUM	0.009	0.012		0.005	0.006
ZINC	0.15	0.199		LDL	
pH	6.28			7.42	

Volume of Flow: Treated = 1,328,463.0 liters Final = 1,185,870.0 liters

TA50 MINERALS

DEC-1997

	RAW Concentration	Total (KG)		FINAL Concentration	Total (KG)
ALKALINITY-MO	26.0	36.383		320.0	455.375
ALKALINITY-P	LDL			LDL	
ALUMINUM	0.92	1.287		LDL	
AMMONIA-N	3.65	5.108		5.38	7.656
ARSENIC	0.001	0.001		LDL	
BARIUM	0.092	0.129		0.016	0.023
BERYLLIUM	LDL			LDL	
BORON	0.22	0.308		0.19	0.27
CADMIUM	0.003	0.004		LDL	
CALCIUM	12.0	16.792		110.0	156.535
CHLORIDE	18.0	25.188		35.0	49.807
COBALT	LDL			LDL	
COD	43.0	60.172		36.0	51.23
CONDUCTIVITY	479.0			1160.0	
COPPER	0.2	0.28		0.076	0.108
CYANIDE	LDL			LDL	
FLUORIDE	1.66	2.323		2.07	2.946
HARDNESS	40.671	56.912		277.388	394.736
IRON	1.7	2.379		0.058	0.083
LEAD	0.073	0.102		LDL	
MAGNESIUM	2.6	3.638		0.66	0.939
MERCURY	0.003	0.004		2.66e-4	3.785e-4
NICKEL	1.1	1.539		0.082	0.117
NITRATE-N	18.9	26.448		47.3	67.31
NITRITE-N	LDL			0.36	0.512
PHOSPHORUS	3.49	4.884		0.56	0.797
POTASSIUM	3.6	5.038		13.0	18.5
SELENIUM	LDL			LDL	
SILICA_DIOXIDE	76.0	106.35		61.0	86.806
SILVER	0.027	0.038		LDL	
SODIUM	66.0	92.356		130.0	184.996
SULFATE	97.0	135.736		87.0	123.805
Si	LDL			LDL	
TDS	352.0	492.568		810.0	1152.668
THALLIUM	LDL			LDL	
TOTAL_CATIONS	4.18			11.8	
TOTAL_CHROMIUM	0.063	0.088		0.003	0.004
TSS	19.0	26.587		7.0	9.961
URANIUM	0.12	0.168		0.007	0.01
VANADIUM	0.009	0.013		0.006	0.009
ZINC	0.18	0.252		LDL	
pH	6.76			6.94	

Volume of Flow: Treated = 1,399,340.0 liters Final = 1,423,047.0 liters

Flows, TA-21

TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
JAN-1997									
Total	77261	47762	2.0		1.917		36439	0	0
Maximum	10598						13303		
Minimum	106						819		
Average	2575			398.015		101.298	5206		
FEB-1997									
Total	92419	66493	2.833		2.833		82425	11112	0
Maximum	15579						44199		
Minimum	530						38226		
Average	3554			391.138		95.399	41213		
MAR-1997									
Total	107767	127532	6.717		6.533		82036	0	0
Maximum	11446	73290	4.667	440.995	4.567	112.117	52104		
Minimum	424	54242	2.05	261.75	1.967	65.239	29932		
Average	3716	63766	3.358	351.372	3.267	88.678	41018		
APR-1997									
Total	137668	73766	3.117		3.017		160217	9662	0
Maximum	18123						60154		
Minimum	1060						12628		
Average	4917			394.471		99.402	32043		
MAY-1997									
Total	151606	214978	10.383		10.383		167061	0	0
Maximum	15049	78052	4.967	534.631	4.967	130.398	82422		
Minimum	38	64156	2.0	244.196	2.0	59.56	28775		
Average	4890	71659	3.461	386.523	3.461	94.274	55687		

TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
JUN-1997									
Total	96655	78225	5.5		5.5		73312	0	0
Maximum	12824								
Minimum	636								
Average	3866			237.046		57.816			
JUL-1997									
Total	188217	247856	8.2		7.45		172074	23178	0
Maximum	71938	84935	2.883	592.545	2.883	342.097	84832	15972	
Minimum	530	7013	0.4	292.207	0.083	119.745	36825	7206	
Average	7239	49571	1.64	476.398	1.49	177.094	57358	11589	
AUG-1997									
Total	96159	152017	5.483		5.133		160072	53060	0
Maximum	12643	66104	2.233	510.591	2.233	169.82	88206	46000	
Minimum	318	38294	1.25	396.825	0.917	97.6	28486	7060	
Average	3561	50672	1.828	466.909	1.711	129.247	53357	26530	
SEP-1997									
Total	71434	0	0.0		0.0		88880	0	0
Maximum	10174								
Minimum	212								
Average	2857			0.0		0.0			
OCT-1997									
Total	52673	80866	2.9		2.9		0	0	0
Maximum	8690								
Minimum	212								
Average	2926			464.746		113.353			

TA21 MONTHLY FLOWS (liters)

JAN-1997 through DEC-1997

	Influent	Treated	Time (hrs)	Rate (liters/min)	Filter Time (hrs)	Filter Rate (liters/min)	Transfer	Misc	Recirc
NOV-1997									
Total	9645	0	0.0		0.0		7386	0	0
Maximum	3815								
Minimum	106								
Average	603			0.0		0.0			
DEC-1997									
Total	4876	0	0.0		0.0		14980	0	0
Maximum	1272						7132		
Minimum	212						1157		
Average	488			0.0		0.0	3745		
SUMMARY									
Total	1086380	1089495	47.133		45.667		1044882	97012	0
Maximum	188217	247856					172074	53060	0
Minimum	4876	47762					7386	9662	
Average	90532	90791	3.928	385.253	3.806	96.982	87074	8084	0

Analyses of Composite Radiological Samples, TA-21

TA21 RADIOISOTOPES

JAN-1997

	RAW Ci/l	Total (Ci)
ALPHA	3.2e-9	1.528e-4
Am-241	1.0e-10	4.776e-6
BETA	3.8e-10	1.815e-5
Cs-137	LDL	
GAMMA	LDL	
Pu-238	2.1e-9	1.003e-4
Pu-239	3.0e-10	1.433e-5
Sr-89	LDL	
Sr-90	4.0e-11	1.91e-6
TOTAL_PLUTONIUM	2.4e-9	1.146e-4
TRITIUM	1.5e-6	0.072
U-234	8.0e-11	3.821e-6
U-235	LDL	
Total Alpha		1.232e-4

Volume of Flow: Treated = 47,762.0 liters Transfered = 36,439.0 liters

TA21 RADIOISOTOPES

FEB-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.6e-10	1.729e-5
Am-241	6.0e-11	3.99e-6
BETA	1.3e-10	8.644e-6
Cs-137	LDL	
GAMMA	LDL	
Pu-238	7.0e-11	4.655e-6
Pu-239	3.2e-11	2.128e-6
Sr-89	1.0e-11	6.649e-7
Sr-90	2.5e-11	1.662e-6
TOTAL_PLUTONIUM	1.02e-10	6.782e-6
TRITIUM	8.4e-7	0.056
U-234	5.0e-11	3.325e-6
U-235	2.0e-12	1.33e-7
Total Alpha		1.423e-5

Volume of Flow: Treated = 66,493.0 liters Transfered = 82,425.0 liters

TA21 RADIOISOTOPES

MAR-1997

	RAW Ci/l	Total (Ci)
ALPHA	6.6e-10	8.415e-5
Am-241	5.0e-11	6.375e-6
BETA	3.5e-10	4.463e-5
Cs-137	LDL	
GAMMA	LDL	
Pu-238	4.6e-10	5.865e-5
Pu-239	9.0e-11	1.147e-5
Sr-89	LDL	
Sr-90	3.2e-11	4.08e-6
TOTAL_PLUTONIUM	5.5e-10	7.012e-5
TRITIUM	2.0e-6	0.255
U-234	3.4e-11	4.335e-6
U-235	LDL	
Total Alpha		8.084e-5

Volume of Flow: Treated = 127,532.0 liters Transfered = 82,036.0 liters

TA21 RADIOISOTOPES

APR-1997

	RAW Ci/l	Total (Ci)
ALPHA	5.8e-10	4.278e-5
Am-241	5.0e-11	3.688e-6
BETA	1.9e-10	1.402e-5
Cs-137	LDL	
GAMMA	LDL	
Pu-238	4.7e-10	3.467e-5
Pu-239	8.0e-11	5.901e-6
Sr-89	1.0e-11	7.377e-7
Sr-90	1.5e-11	1.106e-6
TOTAL_PLUTONIUM	5.5e-10	4.057e-5
TRITIUM	1.3e-6	0.096
U-234	3.0e-11	2.213e-6
U-235	3.0e-12	2.213e-7
Total Alpha		4.669e-5

Volume of Flow: Treated = 73,766.0 liters Transfered = 160,217.0 liters

TA21 RADIOISOTOPES

MAY-1997

	RAW Ci/l	Total (Ci)
ALPHA	1.3e-8	0.003
Am-241	1.0e-8	0.002
BETA	1.4e-9	3.01e-4
Cs-137	LDL	
GAMMA	LDL	
Pu-238	2.0e-10	4.3e-5
Pu-239	2.0e-10	4.3e-5
Sr-89	8.0e-12	1.72e-6
Sr-90	LDL	
TOTAL_PLUTONIUM	4.0e-10	8.6e-5
TRITIUM	8.5e-7	0.183
U-234	LDL	
U-235	LDL	
Total Alpha		0.002

Volume of Flow: Treated = 214,978.0 liters Transfered = 167,061.0 liters

TA21 RADIOISOTOPES

JUN-1997

	RAW Ci/l	Total (Ci)
ALPHA	3.1e-8	0.002
Am-241	25000.0	1.956e9
BETA	2.7e-9	2.112e-4
Cs-137	LDL	
GAMMA	LDL	
Pu-238	1.1e-9	8.605e-5
Pu-239	3.0e-10	2.347e-5
Sr-89	LDL	
Sr-90	5.0e-11	3.911e-6
TOTAL_PLUTONIUM	1.4e-9	1.095e-4
TRITIUM	5.5e-7	0.043
U-234	1.1e-10	8.605e-6
U-235	2.0e-11	1.565e-6
Total Alpha		1.956e9

Volume of Flow: Treated = 78,225.0 liters Transfered = 73,312.0 liters

TA21 RADIOISOTOPES

JUL-1997

	RAW Ci/l	Total (Ci)
ALPHA	6.0e-9	0.001
Am-241	3.8e-9	9.42e-4
BETA	1.0e-9	2.479e-4
Cs-137	1.0e-10	2.479e-5
GAMMA	LDL	
Pu-238	3.5e-10	8.677e-5
Pu-239	1.4e-10	3.471e-5
Sr-89	LDL	
Sr-90	6.0e-11	1.487e-5
TOTAL_PLUTONIUM	4.9e-10	1.215e-4
TRITIUM	1.0e-6	0.248
U-234	8.0e-11	1.983e-5
U-235	6.0e-12	1.487e-6
Total Alpha		0.001

Volume of Flow: Treated = 247,856.0 liters Transfered = 172,074.0 liters

TA21 RADIOISOTOPES

AUG-1997

	RAW Ci/l	Total (Ci)
ALPHA	6.9e-9	0.001
Am-241	3.1e-9	4.712e-4
BETA	1.2e-9	1.824e-4
Cs-137	3.0e-10	4.56e-5
GAMMA	3.0e-9	4.56e-4
Pu-238	1.1e-9	1.672e-4
Pu-239	1.8e-10	2.736e-5
Sr-89	LDL	
Sr-90	1.0e-10	1.52e-5
TOTAL_PLUTONIUM	1.28e-9	1.946e-4
TRITIUM	8.2e-7	0.125
U-234	4.9e-10	7.448e-5
U-235	2.0e-11	3.04e-6
Total Alpha		7.433e-4

Volume of Flow: Treated = 152,017.0 liters Transfered = 160,072.0 liters

TA21 RADIOISOTOPES

SEP-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.8e-9	0.0
Am-241	1.1e-9	0.0
BETA	3.6e-9	0.0
Cs-137	6.0e-10	0.0
GAMMA	LDL	
Pu-238	8.5e-11	0.0
Pu-239	3.3e-10	0.0
Sr-89	7.5e-11	0.0
Sr-90	4.8e-11	0.0
TOTAL_PLUTONIUM	4.15e-10	0.0
TRITIUM	9.6e-10	0.0
U-234	6.0e-10	0.0
U-235	2.1e-11	0.0

Volume of Flow: Treated = 0.0 liters Transfered = 88,880.0 liters

TA21 RADIOISOTOPES

OCT-1997

	RAW Ci/l	Total (Ci)
ALPHA	2.2e-9	1.779e-4
Am-241	9.3e-10	7.521e-5
BETA	LDL	
Cs-137	LDL	
GAMMA	LDL	
Pu-238	1.3e-9	1.051e-4
Pu-239	1.0e-9	8.087e-5
Sr-89	LDL	
Sr-90	4.5e-11	3.639e-6
TOTAL_PLUTONIUM	2.3e-9	1.86e-4
TRITIUM	6.3e-7	0.051
U-234	2.7e-10	2.183e-5
U-235	LDL	
Total Alpha		2.83e-4

