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Date: March 12, 1999
Refer to: ESH-DO:99-046

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

SUBJECT: RESPONSE TO NMED GWQB REQUEST FOR ADDITIONAL INFORMATION, GROUND WATER DISCHARGE PLAN APPLICATION FOR THE TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY, DP-1132

Dear Ms. Bustamante:

Enclosed, please find the Laboratory's response to your February 19, 1999, letter to Mr. David A. Gurule, U. S. Department of Energy, Los Alamos Area Office, requesting additional information for the Laboratory's Ground Water Discharge Plan Application (DP-1132) for the Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50. The Laboratory is providing this information on behalf of the U.S. Department of Energy, Los Alamos Area Office, and Los Alamos National Laboratory. Please note that Attachment 3.0, Description of the Chemical Denitrification Process, is confidential and proprietary information and has been provided for your internal review only.

In the enclosed response and Attachments (1.0-11.0), the Laboratory has endeavored to provide comprehensive, detailed answers to the nineteen questions posed in your February 19, 1999, letter. In several instances the information you requested was not available at this time. This was noted in the response and a commitment was made to provide that information as soon as it becomes available. Please do not hesitate to contact the Laboratory if you find that additional information or clarification is required.

We would like to take this opportunity to provide you with a progress report on the RLWTF's Long-Term Operational Plan. As stated in the Laboratory's December 23, 1998, letter (ESH-DO:98-358) to the NMED GWQB, it is our goal to achieve nearly total salt removal from the RLWTF effluent through mechanical evaporation within 18 months. On Monday, March 15, 1999, the Laboratory will be opening bids for the installation of a mechanical evaporator. This off-the-shelf evaporator will serve as an interim bridge until a permanent mechanical evaporator, designed and constructed specifically for application at the RLWTF, can be installed. Based on the bids received and the delivery times specified, the Laboratory will confirm no later than March 19, 1999, that our goal of 18 months for installation and start-up of the mechanical evaporator can be achieved.

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In our November 20, 1998, letter (ESH-DO:98-349) to the NMED GWQB, the Laboratory presented its Short-Term Operational Plan for ensuring that the RLWTF's effluent is in compliance with NM WQCC numerical standards on March 21, 1999. One key component of the Short-Term Operational Plan, the Nitrate Restriction Program, will control the discharge of nitrogenous wastes into the RLWTF collection system. We would like to report that the Laboratory is on-schedule for implementing the Nitrate Restriction Program for the NMED GWQB's March 21, 1999, compliance date. Initial reports indicate that the Nitrate Restriction Program is successful at reducing the concentration of nitrates in the RLWTF's influent and effluent.

After March 21, 1999, the Laboratory is committed to ensuring that each batch of RLWTF effluent discharged to Mortandad Canyon will meet NM WQCC 3103 numerical standards. However, until the Laboratory's long-term goals of evaporation and of zero-liquid discharge are complete, the RLWTF remains vulnerable to receiving unexpected high nitrate influent. This could result in some individual batches of effluent exceeding the nitrate limit of 10 mg/L (NO3-N). However, these will be balanced by batches that are expected to have low levels of nitrates, and on average the effluent will fully comply with the NM WQCC 3103 numerical standards. Therefore, the Laboratory proposes that for a limited period while the Short-Term Operational Plan is in effect, compliance of the RLWTF's effluent with NM WQCC 3103 numerical standards be based upon a quarterly average rather than a single sample.

The revised Table 3.0 Monitoring Plan, enclosed in Attachment 10.0 of this submittal, shows that all effluent monitoring, with the exception of Radium 226 & 228, will consist of flow-proportioned composite samples from each batch of effluent discharged to Mortandad Canyon. The Laboratory proposes to average both the weekly sampling results (12 samples per quarter) and the monthly sampling results (3 samples per quarter) to obtain a quarterly average for each parameter. It is our understanding that an exceedance of a quarterly average for a NM WQCC 3103 numerical standard would require that the Laboratory submit a corrective action plan within 30 days.

In closing, the Laboratory would like to provide you with the analytical results from recent sampling of four monitoring wells in Mortandad Canyon, MCO-3, MCO-4B, MCO-6, and MCO-7, for nitrates (NO3-N), fluoride (F), and total dissolved solids (TDS). Table 2, in Attachment 9.0 of this submittal, contains the analytical results from sampling conducted in October 1998, December 1998, and February 1999 at the above wells. These wells are being sampled on a more frequent schedule in order to closely track the effects of the forthcoming improvements in the quality of the RLWTF's effluent.

If you would like additional information concerning this response, please contact Bob Beers of the Laboratory's Water Quality and Hydrology Group at 667-7969. As promised, the Laboratory will provide the NMED GWQB with quarterly progress reports beginning in April, 1999.

Sincerely,

Dennis J. Erickson
Division Director
Environment, Safety, and Health Division

Thomas Baca
Program Director
Environmental Management Program

DJE/amt

Enclosures: a/s

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Cy: M. Leavitt, NMED, GWQB, Santa Fe, New Mexico, w/enc.
J. Davis, NMED, SWQB, Santa Fe, New Mexico, w/enc.
B. Garcia, NMED, HRMB, Santa Fe, New Mexico, w/enc.
B. Stine, ALDNW, w/enc., MS F629
R. Michelotti, CST-7, w/enc., MS E525
D. Gurule, DO/ LAAO, w/enc., MS A316
J. Vozella, DOE/LAAO, w/enc., MS A316
R. Burick, DLD-OPS, w/enc., MS A100
T. Gunderson, DLD-OPS, w/enc., MS A100
D. Broxton, EES-1, w/enc., MS D462
S. Hanson, EM/RLW, w/enc., MS E518
D. Moss, EM/RLW, w/enc., MS E518
P. Worland, EM/RLW, w/enc., MS E518
K. Hargis, EM/WM, w/enc., MS J591
S. Rae, ESH-18, (ESH-18\WQ&H:99-0092) w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
N. Williams, ESH-18, w/enc., MS K497
D. Woitte, LC/GL, w/enc., MS A187
B. Matthews, NMT-DO, w/enc., MS E500
S. Gibbs, NW-MM, w/enc., MS A102
S. Schriber, NMT-2, w/enc., MS E511
S. Yarbro, NMT-2, w/enc., MS E511
ESH-DO File, w/enc., MS K491
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

ATTACHMENT 1.0

Revised Map 4.0

TA-50 Radioactive Liquid Waste Treatment Facility

Ground Water Discharge Plan Monitoring Wells

Revised March 1999

1. **NMED Request**: *Please submit clarification on how wastewater will be treated in order to meet effluent limitations by March 21, 1999 if Phase I has not been implemented.*

   LANL Response: If the RLWTF's Phase I upgrades (TUF and RO) are not operational by March 21, 1999, then wastewater will be treated by the following methods to ensure that effluent meets NM WQCC 3103 ground water standards:

   1. Upstream controls will restrict the discharge of nitrogenous wastes into the RLWTF collection system through waste minimization, product substitution, and containerization;

   2. Nitrogenous wastes containerized by generators will be treated by Chemical Denitrification (See Attachment 3.0 for a description of the Chemical Denitrification Process) at the RLWTF or disposed of through alternative disposal methods at approved facilities;

   3. The Room 60 Process acid stream from TA-55, which contains highly concentrated nitrogenous wastes, will be temporarily stored until the NARS Project is operational in June, 1999; and

   4. Batch treatment of the remaining RLWTF influent using the current treatment process of chemical flocculation, precipitate settling, filtration, and solidification for radionuclide removal.

2. **NMED Request**: *The GWQB requests that LANL contact the NMED, Surface Water Quality Bureau (SWQB) to insure that blending RO reject water back into the discharge to Effluent Canyon is in compliance with the National Pollutant Discharge Elimination System (NPDES) permit for the discharge from RLWTF to Effluent Canyon.*

   LANL Response: The Laboratory has re-evaluated its proposed plan (Short-Term Operational Plan, November 20, 1998, ESH-DO:98-349) to blend the RO reject stream into the RO permeate stream. In order to maintain the highest quality effluent possible, RO reject water will not be blended with RO permeate water. Figure 1.0, of Attachment 2.0, is a schematic of the RLWTF's treatment process for the interim operating period (prior to the installation of the Electrodialysis Reversal [EDR] and the Mechanical Evaporator). Figure 1.0 shows that all RO reject water will be (1) temporarily stored in Clarifier No. 1 (25,000 gallons) or WM-90 (100,000 gallons), or (2) returned to the RLWTF's headworks for further treatment.

As shown in Figure 1.0, when the permeate stream from the Tubular Ultrafilter (TUF) meets NM WQCC and CWA requirements then it will be discharged directly into the effluent tank and will not be treated by the RO unit. Operational monitoring of the TUF permeate stream will determine when treatment by the RO unit is required.

Figure 2.0, of Attachment 2.0, is a schematic of the RLWTF's treatment process after installation of the Electrodialysis Reversal (EDR) and the Mechanical Evaporator. The Laboratory's goal is to have these upgrades operational within 18 months (Please see the cover letter for further information). The Laboratory will continue to provide the NMED GWQB with routine progress reports on these upgrades.

The NMED Surface Quality Bureau is being notified of the reject water handling procedures through this response and through other documentation.

3. **NMED Request**: *Please submit the volume, treatment methods, and final disposal of nitrogenous chemicals that will be containerized at upstream sources. If the nitrogenous chemicals will eventually go through the RLWTF, any pre-treatment options such as the nitrate conversion technology should be submitted to NMED.*

LANL Response: On March 1, 1999, the Laboratory instituted a Nitrate Restriction Program to reduce the discharge of nitrogenous wastes into the RLWTF collection system. The program contains the following three components: (1) waste minimization; (2) product substitution; and (3) segregation and containerization of concentrated nitrogenous wastes. A survey of waste generators to the RLWTF estimated that approximately 440 liters per month (116 gallons per month) of concentrated nitrogenous wastes require segregation and containerization. Containerized wastes will be disposed of by one of the following methods:

1. Chemical Denitrification at the RLWTF, or

2. Alternative disposal at an approved disposal facility.

Chemical Denitrification is a process to pre-treat small volumes of highly concentrated nitrogenous wastes. Treated water from the Chemical Denitrification Process will be discharged into the headworks of the RLWTF. Figure 1.0, of Attachment 2.0, shows how the Chemical Denitrification Process fits into the RLWTF's operations. Attachment 3.0 is a detailed description of how the Chemical Denitrification Process works. Please note that Attachment 3.0 contains confidential and proprietary information and has been provided for your internal review only.

Alternative disposal will consist of storing the containerized waste at the Laboratory's TA-54 Area L with final disposition and disposal at an approved disposal facility.

4. **NMED Request:** *Please submit clarification on the data submitted in the attachments [LANL letter, November 20, 1998] and if needed, a revised table of projected concentrations in the RO permeate stream by percent of recovery. In addition, please submit chemical concentrations for all WQCC Regulation 3103 constituents that may be in the reject waste stream.*

LANL Response: On November 20, 1998, the Laboratory submitted to the NMED GWQB the following: Attachment 1, *Estimated Quality of the Reverse Osmosis Concentrate Stream*, and Attachment 2, *Estimated Quality of the Reverse Osmosis Permeate Stream* (ESH-DO:98-349). In February 1999, at the request of the NMED GWQB staff, the Laboratory reviewed Attachments 1 and 2 for accuracy. No errors were found in Attachment 1. The following error was found in Attachment 2: The permeate concentration for iron (Fe) at an 80% recovery (for all 3 temperatures) should be 0.0047 mg/L, not 0.4675 mg/L as originally indicated. Attachment 1 and a corrected version of Attachment 2 have been enclosed as Attachment 4.0.

The reason the data in Attachments 1 and 2 show different trends (e.g., Attachment 2, nitrate concentrations increase at higher recovery rates while boron concentrations decrease at higher recovery rates) is that two different methods were used to calculate the RO permeate and reject stream compositions. The data for salts (nitrate, Ba, Cl, F, sulfate, and TDS) were generated using a *DOW Chemical Company* computer model called *ROSA* (Reverse Osmosis System Analysis). The data for metals (Al, As, B, Cd, Cr, Cu, CN, Fe, Pb, Hg, Se, U, and Zn), however, were not generated by the *ROSA* model. The *ROSA* model would not account for metals so the Laboratory used industry standard removal efficiencies to calculate the concentrations of metals in the permeate and reject streams. Below is a detailed explanation as to why the data in the Attachments 1 and 2 follow opposing trends.

The permeate stream concentrations for salts increase as the recovery rate increases. This is due to the fact that at higher recoveries a greater volume of recycle is used to keep a minimum velocity across the membranes. At higher flows, the efficiency of the membrane to reject the salts is reduced. The *ROSA* model is programmed to adjust membrane efficiency for the rejection of salts depending upon the temperature of the water and the rate of flow across the membrane.

In contrast, the permeate stream concentrations for metals decreases as the recovery rate increases, a trend opposite that of salts. The *ROSA* model would not account for metals so the Laboratory used a fixed percent as the removal rate for metals (i.e., removal efficiency did not change with temperature or flow rate). Since the removal rates are independent of recovery rates, the mass of contaminant in the permeate stream is constant. As the volume of the permeate stream increases (due to increased recovery rates), the concentration of the contaminant decreases due to dilution.

For example, a removal rate of 70% was selected for boron. If we assume an influent concentration of 10 mg/L and a flow rate of 1,000 L/day, then the amount of boron through the RO is 10,000 mg/day. At a removal rate of 70%, 3,000 mg/day (30%) will be in the permeate stream. If the recovery rate is 70%, then the permeate flow rate is 700 L/day which gives a boron concentration of (3,000/700) = 4.29 mg/L. If the recovery rate is 90%, then the permeate flow rate is 900 l/day which gives a boron concentration of (3,000/900) = 3.33 mg/L.

5. **NMED Request:** *NMED is requesting that LANL commit to discharging only RO permeate water to Effluent Canyon by June 30, 2000.*

   LANL Response: As indicated previously, the Laboratory will not blend RO reject water into the RO permeates stream. In addition to RO permeate water, the Laboratory will discharge two other process streams into the effluent tank for discharge to Mortandad Canyon: (1) the TUF permeate stream when it meets NM WQCC and CWA requirements (See Figure 1.0, Attachment 2.0); and (2) the distillate stream from the mechanical evaporator once it becomes operational (See Figure 2.0, Attachment 2.0).

6. **NMED Request:** *Please submit water quality data that is representative of influent quality for metals and general chemistry for the past year.*

   LANL Response: See Attachment 5.0 for a copy of the 1997 RLWTF Annual Report. Chapter 5, Mineral Summary, presents the average, maximum, and minimum concentrations of metals in the RLWTF's influent (RAW) and effluent (FINAL) for CY1997. A copy of the 1998 RLWTF Annual Report will be provided to the NMED GWQB as soon as it becomes available in late 1999.

7. **NMED Request:** *Please review the data and submit accurate analytical results for effluent quality for metals and general chemistry.*

   LANL Response: Please replace the draft 1997 RLWTF Annual Report submitted to the NMED GWQB on August 25, 1998, (ESH-18/WQ&H:98-0289) with the final version of the 1997 RLWTF Annual Report in Attachment 5.0. The data included in the final 1997 RLWTF Annual Report has been quality assured (QA) and validated.

8. **NMED Request:** *Please submit influent and effluent water quality data for all organic compounds listed in WQCC Regulation 3103, and for any other analyte listed in WQCC 1101. TT. known to exist in influent to the RLWTF for the past year.*

LANL Response: The RLWTF collects weekly influent samples and analyzes them for volatile (VOC) and semi-volatile (SVOC) compounds. On August 25, 1998, the Laboratory submitted to the NMED GWQB a summary table of SVOC and VOC analytical results for RLWTF influent for 1997 (ESH-18/WQ&H:98-0289, Attachment D). The analytical results presented in Attachment D represent all SVOC and VOC detections (analytical results greater than the laboratory's Reporting Limit) for 1997. Non-detect results were not presented in Attachment D. Enclosed in Attachment 6.0 are the analytical reports for one week's SVOC and VOC monitoring of RLWTF influent in 1997. This is being presented as a sample of the SVOC and VOC analysis conducted weekly at the RLWTF. The remaining 51 weekly analytical reports for 1997 are available upon request.

The analytical reports from the RLWTF's SVOC and VOC influent monitoring for 1998 are also available upon request. A summary table of SVOC and VOC detections for 1998 is not currently available and will be submitted to the NMED GWQB by June 1, 1999.

In May 1998, the Laboratory submitted to the EPA Region 6 a NPDES Permit Re-Application (NPDES Permit No. NM0028355). As part of the re-application process, the Laboratory was required to sample the RLWTF's effluent in order to characterize the quality and identify contaminants of concern. Enclosed in Attachment 6.0 is a copy of the Laboratory's NPDES Permit Re-Application Form 2C, with supporting documentation, which characterizes the quality of the RLWTF's effluent at NPDES Outfall 051. Form 2C provides water quality data for organics, metals, and general chemistry.

9. **NMED Request:** *Please take water samples of the surface water in Effluent Canyon above the TA-50 outfall for analysis of all WQCC Regulation 3103 constituents. The results must be submitted to the NMED, GWQB.*

LANL Response: Attachment 7.0 presents the analytical results from the February 25, 1999, sampling of Effluent Canyon, an ephemeral tributary to Mortandad Canyon, approximately 100 yards above the TA-50 outfall. Please note that this sample was taken from snowmelt and may not be representative of this discharge during other runoff events.

10. **NMED Request:** *Please submit all water quality data for samples taken in MCC 8.2 and MCO-13 for the past two years. If current data is not available, please sample the wells for analysis of all WQCC Regulation 3103 constituents.*

LANL Response: Please note that MCC 8.2 was plugged and abandoned in 1989. The Laboratory proposes that MCO-8.2, an alluvial monitoring well completed in 1961, be used in lieu of MCC-8.2. Attachment 8.0 presents the geologic logs and construction data for MCO-8.2 and MCO-13.

No water quality data is available for MCO-8.2 or MCO-13 for 1996, 1997, 1998, or 1999. The table below presents all of the water levels measurements taken by the Laboratory at MCO-8.2 and MCO-13 since 1996. The Laboratory will monitor both MCO-13 and MCO-8.2 quarterly. Samples will be collected when sufficient water is present.

Monitoring Well	Year	Date of Measurement	Status
MCO-8.2	1996	11/13/96	Dry
MCO-8.2	1997	NA	NA
MCO-8.2	1998	5/7/98	Dry
MCO-8.2	1998	8/4/98	Dry
MCO-8.2	1999	3/2/99	Dry
MCO-13	1996	NA	NA
MCO-13	1997	NA	NA
MCO-13	1998	5/7/98	Dry
MCO-13	1998	8/4/98	Dry
MCO-13	1999	3/2/99	Dry

11. **NMED Request:** *Please submit information on the status of the pump in TW-8 and the general condition of the well. Please submit all water quality data available for TW-8 for the past two years and submit the depth below the top of the aquifer that the samples were taken.*

LANL Response: During 1997, the pump in TW-8 failed and no ground water sample was collected. In March 1998, a new pump was installed in TW-8. The pump was set approximately 14 feet below the top of the aquifer in a screened interval. Video logs of TW-8 were taken on February 27, 1998, and on March 9, 1998, prior to the pump's installation. The video logs show the well to be in good condition. Copies of the video logs are available for viewing upon request. Two groundwater samples were collected from TW-8 on September 2, 1998. The analytical results, presented in Table 2 of Attachment 9.0, are below NM WQCC 3103 numerical standards.

12. **NMED Request:** *Please submit information on the status of MCO-3 and the date it was replaced or the date it will be replaced.*

    LANL Response: The Laboratory's Environmental Restoration Project Work Plan for Mortandad Canyon (LA-UR-97-3291) recommends that MCO-3 be replaced because the well does not meet RCRA standards. Replacement of the well has been proposed for inclusion in the FY2000 Budget and will be completed by September 30, 2000. Access to Mortandad Canyon for drilling operations is limited to the summer months due to weather conditions and endangered species concerns (i.e., nesting of the Mexican Spotted owl). Until the well is replaced, the existing well will continue to be sampled. New sampling procedures using a peristaltic pump have shown to be an effective method for collecting a sample.

13. **NMED Request:** *If groundwater intersects MCC-8.2 and MCO-13 then please commit to sampling MCC-8.2 and MCO-13 for the same constituents, at the same frequency as wells MCO-4B, 6 and 7 as submitted in the Revised Monitoring Plan, June 1997.*

    LANL Response: The Laboratory will sample MCO-8.2 (Note: MCC-8.2 was plugged and abandoned in 1989) and MCO-13 at the same frequency as MCO-4B, 6, and 7. Attachment 10.0 presents a revised Table 3.0, *Proposed Monitoring Plan for the RLWTF Ground Water Discharge Plan Application,* showing the inclusion of MCO-8.2 and MCO-13. Please note that samples can be collected only when sufficient water is present.

    Additionally, the Laboratory would like to substitute Mortandad Canyon monitoring well MCO-7A for the plan's current well, MCO-7. MCO-7A is located adjacent to MCO-7 and has the benefit of being a compliance well for the Laboratory's RCRA Permit. Geologic log and construction information for MCO-7A have been included in Attachment 8.0. A revised map showing the location of monitoring wells in Mortandad Canyon (Map 4.0 from the original Ground Water Discharge Plan Application) has been enclosed in Attachment 1.0. This map also reflects the monitoring plan changes requested by your agency to-date.

14. **NMED Request:** *Please commit to submitting a monitoring plan for NMED, GWQB approval for the monitoring of any saturated zones discovered in Mortandad Canyon between the alluvial aquifer and the regional aquifer. The monitoring plan shall be submitted to the GWQB within 30 days of receiving analytical data for ground water samples taken from the saturated zone or zones.*

    LANL Response: The Laboratory will develop and submit to the NMED GWQB a monitoring plan for intermediate zones that may exist in Mortandad Canyon within 30 days of completing the following activities:
    1. The well to the main aquifer (R-15) has been drilled to TD (total depth);
    2. All water quality data has been received and validated; and
    3. The well and its hydrogeologic setting have been fully characterized.

    The Laboratory will submit validated data from the monitoring of ground water produced during the drilling of Mortandad Canyon monitoring wells to the NMED GWQB as soon as it is available. In addition, the Laboratory invites the NMED GWQB to continue to participate in the quarterly meetings that the Laboratory and the NMED HRMB routinely conduct on the Monitoring Well Project.

15. **NMED Request:** *In addition to TW-8, please commit to quarterly sampling of all regional aquifer monitor wells R-13, R-14, and R-15 for analysis of nitrate as nitrogen (NO3), fluoride (F) and total dissolved solids (TDS). The list of analytes may change depending on water quality data from new monitor wells.*

    LANL Response: The Laboratory will sample R-13, R-14, and R-15 for nitrate as nitrogen (NO3-N), fluoride (F), and total dissolved solids (TDS) on a quarterly basis once each well is drilled to its total depth (TD), characterized, and equipped for routine sampling.

16. **NMED Request:** *In order for NMED to approve DP-1132, LANL will need to commit to submitting a corrective action plan to the NMED, GWQB for approval if concentrations of constituents in the alluvial aquifer that are not effective and enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act do not drop below WQCC 3103 numerical standards within two years of the discharge plan approval.*

    LANL Response: The Laboratory will submit a corrective action plan for NMED GWQB approval if the concentration of constituents in the Mortandad Canyon alluvial aquifer exceed NM WQCC numerical standards within two years of the discharge plan approval. Compliance with this requirement will be based upon ground water samples collected from the following wells: MCO-3, MCO-4B, MCO-5, MCO-6, MCO-7A, MCO-7.5, MCO-8.2, and MCO-13. The corrective action plan will take into consideration the repeatability of exceedances and the presence of trends. Contaminants exceeding NM WQCC 3103 numerical standards that are enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act will be addressed and mitigated under these programs.

17. **NMED Request:** *Please submit an update on the location and dates for the installation of the Bandelier Tuff wells [MCOBT- 4.4 and 8.5] to be drilled in Mortandad Canyon. The update should include well installation within 2 years of the discharge plan approval. If ground water is discovered in the wells, samples must be taken within 30 days of completion of the wells.*

    LANL Response: The Laboratory's Environmental Restoration Project Work Plan for Mortandad Canyon (LA-UR-97-3291) has recommended that two Bandelier Tuff characterization wells, MCOBT-4.4 and MCOBT-8.5, be drilled. Attachment 11.0 shows the proposed locations for MCOBT-4.4 and MCOBT-8.5. These two wells have been proposed for inclusion in the FY2001 Budget and will be completed by September 30, 2001. Access to Mortandad Canyon for drilling operations is limited to the summer months due to weather conditions and endangered species concerns (i.e., nesting of the Mexican Spotted owl).

18. **NMED Request:** *LANL will need to commit to submitting a corrective action plan for NMED, GWQB approval if water quality data from either of the Bandelier Tuff wells indicates that concentrations of constituents in the intermediate aquifer(s) that are not effective and enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act exceed WQCC 3103 numerical standards.*

    LANL Response:
    The Laboratory will submit a corrective action plan for NMED GWQB approval if the Mortandad Canyon monitoring wells MCOBT-4.4 and MCOBT-8.5 confirm that the concentration of constituents in the intermediate aquifer(s) exceed NM WQCC 3103 numerical standards two years after completion of the well. The corrective action plan will take into consideration the repeatability of exceedances and the presence of trends. Contaminants exceeding NM WQCC 3103 numerical standards which are enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act will be addressed and mitigated under these programs.

19. **NMED Request:** *LANL will need to commit to submitting a corrective action plan for NMED, GWQB approval if water quality data from any R wells indicates that concentrations of constituents in the regional aquifer that are not effective and enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act exceed WQCC 3103 numerical standards.*

    LANL Response: The Laboratory will commit to submitting a corrective action plan for NMED GWQB approval if the Mortandad Canyon monitoring wells R-13, R-14, and R-15 confirm that the concentration of constituents in the regional aquifer exceed NM WQCC 3103 numerical standards two years after completion of the well. The corrective action plan will take into consideration the repeatability of exceedances and the presence of trends. Contaminants exceeding NM WQCC 3103 numerical standards which are enforceable pursuant to the Hazardous Waste Act or the Atomic Energy Act will be addressed and mitigated under these programs.

ATTACHMENT 2.0

Figure 1.0. Schematic of Interim Treatment Process

Figure 2.0. Schematic of Final Treatment Process

Figure 1.0

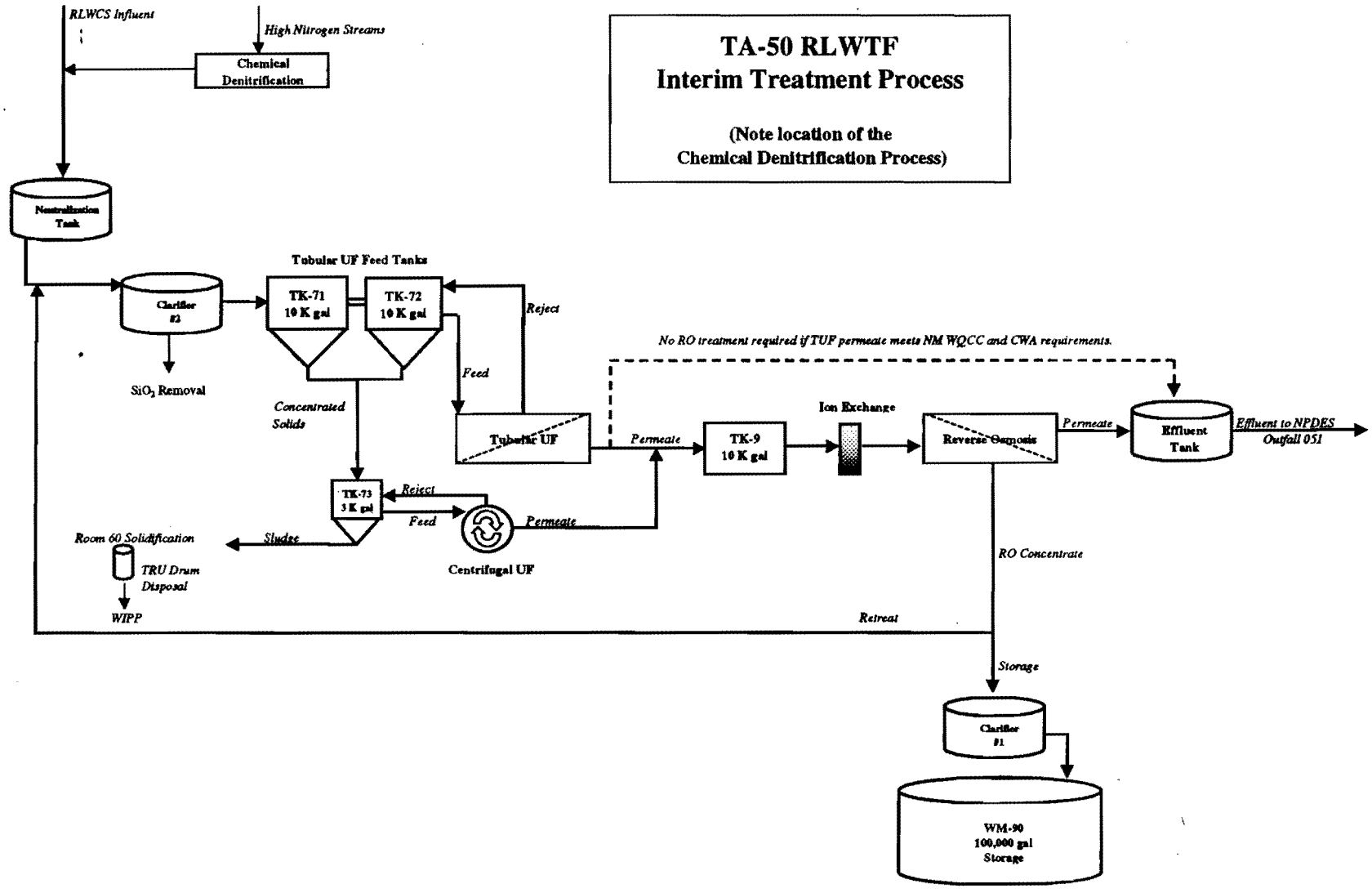
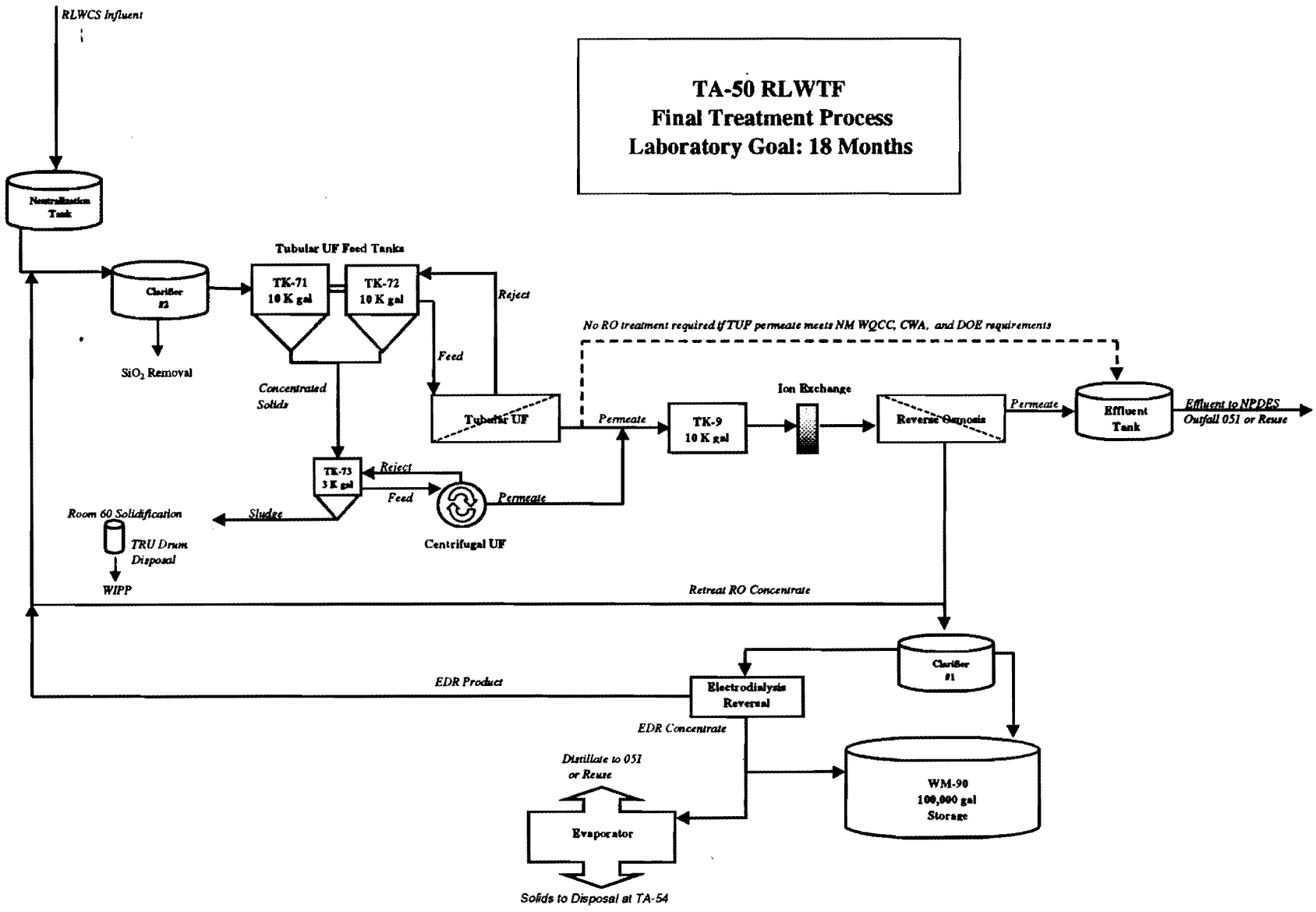

TA-50 RLWTF
Interim Treatment Process
(Note location of the
Chemical Denitrification Process)
RLWCS Influent
High Nitrogen Streams
Chemical Denitrification
Neutralization Tank
Clarifier #2
SiO2 Removal
Tubular UF Feed Tanks
TK-71 10 K gal
TK-72 10 K gal
Reject
Feed
Concentrated Solids
Tubular UF
Permeate
No RO treatment required if TUF permeate meets NM WQCC and CWA requirements.
TK-9 10 K gal
Ion Exchange
Reverse Osmosis
Permeate
Effluent Tank
Effluent to NPDES Outfall 051
TK-73 3 K gal
Reject
Feed
Permeate
Sludge
Centrifugal UF
Room 60 Solidification
TRU Drum Disposal
WIPP
RO Concentrate
Retreat
Storage
Clarifier #1
WM-90 100,000 gal Storage