Volume of Flow: Treated = 80,866.0 liters Transfered = 0.0 liters

TA21 RADIOISOTOPES

NOV-1997

Volume of Flow: Treated = 0.0 liters Transfered = 7,386.0 liters

TA21 RADIOISOTOPES

DEC-1997

Volume of Flow: Treated = 0.0 liters Transfered = 14,980.0 liters

Appendix

Analyses of Composite Mineral Samples, TA-21

TA21 MINERALS

JAN-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	117.0	5.588
ALKALINITY-P	LDL	
ALUMINUM	0.67	0.032
AMMONIA-N	LDL	
ARSENIC	0.009	4.299e-4
BARIUM	0.066	0.003
BERYLLIUM	LDL	
BORON	0.121	0.006
CADMIUM	0.003	1.433e-4
CALCIUM	32.2	1.538
CHLORIDE	39.0	1.863
COBALT	0.004	1.91e-4
COD	170.0	8.12
CONDUCTIVITY	490.0	
COPPER	0.27	0.013
FLUORIDE	1.58	0.075
HARDNESS	112.524	5.374
IRON	11.8	0.564
LEAD	0.08	0.004
MAGNESIUM	7.8	0.373
NICKEL	0.03	0.001
NITRATE-N	LDL	
NITRITE-N	LDL	
PHOSPHORUS	0.96	0.046
POTASSIUM	6.8	0.325
SELENIUM	0.002	9.552e-5
SILICA_DIOXIDE	76.0	3.63
SILVER	0.027	0.001
SODIUM	49.2	2.35
SULFATE	29.0	1.385
TDS	380.0	18.15
THALLIUM	0.4	0.019
TOTAL_CATIONS	3.44	
TOTAL_CHROMIUM	0.024	0.001
TSS	32.0	1.528
URANIUM	28.0	1.337
VANADIUM	0.018	8.597e-4
ZINC	0.31	0.015
pH	7.5	

Volume of Flow: Treated = 47,762.0 liters Transfered = 36,439.0 liters

TA21 MINERALS

FEB-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	167.0	11.104
ALKALINITY-P	LDL	
ALUMINUM	0.47	0.031
AMMONIA-N	LDL	
ARSENIC	0.006	3.99e-4
BARIUM	0.065	0.004
BERYLLIUM	LDL	
BORON	0.123	0.008
CADMIUM	0.003	1.995e-4
CALCIUM	37.0	2.46
CHLORIDE	4.5	0.299
COBALT	LDL	
COD	55.0	3.657
CONDUCTIVITY	480.0	
COPPER	0.19	0.013
FLUORIDE	1.07	0.071
HARDNESS	139.746	9.292
IRON	6.76	0.449
LEAD	0.06	0.004
MAGNESIUM	11.5	0.765
MERCURY	0.027	0.002
NICKEL	0.02	0.001
NITRATE-N	0.21	0.014
NITRITE-N	LDL	
PHOSPHORUS	1.5	0.1
POTASSIUM	8.2	0.545
SELENIUM	0.003	1.995e-4
SILICA_DIOXIDE	84.0	5.585
SILVER	0.015	9.974e-4
SODIUM	53.0	3.524
SULFATE	59.0	3.923
TDS	390.0	25.932
THALLIUM	LDL	
TOTAL_CATIONS	5.38	
TOTAL_CHROMIUM	0.018	0.001
TSS	9.0	0.598
URANIUM	14.0	0.931
VANADIUM	0.019	0.001
ZINC	0.23	0.015
pH	7.6	

Volume of Flow: Treated = 66,493.0 liters Transfered = 82,425.0 liters

TA21 MINERALS

MAR-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	0.0	0.0
ALKALINITY-P	0.0	0.0
ALUMINUM	0.18	0.023
AMMONIA-N	LDL	
ARSENIC	0.01	0.001
BARIUM	0.053	0.007
BERYLLIUM	LDL	
BORON	0.14	0.018
CADMIUM	LDL	
CALCIUM	30.0	3.825
CHLORIDE	44.0	5.61
COBALT	LDL	
COD	80.0	10.2
COPPER	0.12	0.015
FLUORIDE	0.0	0.0
HARDNESS	111.56	14.224
IRON	4.0	0.51
LEAD	0.042	0.005
MAGNESIUM	8.9	1.135
MERCURY	0.009	0.001
NICKEL	LDL	
NITRATE-N	0.0	0.0
NITRITE-N	0.0	0.0
PHOSPHORUS	1.87	0.238
POTASSIUM	6.3	0.803
SELENIUM	0.003	3.825e-4
SILICA_DIOXIDE	0.0	0.0
SILVER	LDL	
SODIUM	44.0	5.61
SULFATE	52.0	6.63
TDS	496.0	63.24
THALLIUM	LDL	
TOTAL_CATIONS	0.0	
TOTAL_CHROMIUM	0.017	0.002
TSS	25.0	3.188
URANIUM	17.0	2.167
VANADIUM	0.02	0.003
ZINC	0.17	0.022
pH	7.5	

Volume of Flow: Treated = 127,532.0 liters Transfered = 82,036.0 liters

TA21 MINERALS

APR-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	114.0	8.409
ALKALINITY-P	LDL	
ALUMINUM	0.18	0.013
AMMONIA-N	0.28	0.021
ARSENIC	0.012	8.852e-4
BARIUM	0.055	0.004
BERYLLIUM	LDL	
BORON	0.15	0.011
CADMIUM	LDL	
CALCIUM	26.0	1.918
CHLORIDE	42.0	3.098
COBALT	LDL	
COD	57.0	4.205
CONDUCTIVITY	386.0	
COPPER	0.097	0.007
FLUORIDE	3.22	0.238
HARDNESS	94.572	6.976
IRON	4.8	0.354
LEAD	0.028	0.002
MAGNESIUM	7.2	0.531
MERCURY	0.009	6.713e-4
NICKEL	0.011	8.114e-4
NITRATE-N	0.39	0.029
NITRITE-N	LDL	
PHOSPHORUS	1.35	0.1
POTASSIUM	5.4	0.398
SELENIUM	0.009	6.639e-4
SILICA_DIOXIDE	86.0	6.344
SILVER	0.009	6.639e-4
SODIUM	42.0	3.098
SULFATE	51.0	3.762
TDS	2.0	0.148
THALLIUM	LDL	
TOTAL_CATIONS	4.08	
TOTAL_CHROMIUM	0.019	0.001
TSS	13.0	0.959
URANIUM	0.078	0.006
VANADIUM	0.019	0.001
ZINC	0.18	0.013
pH	7.28	

Volume of Flow: Treated = 73,766.0 liters Transfered = 160,217.0 liters

TA21 MINERALS

MAY-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	118.0	25.37
ALKALINITY-P	LDL	
ALUMINUM	0.27	0.058
AMMONIA-N	0.06	0.013
ARSENIC	0.01	0.002
BARIUM	0.046	0.01
BERYLLIUM	LDL	
BORON	0.11	0.024
CADMIUM	0.004	8.6e-4
CALCIUM	27.0	5.805
CHLORIDE	12.9	2.773
COBALT	LDL	
COD	42.0	9.03
CONDUCTIVITY	360.0	
COPPER	0.07	0.015
FLUORIDE	2.61	0.561
HARDNESS	90.068	19.365
IRON	4.4	0.946
LEAD	0.026	0.006
MAGNESIUM	5.5	1.182
MERCURY	4.7	1.01
NICKEL	0.035	0.008
NITRATE-N	2.54	0.546
NITRITE-N	LDL	
PHOSPHORUS	0.67	0.144
POTASSIUM	5.2	1.118
SELENIUM	0.003	6.45e-4
SILICA_DIOXIDE	77.0	16.555
SILVER	LDL	
SODIUM	36.0	7.74
SULFATE	31.7	6.816
TDS	304.0	65.36
THALLIUM	LDL	
TOTAL_CATIONS	3.6	
TOTAL_CHROMIUM	0.017	0.004
TSS	37.0	7.955
URANIUM	0.024	0.005
VANADIUM	0.02	0.004
ZINC	0.13	0.028
pH	7.5	

Volume of Flow: Treated = 214,978.0 liters Transfered = 167,061.0 liters

TA21 MINERALS

JUN-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	110.0	8.605
ALKALINITY-P	LDL	
ALUMINUM	0.22	0.017
AMMONIA-N	0.21	0.016
ARSENIC	0.01	7.822e-4
BARIUM	0.05	0.004
BERYLLIUM	LDL	
BORON	0.116	0.009
CADMIUM	0.002	1.564e-4
CALCIUM	34.1	2.667
CHLORIDE	13.9	1.087
COBALT	0.003	2.347e-4
COD	34.0	2.66
CONDUCTIVITY	410.0	
COPPER	0.075	0.006
FLUORIDE	2.4	0.188
HARDNESS	109.567	8.571
IRON	5.77	0.451
LEAD	LDL	
MAGNESIUM	5.93	0.464
NICKEL	0.012	9.387e-4
NITRATE-N	1.9	0.149
NITRITE-N	LDL	
PHOSPHORUS	0.88	0.069
POTASSIUM	6.11	0.478
SELENIUM	0.003	2.347e-4
SILICA_DIOXIDE	76.0	5.945
SILVER	LDL	
SODIUM	36.6	2.863
SULFATE	64.1	5.014
TDS	344.0	26.909
THALLIUM	0.001	7.822e-5
TOTAL_CATIONS	4.06	
TOTAL_CHROMIUM	0.017	0.001
TSS	49.0	3.833
URANIUM	0.027	0.002
VANADIUM	0.018	0.001
ZINC	0.112	0.009
pH	6.9	

Volume of Flow: Treated = 78,225.0 liters Transfered = 73,312.0 liters

TA21 MINERALS

JUL-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	147.0	36.441
ALKALINITY-P	LDL	
ALUMINUM	0.214	0.053
AMMONIA-N	1.53	0.379
ARSENIC	0.007	0.002
BARIUM	0.091	0.023
BERYLLIUM	LDL	
BORON	0.115	0.029
CADMIUM	LDL	
CALCIUM	46.2	11.453
CHLORIDE	30.9	7.66
COBALT	0.006	0.001
COD	45.0	11.155
CONDUCTIVITY	480.0	
COPPER	0.075	0.019
FLUORIDE	2.18	0.54
HARDNESS	146.493	36.316
IRON	3.82	0.947
LEAD	0.048	0.012
MAGNESIUM	7.56	1.874
MERCURY	7.8e-4	1.934e-4
NICKEL	0.023	0.006
NITRATE-N	0.37	0.092
NITRITE-N	LDL	
PHOSPHORUS	0.96	0.238
POTASSIUM	7.21	1.787
SELENIUM	0.005	0.001
SILICA_DIOXIDE	83.0	20.576
SILVER	0.016	0.004
SODIUM	42.2	10.461
SULFATE	60.2	14.924
TDS	384.0	95.194
THALLIUM	LDL	
TOTAL_CATIONS	4.84	
TOTAL_CHROMIUM	0.015	0.004
TSS	22.0	5.454
URANIUM	0.04	0.01
VANADIUM	0.014	0.003
ZINC	0.206	0.051
pH	7.5	

Volume of Flow: Treated = 247,856.0 liters Transfered = 172,074.0 liters

TA21 MINERALS

AUG-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	138.0	20.976
ALKALINITY-P	LDL	
ALUMINUM	0.25	0.038
AMMONIA-N	0.5	0.076
ARSENIC	1.0e-6	1.52e-7
BARIUM	0.06	0.009
BERYLLIUM	LDL	
BORON	0.13	0.02
CADMIUM	0.004	6.08e-4
CALCIUM	48.0	7.296
CHLORIDE	35.9	5.457
COBALT	0.004	6.08e-4
COD	32.0	4.864
CONDUCTIVITY	470.0	
COPPER	0.065	0.01
FLUORIDE	2.27	0.345
HARDNESS	142.093	21.598
IRON	3.5	0.532
LEAD	0.054	0.008
MAGNESIUM	5.4	0.821
MERCURY	LDL	
NICKEL	0.042	0.006
NITRATE-N	0.44	0.067
NITRITE-N	LDL	
PHOSPHORUS	0.3	0.046
POTASSIUM	8.9	1.353
SELENIUM	2.0e-6	3.04e-7
SILICA_DIOXIDE	60.0	9.12
SILVER	0.008	0.001
SODIUM	40.0	6.08
SULFATE	75.2	11.43
TDS	370.0	56.24
THALLIUM	LDL	
TOTAL_CATIONS	4.81	
TOTAL_CHROMIUM	0.013	0.002
TSS	56.0	8.512
URANIUM	3.8e-5	5.776e-6
VANADIUM	0.012	0.002
ZINC	0.24	0.036
pH	7.5	

Volume of Flow: Treated = 152,017.0 liters Transfered = 160,072.0 liters

TA21 MINERALS

SEP-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	117.0	0.0
ALKALINITY-P	LDL	
ALUMINUM	0.35	0.0
AMMONIA-N	0.94	0.0
ARSENIC	1.0	0.0
BARIUM	0.029	0.0
BERYLLIUM	LDL	
BORON	0.17	0.0
CADMIUM	LDL	
CALCIUM	14.0	0.0
CHLORIDE	29.0	0.0
COBALT	LDL	
COD	42.0	0.0
CONDUCTIVITY	429.0	
COPPER	0.4	0.0
FLUORIDE	2.33	0.0
HARDNESS	50.195	0.0
IRON	1.8	0.0
LEAD	0.13	0.0
MAGNESIUM	3.7	0.0
MERCURY	8.0e-4	0.0
NICKEL	0.13	0.0
NITRATE-N	0.16	0.0
NITRITE-N	LDL	
PHOSPHORUS	0.93	0.0
POTASSIUM	6.4	0.0
SELENIUM	2.0	0.0
SILICA_DIOXIDE	54.0	0.0
SILVER	0.02	0.0
SODIUM	37.0	0.0
SULFATE	72.6	0.0
TDS	404.0	0.0
THALLIUM	LDL	
TOTAL_CATIONS	4.29	
TOTAL_CHROMIUM	0.11	0.0
TSS	3.0	0.0
URANIUM	0.09	0.0
VANADIUM	0.01	0.0
ZINC	0.13	0.0
pH	7.62	