Figure 2.0


TA-50 RLWTF
Final Treatment Process
Laboratory Goal: 18 Months
RLWCS Influent
Neutralization Tank
Clarifier #2
SiO2 Removal
Tubular UF Feed Tanks
TK-71 10 K gal
TK-72 10 K gal
Reject
Feed
Concentrated Solids
Tubular UF
No RO treatment required if TUF permeate meets NM WQCC, CWA, and DOE requirements
Permeate
TK-9 10 K gal
Ion Exchange
Reverse Osmosis
Permeate
Effluent Tank
Effluent to NPDES Outfall 051 or Reuse
TK-73 3 K gal
Reject
Feed
Permeate
Sludge
Centrifugal UF
Room 60 Solidification
TRU Drum Disposal
WIPP
Retreat RO Concentrate
Clarifier #1
EDR Product
Electrodialysis Reversal
EDR Concentrate
Distillate to 051 or Reuse
Evaporator
Solids to Disposal at TA-54
WM-90 100,000 gal Storage

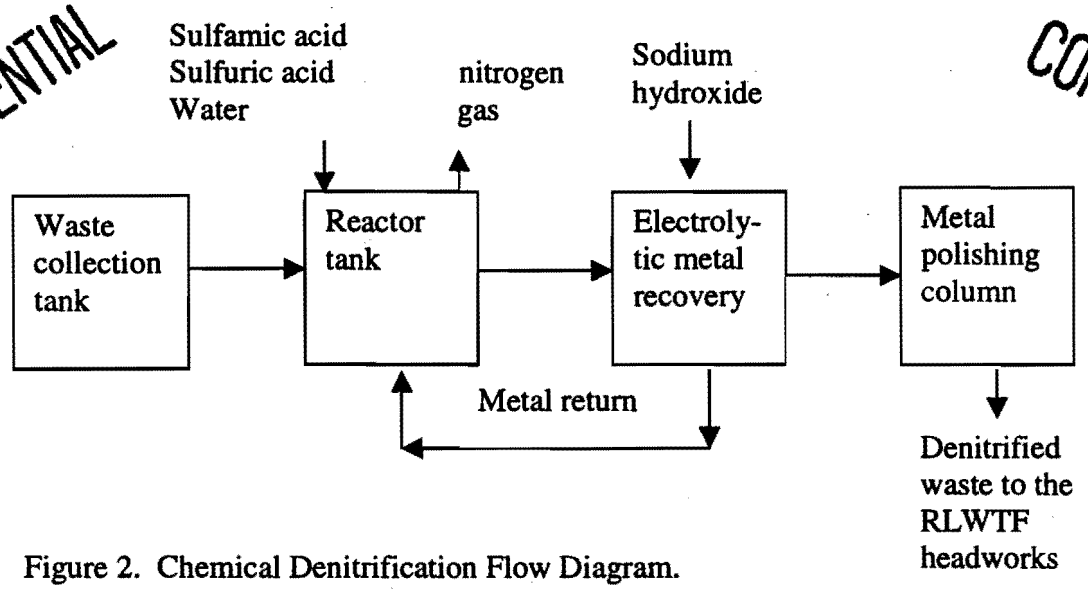
ATTACHMENT 3.0

Description of Chemical Denitrification Process

CONFIDENTIAL AND PROPRIETARY INFORMATION

NOT FOR DISTRIBUTION

CONFIDENTIAL



CONFIDENTIAL

Figure 2. Chemical Denitrification Flow Diagram.

The following part shows the average input and output flow streams as well as the chemical use. These streams were calculated based on the survey of the main nitrate waste generators (other than TA-55) described in the Draft Radioactive Liquid Waste Survey Report, by Benchmark Environmental Corporation, December, 1998.

INPUT (per week)

Volume: 110 L
Nitrate content: 477 g/L NO_3^- (or 108 g/L N)
Composition: 40 % Nitric Acid (HNO_3)
Total N: 11.8 kg
Total nitrate: 52 kg

OUTPUT (per week)

Volume: 700 L*
Nitrate content: 742 mg/L NO_3^- (or 168 mg/L N)
Composition: $NaNO_3$, 742 mg/L, Na_2SO_4 195 g/L
Total N: 118 g
Total nitrate: 522 g

* Water will be added to the process due to the high nitric acid concentration in the input. Otherwise, at these high concentrations the resulting salts would precipitate.

CHEMICAL USE (per week):

Sulfamic acid (H_2NSO_3H) 82 kg
Sodium hydroxide (NaOH) 68 kg
Sulfuric acid (H_2SO_4) 4 kg

CONFIDENTIAL

CONFIDENTIAL

UPSTREAM TREATMENT OF NITRATE WASTE

A non-thermal chemical denitrification process which converts nitrate ions to nitrogen gas has recently been developed at Los Alamos National Laboratory. The waste streams to the radioactive liquid waste collection system which contain the highest concentration of nitrates will be collected at points of generation in plastic carboys, transferred to TA-50-1 Room 34, and treated prior to discharge to the headworks of the RLWTF. The following diagram shows the nitrate waste treatment train.

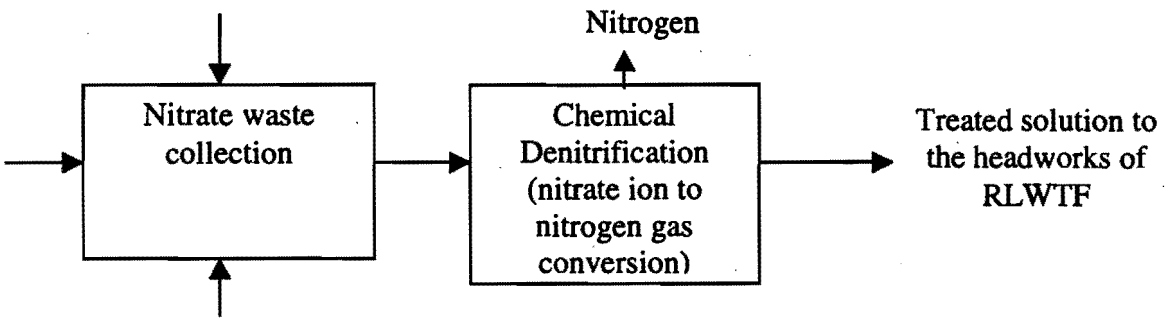


Figure 1. Nitrate Waste Treatment Train.

During the nitrate conversion process nitrate waste will be introduced to a 20 gallon agitated tank containing a metal slurry (cadmium or zinc). An amide reagent (sulfamic acid) will be added to the reactor tank and reduce the nitrate ions to nitrogen gas. The metal will oxidize to M^{+2} in this process. The denitrified waste will then be transferred to an electrochemical cell where the metal reagent will be recovered and returned to the reactor tank. In the initial implementation stage of this technology, sodium hydroxide will be used to neutralize the acid generated in the electrochemical cell. In a later stage of implementation, a membrane electrochemical cell will be used to recover this acid. Residual cadmium in the treated water will be removed by a a polishing column composed of iron filings. The polishing column will be regenerated every 5 – 6 months by dissolving its contents in the acid and recovering the cadmium metal by an electrolysis process. If zinc is used, the polishing column is not expected to be required. The denitrified stream will be collected in a tank and analyzed before discharging to the headworks of the RLWTF. Figure 2 shows the flow diagram for the chemical denitrification system.

ATTACHMENT 4.0

Attachment 1, Estimated Quality of the Reverse Osmosis Concentrate Stream

Attachment 2, Estimated Quality of the Reverse Osmosis Permeate Stream

(Revised March 1999)

Submitted to NMED GWQB on November 20, 1998 (ESH-DO:98-349)

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.

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	0.0047	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.

ATTACHMENT 5.0

1997 RLWTF Annual Report

EM/RLW Environmental Management Radioactive Liquid Waste Group

1997 RLWTF Annual Report

Prepared By:	Rich Hassman	22 Oct 98 Date
And	Robert Harris	23 Oct 98 Date
Reviewed By:	Debora Hall	11/17/98 Date
	Wm. David Moss	11-17-98 Date
	Mark Gardner	12-9-98 Date
Approved By:	Steven W. Hanson	12.9.98 Date

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Chapter

Flow Summary

TA-50 WM-1

FLOW SUMMARY (megaliters)

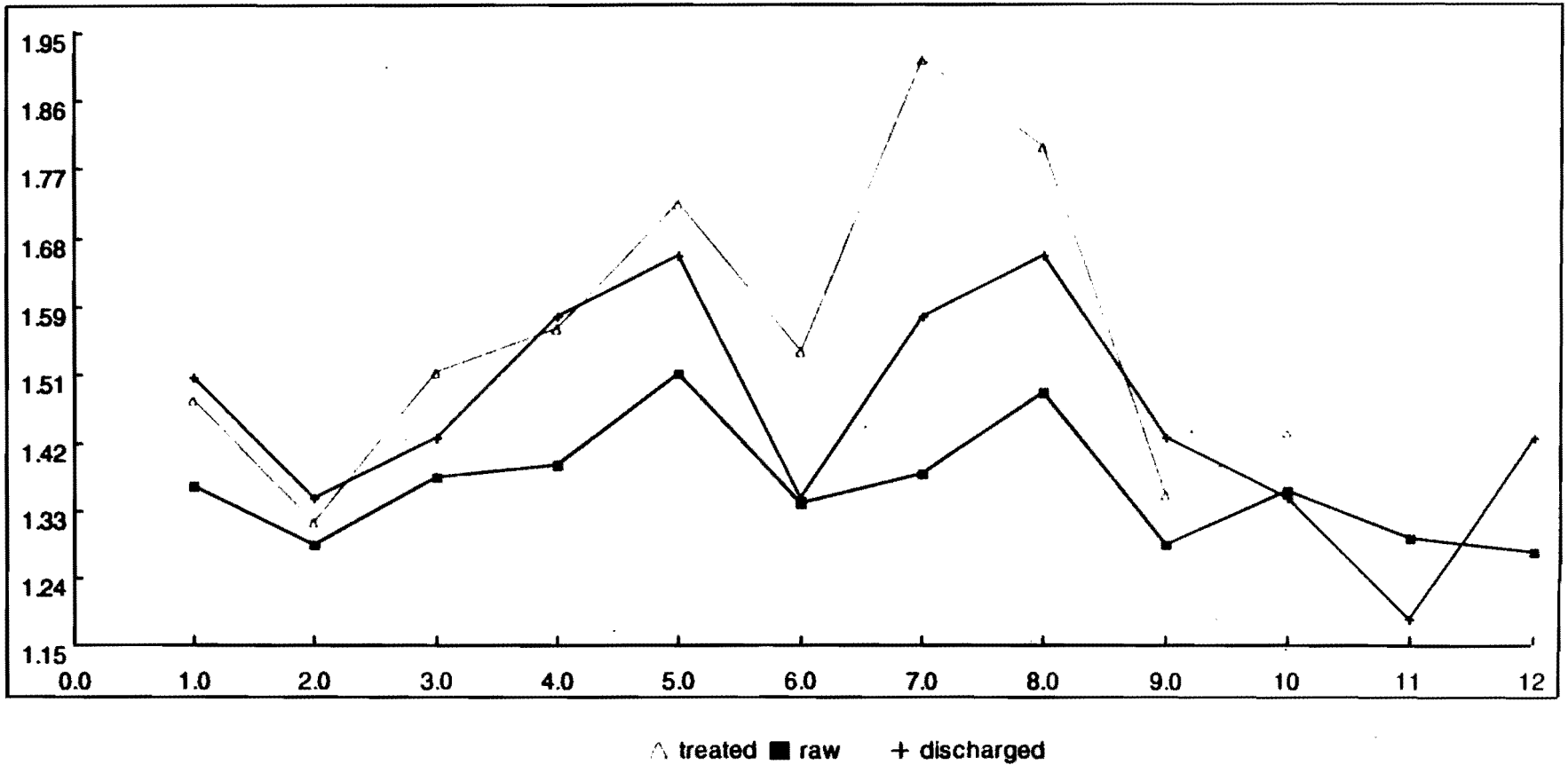
JAN-1997 through DEC-1997

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

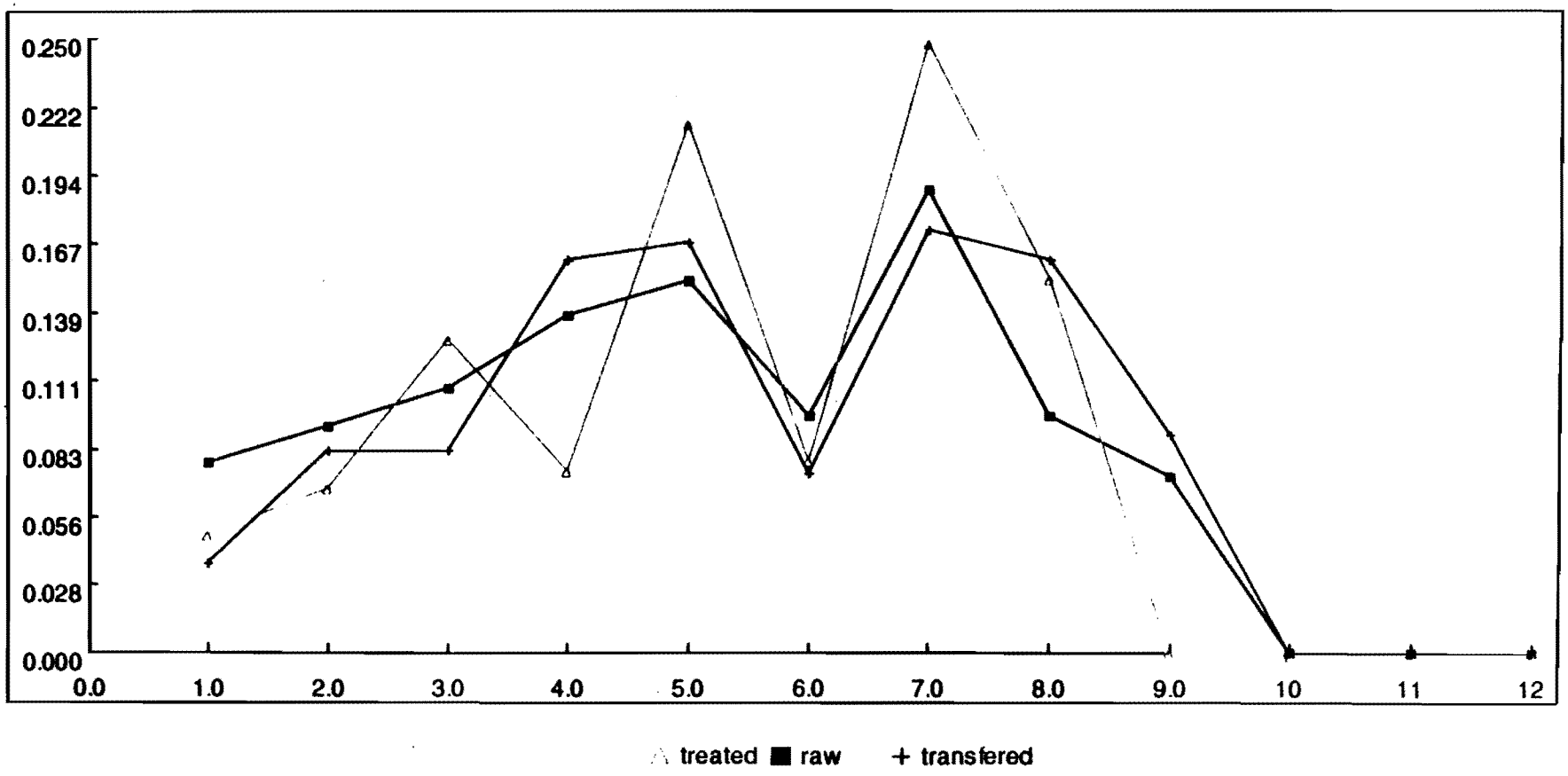
Chapter

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

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	0.008	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	67.966	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	54.408	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	0.008	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	60.064
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	

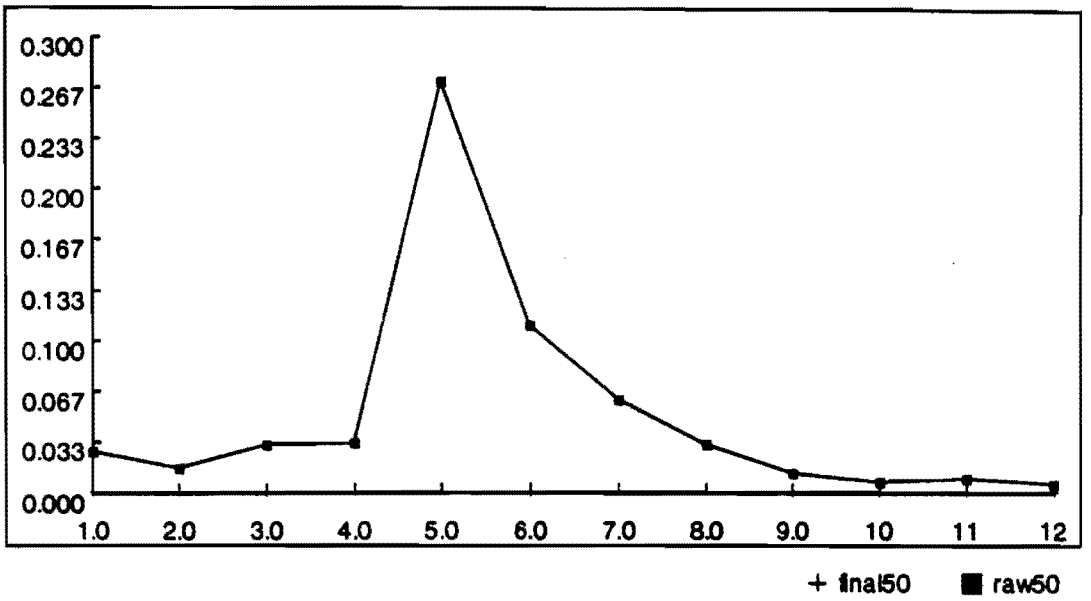
Volume of Flow: Influent = 16,298,612.0 liters Final = 17,471,848.0 liters

*Alkalinities and hardness as mg CaC03/l. *Conductivity as uS/cm. *Total Cations as meq/l. *LDL: Less than Detection Limit.