Volume of Flow: Treated = 0.0 liters Transfered = 88,880.0 liters

TA21 MINERALS

OCT-1997

	RAW Concentration	Total (KG)
ALKALINITY-MO	131.0	10.593
ALKALINITY-P	LDL	
ALUMINUM	0.21	0.017
AMMONIA-N	1.76	0.142
ARSENIC	6.0e-6	4.852e-7
BARIUM	0.059	0.005
BERYLLIUM	LDL	
BORON	0.12	0.01
CADMIUM	0.003	2.426e-4
CALCIUM	39.0	3.154
CHLORIDE	27.0	2.183
COBALT	0.003	2.426e-4
COD	33.0	2.669
CONDUCTIVITY	441.0	
COPPER	0.06	0.005
FLUORIDE	2.3	0.186
HARDNESS	117.973	9.54
IRON	5.4	0.437
LEAD	0.029	0.002
MAGNESIUM	5.0	0.404
MERCURY	4.0e-4	3.235e-5
NICKEL	0.038	0.003
NITRATE-N	0.22	0.018
NITRITE-N	LDL	
PHOSPHORUS	LDL	
POTASSIUM	6.5	0.526
SELENIUM	LDL	
SILICA_DIOXIDE	62.0	5.014
SILVER	0.004	3.235e-4
SODIUM	36.0	2.911
SULFATE	72.7	5.879
TDS	310.0	25.068
THALLIUM	LDL	
TOTAL_CATIONS	4.43	
TOTAL_CHROMIUM	0.008	6.469e-4
TSS	51.0	4.124
URANIUM	0.022	0.002
VANADIUM	0.007	5.661e-4
ZINC	0.16	0.013
pH	7.79	

Volume of Flow: Treated = 80,866.0 liters Transfered = 0.0 liters

TA21 MINERALS

NOV-1997

Volume of Flow: Treated = 0.0 liters Transfered = 7,386.0 liters

TA21 MINERALS

DEC-1997

Volume of Flow: Treated = 0.0 liters Transfered = 14,980.0 liters

Appendix C

TA-50-WM-1, Room 60 Operations

TA-50-WM-1
ROOM 60
PRETREATMENT OPERATIONS

****

CALENDAR YEAR, 1997

MONTH	CAUSTIC TREATED (Liters)	^{238,239,240}Pu (Curies)	^{241}Am (Curies)	GROSS ALPHA (Curies)	ACID TREATED (Liters)	^{238,239,240}Pu (Curies)	^{241}Am (Curies)	GROSS ALPHA (Curies)	Pu in Final (Curies)	Am in Final (Curies)	GROSS ALPHA (Curies)	ALPHA Decon Factor *
JAN												
FEB												
MAR	4766.37	6.756	2.099	8.855	9830.34	2.65E-2	3.79E-2	6.44E-2	0.185	0.136	0.321	96.40
APR	0	0	0	0	0	0						
MAY	0	0	0	0	0	0						
JUN	3717.5	4.892	1.672	6.564	10,645.25	6.44E-2	3.34E-2	9.78E-2	6.0E-2	3.4E-2	9.4E-2	98.59
JUL	0	0	0	0	0	0						
AUG	0	0	0	0	14,735.3	0.393	0.152	0.545	1.6E-2	1.7E-2	3.3E-2	93.94
SEP	0	0	0	0	0	0						
OCT	0	0	0	0	0	0						
NOV	0	0	0	0	0	0						
DEC	2574.25	1.081	2.008	3.089	10,535.5	8.848	0.203	1.051	2.1E-3	1.5E-3	3.6E-3	99.91
TOTAL	11058.12	12.729	5.779	18.508	45,746.39	9.332	0.426	1.758	0.263	0.189	0.452	97.77

* Decon Factor = ($^{\text{Inf. - Eff.}}/_{\text{Inf.}}$) × 100

TA-50 WM-1-ROOM 60
SLUDGE/CEMENT PASTE

****

CALENDAR YEAR, 1997

MON	NO. of DRUMS	SLUDGE SOLIDIFIED (Liters)	TOTAL VOLUME (Liters)	GROSS WEIGHT (KG)	^{235}U (Curies)	^{238}Pu (Curies)	^{239}Pu (Curies)	^{241}Am (Curies)
JAN	0	0	0	0				
FEB	0	0	0	0				
MAR	0	0	0	0				
APR	0	0	0	0				
MAY	0	0	0	0				
JUN	0	0	0	0				
JUL	0	0	0	0				
AUG	0	0	0	0				
SEP	0	0	0	0				
OCT	20	440	4160	5273.26	2.50 ± 0.58 E-3	4.28 ± 0.72 E+0	5.70 ± 0.72 E+0	7.84 ± 0.72 E+0
NOV	0	0	0	0				
DEC	0	0	0	0				
TOT	20	440	4160	5273.26	2.50 ± 0.58 E-3	4.28 ± 0.72 E+0	5.70 ± 0.72 E+0	7.84 ± 0.72 E+0

ATTACHMENT 6.0

1997 RLWTF VOC and SVOC Analytical Report Weekly Influent Monitoring

Los Alamos National Laboratory
1998 NPDES Permit Application
Outfall 051
Form 2C

Los Alamos
NATIONAL LABORATORY

Chemical Science and Technology
Responsible Chemistry for America

CST-12 Organic Chemistry
Semivolatile Analysis Team, MS G740
Los Alamos, New Mexico 87545

To/MS: Dave Salazar, CST-13
From/MS: Michael Randow, CST-12
Through: Anthony Lombardo, CST-12 7/1/97
Phone/FAX: 665-7410/665-9345
Date: June 24, 1997
Symbol: CST-12:97-337

CASE NARRATIVE. SEMIVOLATILE ORGANIC ANALYSIS.

Request Number: 1000 19025

Sample Summary

Matrix: **Water**	Date Sampled: 5/1/97
Number of samples: 1	Date Extracted: 5/7/97
All hold times were met.	Date Analyzed: 5/30/97

Tentatively Identified Compounds were not reported for this request.
Attached is a summary of results (Table 1). Laboratory sample numbers are listed. Cross references to client sample numbers are included as part of the final report.

Method Summary

EPA method references: SW-846 methods 3510B and 8270.
Laboratory analytical procedures: EO531, *Semivolatile Organics in Aqueous Matrixes: Solvent Extraction.*
EO550, *Analysis of Semivolatile Organics by GC/MS.*

Samples were extracted by Limited Volume Separatory Funnel Liquid-Liquid Extraction. 0.25 liter of sample is placed in a 2 liter separatory funnel. Sample is acidified and shaken with methylene chloride. The methylene chloride is separated from the sample, more methylene chloride is added, and the process is repeated for a total of three times. The sample is made basic and methylene chloride extraction is repeated. Sample extracts were combined, dried and concentrated to 1.0 ml final volume. Analysis was performed by capillary column GC/MS methods. Analytical column used was a J&W Scientific DB5.MS 30 M by 0.25 mm ID, 0.25 micron film or equivalent.

This process is used for radioactive samples and is performed in a glove box.

Quality Control

A method blank was prepared and analyzed with the samples.
Matrix spike and matrix spike duplicate were analyzed as part of the analytical batch which included the samples from this work request. A copy of the MS/MSD recovery form is included with this report.
A blind quality control sample was analyzed as part of the analytical batch which included the samples from this work request. Results were included in the final report.

Anomalies And Analysis Notes

Except where noted below, analyses were performed following the analytical procedures listed above. Except where noted below, all calibration and quality control criteria stated in the analytical procedures were met.

If you have any questions regarding this data, please call Anthony Lombardo at 665-7410.

CST-12 SEMIVOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS

Table 1. Summary of results of sample analyses for semivolatiles.

REQUEST NUMBER: 1000 19025

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B25056	Di-n-butylphthalate	6 J	40	Y
	bis-2-Ethylhexylphthalate	14 J	40	
S25053	Diethylphthalate	14 J	40	Y
	Di-n-butylphthalate	710 B	40	
	bis-2-Ethylhexylphthalate	26 JB	40	
	Di-n-octylphthalate	12 J	40	

Sample ID beginning with a B is a blank. Sample ID beginning with a S is a sample.

LOQ: Limit of quantitation. LOQs normally range between 10 and 50ug/L depending on the compound, unless otherwise noted.

TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: Compound is present in the sample, but at a concentration that is less than LOQ. This concentration should be considered an estimate.

B: This compound was seen in the method blank as well as the sample. Concentration is considered significant at ten times the blank amount for phthalate esters and five times blank amount for the remaining compounds.

D: Sample was diluted.

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: LANL-CST12 Contract: ______

Project No.: 18791 Site: ______ Location: ______ Group: ______

Matrix Spike - Sample No.: S24696

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	#	QC. LIMITS REC.
Phenol	400	0	98	25		(12-89)
2-Chlorophenol	400	10	180	43		(27-123)
1,4-Dichlorobenzene	200	0	50	25	*	(36-97)
N-Nitroso-di-n-propylamine	200	0	72	36	*	(41-116)
1,2,4-Trichlorobenzene	200	0	62	31	*	(39-98)
4-Chloro-3-methylphenol	400	0	200	50		(23-97)
Acenaphthene	200	0	84	42	*	(46-118)
4-Nitrophenol	400	0	100	25		(10-80)
2,4-Dinitrotoluene	200	0	73	37		(24-96)
Pentachlorophenol	400	0	210	53		(9-103)
Pyrene	200	0	110	55		(26-127)

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS REC.
Phenol	400	120	30		20		42	(12-89)
2-Chlorophenol	400	260	63		39		40	(27-123)
1,4-Dichlorobenzene	200	110	55		75	*	28	(36-97)
N-Nitroso-di-n-propylamine	200	130	65		57	*	38	(41-116)
1,2,4-Trichlorobenzene	200	120	60		64	*	28	(39-98)
4-Chloro-3-methylphenol	400	280	70		33		42	(23-97)
Acenaphthene	200	140	70		50	*	31	(46-118)
4-Nitrophenol	400	120	30		18		50	(10-80)
2,4-Dinitrotoluene	200	130	65		56	*	38	(24-96)
Pentachlorophenol	400	330	83		44		50	(9-103)
Pyrene	200	150	75		31		31	(26-127)

(1) N-Nitroso-di-n-propylamine

\# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 5 out of 11 outside limits
Spike Recovery: 4 out of 22 outside limits

Comments: T- 7/1/97

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC CHEMISTRY
SEMIVOLATILE ANALYSIS NONCONFORMANCE REPORTING FORM

Reported by: A. Lombardo

Date Reported: 7/1/97

Request Number: N/A

NCR No: 97.010

TYPE OF ANOMALY (Circle appropriate choice or describe):

Surrogate recovery
Retention time shift
Missed hold time
Internal standard response
Calibration QC
Sample matrix affect
Extraction problem
Analysis problem
[✓ Other (Describe): Reporting problem]

Description: Include sample numbers, dates, etc. as appropriate.

Pertains to all samples and QC:

Samples are reported through CSTLIMS, which was implemented about April15, 1997. This new system does not allow for reporting of blanks or QC samples with sample data. Therefore, final reports do not include blank or QC data.

Corrective actions taken and disposition of affected data: Include dates taken or schedule. If problem is ongoing, address actions taken/to be taken to prevent recurrence.

1. CST-3 is in the process of correcting this problem.
2. Report data as is. Blank and QC (MS/MSD) data summaries will be included in CST-12 case narratives.
3. Frequency of analysis of blanks and QC is not affected. Blanks and QC are being extracted and analyzed in accordance with analytical procedures.

Corrective action taken by: A Lombardo

Date: 7/1/97

Team leader:

Date: 7/1/97

LOS ALAMOS NATIONAL LABORATORY ANALYTICAL CHEMISTRY | **ANALYTICAL NONCONFORMANCE REPORT**

Reported by: A. Lombardo

Date Reported: 6/30/97

Request No.: 10001879 1

NCR No.: 97.009

Analysis: Semivol

Matrix: Water

Analytical Area (check appropriate box):

☐ Sample control
☒ Organic preparation
☐ Inorganic preparation
☐ GC
☐ HPLC
☑ GCMS
☐ Wet chemistry
☐ Metals
☐ Reporting
☐ Data review
☐ Radiochemistry
☐ Bioassay

Nonconformance (check appropriate area):

☐ 1. Holding time expired in transit (exceeded by _____ days)
☐ 2. Sample received >48 hours or ½ holding time has expired
☐ 3. Test added by client after expiration
☐ 4. Instrument failure
☐ 5. Analyst error
☐ 6. Login error
☐ 7. Miscommunication
■ 8. Surrogates
☐ 9. Internal standards/tracer/carrier
☐ 10. QC sample recovery (open/blind)
☐ 11. Blank contamination
☐ 12. Second column
☐ 13. Contamination check
☐ 14. Confirmation of matrix effects
■ 15. QC data reported outside of controls
☐ 16. Incorrect procedure used
☐ 17. Invalid instrument calibration
☐ 18. Insufficient sample received for proper analysis
☐ 19. Hard-copy deliverable error
☐ 20. Electronic deliverable error
☐ 21. Sample matrix
☐ 22. Insufficient sample volume
☐ 23. Other (specify):

Comments/Explanation: MS/MSD set: MS sample showed low recovery for spike compounds and surrogates, see attached form 2 and 3.

Notification (check appropriate area):

Customer notified by (name and date):
☐ in writing
☐ by facsimile
☐ by telephone
■ other (explain)
NCR included in final report.

Customer name and response:
☐ process "as is"
☐ re-sample
☐ on hold until_______
☐ other (explain)

Team Leader (signature and date): Mitchell T. Conza 7-1-97

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: LANL-CST12 Contract:

Project No.: 18791 Site: Location: Group:

	SAMPLE NO.	S1 0	#	S2 0	#	S3 0	#	S4 0	#	S5	#	S6	#		#		#	TOT OUT
01	SBLK01	32		25		61		69		80		83						
02	S24696MS	22		17		31	*	37	*	39		51						2
03	S24696MSD	27		21		52		60		71		62						
04	S24696	26		20		51		60		69		63						
05	S24697	27		22		57		69		82		77						
06																		
07																		
08																		
09																		
10																		
11																		
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20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		
28																		
29																		
30																		

	QC LIMITS
S1 0 = 2-Fluorophenol	(21-100)
S2 0 = Phenol-d5	(10-94)
S3 0 = Nitrobenzene-d5	(35-114)
S4 0 = 2-Fluorobiphenyl	(43-116)
S5 = 2,4,6-Tribromophenol	(10-123)
S6 = Terphenyl-d14	(33-141)

\# Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate diluted out

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: LANL-CST12 Contract: ____________

Project No.: 18791 Site: ______ Location: ____________ Group: __________

Matrix Spike - Sample No.: S24696

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	#	QC. LIMITS REC.
Phenol	400	0	98	25		(12-89)
2-Chlorophenol	400	10	180	43		(27-123)
1,4-Dichlorobenzene	200	0	50	25	*	(36-97)
N-Nitroso-di-n-propylamine	200	0	72	36	*	(41-116)
1,2,4-Trichlorobenzene	200	0	62	31	*	(39-98)
4-Chloro-3-methylphenol	400	0	200	50		(23-97)
Acenaphthene	200	0	84	42	*	(46-118)
4-Nitrophenol	400	0	100	25		(10-80)
2,4-Dinitrotoluene	200	0	73	37		(24-96)
Pentachlorophenol	400	0	210	53		(9-103)
Pyrene	200	0	110	55		(26-127)

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	#	% RPD	#	QC LIMITS	
							RPD	REC.
Phenol	400	120	30		20		42	(12-89)
2-Chlorophenol	400	260	63		39		40	(27-123)
1,4-Dichlorobenzene	200	110	55		75	*	28	(36-97)
N-Nitroso-di-n-propylamine	200	130	65		57	*	38	(41-116)
1,2,4-Trichlorobenzene	200	120	60		64	*	28	(39-98)
4-Chloro-3-methylphenol	400	280	70		33		42	(23-97)
Acenaphthene	200	140	70		50	*	31	(46-118)
4-Nitrophenol	400	120	30		18		50	(10-80)
2,4-Dinitrotoluene	200	130	65		56	*	38	(24-96)
Pentachlorophenol	400	330	83		44		50	(9-103)
Pyrene	200	150	75		31		31	(26-127)

(1) N-Nitroso-di-n-propylamine

\# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 5 out of 11 outside limits
Spike Recovery: 4 out of 22 outside limits

Comments: ______________________________

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC ANALYSIS GROUP

DATA REVIEW CERTIFICATION

Request Number: 1000 19025 Analysis: Semivolatile SW-846 8270

The data contained in the enclosed report has been reviewed and approved by the people listed below:

Mike Rawdon	Mike Rawdon	6/23/97
Analyst Name (print)	Analyst Signature	Date
Anthony Coulardo	Anthony Coulardo	7/1/97
Data Reviewer Name (print)	Data Reviewer Signature	Date

08-Jul-1997 09:29

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Request For Analytical Services

Workgroup: SVOA **Datagroup:** EH-ORGANIC **Submission Id :** 100019025

Requester Name : DAVE F. SALAZAR
Customer Cost Code: M3592100
Customer Due Date : 28-MAY-97
Requester Group: CST-13
Agreement Date : 05-MAY-97
Screening Data : SEE ATTACHED SCREENING DATA

Mail Stop : E518
Requester Phone: 667-6904
Logged by: DDECKER
Requester Fax #: 1
Analytical Service Agreement#:

REMARKS :

TA-50 WEEKLY PLANT SAMPLES

*****SEE ATTACHED RAD SCREENING DATA*****

Method	Sample Id	Task Id	Analytes	Prep Method	Analytical Method
GENERIC SVOA-HOT	200025053	300082209		SVOCWATER	GCMS
	200025056	300082212			
GENERIC VOA-HOT	200025051	300082207			
	200025052	300082208			
	200025054	300082210			
	200025055	300082211			

Sample Id	Matrix	Preservative	Date Sampled	Hazard	Priority
200025053	WATERS - UNSPECIFIED	REFRIGERATE	01-MAY-97	NONE	2
200025056	WATERS - UNSPECIFIED	NONE	01-MAY-97	NONE	2

08-Jul-1997 09:29

Workgroup: VOA **Datagroup:** EH-ORGANIC **Submission Id :** 100019025

Requester Name : DAVE F. SALAZAR **Customer Cost Code:** M3592100 **Customer Due Date :** 28-MAY-97
Requester Group: CST-13 **Agreement Date :** 05-MAY-97 **Screening Data :** SEE ATTACHED SCREENING DATA

Mail Stop : E518
Requester Phone: 667-6904 **Logged by:** DDECKER
Requester Fax #: 1 **Analytical Service Agreement#:**

REMARKS :
TA-50 WEEKLY PLANT SAMPLES

*****SEE ATTACHED RAD SCREENING DATA*****

Method	**Sample Id**	**Task Id**	**Analytes**	**Prep Method**	**Analytical Method**
GENERIC SVOA-HOT	200025053	300082209		SVOCWATER	GCMS
	200025056	300082212			
GENERIC VOA-HOT	200025051	300082207			
	200025052	300082208			
	200025054	300082210			
	200025055	300082211			

Sample Id	**Matrix**	**Preservative**	**Date Sampled**	**Hazard**	**Priority**
200025051	WATERS - UNSPECIFIED	REFRIGERATE, HCL	01-MAY-97	NONE	2
200025052	WATERS - UNSPECIFIED	REFRIGERATE, HCL	01-MAY-97	NONE	2
200025054	WATERS - UNSPECIFIED	NONE	01-MAY-97	NONE	2
200025055	WATERS - UNSPECIFIED	NONE	01-MAY-97	NONE	2

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ORGANIC

Submission Id : 100019025

Requester Name : DAVE F. SALAZAR
Requester Group: CST-13
Customer Cost Code: M3592100
Logged Date : 05-MAY-97
Due Date : 28-MAY-97
Screening Data : SEE ATTACHED SCREENING DATA

Mail Stop : E518
Requester Phone: 667-6904
Requester Fax #: 1
Analytical Service Agreement #:
Logged by: DDECKER

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-HOT	200025053	300082209	TA210597-01 DP257	62-75-9 N-Nitrosodimethylamine	<40		ug/L	U
				110-86-1 Pyridine	<40		ug/L	U
				109-06-8 2-Picoline	<40		ug/L	U
				625-3-3 Aniline	<40		ug/L	U
				108-95-2 Phenol	<40		ug/L	U
				111-44-4 bis-2-Chloroethyl ether	<40		ug/L	U
				95-57-8 2-Chlorophenol	<40		ug/L	U
				541-73-1 1,3-Dichlorobenzene	<40		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<40		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<40		ug/L	U
				100-51-6 Benzyl alcohol	<40		ug/L	U
				95-48-7 2-Methylphenol	<40		ug/L	U
				108-60-1 bis-2-Chloroisopropyl ether	<40		ug/L	U
				106-44-5 4-Methylphenol	<40		ug/L	U
				621-64-7 N-Nitroso-di-n-propylamine	<40		ug/L	U
				67-72-1 Hexachloroethane	<40		ug/L	U
				98-95-3 Nitrobenzene	<40		ug/L	U
				78-59-1 Isophorone	<40		ug/L	U
				88-75-5 2-Nitrophenol	<40		ug/L	U
				105-67-9 2,4-Dimethylphenol	<40		ug/L	U
				111-91-1 bis-2-Chloroethoxy methane	<40		ug/L	U

Customer Id: from TA21 to DP257.

Method Area: EH-ORGANIC

Submission Id : 100019025

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-HOT	200025053	300082209	TA210597-01	120-83-2 2,4-Dichlorophenol	<40		ug/L	U
				120-82-1 1,2,4-Trichlorobenzene	<40		ug/L	U
				65-85-0 Benzoic acid	<200		ug/L	U
				91-20-3 Naphthalene	<40		ug/L	U
				106-47-8 4-Chloroaniline	<40		ug/L	U
				87-68-3 Hexachlorobutadiene	<200		ug/L	U
				59-50-7 4-Chloro-3-methylphenol	<40		ug/L	U
				91-57-6 2-Methylnaphthalene	<40		ug/L	U
				77-47-4 Hexachlorocyclopentadiene	<40		ug/L	U
				88-06-2 2,4,6-Trichlorophenol	<40		ug/L	U
				95-95-4 2,4,5-Trichlorophenol	<40		ug/L	U
				91-58-7 2-Chloronaphthalene	<40		ug/L	U
				88-74-4 2-Nitroaniline	<80		ug/L	U
				131-11-3 Dimethylphthalate	<40		ug/L	U
				208-96-8 Acenaphthylene	<40		ug/L	U
				83-32-9 Acenaphthene	<40		ug/L	U
				99-09-2 3-Nitroaniline	<80		ug/L	U
				51-28-5 2,4-Dinitrophenol	<200		ug/L	U
				100-02-7 4-Nitrophenol	<200		ug/L	U
				132-64-9 Dibenzofuran	<40		ug/L	U
				121-14-2 2,4-Dinitrotoluene	<40		ug/L	U
				606-20-2 2,6-Dinitrotoluene	<40		ug/L	U
				86-73-7 Fluorene	<40		ug/L	U
				7005-72-3 4-Chlorophenyl phenyl ether	<40		ug/L	U
				84-66-2 Diethylphthalate	14	4.200	ug/L	J
				100-01-6 4-Nitroaniline	<80		ug/L	U
				534-52-1 4,6-Dinitro-2-methylphenol	<200		ug/L	U
				86-30-6 N-Nitrosodiphenylamine	<40		ug/L	U

Method Area: EH-ORGANIC **Submission Id : 100019025**

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC SVOA-HOT	200025053	300082209	TA210597-01	103-33-3 Azobenzene	<40		ug/L	U
				101-55-3 4-Bromophenyl phenyl ether	<40		ug/L	U
				118-74-1 Hexachlorobenzene	<40		ug/L	U
				87-86-5 Pentachlorophenol	<200		ug/L	U
				85-01-8 Phenanthrene	<40		ug/L	U
				120-12-7 Anthracene	<40		ug/L	U
				84-74-2 Di-n-butylphthalate	710	213.000	ug/L	B
				206-44-0 Fluoranthene	<40		ug/L	U
				92-87-5 Benzidine	<200		ug/L	U
				129-00-0 Pyrene	<40		ug/L	U
				85-68-7 Butylbenzylphthalate	<40		ug/L	U
				91-94-1 3,3'-Dichlorobenzidine	<80		ug/L	U
				56-55-3 Benzo(a)anthracene	<40		ug/L	U
				218-01-9 Chrysene	<40		ug/L	U
				117-81-7 bis-2-Ethylhexylphthalate	26	7.800	ug/L	JB
				117-84-0 Di-n-octylphthalate	12	3.600	ug/L	J
				205-99-2 Benzo(b)fluoranthene	<40		ug/L	U
				207-08-9 Benzo(k)fluoranthene	<40		ug/L	U
				50-32-8 Benzo(a)pyrene	<40		ug/L	U
				193-39-5 Indeno(1,2,3-cd)pyrene	<40		ug/L	U
				53-70-3 Dibenzo(a,h)anthracene	<40		ug/L	U
				191-24-2 Benzo(g,h,i)perylene	<40		ug/L	U

Method Area: EH-ORGANIC **Submission Id :** 100019025

TENTATIVELY IDENTIFIED COMPOUNDS

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier

DUPLICATE TASKS

None run for this submission

Method Area: EH-ORGANIC

Submission Id : 100019025

************ CST QUALITY ASSURANCE REPORT **********

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QA SAMPLES RUN WITH THIS BATCH

There were no open (non-blind) QC materials run with the samples reported above for the following reasons:

____ Only qualitative data requested
____ Only Blind QC samples run with this batch
____ No QC samples run with this sample batch
____ No QC samples for this constituent and matrix type available within CS

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

Method Area: EH-ORGANIC **Submission Id :** 100019025

			mag
Analyst	Review	Team Leader	QA Officer
		7/14/97	7/14/97
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

4/24/97

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC ANALYSIS GROUP

DATA REVIEW CERTIFICATION

Request Number: 10001879I

Analysis: VOLATILES BY EPA 8260

The data contained in the enclosed report has been reviewed and approved by the people listed below:

Analyst Name (print): LAURA C. ORTEGA

Analyst Signature:

Date: 6/4/97

Data Reviewer Name (print): Doris M. Quintana

Data Reviewer Signature: Doris M. Quintana

Date: 6/5/97

CST-12 ORGANIC ANALYSIS GROUP
SUMMARY OF ANALYTICAL RESULTS FOR VOLATILES

Table 1. Summary of results of sample analyses for volatiles.