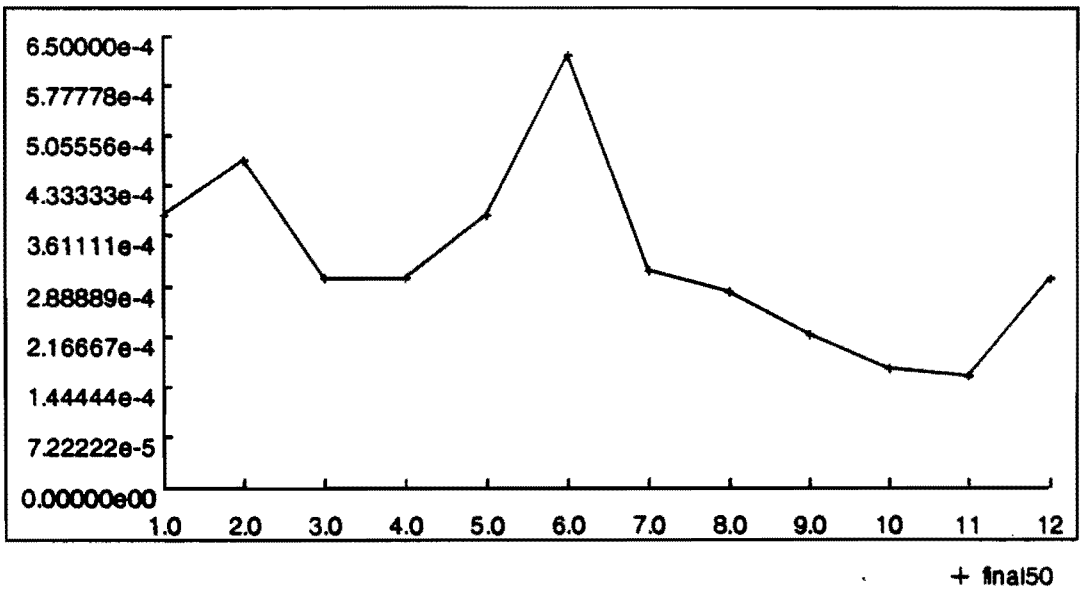
Chapter

Concentration Charts

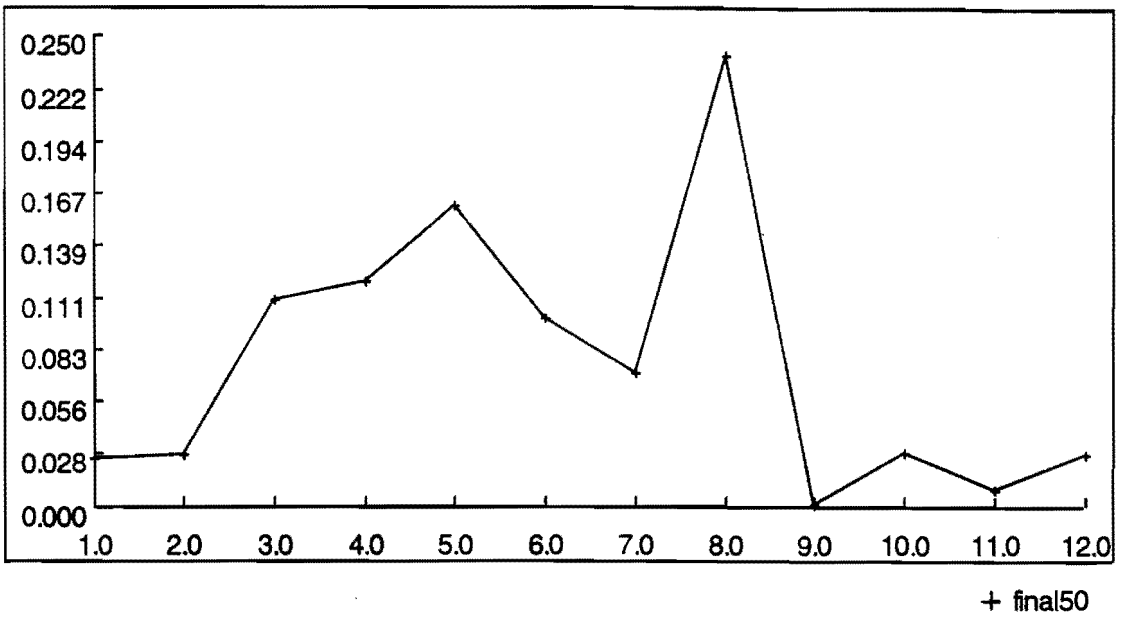
ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997



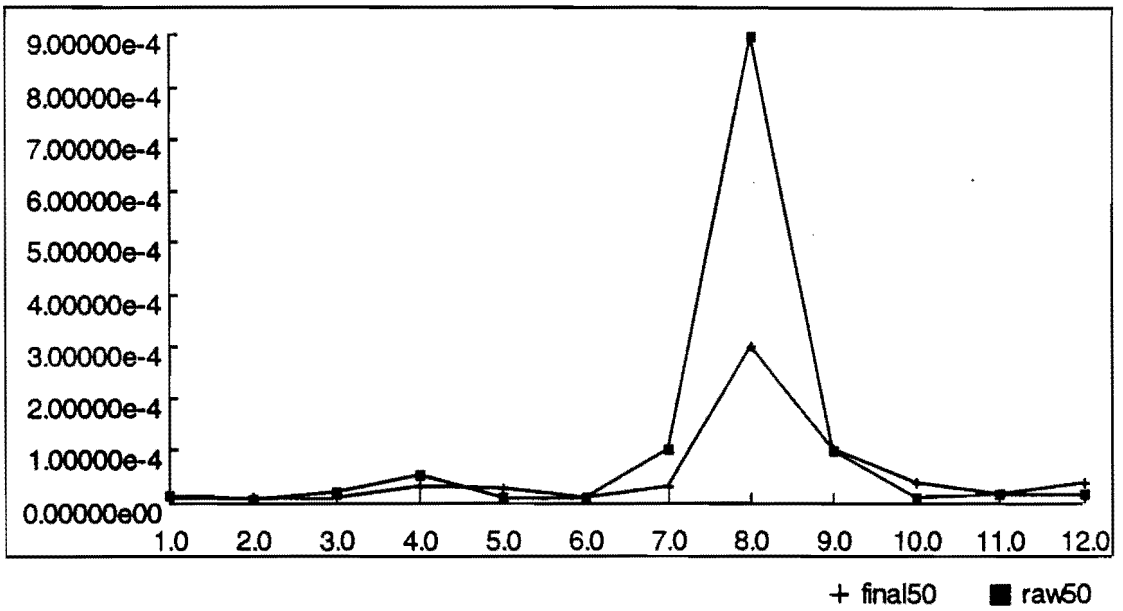
ALPHA concentration (uCi/L).
JAN-1997 through DEC-1997



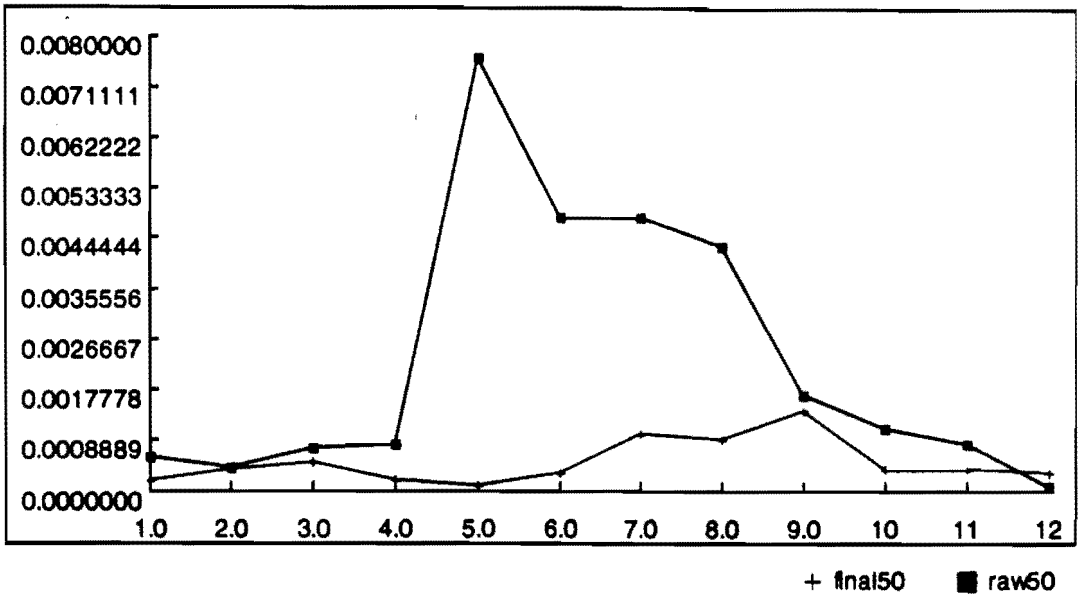
TRITIUM concentration (uCi/L).
JAN-1997 through DEC-1997



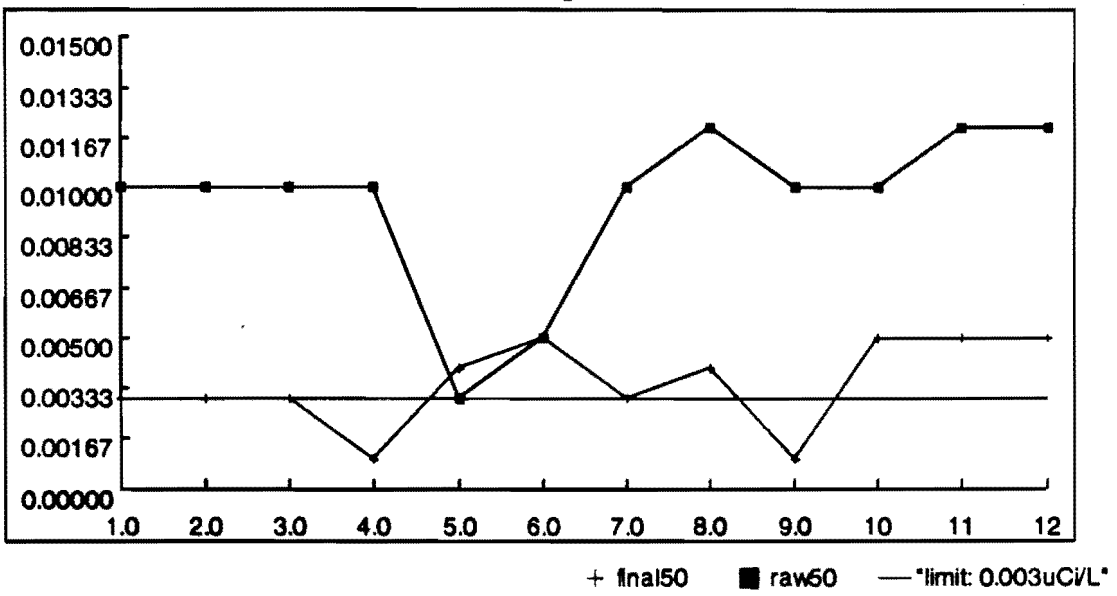
Sr-89 concentration (uCi/L).
JAN-1997 through DEC-1997



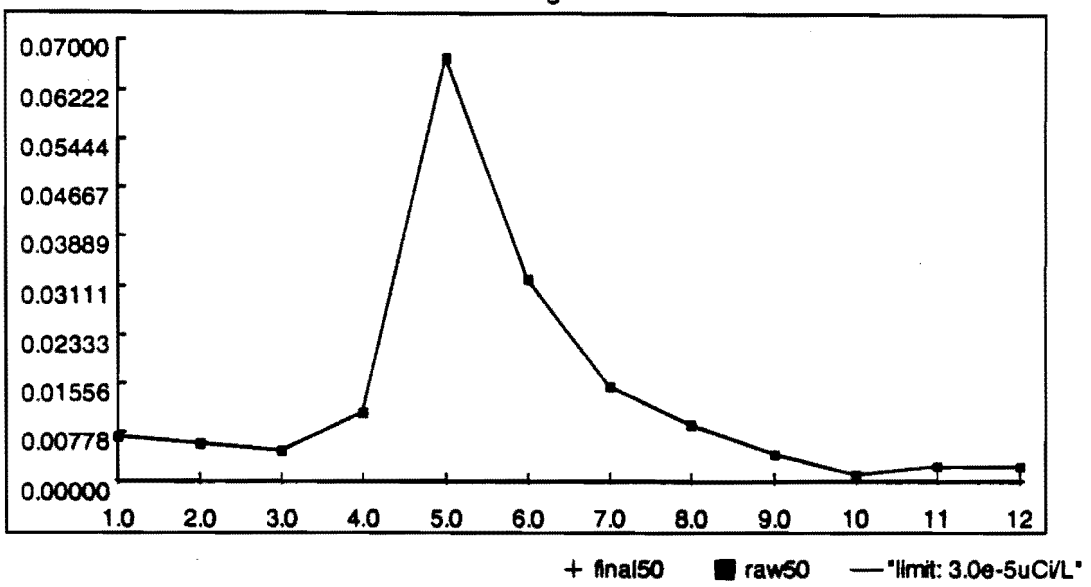
BETA concentration (uCi/L).
JAN-1997 through DEC-1997



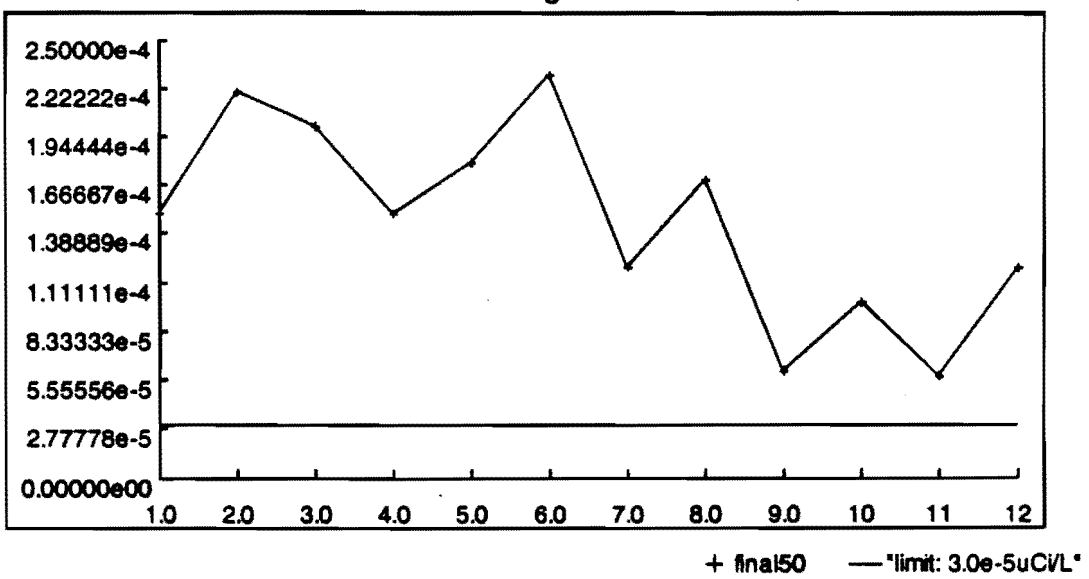
GAMMA concentration (uCi/L).
JAN-1997 through DEC-1997



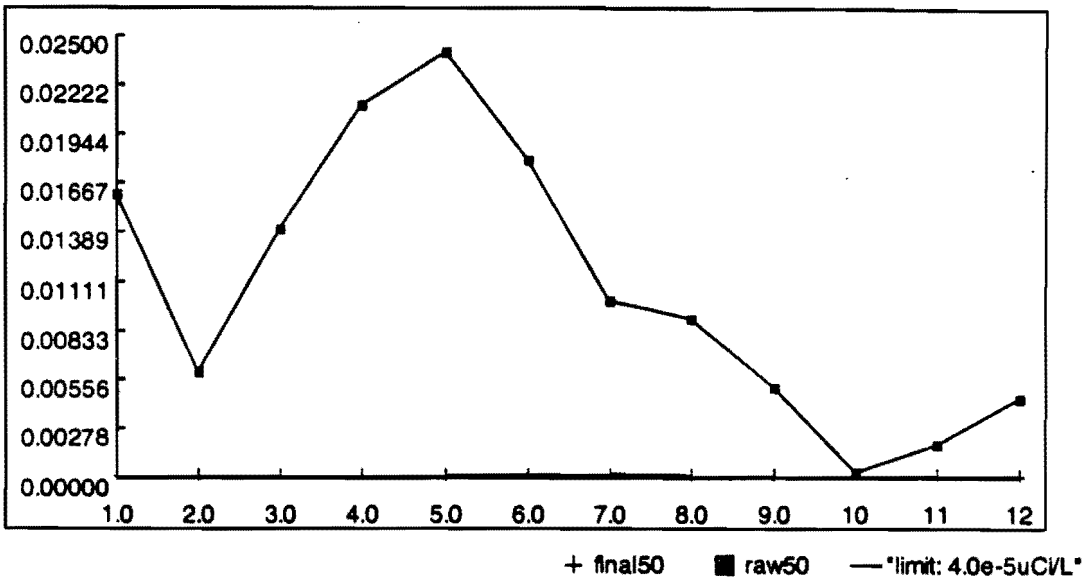
Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997