SUBMISSION I.D.: 100018791

SAMPLE ID	TARGET COMPOUNDS FOUND	AMOUNT (ug/L)	LOQ (ug/L)	TICs
B200024698	Styrene	3 J	5	N
S200024692	Acetone	920	200	Y
	Styrene	5 B	5	
S200024694	Acetone	1400	200	N
	Styrene	25 J	50	

Sample IDs beginning with the letter S are samples; those beginning with the letter B are blanks.

LOQ: Limit of quantitation. LOQs normally range between 5 and 20ug/L depending on the compound, unless otherwise noted.

TICs: Tentatively identified compounds. Y = TICs were found. N = TICs were not found.

J: This data qualifier indicates that the compound was detected, but the reported result is less than the LOQ and is an estimated value.

B: This data qualifier indicates that the reported compound was found in the associated method blank as well as in the sample.

6/4/97

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.
T24692

Lab Name: LANL
Contract:
Project No.: SUB100018791
Site:
Location:
Group: CST-12
Matrix: (soil/water) WATER
Lab Sample ID: T24692
Sample wt/vol: 5.0 (g/mL) ML
Lab File ID: F051216.D
Level: (low/med)
Date Received: 5/12/97
% Moisture: not dec.
Date Analyzed: 5/12/97
GC Column: DB624
ID: 0.53 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)

Concentration Units:
Number TICs found: 3
(ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 67-63-0	Isopropyl Alcohol	4.39	7	J
2.	Unknown	14.53	7	J
3.	Unknown	15.45	5	J
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
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29.				
30.				

FORM I VOA-TIC 6/4/97

LOS ALAMOS NATIONAL LABORATORY
CST Analytical Chemistry
Analytical Results Report

Method Area: EH-ORGANIC

Submission Id : 100018791

Requester Name : DAVE F. SALAZAR
Customer Cost Code: M3592100
Due Date : 22-MAY-97
Requester Group: CST-13
Logged Date : 30-APR-97
Screening Data : SEE ATTACHED SCREENING DATA

Mail Stop : E518
Requester Phone: 667-6904
Logged by: DDECKER
Requester Fax #: 1
Analytical Service Agreement #:

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	200024692	300098034	I0497.29	75-71-8 Dichlorodifluoromethane	< 10		ug/L	U
				74-87-3 Chloromethane	< 10		ug/L	U
				75-01-4 Vinyl Chloride	< 10		ug/L	U
				74-83-9 Bromomethane	< 10		ug/L	U
				75-00-3 Chloroethane	< 10		ug/L	U
				75-69-4 Trichlorofluoromethane	< 5		ug/L	U
				75-35-4 1,1-Dichloroethene	< 5		ug/L	U
				76-13-1 Trichlorotrifluoroethane	< 5		ug/L	U
				74-88-4 Iodomethane	< 5		ug/L	U
				75-15-0 Carbon Disulfide	< 5		ug/L	U
				67-64-1 Acetone	920	276.000	ug/L	D
				75-09-2 Methylene Chloride	< 5		ug/L	U
				156-60-5 trans-1,2-Dichloroethene	< 5		ug/L	U
				75-34-3 1,1-Dichloroethane	< 5		ug/L	U
				594-20-7 2,2-Dichloropropane	< 5		ug/L	U
				156-59-2 cis-1,2-Dichloroethene	< 5		ug/L	U
				78-93-3 2-Butanone	< 20		ug/L	U
				74-97-5 Bromochloromethane	< 5		ug/L	U
				67-66-3 Chloroform	< 5		ug/L	U
				71-55-6 1,1,1-Trichloroethane	< 5		ug/L	U

Method Area: EH-ORGANIC **Submission Id :** 100018791

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	200024692	300098034	I0497.29	563-58-6 1,1-Dichloropropene	<5		ug/L	U
				56-23-5 Carbon Tetrachloride	<5		ug/L	U
				71-43-2 Benzene	<5		ug/L	U
				107-06-2 1,2-Dichloroethane	<5		ug/L	U
				79-01-6 Trichloroethene	<5		ug/L	U
				78-87-5 1,2-Dichloropropane	<5		ug/L	U
				74-95-3 Dibromomethane	<5		ug/L	U
				75-27-4 Bromodichloromethane	<5		ug/L	U
				10061-01-5 cis-1,3-Dichloropropene	<5		ug/L	U
				108-10-1 4-Methyl-2-Pentanone	<20		ug/L	U
				108-88-3 Toluene	<5		ug/L	U
				10061-02-6 trans-1,3-Dichloropropene	<5		ug/L	U
				79-00-5 1,1,2-Trichloroethane	<5		ug/L	U
				127-18-4 Tetrachloroethene	<5		ug/L	U
				142-28-9 1,3-Dichloropropane	<5		ug/L	U
				591-78-6 2-Hexanone	<20		ug/L	U
				124-48-1 Dibromochloromethane	<5		ug/L	U
				106-93-4 1,2-Dibromoethane	<5		ug/L	U
				108-90-7 Chlorobenzene	<5		ug/L	U
				630-20-6 1,1,1,2-Tetrachloroethane	<5		ug/L	U
				100-41-4 Ethylbenzene	<5		ug/L	U
				1330-20-7 o,m,p-Xylene (mixed)	<5		ug/L	U
				100-42-5 Styrene	5	1.500	ug/L	B
				75-25-2 Bromoform	<5		ug/L	U
				98-82-8 Isopropylbenzene	<5		ug/L	U
				108-86-1 Bromobenzene	<5		ug/L	U
				96-18-4 1,2,3-Trichloropropane	<5		ug/L	U
				79-34-5 1,1,2,2-Tetrachloroethane	<5		ug/L	U
				103-65-1 n-Propylbenzene	<5		ug/L	U

Method Area: EH-ORGANIC **Submission Id : 100018791**

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	200024692	300098034	I0497.29	95-49-8 2-Chlorotoluene	<5		ug/L	U
				106-43-4 4-Chlorotoluene	<5		ug/L	U
				108-67-8 1,3,5-Trimethylbenzene	<5		ug/L	U
				98-06-6 tert-Butylbenzene	<5		ug/L	U
				95-63-6 1,2,4-Trimethylbenzene	<5		ug/L	U
				135-98-8 sec-Butylbenzene	<5		ug/L	U
				541-73-1 1,3-Dichlorobenzene	<5		ug/L	U
				99-87-6 4-Isopropyltoluene	<5		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<5		ug/L	U
				104-51-8 n-Butylbenzene	<5		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<5		ug/L	U
				96-12-8 1,2-Dibromo-3-Chloropropane	<10		ug/L	U
	200024694	300098060	I0497.29	75-71-8 Dichlorodifluoromethane	<100		ug/L	U
				74-87-3 Chloromethane	<100		ug/L	U
				75-01-4 Vinyl Chloride	<100		ug/L	U
				74-83-9 Bromomethane	<100		ug/L	U
				75-00-3 Chloroethane	<100		ug/L	U
				75-69-4 Trichlorofluoromethane	<50		ug/L	U
				75-35-4 1,1-Dichloroethene	<50		ug/L	U
				76-13-1 Trichlorotrifluoroethane	<50		ug/L	U
				74-88-4 Iodomethane	<50		ug/L	U
				75-15-0 Carbon Disulfide	<50		ug/L	U
				67-64-1 Acetone	1400	420.000	ug/L	D
				75-09-2 Methylene Chloride	<50		ug/L	U
				156-60-5 trans-1,2-Dichloroethene	<50		ug/L	U
				75-34-3 1,1-Dichloroethane	<50		ug/L	U
				594-20-7 2,2-Dichloropropane	<50		ug/L	U
				156-59-2 cis-1,2-Dichloroethene	<50		ug/L	U

Method Area: EH-ORGANIC **Submission Id :** 100018791

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	200024694	300098060	P0497.29	78-93-3 2-Butanone	<200		ug/L	U
				74-97-5 Bromochloromethane	<50		ug/L	U
				67-66-3 Chloroform	<50		ug/L	U
				71-55-6 1,1,1-Trichloroethane	<50		ug/L	U
				563-58-6 1,1-Dichloropropene	<50		ug/L	U
				56-23-5 Carbon Tetrachloride	<50		ug/L	U
				71-43-2 Benzene	<50		ug/L	U
				107-06-2 1,2-Dichloroethane	<50		ug/L	U
				79-01-6 Trichloroethene	<50		ug/L	U
				78-87-5 1,2-Dichloropropane	<50		ug/L	U
				74-95-3 Dibromomethane	<50		ug/L	U
				75-27-4 Bromodichloromethane	<50		ug/L	U
				10061-01-5 cis-1,3-Dichloropropene	<50		ug/L	U
				108-10-1 4-Methyl-2-Pentanone	<200		ug/L	U
				108-88-3 Toluene	<50		ug/L	U
				10061-02-6 trans-1,3-Dichloropropene	<50		ug/L	U
				79-00-5 1,1,2-Trichloroethane	<50		ug/L	U
				127-18-4 Tetrachloroethene	<50		ug/L	U
				142-28-9 1,3-Dichloropropane	<50		ug/L	U
				591-78-6 2-Hexanone	<200		ug/L	U
				124-48-1 Dibromochloromethane	<50		ug/L	U
				106-93-4 1,2-Dibromoethane	<50		ug/L	U
				108-90-7 Chlorobenzene	<50		ug/L	U
				630-20-6 1,1,1,2-Tetrachloroethane	<50		ug/L	U
				100-41-4 Ethylbenzene	<50		ug/L	U
				1330-20-7 o,m,p-Xylene (mixed)	<50		ug/L	U
				100-42-5 Styrene	25	7.500	ug/L	J
				75-25-2 Bromoform	<50		ug/L	U
				98-82-8 Isopropylbenzene	<50		ug/L	U
				108-86-1 Bromobenzene	<50		ug/L	U

Method Area: EH-ORGANIC

Submission Id : 100018791

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	200024694	300098060	P0497.29	96-18-4 1,2,3-Trichloropropane	<50		ug/L	U
				79-34-5 1,1,2,2-Tetrachloroethane	<50		ug/L	U
				103-65-1 n-Propylbenzene	<50		ug/L	U
				95-49-8 2-Chlorotoluene	<50		ug/L	U
				106-43-4 4-Chlorotoluene	<50		ug/L	U
				108-67-8 1,3,5-Trimethylbenzene	<50		ug/L	U
				98-06-6 tert-Butylbenzene	<50		ug/L	U
				95-63-6 1,2,4-Trimethylbenzene	<50		ug/L	U
				135-98-8 sec-Butylbenzene	<50		ug/L	U
				541-73-1 1,3-Dichlorobenzene	<50		ug/L	U
				99-87-6 4-Isopropyltoluene	<50		ug/L	U
				106-46-7 1,4-Dichlorobenzene	<50		ug/L	U
				104-51-8 n-Butylbenzene	<50		ug/L	U
				95-50-1 1,2-Dichlorobenzene	<50		ug/L	U
				96-12-8 1,2-Dibromo-3-Chloropropane	<100		ug/L	U

Method Area: EH-ORGANIC **Submission Id :** 100018791

TENTATIVELY IDENTIFIED COMPOUNDS

Method	Sample Id	Task Id	Customer Id	Component	Result Value	Uncertainty	Units	Qualifier
GENERIC VOA-HOT	I0497.29	300098034	I0497.29	TIC 67-63-0 TIC Isopropyl Alcohol	7	0.700	ug/L	J
GENERIC VOA-HOT	I0497.29	300098034	I0497.29	TIC UNKNOWN 1	7		ug/L	J
				TIC UNKNOWN 2	5		ug/L	J

DUPLICATE TASKS

None run for this submission

Method Area: EH-ORGANIC **Submission Id :** 100018791

************ CST QUALITY ASSURANCE REPORT **********

SUMMARY OF CONTROL STATUS OF OPEN (NON-BLIND) QA SAMPLES RUN WITH THIS BATCH

There were no open (non-blind) QC materials run with the samples reported above for the following reasons:

____ Only qualitative data requested
____ Only Blind QC samples run with this batch
____ No QC samples run with this sample batch
____ No QC samples for this constituent and matrix type available within CS

BLIND QC

None run for this submission

METHOD BLANKS

None run for this submission

OPEN QC

None run for this submission

Method Area: EH-ORGANIC **Submission Id : 100018791**

	Doris M. Quintana		mag
Analyst	Review	Team Leader	QA Officer
7/15/97	7/15/97	7/15/97	7/21/97
Date	Date	Date	Date

No Sample Discrepancies Noted by Sample Management Section

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in Quality Assurance for Health and Environmental Chemistry: 1992, LA-12790-MS, Vol I, pp. 19-29.

"The reported uncertainties are at the 1 sigma confidence level."

PLEASE PRINT C E IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
NM0890010515

OUTFALL NO.
051

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVG VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand (BOD)	< 2 k	< 0.3484	***See DMR Summary.***				1	mg / L	lbs/day	N/A	N/A	N/A
b. Chemical Oxygen Demand (COD)	24	4.1807					1	mg / L	lbs/day	N/A	N/A	N/A
c. Total Organic Carbon (TOC)	11	1.9162					1	mg / L	lbs/day	N/A	N/A	N/A
d. Total Suspended Solids (TSS)	< 1	< 0.1742					1	mg / L	lbs/day	N/A	N/A	N/A
e. Ammonia (as N)	2.18	0.3798					1	mg / L	lbs/day	N/A	N/A	N/A
f. Flow	VALUE 0.020887 a		VALUE		VALUE		1	mgd	lbs/day	VALUE N/A		N/A
g. Temperature (winter)	VALUE 20.0		VALUE		VALUE		1	°C		VALUE N/A		N/A
h. Temperature (summer)	VALUE h		VALUE		VALUE		0	°C		VALUE N/A		N/A
i. pH	MINIMUM 5.9	MAXIMUM 9.0	MINIMUM	MAXIMUM			Continuous b	STANDARD UNITS				N/A

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'		3. EFFLUENT							4. UNITS *(specify if blank)*		5. INTAKE *(optional)*		
	a. BE-LIEVED PRE-SENT	b. BE-LIEVED AB-SENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVG VALUE *(if available)*		d. NO. OF ANAL-YSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANAL-YSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)	X		< 1	< 0.1742	***See DMR Summary.***				1	mg / L	lbs/day	N/A	N/A	N/A
b. Chlorine, Total Residual	X		0.01	0.0017					1	mg / L	lbs/day	N/A	N/A	N/A
c. Color	X		< 5	N/A					1	APHA	lbs/day	N/A	N/A	N/A
d. Fecal Coliform		X	l	N/A					0	CFU/100 ml	lbs/day	N/A	N/A	N/A
e. Fluoride (16984-48-8)	X		0.77	0.1341					1	mg / L	lbs/day	N/A	N/A	N/A
f. Nitrate-Nitrite (as N)	X		11.46	1.9963					1	mg / L	lbs/day	N/A	N/A	N/A

ITEM V-B CONTI ROM FRONT

1. POLLUTANT AND CAS NO. (if available)	ARK 'X' a. BE-LIEVED PRE-SENT	b. BE-LIEVED AB-SENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVG VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANAL-YSES	4. UNITS a. CONCEN-TRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANAL-YSES
g. Nitrogen, Total Organic (as N)	X		1.6	0.2787	***See DMR Summary.***				1	mg / L	lbs/day	N/A	N/A	N/A
h. Oil and Grease	X		< 1	< 0.1742					1	mg / L	lbs/day	N/A	N/A	N/A
i. Phosphorus (as P), Total (7723-14-0)	X		0.34	0.0592					1	mg / L	lbs/day	N/A	N/A	N/A
j. Radioactivity														
(1) Alpha, Total	X		47	N/A					1	pCi/L	N/A	N/A	N/A	N/A
(2) Beta, Total	X		165	N/A					1	pCi/L	N/A	N/A	N/A	N/A
(3) Radium, Total	X		9.87 f	N/A					1	pCi/L	N/A	N/A	N/A	N/A
(4) Radium 226, Total	X		0.07	N/A					1	pCi/L	N/A	N/A	N/A	N/A
k. Sulfate (as SO4) (14808-79-8)	X		20.9	3.6407					1	mg / L	lbs/day	N/A	N/A	N/A
l. Sulfide (as S)	X								0	mg / L	lbs/day	N/A	N/A	N/A
m. Sulfite (as SO3) (14265-45-3)	X		< 3	< 0.5226					1	mg / L	lbs/day	N/A	N/A	N/A
n. Surfactants	X		< 0.1	< 0.017					1	mg / L	lbs/day	N/A	N/A	N/A
o. Aluminum, Total (7429-90-5)	X		< 0.05	< 0.009					1	mg / L	lbs/day	N/A	N/A	N/A
p. Barium, Total (7440-39-3)	X		0.02	0.0035					1	mg / L	lbs/day	N/A	N/A	N/A
q. Boron, Total (7440-42-8)	X		0.14	0.0244					1	mg / L	lbs/day	N/A	N/A	N/A
r. Cobalt, Total (7440-48-4)	X		< 0.003	< 0.0005					1	mg / L	lbs/day	N/A	N/A	N/A
s. Iron, Total (7439-89-6)	X		< 0.04	< 0.007					1	mg / L	lbs/day	N/A	N/A	N/A
t. Magnesium, Total (7439-95-4)	X		0.43	0.0749					1	mg / L	lbs/day	N/A	N/A	N/A
u. Molybdenum, Total (7439-98-7)	X		0.022	0.0038					1	mg / L	lbs/day	N/A	N/A	N/A
v. Manganese, Total (7439-96-5)	X		0.007	0.0012					1	mg / L	lbs/day	N/A	N/A	N/A
w. Tin, Total (7440-31-5)	X		< 0.02	< 0.0035					1	mg / L	lbs/day	N/A	N/A	N/A
x. Titanium, Total (7440-32-6)	X		< 0.002	< 0.0003					1	mg / L	lbs/day	N/A	N/A	N/A

CONTINUED FROM PAGE 3 OF FORM 2-C

EPA I.D. NUMBER *(copy from Item 1 o. 1)*	OUTFALL NUMBER
NM0890010515	051

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)		X		< 0.04	< 0.007	*See DMR Summary.*				1	mg / L	lbs/day	N/A	N/A	N/A
2M. Arsenic, Total (7440-38-2)		X		*i*						0	mg / L	lbs/day	N/A	N/A	N/A
3M. Beryllium, Total (7440-41-7)		X		< 0.003	< 0.0005					1	mg / L	lbs/day	N/A	N/A	N/A
4M. Cadmium, Total (7440-43-9)		X		< 0.9	< 0.1568					1	mg / L	lbs/day	N/A	N/A	N/A
5M. Chromium, Total (7440-47-3)		X		0.006	0.0010					1	mg / L	lbs/day	N/A	N/A	N/A
6M. Copper, Total (7440-50-8)		X		0.039	0.0068					1	mg / L	lbs/day	N/A	N/A	N/A
7M. Lead, Total (7439-92-1)		X		2.4	0.4181					1	mg / L	lbs/day	N/A	N/A	N/A
8M. Mercury, Total (7439-97-6)		X		< 0.000032	< 6E-06					1	mg / L	lbs/day	N/A	N/A	N/A
9M. Nickel, Total (7440-02-0)		X		0.03	0.005					1	mg / L	lbs/day	N/A	N/A	N/A
10M. Selenium, Total (7782-49-2)		X		*i*						0	mg / L	lbs/day	N/A	N/A	N/A
11M. Silver, Total (7440-22-4)		X		< 0.004	< 0.0007					1	mg / L	lbs/day	N/A	N/A	N/A
12M. Thallium, Total (7440-28-0)		X		< 0.07	< 0.012					1	mg / L	lbs/day	N/A	N/A	N/A
13M. Zinc, Total (7440-66-6)		X		< 0.05	< 0.009					1	mg / L	lbs/day	N/A	N/A	N/A
14M. Cyanide, Total (57-12-5)		X		0	0					1	mg / L	lbs/day	N/A	N/A	N/A
15M. Phenols, Total		X		< 0.05	< 0.009					1	mg / L	lbs/day	N/A	N/A	N/A
DIOXIN															
2, 3, 7, 8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS < 1.000 nanograms/liter											

CONTINUED FRC FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X	< 100	< 0.01742	***Data not available.***				1	ug / L	lbs/day	N/A	N/A	N/A
2V. Acrylonitrile (107-13-1)			X	< 100	< 0.01742					1	ug / L	lbs/day	N/A	N/A	N/A
3V. Benzene (71-43-2)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
4V. BIS (Chloro-methyl) Ether (542-88-1)				N/A ***c***	N/A					N/A	N/A	N/A	N/A	N/A	N/A
5V. Bromoform (75-25-2)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
6V. Carbon Tetrachloride (56-23-5)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
7V. Chlorobenzene (108-90-7)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
8V. Chlorodi-bromomethane (124-48-1)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
9V. Chloroethane (75-00-3)		X		< 10	< 0.001742					1	ug / L	lbs/day	N/A	N/A	N/A
10V. 2-Chloro-ethylvinyl Ether (110-75-8))			X	< 50	< 0.00871					1	ug / L	lbs/day	N/A	N/A	N/A
11V. Chloroform (67-66-3)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
12V. Dichloro-bromomethane (75-27-4)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
13V. Dichloro-difluoromethane (75-71-8)				N/A ***c***	N/A					N/A	N/A	N/A	N/A	N/A	N/A
14V. 1,1-Dichloro-ethane (75-34-3)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
15V. 1,2-Dichloro-ethane (107-06-2)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
16V. 1,1- Dichloro-ethylene (75-35-4)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
17V. 1,2- Dichloro-propane (78-87-5)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
18V. 1,3-Dichloro-propylene (542-75-6)			X	< 5 ***e***	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
19V. Ethylbenzene (100-41-4)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
20V. Methyl Bromide (74-83-9)			X	< 10	< 0.001742					1	ug / L	lbs/day	N/A	N/A	N/A
21V. Methyl Chloride (74-87-3)		X		< 10	< 0.001742					1	ug / L	lbs/day	N/A	N/A	N/A

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EPA I.D. NUMBER (copy from Item 1 o 1)	OUTFALL NUMBER
NM0890010515	051

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)		X		2	0.000348	***Data not available.***				1	ug / L	lbs/day	N/A	N/A	N/A
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
24V. Tetrachloroethylene (127-18-4)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
25V. Toluene (108-88-3)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
26V. 1,2-Trans-Dichloroethylene (156-60-5)		X		< 2	< 0.000348					1	ug / L	lbs/day	N/A	N/A	N/A
27V. 1,1,1-Trichloroethane (71-55-6)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
28V. 1,1,2-Trichloroethane (79-00-5)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
29V. Trichloroethylene (79-01-6)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
30V. Trichlorofluoromethane (75-69-4)				N/A *C*	N/A					N/A	N/A	N/A	N/A	N/A	N/A
31V. Vinyl Chloride (75-01-4)		X		< 10	< 0.001742					1	ug / L	lbs/day	N/A	N/A	N/A
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
2A. 2,4-Dichlorophenol (120-83-2)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
3A. 2,4-Dimethylphenol (105-67-9)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X	< 50	< 0.009					1	ug / L	lbs/day	N/A	N/A	N/A
5A. 2,4-Dinitrophenol (51-28-5)		X		< 50	< 0.009					1	ug / L	lbs/day	N/A	N/A	N/A
6A. 2-Nitrophenol (88-75-5)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
7A. 4-Nitrophenol (100-02-7)		X		< 50	< 0.009					1	ug / L	lbs/day	N/A	N/A	N/A
8A. P-Chloro-M-Cresol (59-50-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
9A. Pentachlorophenol (87-86-5)		X		< 50	< 0.009					1	ug / L	lbs/day	N/A	N/A	N/A
10A. Phenol (108-95-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
11A. 2,4,6-Trichlorophenol (88-06-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A

CONTINUED FR E FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X	< 10	< 0.002	***Data not available.***				1	ug / L	lbs/day	N/A	N/A	N/A
2B. Acenaphtylene (208-96-8)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
3B. Anthracene (120-12-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
4B. Benzidine (92-87-5)			X	< 50	< 0.009					1	ug / L	lbs/day	N/A	N/A	N/A
5B. Benzo (a) Anthracene (56-55-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
6B. Benzo (a) Pyrene (50-32-8)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
7B. 3,4-Benzofluoranthene (205-99-2)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
8B. Benzo (ghi) Perylene (191-24-2)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
9B. Benzo (k) Fluoranthene (207-08-9)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
10B. Bis (2-Chloroethoxy) Methane (111-91-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
11B. Bis (2-Chloroethyl) Ether (111-44-4)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
12B. Bis (2-Chloroisopropyl) Ether (102-60-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)		X		4 j	0.0007					1	ug / L	lbs/day	N/A	N/A	N/A
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
15B. Butyl Benzyl Phthalate (85-68-7)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
16B. 2-Chloronaphthalene (91-58-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
18B. Chrysene (218-01-9)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
19B. Dibenzo (a, h) Anthracene (53-70-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
20B. 1,2-Dichlorobenzene (95-50-1)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
21B. 1,3-Dichlorobenzene (541-73-1)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A

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EPA I.D. NUMBER *(copy from Item 1 of*	OUTFALL NUMBER
NM0890010515	051

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TEST-ING RE-QUIR-ED	b. BE-LIEVED PRE-SENT	c. BE-LIEVED AB-SENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANAL-YSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANAL-YSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichloro-benzene (106-46-7)		X		< 10	< 0.002	***Data not available.***				1	ug / L	lbs/day	N/A	N/A	N/A
23B. 3,3-Dichloro-benzidine (91-94-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
24B. Diethyl Phthalate (84-66-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
25B. Dimethyl Phthalate (131-11-3)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
26B. Di-N-Butyl Phthalate (84-74-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
27B. 2,4-Dinitro-toluene (121-14-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
28B. 2,6-Dinitro-toluene (606-20-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
29B. Di-N-Octyl Phthalate (117-84-0)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
31B. Fluoranthene (206-44-0)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
32B. Fluorene (86-73-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
33B. Hexachloro-benzene (118-74-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
34B. Hexa-chlorobutadiene (87-68-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
35B. Hexachloro-cyclopentadiene (77-47-4)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
36B. Hexachloro-ethane (67-72-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
38B. Isophorone (78-59-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
39B. Naphthalene (91-20-3)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
40B. Nitrobenzene (98-95-3)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
41B. N-Nitro-sodimethylamine (62-75-9)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A