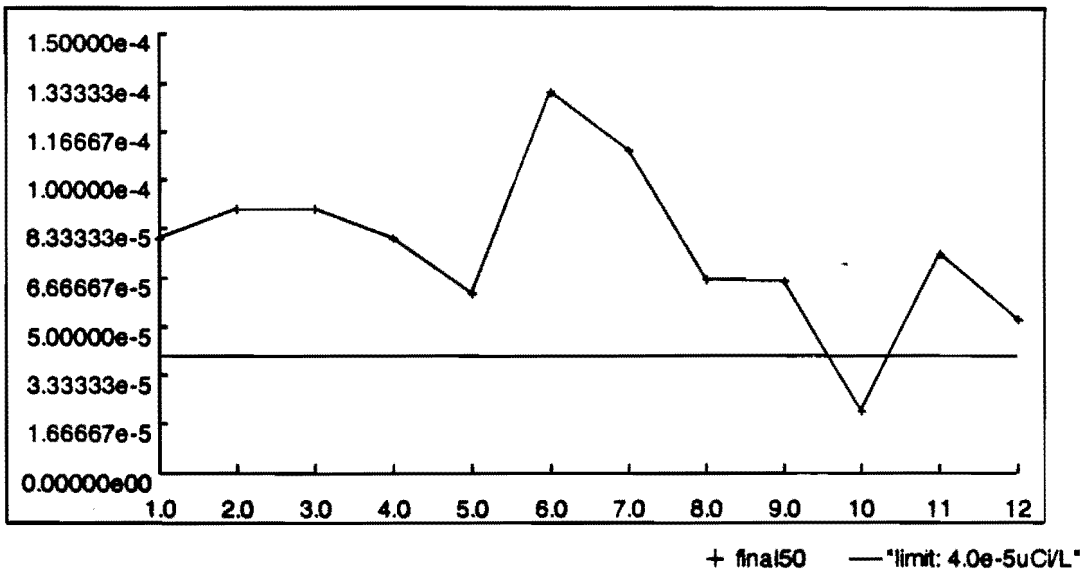
Am-241 concentration (uCi/L).
JAN-1997 through DEC-1997



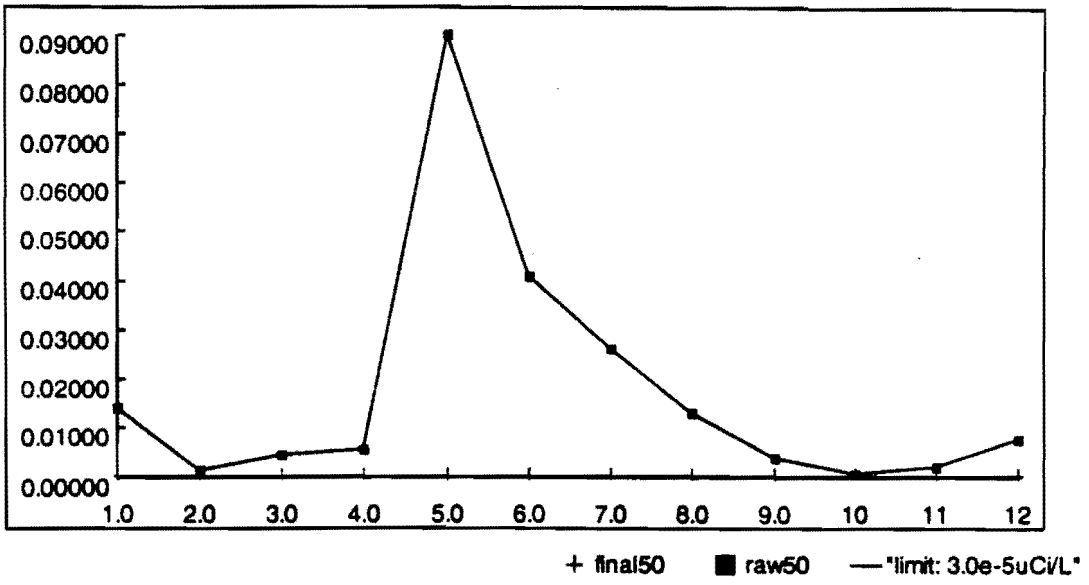
Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997



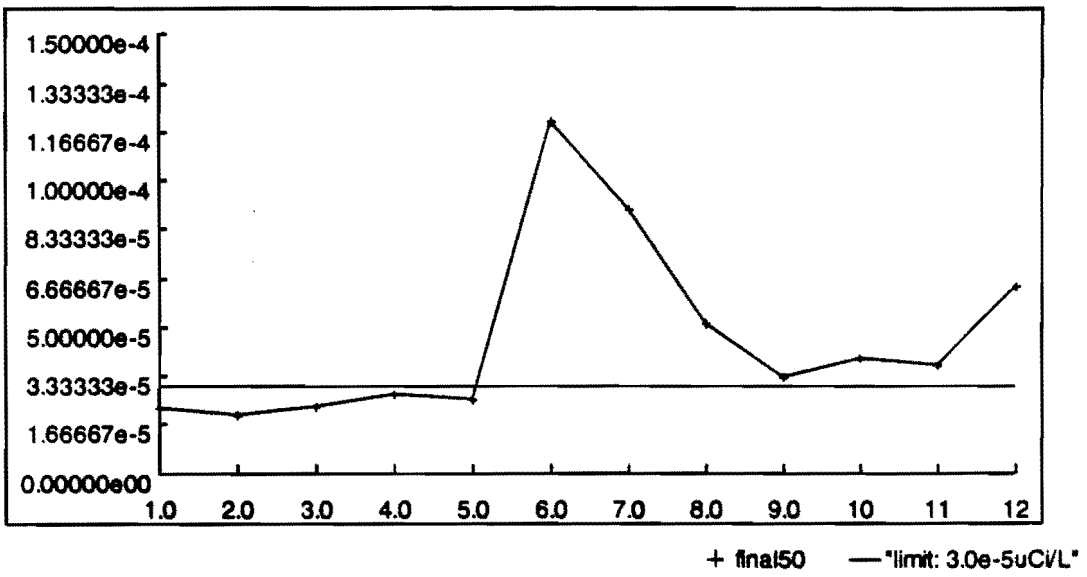
Pu-238 concentration (uCi/L).
JAN-1997 through DEC-1997



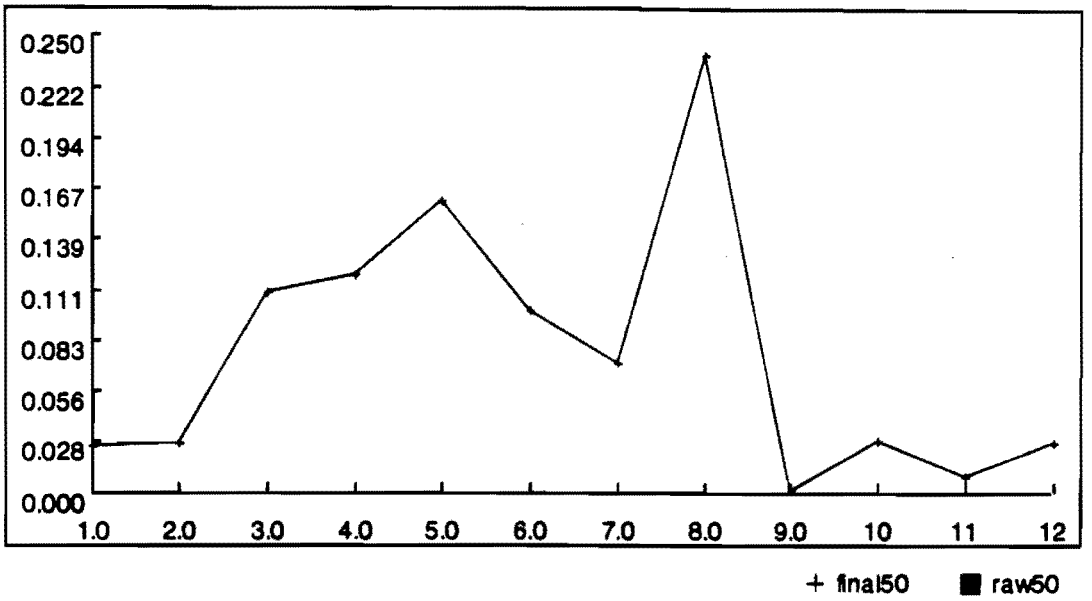
Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997



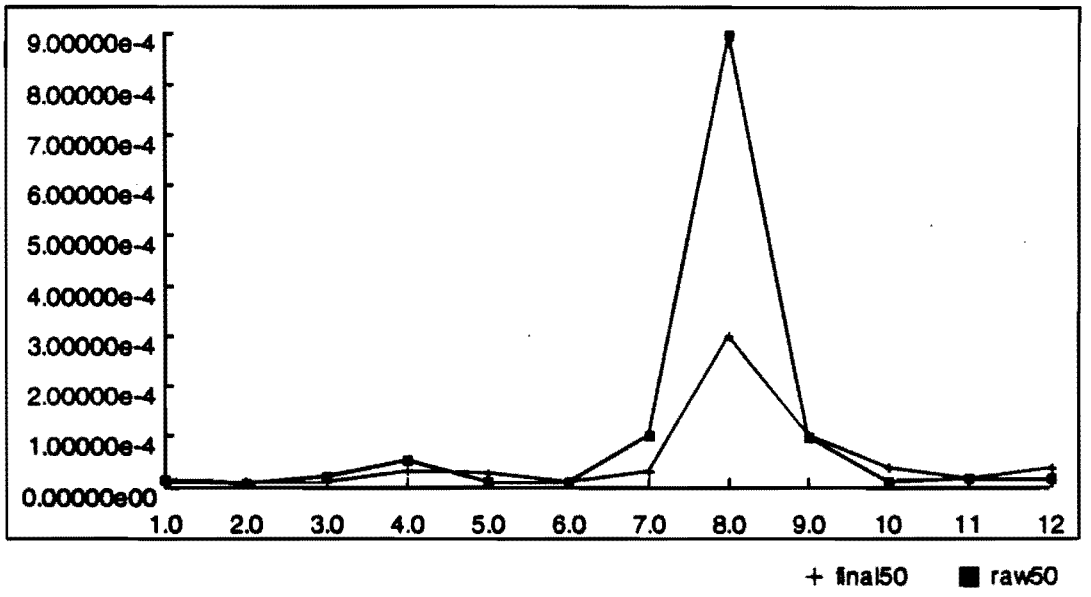
Pu-239 concentration (uCi/L).
JAN-1997 through DEC-1997



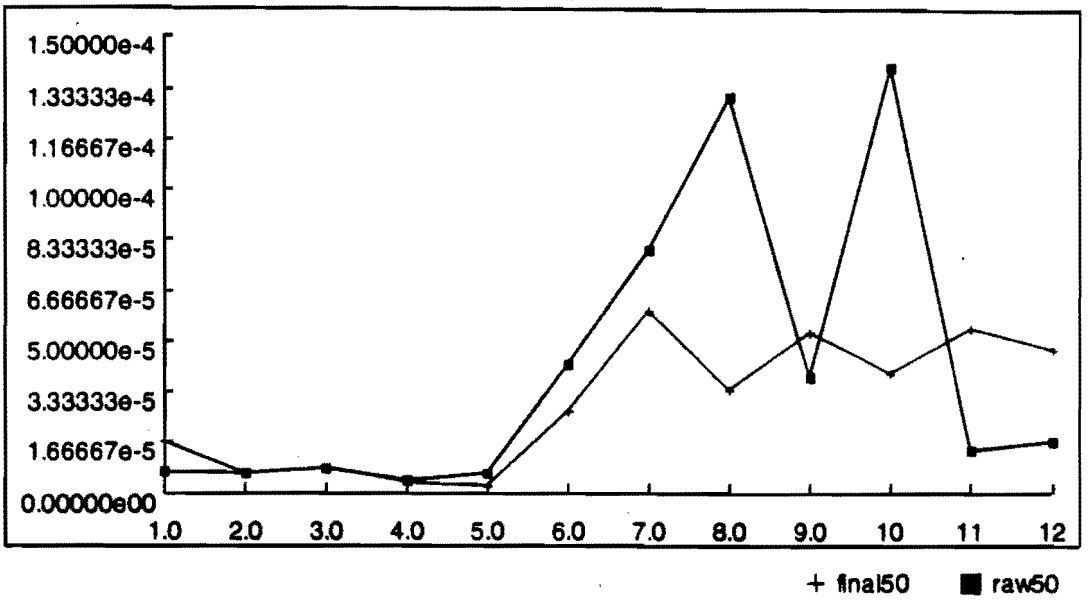
TRITIUM concentration (uCi/L).
JAN-1997 through DEC-1997



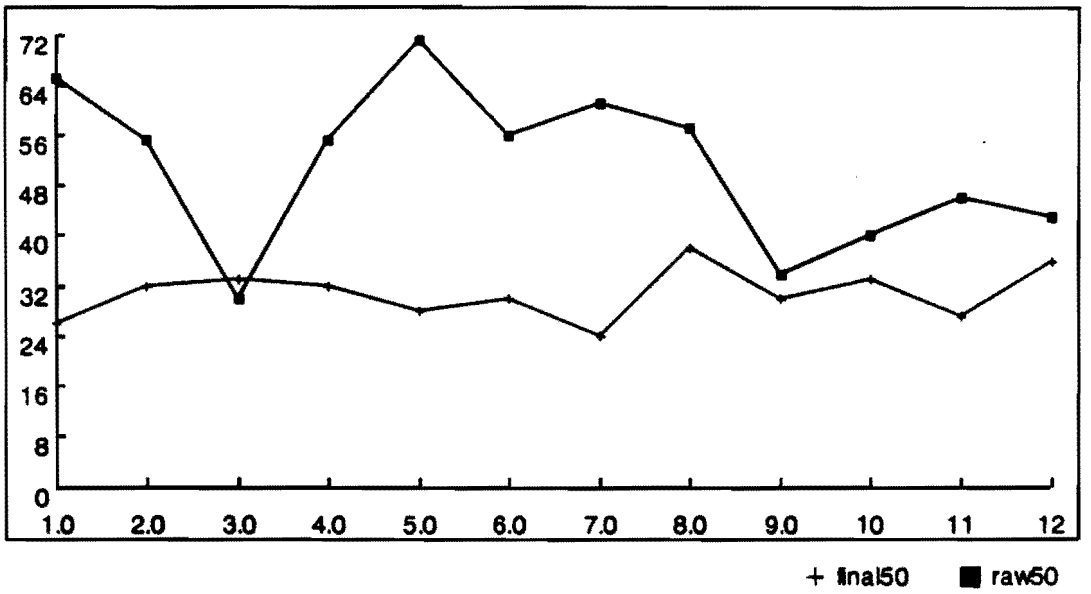
Sr-89 concentration (uCi/L).
JAN-1997 through DEC-1997



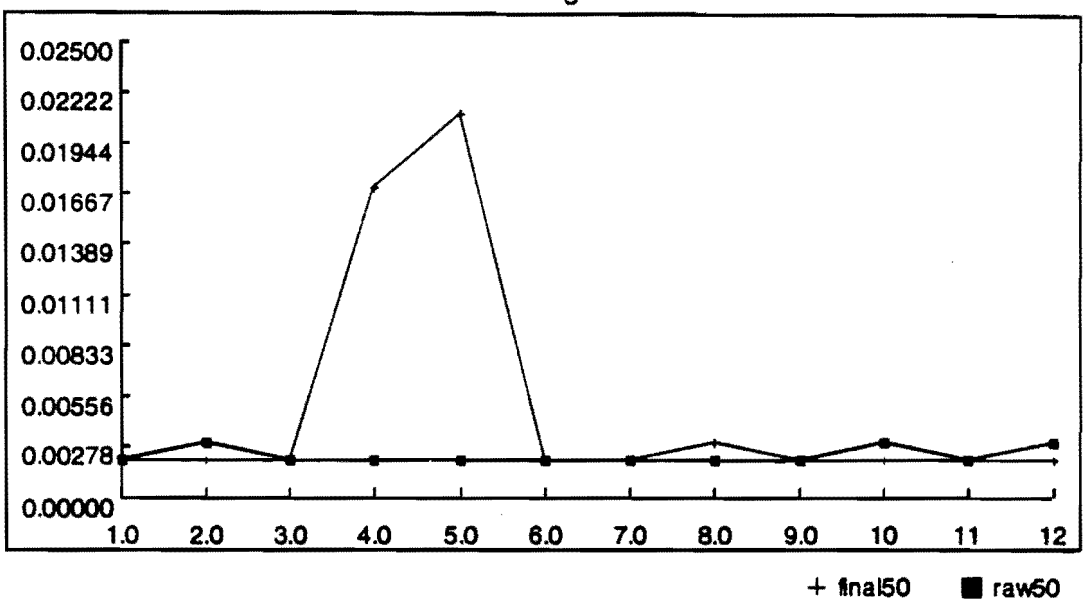
Sr-90 concentration (uCi/L).
JAN-1997 through DEC-1997