CONTINUED FRC FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)			X	< 10	< 0.002	*Data not available.*				1	ug / L	lbs/day	N/A	N/A	N/A
44B. Phenanthrene (85-01-8)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
45B. Pyrene (129-00-0)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
46B. 1,2,4-Trichlorobenzene (120-82-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)		X		< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
2P. α -BHC (319-84-6)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
3P. β -BHC (319-85-7)		X		0.06	1.05E-05					1	ug / L	lbs/day	N/A	N/A	N/A
4P. γ -BHC (58-89-9)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
5P. δ -BHC (319-86-8)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
6P. Chlordane (57-74-9)		X		< 0.5 d	< 8.71E-05					1	ug / L	lbs/day	N/A	N/A	N/A
7P. 4,4'-DDT (50-29-3)		X		< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
8P. 4,4'-DDE (72-55-9)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
9P. 4,4'-DDD (72-54-8)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
10P. Dieldrin (60-57-1)		X		< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
11P. α - Endosulfan (115-29-7)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
12P. β - Endosulfan (115-29-7)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
13P. Endosulfan Sulfate (1031-07-8)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
14P. Endrin (72-20-8)		X		< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
15P. Endrin Aldehyde (7421-93-4)			X	< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A
16P Heptachlor (76-44-8)		X		< 0.05	< 8.71E-06					1	ug / L	lbs/day	N/A	N/A	N/A

CONTINUED FROM PAGE V-8

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
NM0890010515	051

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVG VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - PESTICIDES (continued)															
17P. Heptachlor Epoxide (1024-57-3)			X	< 0.05	< 8.71E-06	***Data not available.***				1	ug / L	lbs/day	N/A	N/A	N/A
18P. PCB-1242 (53469-21-9)			X	< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
19P. PCB-1254 (11097-69-1)		X		< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
20P. PCB-1221 (11104-28-2)			X	< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
21P. PCB-1232 (11141-16-5)			X	< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
22P. PCB-1248 (12672-29-6)			X	< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
23P. PCB-1260 (11096-82-5)		X		< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
24P. PCB-1016 (12674-11-2)			X	< 1	< 0.000174					1	ug / L	lbs/day	N/A	N/A	N/A
25P. Toxaphene (8001-35-2)		X		< 2	< 0.000348					1	ug / L	lbs/day	N/A	N/A	N/A

RLWTF Pollutant Summary for Tables 2C-3 and 2C-4

Pollutant*	Table
2,4,5-TP (2-(2,4,5-trichlorophenoxy) propanoic)	2C-3
aniline	2C-3
benzonitrile	2C-3
butylamine	2C-3
cresol	2C-3
diethylamine	2C-3
dinitrobenzene	2C-3
ethylene diamine	2C-3
formaldehyde	2C-3
isoprene	2C-3
isopropanolamine	2C-3
methoxychlor	2C-3
nitrotoluene	2C-3
strontium	2C-3
strychnine	2C-3
styrene	2C-3
triethanolamine	2C-3
triethylamine	2C-3
trimethylamine	2C-3
uranium	2C-3
vanadium	2C-3
xylene	2C-3
xylenol	2C-3
zirconium	2C-3

RLWTF Pollutant Summary for Tables 2C-3 and 2C-4

Pollutant*	Table
acetic acid	2C-4
acetone cyanohydrin	2C-4
aldrin	2C-4
ammonia	2C-4
ammonium bicarbonate	2C-4
ammonium chloride	2C-4
ammonium citrate	2C-4
ammonium hydroxide	2C-4
antimony trichloride	2C-4
antimony trioxide	2C-4
barium cyanide	2C-4
benzene	2C-4
benzoic acid	2C-4
calcium arsenate	2C-4
calcium chromate	2C-4
carbon tetrachloride	2C-4
chlordane	2C-4
chlorine	2C-4
chlorobenzene	2C-4
chloroform	2C-4
DDT	2C-4
dichlorobenzene	2C-4
dichloropropane	2C-4
dichloropropene	2C-4
dichloropropene-dichlopropane mix	2C-4
dieldrin	2C-4
dimethylamine	2C-4
dinitrophenol	2C-4
dinitrotoluene	2C-4
dintrobenzene	2C-4
endrin	2C-4
ethylbenzene	2C-4
ethylene diaminetetracetic acid (EDTA)	2C-4
ferric chloride	2C-4
ferric nitrate	2C-4
ferric sulfate	2C-4
ferrous chloride	2C-4
ferrous sulfate	2C-4
formic acid	2C-4
heptachlor	2C-4
hydrochloric acid	2C-4
Hydrofluoric acid	2C-4
isopropanolamine dodecylbenzenesulfonate	2C-4
lead acetate	2C-4
lead arsenate	2C-4
lead chloride	2C-4
lead flourite	2C-4
lead fluoborate	2C-4

RLWTF Pollutant Summary for Tables 2C-3 and 2C-4

Pollutant*	**Table**
lead iodide	2C-4
lead nitrate	2C-4
lead stearate	2C-4
lead sulfate	2C-4
lead sulfide	2C-4
lead thiocyanate	2C-4
lindane	2C-4
mercurous nitrate	2C-4
n-butylphathalate	2C-4
naphthalene	2C-4
nickel ammonium sulfate	2C-4
nickel chloride	2C-4
nickel hydroxide	2C-4
nickel nitrate	2C-4
nickel sulfate	2C-4
nitric acid	2C-4
nitrobenzene	2C-4
nitrogen dioxide	2C-4
nitrophenol	2C-4
pentachlorophenol	2C-4
phenol	2C-4
phosphoric acid	2C-4
phosphorus	2C-4
polychlorinated biphenyls (PCB)	2C-4
potassium hydroxide	2C-4
selenium oxide	2C-4
silver nitrate	2C-4
sodium	2C-4
sodium hydroxide	2C-4
sodium hypochlorite	2C-4
sodium nitrite	2C-4
sodium phosphate(dibasic)	2C-4
strontium chromate	2C-4
sulfuric acid	2C-4
toluene	2C-4
toxaphene	2C-4
trichloroethylene	2C-4
trichlorophenol	2C-4
triethanolamine didecylbenzenesulfonate	2C-4
uranyl acetate	2C-4
uranyl nitrate	2C-4
zinc chloride	2C-4

RLWTF Pollutant Summary for Tables 2C-3 and 2C-4

Additional potential pollutants* not listed on Tables 2C-3 or 2C-4 that have been identified at the RLWTF include:

Acetone
Methyl Ethyl Ketone (MEK)
Methylene chloride
Trichlorofluoromethane
Trimethylbenzene
Tetrachloroethene
m,p,o-xylene
n-nitrosodimethylamine
2,4 dinitrophenol
1,3,5 trimethylbenzene
methylpentanone
chlorodibromomethane
4 methyl 2 pentanone
1,2,4 trimethylbenzene
phthalates
methyl napthalene
bromoform
2 methylnapthalene
Ultima Gold scintillation cocktails

*Sources for pollutants identified in Tables 2C-3 and 2C-4 are from the Laboratory's multidisciplinary/multiprogram activities. The Waste Acceptance Criteria (WAC) has been developed for the TA-50 RLWTF based upon DOE Orders, Laboratory Implementation Requirements (LIR's), Resource Conservation Recovery Act (RCRA) and NPDES Permit requirements. Tables 2C-3 and 2C-4 constituents are expected to be present only in small amounts. Radioactive liquid waste streams are characterized under the Laboratory's Waste Profile Form (WPF) process prior to discharge into the TA-50 RLWTF to insure the facility meets all NPDES Permit requirements. Potential pollutants listed were identified by WAC/WPF review or by influent sample data at the headwork's of the RLWTF. Additionally, as part of routine operations, EM-RLW operations personnel collect operational samples of raw feed and plant sludge generated. Analysis of these samples ensures that the TA-50 RLWTF is safely within operational limits and complies with applicable RCRA exclusions (i.e. 40 CFR: 261.4(a) (2) and 261.3 (a) (2) (iv) (A,B,E,F).). Treatment codes for this facility include: 1T Screening, 2K Neutralization, 2B Coagulation, 1G Flocculation, 2C Chemical precipitation, 1U Sedimentation, 1Q Filtration, Multi media, 5L Gravity thickening, 5U Vacuum filtration. Future upgrades at the RLWTF include: 1N, Microstraining, 2J ion exchange, softening, 1S, Reverse Osmosis, 3D, Biodenitrification,

NPDES APPLICATION FORM 2C FOOTNOTES
OUTFALL 051

a Flow based on known tank volume of batch discharge.
b pH values reported are the maximum and minimum pH values for the period August 1, 1994 to December 31, 1997.
c EPA remanded parameter.
d Result reported is for alpha and gamma chlordane.
e Result reported is for cis- and trans – 1,3-dichloropropene.
f Result reported is for Ra-226 + Ra-228.
The Ra-228 result is biased high.
h Summer temperature not available. To be sampled summer 1998.
i See DMR summary for Arsenic and Selenium.
j Result qualified as estimated.
k Result for BOD was estimated because all test dilutions did not meet depletion rule.
l Laboratory did not sample for fecal coliform.

Note: Samples for Outfall 051 were collected by grab.

Los Alamos National Laboratory
NPDES Permit Re-Application Project

DMR OUTFALL DATA SUMMARY (Aug 1, 1994-Dec 31, 1997)

OUTFALL #	TA-BLDG.
051051	50-1

Monthly Sampling Parameters	# of Analyses	Current Analytical Method (as of 1-1-98)	Grab/ Comp.	High Conc.	LTA Conc.	Units	High Mass	LTA Mass	Units
COD	178	EPA 410.4	Grab	145	36.22	mg/L	51	7.43	Lbs/Day
pH	Continuous	EPA 150.1	REC	9.0	7.1	su			
TSS	178	EPA 160.2	Grab				14.8	1.4320	Lbs/Day
Total Nitrogen	41	TKN:EPA 351.2 + Ammonia:EPA 350.1	Grab	175.0	29.37	mg/L			
Ammonia (as N)	41	EPA 350.1	Grab	20.7	5.38	mg/L			
Nitrate-Nitrite (as N)	41	EPA 353.2	Grab	241.1	55.95	mg/L			
Total Cadmium	178	EPA 200.8	Grab	0.1	0.000	mg/L	0.02	0.00002	Lbs/Day
Total Chromium	178	EPA 200.7	Grab	0.020	0.0002	mg/L	0.01	0.0004	Lbs/Day
Total Copper	178	EPA 200.7	Grab	0.9	0.1163	mg/L	0.17	0.0231	Lbs/Day
Total Iron	178	EPA 200.7	Grab				0.6	0.0122	Lbs/Day
Total Lead	178	EPA 200.8	Grab	0.1	0.007	mg/L	0.02	0.0007	Lbs/Day
Total Nickel	178	EPA 200.7	Grab	5.6	0.143	mg/L			
Total Zinc	178	EPA 200.7	Grab	0.2	0.057	mg/L	0.03	0.0092	Lbs/Day
Radium 226 + 228	41	Ra226:EPA 903.1 + Ra228:γ Spec.	Grab	16	4.8	pCi/L			
Flow	Continuous	Totalized	REC				0.0439	0.0247	MGD
l Mercury	178	EPA 245.2	Grab	0.01	0.000	mg/L	0.03	0.0003	Lbs/Day
Total Toxic Organics	41	40 CFR 136	Grab	0.3	0.008	mg/L			

Yearly Water Quality Sampling Parameters	# of Analyses	Current Analytical Method (as of 1-1-98)	Grab/ Comp.	High Conc.	LTA Conc.	Units	High Mass**	LTA Mass**	Units
Total Arsenic	3	EPA 206.2	Grab	0.00	0.00	mg/L	0.000	0.000	Lbs/Day
Total Boron	3	EPA 200.7	Grab	0.2	0.20	mg/L	0.073	0.041	Lbs/Day
Total Cadmium	1	EPA 200.8	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Day
Total Chromium	1	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Day
Total Cobalt	3	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Day
Total Copper	1	EPA 200.7	Grab	0.1	0.10	mg/L	0.037	0.021	Lbs/Day
Total Lead	1	EPA 200.8	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Day
Total Vanadium	3	EPA 200.7	Grab	0.01	0.003	mg/L	0.004	0.001	Lbs/Day
Total Zinc	1	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Day
Total Aluminum	3	EPA 200.7	Grab	0.1	0.10	mg/L	0.037	0.021	Lbs/Day
Total Selenium	3	EPA 270.2	Grab	0.00	0.00	mg/L	0.000	0.000	Lbs/Day
Radium 226+228	1	Ra226:EPA 903.1 + Ra228:γ Spec.	Grab	11.9	11.90	pCi/L			
Total Mercury	1	EPA 245.2	Grab	0.00	0.00	mg/L	0.000	0.000	Lbs/Day
Tritium	3	Liquid Scintillation Counting	Grab	147059*	103534*	pCi/L			

* Waste stream survey results for Outfall 051 indicate no accelerator-produced tritium. Tritium results are reactor-produced.

** High Mass and LTA Mass are not required or reported on DMRs for the Water Quality Parameters.

:01229

Los Alamos National Laboratory

Environment, Safety, and Health Division
P.O. Box 1663, Mail Stop K491
Los Alamos, New Mexico 87545
(505) 667-4218 / FAX: (505) 665-3811

Date: November 20, 1998
Refer to: ESH-DO:98-349

RECEIVED
NOV 20 1998
UND WATER BUR

Ms. Dale Doremus
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: OPERATIONAL PLAN, GROUND WATER DISCHARGE PLAN (DP-1132) FOR LOS ALAMOS NATIONAL LABORATORY'S RADIOACTIVE LIQUID WASTE TREATMENT FACILITY AT TA-50

Dear Ms. Doremus:

In your September 17, 1998, letter (copy enclosed) you requested an operational plan for the discharges from Los Alamos National Laboratory's Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. The enclosed operational plan proposes the following short-term solutions for compliance with New Mexico Water Quality Control Commission (WQCC) ground water standards: upstream controls to minimize the discharge of nitrogenous chemicals to the RLWTF; temporary storage of the reverse osmosis (RO) concentrate stream; and, temporary storage of the TA-55 acid stream. With the exception of the upstream controls, the proposed short-term solutions are temporary and apply only to the interim period beginning March 21, 1999, and extending until a new long-term treatment process for nitrate removal becomes operational.

A short-term operational plan is necessary because of the nonperformance of SKF, Inc., the vendor for the biodenitrification equipment. SKF has delayed for one year the completion of the Phase II upgrades (original contract delivery date: November 30, 1997). The RLWTF is moving forward by recommending termination of the SKF contract and restarting the procurement process for similar equipment. A Request for Proposals (RFP) will be issued in November 1998 to qualified vendors.

In addition, the Laboratory is actively pursuing the option of evaporation as an additional solution for nitrate removal. If feasible, evaporation would offer the added benefit of removing salts from the RLWTF effluent, a necessary step for the Laboratory's long-term goal of zero liquid discharge. Current scheduling estimates, however, show that neither biodenitrificaition nor evaporation upgrades can be operational by March 21, 1999. As a result, the Laboratory proposes to institute a short-term operational plan to ensure compliance until the long-term treatment process upgrades have been completed.

The Phase I upgrades (ultrafiltration and reverse osmosis) are scheduled to begin treating radioactive liquid waste in January 1999. The Laboratory will notify your agency once the Phase I upgrades become fully operational. Additionally, the Nitric Acid Recovery System (NARS) at TA-55 is progressing towards an estimated completion date of June 1999. NARS represents a significant step towards nitrate compliance by reducing the largest source of nitrates in the RLWTF influent.

Please contact Bob Beers of the Laboratory's Water Quality and Hydrology Group at (505)667-7969, if you require additional information on the enclosed operational plan for the Laboratory's Ground Water Discharge Plan for the RLWTF at TA-50.

Sincerely,

Dennis Erickson, Division Leader
Environment, Safety & Health Division

Thomas Baca, Program Director
Environmental Management Program

DJE/md

Enclosures: a/s

Cy: J. Davis, NMED SWQB, Santa Fe, New Mexico, w/enc.
B. Garcia, NMED HRMB, Santa Fe, New Mexico, w/enc.
P. Bustamante, NMED GWQB, Santa Fe, New Mexico, w/enc.
D. Gurule, DOE LAAO, w/enc., MS A316
J. Vozella, AAME, LAAO, w/enc., MS A316
B. Koch, AAME, LAAO, w/enc., MS A316
C. Murnane, LPMO, LAAO, w/enc., MS A316
R. Burick, DIR, w/enc., MS A100
B. Stein, ALDNW, w/enc., MS F629
D. Woitte, LC/GL, w/enc., MS A187
B. Matthews, NMT-DO, w/enc., MS E500
S. Schreiber, NMT-2, w/enc., MS E511
S. Yarbro, NMT-2, w/enc., MS E511
J. Balke, NMT-7, w/enc., MS E501
S. Hanson, EM-RLW, w/enc., MS E518

Cy: (Continued)

K. Hargis, EM/WM, w/enc., MS J591
D. Moss, EM-RLW, w/enc., MS E518
P. Worland, EM-RLW, w/enc., MS E518
T. Conners, EM-RLW, w/enc., MS E518
M. Harris, FE-6, w/enc., MS M984
S. Rae (ESH-18/WQ&H:98-0408), ESH-18, w/enc., MS K497
N. Williams, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
ESH-DO File, w/enc., MS K491
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

SHORT-TERM OPERATIONAL PLAN

Due to the nonperformance of the Laboratory's vendor for the Phase II upgrades (nitrate removal), it is necessary for the RLWTF to institute a short-term operational plan. The plan will become effective on or before March 21, 1999, and will remain active until the new long-term treatment process for nitrate removal is completed. The short-term operational plan consists of the following three programs: upstream controls to minimize the discharge of nitrogenous chemicals into the RLWTF; temporary storage of the reverse osmosis (RO) concentrate stream; and temporary storage of the TA-55 process acid stream. A description of each program follows.

Upstream Controls

In November 1998, the Laboratory initiated a survey to identify generators, locations, and quantities of liquid wastes containing nitrogenous chemicals entering the RLWTF. RLWTF staff are working with each generator to devise practical means of minimizing nitrogen discharges to the collection system; methods such as waste minimization, product substitution, and temporary containerization will be employed. Initial estimates show that each pound of nitrogenous chemicals removed from the RLWTF influent will reduce the volume of RO concentrate requiring storage by several hundred gallons per day.

Survey results are due by the end of December 1998. Minimization, substitution, and containerization of nitrogenous chemicals will be implemented between January and March 1999. The upstream controls program will be conducted in coordination with the Laboratory's new Waste Certification Program, scheduled to begin in January 1999. The Laboratory's goal is to reduce nitrate concentrations in the RLWTF influent to less than 10 mg/L (nitrate as nitrogen).

Temporary Storage of the RO Concentrate Stream

Using existing storage capacity at the RLWTF and, if needed, new storage tanks installed on-site, the Laboratory will temporarily store as much of the RO concentrate stream as necessary to ensure that effluent nitrate concentrations are less than 10 mg/L. Nitrate concentrations in the RLWTF influent can vary substantially throughout the day and the week depending upon the activity of generators. The RO concentrate stream will be stored whenever the RLWTF operators cannot maintain nitrate concentrations in the effluent at less than 10 mg/L. Additional information on the temporary storage of the RO concentrate stream is presented below.

Duration of Temporary Storage

Temporary storage of RO concentrate will commence on or before March 21, 1999. Storage will continue, as needed, until the new treatment process for nitrate removal is fully operational.

Temporary Storage of the RO Concentrate Stream (con't)

Estimated Daily Volume of RO Concentrate to be Temporarily Stored

Estimated recovery rates for the RO treatment process range from 70 to 90 percent, depending upon scale formation and cleaning frequencies. Current estimates of the daily RO reject volume range from 2,500 to 7,500 gallons per day. It is expected that upstream controls combined with the efficient management of off-peak, low-nitrate, influent will reduce the actual storage volume to less than 2,000 gallons per day.

Estimated Quality of RO Concentrate in Temporary Storage

Attachment 1 presents the estimated concentration of NM WQCC Section 3103. ground water contaminants in the RO concentrate stream at 70, 80, and 90 percent recovery rates.

Estimated Quality of RO Permeate Discharge to Mortandad Canyon

Attachment 2 presents the estimated concentration of NM WQCC Section 3103. ground water contaminants in the RO permeate stream at 70, 80, and 90 percent recovery rates. RO permeate will be discharged to Mortandad Canyon under the Laboratory's NPDES Outfall Permit No. 0028355 after pH adjustment in the effluent tank. As needed, RO reject and permeate will be blended in the effluent tank such that no ground water standard is exceeded in the RLWTF effluent.

Description of Existing Storage

The RLWTF has 200,000 gallons of existing storage capacity that can be used to store the RO concentrate stream. This storage capacity is described below.

- 25,000 gallon clarifier tank. This is an inspectable, single-walled, concrete tank located inside building 01 at TA-50. This tank was nondestructively tested (NDT) in 1994 and refurbished in 1996.

- 75,000 gallon influent tank. This is a belowground, single-walled, concrete tank that was tested (NDT) in 1994.

- 100,000 gallon WM-90 tank. This is an aboveground, single-walled, steel tank that has a concrete berm surrounding it.

Description of New Storage

If necessary, new storage tanks will be installed for the temporary storage of the RO concentrate. The following general specifications will apply to each new temporary storage tank installed:

- Approximately 100,000 gallons in capacity;

- Above ground construction;

- Flexible geomembrane lining;

- Double containment with leak detection monitoring;

- Supplied with RO concentrate via tank trucks; and

- Sited on DOE property in close proximity to TA-50.

Temporary Storage of the RO Concentrate Stream (con't)

Final Disposition of the Stored RO Concentrate

Once the new treatment process for nitrate removal is operational, the stored RO concentrate will be treated to remove nitrates and then discharged through the NPDES Outfall 051 at Mortandad Canyon. All discharges will be in compliance with the NM WQCC Section 3103. ground water standards.

Storage of Room 60 Process Acid Stream from TA-55

The process acid stream from TA-55 represents approximately 90 percent of the total nitrogen load in the RLWTF influent. This stream will, beginning on or before March 21, 1999, be temporarily stored in approximately 12,500 gallons of existing storage capacity at TA-50. This capacity will permit temporary storage for a minimum of six months or until the Nitric Acid Recovery System (NARS) at TA-55 becomes operational. NARS, as described in the original Ground Water Discharge Plan Application (August 19, 1996), is a system to recover the nitric acid used in plutonium stabilization operations. NARS is expected to reduce nitrate concentrations in the TA-55 process acid stream to less than 10 mg/L (nitrate as nitrogen). NARS is currently scheduled for completion in June 1999.

ATTACHMENT 1

11/20/98

RLWTF AT TA-50
ESTIMATED QUALITY
OF THE
REVERSE OSMOSIS CONCENTRATE STREAM

CONSTITUENTS	UNITS	RO REJECT 70% RECOVERY*	RO REJECT 80% RECOVERY*	RO REJECT 90% RECOVERY*
ALUMINUM	mg/liter	0.34	0.51	1.02
ARSENIC	mg/liter	0.008	0.012	0.025
BARIUM	mg/liter	0.10	0.10	0.20
BORON	mg/liter	0.49	0.73	1.47
CADMIUM	mg/liter	0.003	0.005	0.010
CHLORIDE	mg/liter	1,722	2,586	5,162
CHROMIUM	mg/liter	0.05	0.07	0.15
COPPER	mg/liter	0.68	1.02	2.03
CYANIDE	mg/liter	0.049	0.074	0.148
FLUORIDE	mg/liter	4.60	6.90	13.70
IRON	mg/liter	1.25	1.87	3.74
LEAD	mg/liter	0.016	0.024	0.047
MERCURY	mg/liter	0.001	0.001	0.002
NITRATE-N	mg/liter	113	168	336
pH	units	7.48	7.65	7.94
SELENIUM	mg/liter	0.002	0.003	0.005
SULFATE	mg/liter	159	239	477
TDS	mg/liter	4,797	7,193	14,365
URANIUM	mg/liter	0.0004	0.0005	0.0011
ZINC	mg/liter	0.29	0.44	0.88

Notes:
*Temperature = 80°F

Data Source:
- Merrick Influent Design Basis #4.
- RLW Collection System with caustic from Room 60 but with acid storage.

ATTACHMENT 2

11/20/98

RLWTF AT TA-50
ESTIMATED QUALITY OF THE REVERSE OSMOSIS PERMEATE STREAM

CONSTITUENTS	UNITS	RO PERMEATE 70% RECOVERY	RO PERMEATE 80% RECOVERY	RO PERMEATE 90% RECOVERY	NM WQCC 3103. GROUND WATER STANDARDS
ALUMINUM	mg/liter	0.0077	0.0067	0.0060	5
ARSENIC	mg/liter	0.0001	0.0001	0.0001	0.1
BARIUM	mg/liter	0	0	0	1
BORON	mg/liter	0.090	0.079	0.070	0.75
CADMIUM	mg/liter	0.00003	0.00002	0.00002	0.01
CHLORIDE	mg/liter	10.6	13.9	26.1	250
CHROMIUM	mg/liter	0.0003	0.0003	0.0003	0.05
COPPER	mg/liter	0.0059	0.25	0.23	1
CYANIDE	mg/liter	0.0018	0.0016	0.0014	0.2
FLUORIDE	mg/liter	0	0	0	1.6
IRON	mg/liter	0.0054	0.4675	0.0042	1
LEAD	mg/liter	0.0003	0.0002	0.0002	0.05
MERCURY	mg/liter	5.15E-06	4.50E-06	4.00E-06	0.002
NITRATE-N	mg/liter	2.24	2.89	5.53	10
pH*	units	5.7	5.8	6.1	6 to 9
SELENIUM	mg/liter	0.00004	0.00004	0.00003	0.05
SULFATE	mg/liter	0.4	0.6	1.1	600
TDS	mg/liter	42	54	102	1000
URANIUM	mg/liter	0.00001	0.00001	0.00001	5
ZINC	mg/liter	0.0052	0.0046	0.0041	10

Notes:
Temperature = 80°F.
* pH adjustment will occur in the effluent tank prior to discharge.

Data Souce:

- Merrick Influent Design Basis #4
- RLW Collection System with caustic from Room 60 but with acid storage.

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