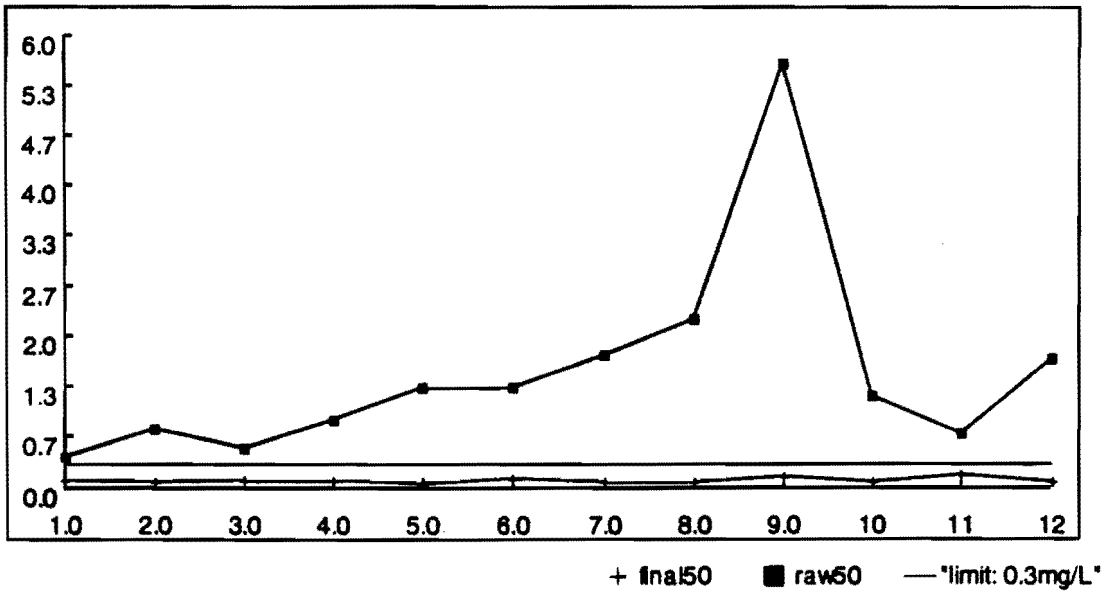
COD concentration (mg/L).
JAN-1997 through DEC-1997



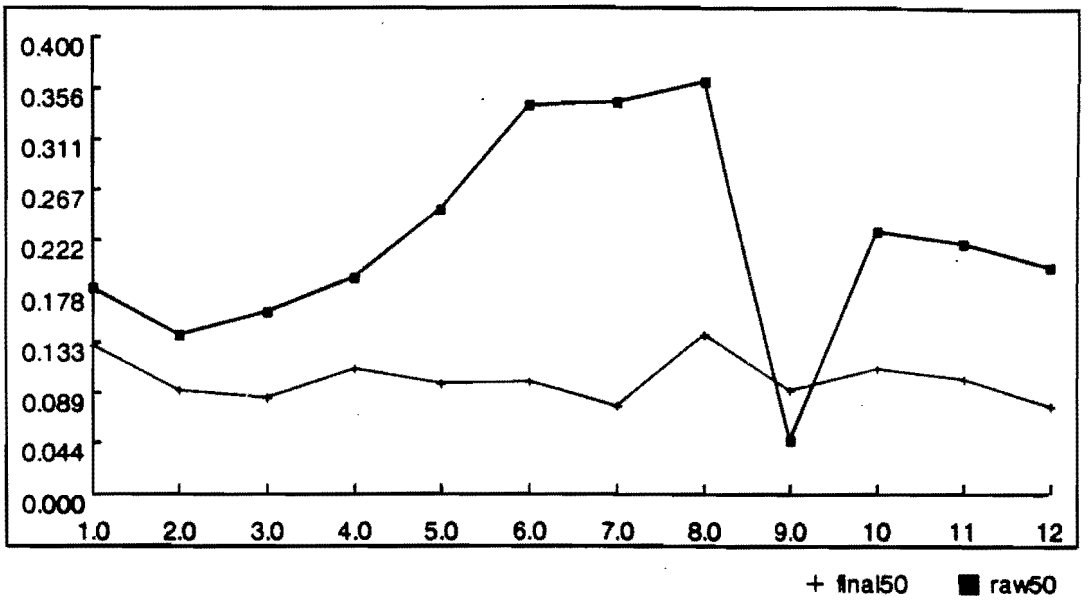
CADMIUM concentration (mg/L).
JAN-1997 through DEC-1997



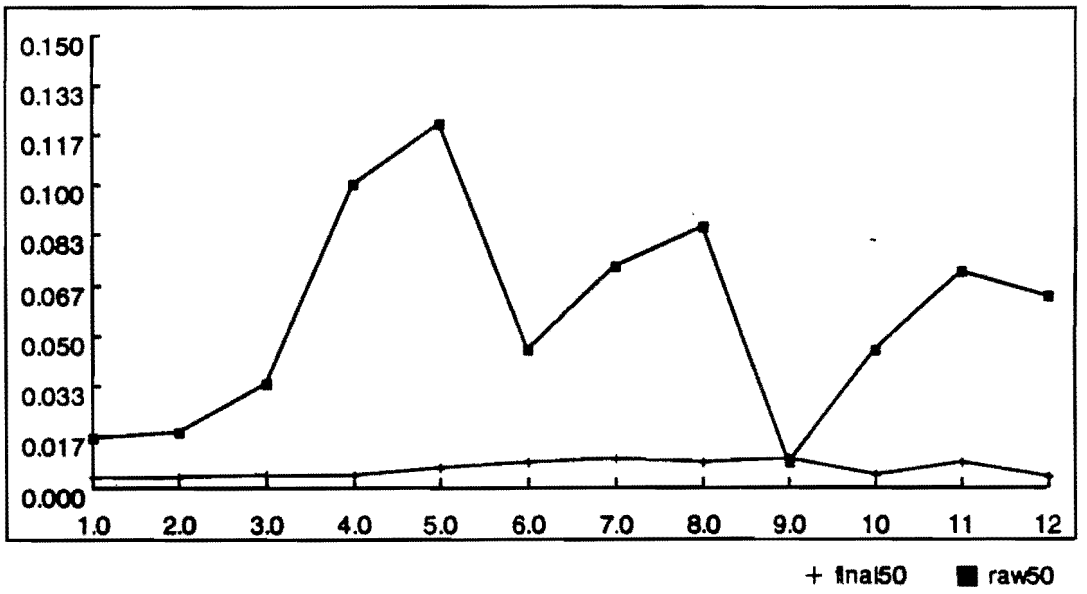
IRON concentration (mg/L).
JAN-1997 through DEC-1997



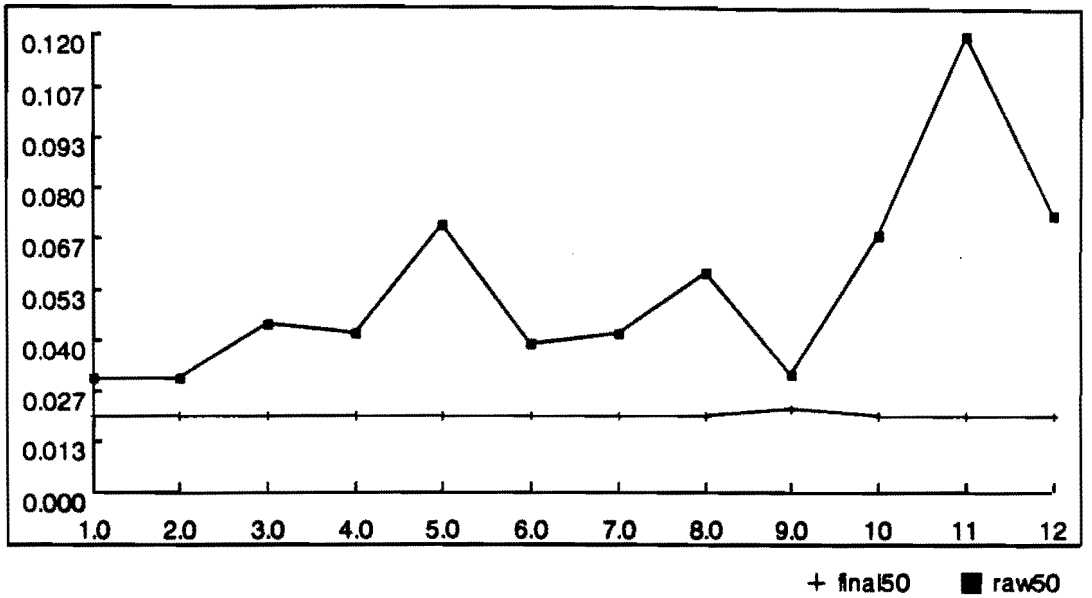
COPPER concentration (mg/L).
JAN-1997 through DEC-1997



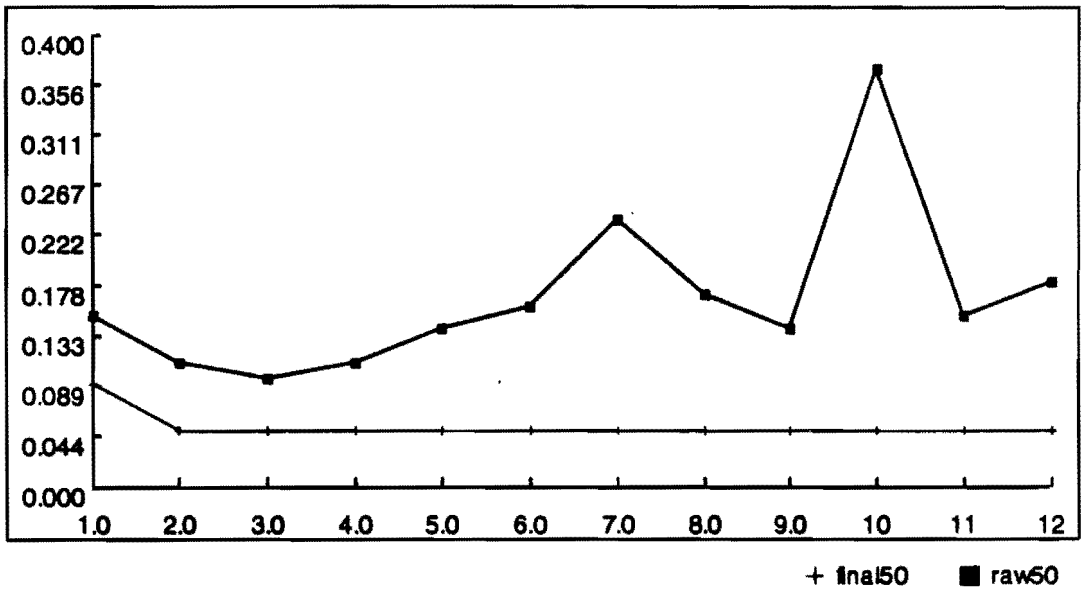
TOTAL_CHROMIUM concentration (mg/L).
JAN-1997 through DEC-1997



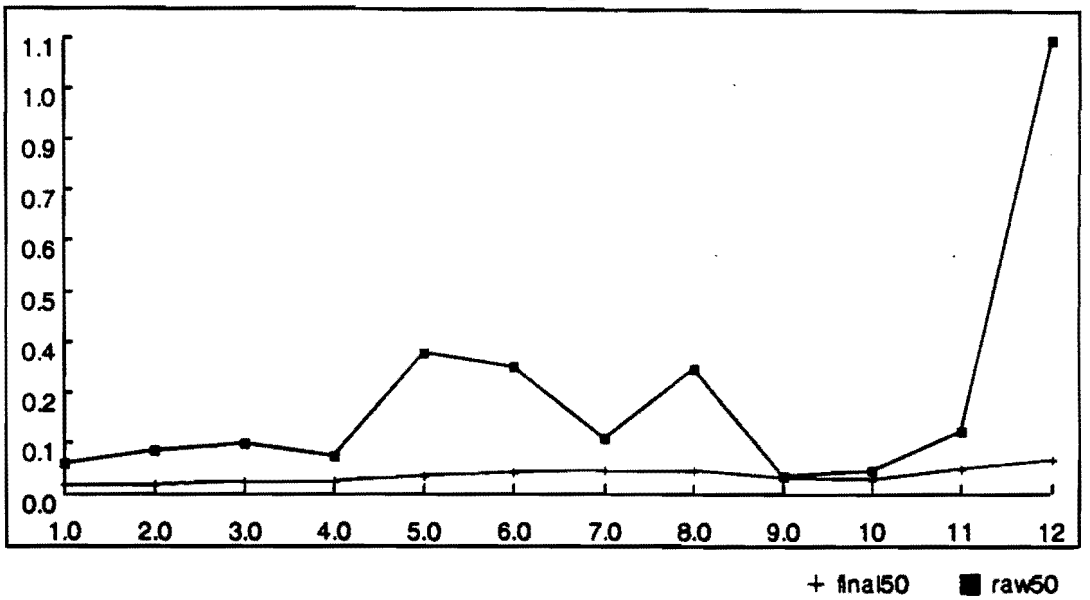
LEAD concentration (mg/L).
JAN-1997 through DEC-1997



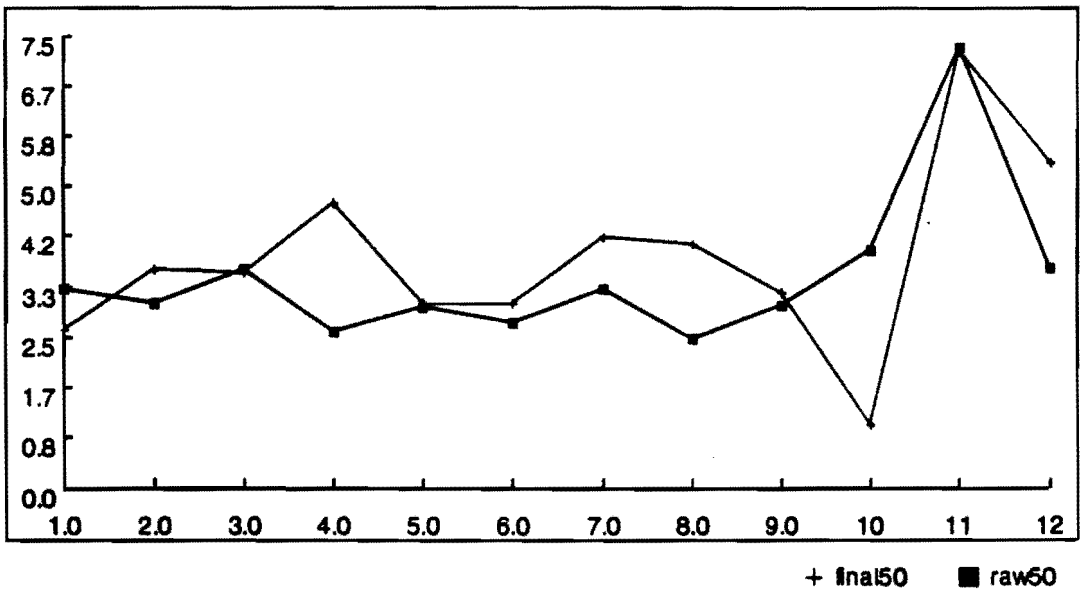
ZINC concentration (mg/L).
JAN-1997 through DEC-1997



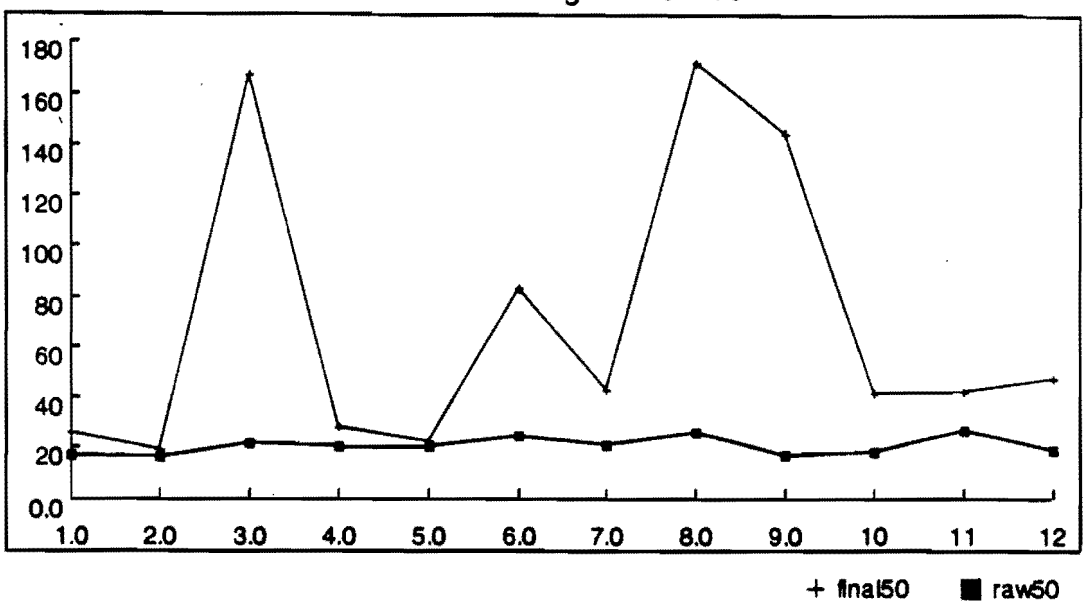
NICKEL concentration (mg/L).
JAN-1997 through DEC-1997



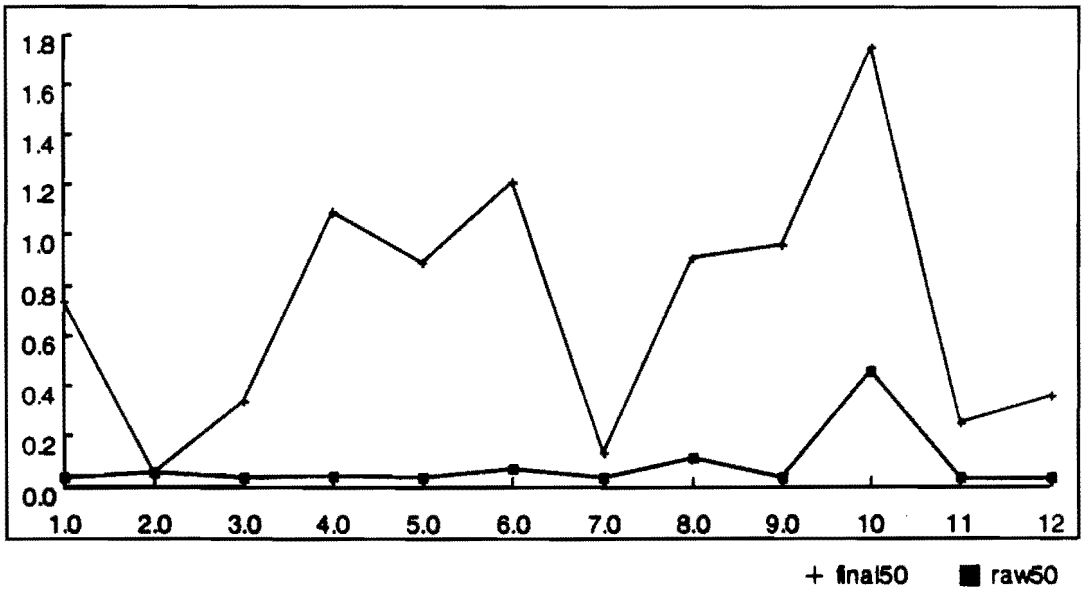
AMMONIA-N concentration (mg/L).
JAN-1997 through DEC-1997



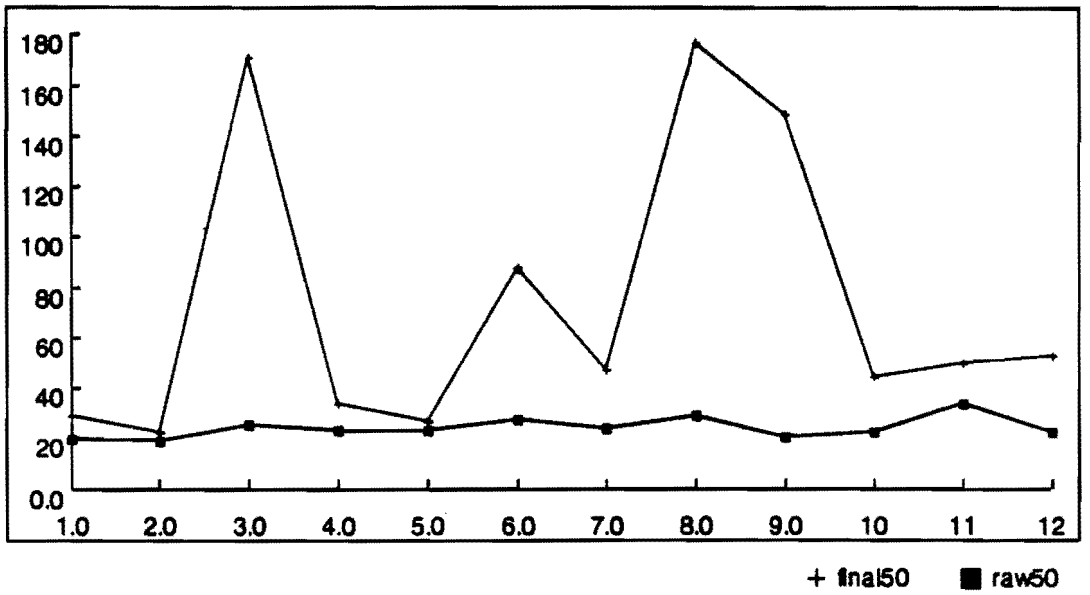
NITRATE-N concentration (mg/L).
JAN-1997 through DEC-1997



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	0.006	0.188	idl	idl	0.012	idl	No Data	idl
FEB-1997	2.688	0.005	0.0	idl	idl	0.008	idl	idl	idl
MAR-1997	2.782	0.008	0.335	idl	3.348e-4	0.007	idl	3.348e-5	idl
APR-1997	2.811	0.007	0.068	0.001	3.514e-4	0.01	0.002	0.026	0.004
MAY-1997	2.583	idl	0.184	0.002	5.534e-4	0.009	idl	idl	idl
JUN-1997	2.88	0.01	idl	idl	7.68e-4	0.01	idl	No Data	idl
JUL-1997	2.53	0.006	0.422	idl	9.487e-4	0.008	idl	2.741e-5	idl
AUG-1997	3.943	0.007	idl	3.113e-4	8.301e-4	0.015	idl	idl	idl
SEP-1997	2.668	0.012	1.423	idl	8.005e-4	0.008	0.002	3.024e-5	idl
OCT-1997	2.957	0.006	0.0	1.792e-4	3.584e-4	0.01	idl	idl	idl
NOV-1997	2.135	0.012	0.316	idl	6.325e-4	0.008	idl	3.953e-5	idl
DEC-1997	3.415	0.006	0.664	idl	2.846e-4	0.007	idl	2.524e-5	idl

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	0.008	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	0.008	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	2.868	0.012	1.423	LDL	8.005e-4	0.008	0.002	3.024e-5	LDL
OCT-1997	2.957	0.008	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

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

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

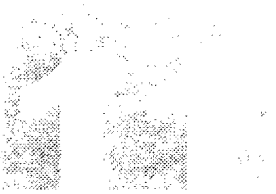
Chapter

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



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

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 = 1,472,697.0 liters Final = 1,502,105.0 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 = 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 Ci/l	Total (Ci)		FINAL 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 Ci/l	Total (Ci)		FINAL 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	0.008
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**

Appendix

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

Appendix

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

G

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 = ($^{Inf. - Eff.}/_{Inf.}$) × 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**
Number of samples: 1
All hold times were met.

Date Sampled: 5/1/97
Date Extracted: 5/7/97
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	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: 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: Michael K. Carey Date: 7/1/97

LOS ALAMOS NATIONAL LABORATORY ANALYTICAL CHEMISTRY	ANALYTICAL NONCONFORMANCE REPORT

Reported by: A. Lombardo

Date Reported: 6/30/97

Request No.: 100018791

NCR No.: 97.009

Analysis: Semivol

Matrix: Water

Analytical Area (check appropriate box):

- ☐ Sample control
- ☐ GC
- ☐ Wet chemistry
- ☐ Data review
- ☒ Organic preparation
- ☐ HPLC
- ☐ Metals
- ☐ Radiochemistry
- ☐ Inorganic preparation
- ☒ GCMS
- ☐ Reporting
- ☐ 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): Michael T. Cox 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										
12										
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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

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 Rawson	Mike Rawson	6/23/97
Analyst Name (print)	Analyst Signature	Date
Anthony Lombardo	Anthony Lombardo	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	**Customer Cost Code:**	M3592100	**Due Date :**	28-MAY-97
Requester Group:	CST-13	**Logged 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 #:**			

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

DP
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

Analyst	Review	Team Leader	QA Officer
			mag
Date	Date	7/14/97 Date	7/14/97 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."

4/27/97

LOS ALAMOS NATIONAL LABORATORY
CST-12 ORGANIC ANALYSIS GROUP

DATA REVIEW CERTIFICATION

Request Number: 10001 8791 Analysis: VOLATILES BY EPA 8260

The data contained in the enclosed report has been reviewed and approved by the people listed below:

LAURA C. ORTEGA		6/4/97
Analyst Name (print)	Analyst Signature	Date
Doris M. Quintana		6/5/97
Data Reviewer Name (print)	Data Reviewer Signature	Date

VOADRVCT.DOC

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.: SUB10001 8791 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)

Number TICs found: 3 Concentration Units: (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.				
13.				
14.				
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26.				
27.				
28.				
29.				
30.				

FORM I VOA-TIC 6/4/97 3/90

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	<5		ug/L	U
				cis-1,3-Dichloropropene				
				108-10-1 4-Methyl-2-Pentanone	<20		ug/L	U
				108-88-3 Toluene	<5		ug/L	U
				10061-02-6	<5		ug/L	U
				trans-1,3-Dichloropropene				
				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	<5		ug/L	U
				1,1,1,2-Tetrachloroethane				
				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	<5		ug/L	U
				1,1,2,2-Tetrachloroethane				
				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	10497.29	95-49-8 2-Chlorotoluene	<5		ug/L	U
				106-43-4 4-Chlorotoluene	<5		ug/L	U
				108-67-8	<5		ug/L	U
				1,3,5-Trimethylbenzene				
				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	<10		ug/L	U
				1,2-Dibromo-3-Chloropropane				
	200024694	300098060	10497.29	75-71-8	<100		ug/L	U
				Dichlorodifluoromethane				
				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	<50		ug/L	U
				Trichlorotrifluoroethane				
				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	<50		ug/L	U
				trans-1,2-Dichloroethene				
				75-34-3 1,1-Dichloroethane	<50		ug/L	U
				594-20-7 2,2-Dichloropropane	<50		ug/L	U
				156-59-2	<50		ug/L	U
				cis-1,2-Dichloroethene				

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	<50		ug/L	U
				cis-1,3-Dichloropropene				
				108-10-1 4-Methyl-2-Pentanone	<200		ug/L	U
				108-88-3 Toluene	<50		ug/L	U
				10061-02-6	<50		ug/L	U
				trans-1,3-Dichloropropene				
				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	<50		ug/L	U
				1,1,1,2-Tetrachloroethane				
				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	<50		ug/L	U
				1,1,2,2-Tetrachloroethane				
				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	<50		ug/L	U
				1,3,5-Trimethylbenzene				
				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	<100		ug/L	U
				1,2-Dibromo-3-Chloropropane				

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

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 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 ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
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' a. BELIEVED PRESENT	b. BELIEVED ABSENT	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 ANALYSES	4. UNITS (specify if blank) a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
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 CONTIN ROM FRONT

1. POLLUTANT AND CAS NO. (if available)	MARK "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/
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

EPA I.D. NUMBER (copy from Item 1 o. I)	OUTFALL NUMBER
NM0890010515	051

CONTINUED FROM PAGE 3 OF FORM 2-C

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	
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	
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 FROM PAGE V-4

EPA I.D. NUMBER (copy from item 1 o 1)	OUTFALL NUMBER
NM0890010515	051

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO OF ANALYSES
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	[illegible]
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' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO OF ANALYSES
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	I
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-Benzo-fluoranthene (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-Chloro-ethoxy) Methane (111-91-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
11B. Bis (2-Chloro-ethyl) Ether (111-44-4)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
12B. Bis (2-Chloro-isopropyl) Ether (102-80-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
13B. Bis (2-Ethyl-hexyl) Phthalate (117-81-7)		X		4 j	0.0007					1	ug / L	lbs/day	N/A	N/A	N/
14B. 4-Bromo-phenyl 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-Chloro-naphthalene (91-58-7)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
17B. 4-Chloro-phenyl 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-Dichloro-benzene (95-50-1)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
21B. 1,3-Dichloro-benzene (541-73-1)		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' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
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
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
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

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CONTINUED FROM PAGE V-6

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)		X		< 10	< 0.002	Data not available.				1	ug / L	lbs/day	N/A	N/A	N/A
23B. 3,3-Dichlorobenzidine (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-Dinitrotoluene (121-14-2)		X		< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
28B. 2,6-Dinitrotoluene (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-Diphenylhydrazine (as Azobenzene) (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. Hexachlorobenzene (118-74-1)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
34B. Hexachlorobutadiene (87-68-3)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
35B. Hexachlorocyclopentadiene (77-47-4)			X	< 10	< 0.002					1	ug / L	lbs/day	N/A	N/A	N/A
36B. Hexachloroethane (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-Nitrosodimethylamine (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' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
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 (Chloromethyl) 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	
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. Chlorodibromomethane (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-Chloroethylvinyl 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. Dichlorobromomethane (75-27-4)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
13V. Dichlorodifluoromethane (75-71-8)				N/A c	N/A					N/A	N/A	N/A	N/A	N/A	N/A
14V. 1,1-Dichloroethane (75-34-3)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
15V. 1,2-Dichloroethane (107-06-2)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
16V. 1,1-Dichloroethylene (75-35-4)			X	< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
17V. 1,2-Dichloropropane (78-87-5)		X		< 5	< 0.000871					1	ug / L	lbs/day	N/A	N/A	N/A
18V. 1,3-Dichloropropylene (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

EPA I.D. NUMBER (copy from Item 1 of 1)	OUTFALL NUMBER
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CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	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 ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
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/Da
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**	Unit
Total Arsenic	3	EPA 206.2	Grab	0.00	0.00	mg/L	0.000	0.000	Lbs/Da
Total Boron	3	EPA 200.7	Grab	0.2	0.20	mg/L	0.073	0.041	Lbs/Da
Total Cadmium	1	EPA 200.8	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Da
Total Chromium	1	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Da
Total Cobalt	3	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Da
Total Copper	1	EPA 200.7	Grab	0.1	0.10	mg/L	0.037	0.021	Lbs/Da
Total Lead	1	EPA 200.8	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Da
Total Vanadium	3	EPA 200.7	Grab	0.01	0.003	mg/L	0.004	0.001	Lbs/Da
Total Zinc	1	EPA 200.7	Grab	0.0	0.00	mg/L	0.000	0.000	Lbs/Da
Total Aluminum	3	EPA 200.7	Grab	0.1	0.10	mg/L	0.037	0.021	Lbs/Da
Total Selenium	3	EPA 270.2	Grab	0.00	0.00	mg/L	0.000	0.000	Lbs/Da
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/Da
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.

ATTACHMENT 7.0

Effluent Canyon Surface Water Monitoring

-Summary Table of Results

-Assaigai Analytical Laboratories, Inc. Report

Effluent Canyon[2]
Surface Water Monitoring
Sample Type: Water, Filtered
Units: mg/L

Sample ID No.	Sample Date	Al	Ag	As	B	Ba	Cd	Cr	Co	Cu	Fe	Hg	Mn	Mo	Ni	Pb	Se	Zn
EFF.022599	2/25/99	<0.5	<0.02	<0.06	<0.1	0.02	<0.008	<0.04	<0.01	<0.04	0.3	<0.0002	0.056	<0.5	<0.04	<0.06	<0.05	<0.1
EFFA.022599	2/25/99	<0.5	<0.02	<0.06	<0.1	0.02	<0.008	<0.04	<0.01	<0.04	0.3	<0.0002	0.055	<0.5	<0.04	<0.06	>0.05	<0.1

Sample ID No.	Sample Date	pH[1]	TDS	Cl	F	NO3-N	PO4-P	SO4	Alkalinity
EFF.022599	2/25/99	7.9	238	7.1	0.7	<0.1	0.9	4.4	116
EFFA.022599	2/25/99	7.9	235	7.0	0.7	<0.1	1.0	4.5	114

Notes:
[1] pH is expressed in standard units.
[2] Sampling location is approximately 100 yards above TA-50 outfall in Effluent Canyon.

ASSAIGAI ANALYTICAL LABORATORIES, INC.

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LOS ALAMOS NATIONAL LABS
attn: **BOB BEERS**
PO BOX 1663-MSK497
LOS ALAMOS, NM, 87545

*** explanation of codes**

B	analyte detected in Method Blank
E	result is estimated
H	analyzed out of hold time
N	tentatively identified compound
S	subcontracted
1-9	see footnote

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**
Project: **9902242 DP-1132 APP. 7C18WE3A00000000**

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID ***EFF.022599*** Sample Matrix ***H20*** Sample Collected ***02/25/99 10:15:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 245.1 CVAA							
9902242-01A	M99295	7439-97-6	Mercury	ND	mg / L	1	0.0002		MT.1999.525-4	03/10/99
			Test: EPA200 series AA-FL							
9902242-01A	M99305	7439-98-7	Molybdenum	ND	mg / L	1	0.5		MW.1999.272-12	03/09/99
			Test: EPA200.7 ICP							
9902242-01A	M99275	7429-90-5	Aluminum	ND	mg / L	1	0.5		MW.1999.255-21	03/03/99
	M99275	7440-38-2	Arsenic	ND	mg / L	1	0.06		MW.1999.255-21	
	M99275	7440-39-3	Barium	0.02	mg / L	1	0.01		MW.1999.255-21	
	M99275	7440-42-8	Boron	ND	mg / L	1	0.1		MW.1999.260-42	03/05/99
	M99275	7440-43-9	Cadmium	ND	mg / L	1	0.008		MW.1999.255-21	03/03/99
	M99275	7440-47-3	Chromium	ND	mg / L	1	0.04		MW.1999.255-21	
	M99275	7440-48-4	Cobalt	ND	mg / L	1	0.01		MW.1999.255-21	
	M99275	7440-50-8	Copper	ND	mg / L	1	0.04		MW.1999.255-21	
	M99275	7439-89-6	Iron	0.3	mg / L	1	0.2		MW.1999.255-21	
	M99275	7439-92-1	Lead	ND	mg / L	1	0.06		MW.1999.260-42	03/05/99
	M99275	7439-96-5	Manganese	0.056	mg / L	1	0.01		MW.1999.255-21	03/03/99
	M99275	7440-02-0	Nickel	ND	mg / L	1	0.04		MW.1999.255-21	
	M99275	7782-49-2	Selenium	ND	mg / L	1	0.05		MW.1999.255-21	
	M99275	7440-22-4	Silver	ND	mg / L	1	0.02		MW.1999.255-21	
	M99275	7440-66-6	Zinc	ND	mg / L	1	0.1		MW.1999.255-21	
			Test: EPA 150.1							
9902242-01B	WPH9921		pH	7.9	units	1	0.1	H	MT.1999.458-1	02/27/99

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Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242** **DP-1132 APP. 7C18WE3A00000000**

		Test: EPA 160.1							
9902242-01B	TD994	Total Dissolved Solids	238	mg / L	1	10		MT.1999.479-2	03/02/99
		Test: EPA 300.0							
9902242-01B	W9939	Chloride	7.1	mg / L	1	0.5		MW.1999.236-4	02/27/99
	W9939	Fluoride	0.7	mg / L	1	0.5		MW.1999.236-4	
	W9939	Nitrate, as N	ND	mg / L	1	0.1	H	MW.1999.236-4	
	W9939	Nitrite, as N	ND	mg / L	1	0.1	H	MW.1999.236-4	
	W9939	Orthophosphate, as P	0.9	mg / L	1	0.4	H	MW.1999.236-4	
	W9939	Sulfate	4.4	mg / L	1	0.5		MW.1999.236-4	
		Test: EPA 310.1							
9902242-01B	ALK998	Alkalinity, Bicarbonate	116	mg / L	1	2		MT.1999.468-21	03/01/99

Client Sample ID ***EFFA.022599*** Sample Matrix ***H20*** Sample Collected ***02/25/99 10:30:00***

Fraction	QC Group	CAS #		Result	Units	Dilution Factor	Detection Limit	*	Sequence	Run Date
			Test: EPA 245.1 CVAA							
9902242-02A	M99295	7439-97-6	Mercury	ND	mg / L	1	0.0002		MT.1999.525-5	03/10/99
			Test: EPA200 series AA-FL							
9902242-02A	M99305	7439-98-7	Molybdenum	ND	mg / L	1	0.5		MW.1999.272-13	03/09/99
			Test: EPA200.7 ICP							
9902242-02A	M99275	7429-90-5	Aluminum	ND	mg / L	1	0.5		MW.1999.255-24	03/03/99
	M99275	7440-38-2	Arsenic	ND	mg / L	1	0.06		MW.1999.255-24	
	M99275	7440-39-3	Barium	0.02	mg / L	1	0.01		MW.1999.255-24	
	M99275	7440-42-8	Boron	ND	mg / L	1	0.1		MW.1999.260-45	03/05/99
	M99275	7440-43-9	Cadmium	ND	mg / L	1	0.008		MW.1999.255-24	03/03/99
	M99275	7440-47-3	Chromium	ND	mg / L	1	0.04		MW.1999.255-24	
	M99275	7440-48-4	Cobalt	ND	mg / L	1	0.01		MW.1999.255-24	
	M99275	7440-50-8	Copper	ND	mg / L	1	0.04		MW.1999.255-24	
	M99275	7439-89-6	Iron	0.3	mg / L	1	0.2		MW.1999.255-24	
	M99275	7439-92-1	Lead	ND	mg / L	1	0.06		MW.1999.260-45	03/05/99
	M99275	7439-96-5	Manganese	0.055	mg / L	1	0.01		MW.1999.255-24	03/03/99
	M99275	7440-02-0	Nickel	ND	mg / L	1	0.04		MW.1999.255-24	
	M99275	7782-49-2	Selenium	ND	mg / L	1	0.05		MW.1999.255-24	
	M99275	7440-22-4	Silver	ND	mg / L	1	0.02		MW.1999.255-24	
	M99275	7440-66-6	Zinc	ND	mg / L	1	0.1		MW.1999.255-24	
			Test: EPA 150.1							
9902242-02B	WPH9921		pH	7.9	units	1	0.1	H	MT.1999.458-2	02/27/99
			Test: EPA 160.1							
9902242-02B	TD994		Total Dissolved Solids	235	mg / L	1	10		MT.1999.479-3	03/02/99
			Test: EPA 300.0							
9902242-02B	W9939		Chloride	7.0	mg / L	1	0.5		MW.1999.236-5	02/27/99
	W9939		Fluoride	0.7	mg / L	1	0.5		MW.1999.236-5	

Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242 DP-1132 APP. 7C18WE3A00000000**

9902242-02B	W9939	Nitrate, as N	ND	mg / L	1	0.1	H	MW.1999.236-5	02/27/99
	W9939	Nitrite, as N	ND	mg / L	1	0.1	H	MW.1999.236-5	
	W9939	Orthophosphate, as P	1.0	mg / L	1	0.4	H	MW.1999.236-5	
	W9939	Sulfate	4.5	mg / L	1	0.5		MW.1999.236-5	
		Test: EPA 310.1							
9902242-02B	ALK998	Alkalinity, Bicarbonate	114	mg / L	1	2		MT.1999.468-22	03/01/99

**** Sample specific analytical Detection Limit is determined by multiplying the sample Dilution Factor by the listed method Detection Limit. ****
**** Results relate only to the items tested. ****

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242 DP-1132 APP. 7C18WE3A00000000**

* explanation of codes	
D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

QC Type **LCS: Lab Control Spike** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-002	Molybdenum	115	(%) Recov		MW.1999.272-10	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-002	Aluminum	100	(%) Recov		MW.1999.255-18	03/03/99
	M99275-002	Arsenic	99	(%) Recov		MW.1999.255-18	
	M99275-002	Barium	98	(%) Recov		MW.1999.255-18	
	M99275-002	Boron	108	(%) Recov		MW.1999.260-40	03/05/99
	M99275-002	Cadmium	104	(%) Recov		MW.1999.255-18	03/03/99
	M99275-002	Chromium	100	(%) Recov		MW.1999.255-18	
	M99275-002	Cobalt	98	(%) Recov		MW.1999.255-18	
	M99275-002	Copper	99	(%) Recov		MW.1999.255-18	
	M99275-002	Iron	104	(%) Recov		MW.1999.255-18	
	M99275-002	Lead	101	(%) Recov		MW.1999.260-40	03/05/99
	M99275-002	Manganese	101	(%) Recov		MW.1999.255-18	03/03/99
	M99275-002	Nickel	98	(%) Recov		MW.1999.255-18	
	M99275-002	Selenium	100	(%) Recov		MW.1999.255-18	
	M99275-002	Silver	101	(%) Recov		MW.1999.255-18	
	M99275-002	Zinc	100	(%) Recov		MW.1999.255-18	

QC Type **LCSD: Lab Control Spike Duplicate Accuracy** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-003	Molybdenum	106	(%) Recov		MW.1999.272-11	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-003	Aluminum	111	(%) Recov		MW.1999.255-19	03/03/99
	M99275-003	Arsenic	110	(%) Recov		MW.1999.255-19	
	M99275-003	Barium	107	(%) Recov		MW.1999.255-19	
	M99275-003	Boron	105	(%) Recov		MW.1999.260-41	03/05/99
	M99275-003	Cadmium	114	(%) Recov		MW.1999.255-19	03/03/99
	M99275-003	Chromium	110	(%) Recov		MW.1999.255-19	
	M99275-003	Cobalt	108	(%) Recov		MW.1999.255-19	
	M99275-003	Copper	109	(%) Recov		MW.1999.255-19	
	M99275-003	Iron	113	(%) Recov		MW.1999.255-19	
	M99275-003	Lead	98	(%) Recov		MW.1999.260-41	03/05/99
	M99275-003	Manganese	111	(%) Recov		MW.1999.255-19	03/03/99
	M99275-003	Nickel	108	(%) Recov		MW.1999.255-19	
	M99275-003	Selenium	110	(%) Recov		MW.1999.255-19	
	M99275-003	Silver	113	(%) Recov		MW.1999.255-19	
	M99275-003	Zinc	110	(%) Recov		MW.1999.255-19	

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242** **DP-1132 APP. 7C18WE3A00000000**

* explanation of codes	
D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

QC Type **LCSD: Lab Control Spike Duplicate Precision** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-003	Molybdenum	8	(%) RPD		MW.1999.272-11	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-003	Aluminum	10	(%) RPD		MW.1999.255-19	03/03/99
	M99275-003	Arsenic	11	(%) RPD		MW.1999.255-19	
	M99275-003	Barium	9	(%) RPD		MW.1999.255-19	
	M99275-003	Boron	3	(%) RPD		MW.1999.260-41	03/05/99
	M99275-003	Cadmium	10	(%) RPD		MW.1999.255-19	03/03/99
	M99275-003	Chromium	9	(%) RPD		MW.1999.255-19	
	M99275-003	Cobalt	9	(%) RPD		MW.1999.255-19	
	M99275-003	Copper	10	(%) RPD		MW.1999.255-19	
	M99275-003	Iron	8	(%) RPD		MW.1999.255-19	
	M99275-003	Lead	2	(%) RPD		MW.1999.260-41	03/05/99
	M99275-003	Manganese	9	(%) RPD		MW.1999.255-19	03/03/99
	M99275-003	Nickel	10	(%) RPD		MW.1999.255-19	
	M99275-003	Selenium	10	(%) RPD		MW.1999.255-19	
	M99275-003	Silver	11	(%) RPD		MW.1999.255-19	
	M99275-003	Zinc	9	(%) RPD		MW.1999.255-19	

QC Type **MB: Method Blank** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-001	Molybdenum	ND	mg / L		MW.1999.272-8	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-001	Aluminum	ND	mg / L		MW.1999.255-17	03/03/99
	M99275-001	Arsenic	ND	mg / L		MW.1999.255-17	
	M99275-001	Barium	ND	mg / L		MW.1999.255-17	
	M99275-001	Boron	ND	mg / L		MW.1999.260-39	03/05/99
	M99275-001	Cadmium	ND	mg / L		MW.1999.255-17	03/03/99
	M99275-001	Chromium	ND	mg / L		MW.1999.255-17	
	M99275-001	Cobalt	ND	mg / L		MW.1999.255-17	
	M99275-001	Copper	ND	mg / L		MW.1999.255-17	
	M99275-001	Iron	ND	mg / L		MW.1999.255-17	
	M99275-001	Lead	ND	mg / L		MW.1999.260-39	03/05/99
	M99275-001	Manganese	ND	mg / L		MW.1999.255-17	03/03/99
	M99275-001	Nickel	ND	mg / L		MW.1999.255-17	
	M99275-001	Selenium	ND	mg / L		MW.1999.255-17	
	M99275-001	Silver	ND	mg / L		MW.1999.255-17	
	M99275-001	Zinc	ND	mg / L		MW.1999.255-17	

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242** **DP-1132 APP. 7C18WE3A00000000**

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type **MS: Matrix Spike** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-006	Molybdenum	115	(%) Recov		MW.1999.272-14	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-006	Aluminum	92	(%) Recov		MW.1999.255-22	03/03/99
	M99275-006	Arsenic	88	(%) Recov		MW.1999.255-22	
	M99275-006	Barium	88	(%) Recov		MW.1999.255-22	
	M99275-006	Boron	98	(%) Recov		MW.1999.260-43	03/05/99
	M99275-006	Cadmium	94	(%) Recov		MW.1999.255-22	03/03/99
	M99275-006	Chromium	90	(%) Recov		MW.1999.255-22	
	M99275-006	Cobalt	90	(%) Recov		MW.1999.255-22	
	M99275-006	Copper	91	(%) Recov		MW.1999.255-22	
	M99275-006	Iron	93	(%) Recov		MW.1999.255-22	
	M99275-006	Lead	88	(%) Recov		MW.1999.260-43	03/05/99
	M99275-006	Manganese	91	(%) Recov		MW.1999.255-22	03/03/99
	M99275-006	Nickel	89	(%) Recov		MW.1999.255-22	
	M99275-006	Selenium	93	(%) Recov		MW.1999.255-22	
	M99275-006	Silver	92	(%) Recov		MW.1999.255-22	
	M99275-006	Zinc	91	(%) Recov		MW.1999.255-22	

QC Type **MSD: Matrix Spike Duplicate Accuracy** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-007	Molybdenum	100	(%) Recov		MW.1999.272-15	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-007	Aluminum	98	(%) Recov		MW.1999.255-23	03/03/99
	M99275-007	Arsenic	94	(%) Recov		MW.1999.255-23	
	M99275-007	Barium	94	(%) Recov		MW.1999.255-23	
	M99275-007	Boron	102	(%) Recov		MW.1999.260-44	03/05/99
	M99275-007	Cadmium	101	(%) Recov		MW.1999.255-23	03/03/99
	M99275-007	Chromium	94	(%) Recov		MW.1999.255-23	
	M99275-007	Cobalt	95	(%) Recov		MW.1999.255-23	
	M99275-007	Copper	97	(%) Recov		MW.1999.255-23	
	M99275-007	Iron	100	(%) Recov		MW.1999.255-23	
	M99275-007	Lead	91	(%) Recov		MW.1999.260-44	03/05/99
	M99275-007	Manganese	98	(%) Recov		MW.1999.255-23	03/03/99
	M99275-007	Nickel	95	(%) Recov		MW.1999.255-23	
	M99275-007	Selenium	98	(%) Recov		MW.1999.255-23	
	M99275-007	Silver	98	(%) Recov		MW.1999.255-23	
	M99275-007	Zinc	97	(%) Recov		MW.1999.255-23	

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242** **DP-1132 APP. 7C18WE3A00000000**

* explanation of codes	
D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

QC Type **MSD: Matrix Spike Duplicate Precision** QC Matrix **DW**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA200 series AA-FL					
M99305	M99305-007	Molybdenum	13	(%) RPD		MW.1999.272-15	03/09/99
		Test: EPA200.7 ICP					
M99275	M99275-007	Aluminum	6	(%) RPD		MW.1999.255-23	03/03/99
	M99275-007	Arsenic	7	(%) RPD		MW.1999.255-23	
	M99275-007	Barium	7	(%) RPD		MW.1999.255-23	
	M99275-007	Boron	4	(%) RPD		MW.1999.260-44	03/05/99
	M99275-007	Cadmium	8	(%) RPD		MW.1999.255-23	03/03/99
	M99275-007	Chromium	5	(%) RPD		MW.1999.255-23	
	M99275-007	Cobalt	6	(%) RPD		MW.1999.255-23	
	M99275-007	Copper	6	(%) RPD		MW.1999.255-23	
	M99275-007	Iron	6	(%) RPD		MW.1999.255-23	
	M99275-007	Lead	3	(%) RPD		MW.1999.260-44	03/05/99
	M99275-007	Manganese	7	(%) RPD		MW.1999.255-23	03/03/99
	M99275-007	Nickel	6	(%) RPD		MW.1999.255-23	
	M99275-007	Selenium	6	(%) RPD		MW.1999.255-23	
	M99275-007	Silver	6	(%) RPD		MW.1999.255-23	
	M99275-007	Zinc	7	(%) RPD		MW.1999.255-23	

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9902242** **DP-1132 APP. 7C18WE3A00000000**

* explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type **LCS: Lab Control Spike** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 160.1					
TD994	TD994(2)	Total Dissolved Solids	99	% Recovery		MT.1999.472-2	02/26/99
		Test: EPA 245.1 CVAA					
M99295	M99295(1)	Mercury	100	% Recovery		MT.1999.525-1	03/10/99
		Test: EPA 300.0					
W9939	W9939-002	Chloride	104	% Recovery		MW.1999.231-43	02/26/99
	W9939-002	Fluoride	104	% Recovery		MW.1999.231-43	
	W9939-002	Nitrate, as N	104	% Recovery		MW.1999.231-43	
	W9939-002	Nitrite, as N	106	% Recovery		MW.1999.231-43	
	W9939-002	Orthophosphate, as P	107	% Recovery		MW.1999.231-43	
	W9939-002	Sulfate	101	% Recovery		MW.1999.231-43	

QC Type **LCSD: Lab Control Spike Duplicate Accuracy** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 160.1					
TD994	TD994(3)	Total Dissolved Solids	99	% Recovery		MT.1999.472-3	02/26/99
		Test: EPA 245.1 CVAA					
M99295	M99295(2)	Mercury	102	% Recovery		MT.1999.525-2	03/10/99
		Test: EPA 300.0					
W9939	W9939-003	Chloride	103	% Recovery		MW.1999.231-44	02/26/99
	W9939-003	Fluoride	102	% Recovery		MW.1999.231-44	
	W9939-003	Nitrate, as N	102	% Recovery		MW.1999.231-44	
	W9939-003	Nitrite, as N	102	% Recovery		MW.1999.231-44	
	W9939-003	Orthophosphate, as P	104	% Recovery		MW.1999.231-44	
	W9939-003	Sulfate	102	% Recovery		MW.1999.231-44	

QC Type **LCSD: Lab Control Spike Duplicate Precision** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 160.1					
TD994	TD994(3)	Total Dissolved Solids	< 1	PFA		MT.1999.472-3	02/26/99
		Test: EPA 245.1 CVAA					
M99295	M99295(2)	Mercury	2	RPD		MT.1999.525-2	03/10/99

*** explanation of codes**

D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

		Test: EPA 300.0					
W9939	W9939-003	Chloride	1	RPD		MW.1999.231-44	02/26/99
	W9939-003	Fluoride	1	RPD		MW.1999.231-44	
	W9939-003	Nitrate, as N	1	RPD		MW.1999.231-44	
	W9939-003	Nitrite, as N	3	RPD		MW.1999.231-44	
	W9939-003	Orthophosphate, as P	3	RPD		MW.1999.231-44	
	W9939-003	Sulfate	< 1	RPD		MW.1999.231-44	

QC Type **MB: Method Blank** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 160.1					
TD994	TD994(1)	Total Dissolved Solids	ND	mg / L		MT.1999.472-1	02/26/99
		Test: EPA 245.1 CVAA					
M99295	M99295(3)	Mercury	ND	mg / L		MT.1999.525-3	03/10/99
		Test: EPA 300.0					
W9939	W9939-001	Chloride	ND	mg / L		MW.1999.231-42	02/26/99
	W9939-001	Fluoride	ND	mg / L		MW.1999.231-42	
	W9939-001	Nitrate, as N	ND	mg / L		MW.1999.231-42	
	W9939-001	Nitrite, as N	ND	mg / L		MW.1999.231-42	
	W9939-001	Orthophosphate, as P	ND	mg / L		MW.1999.231-42	
	W9939-001	Sulfate	ND	mg / L		MW.1999.231-42	

QC Type **MD: Matrix Duplicate** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 150.1					
WPH9921	WPH9921(3)	pH	0.02	DIFF		MT.1999.458-3	02/27/99
		Test: EPA 160.1					
TD994	TD994(9)	Total Dissolved Solids	1	PFA		MT.1999.472-9	02/26/99

QC Type **MS: Matrix Spike** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 245.1 CVAA					
M99295	M99295(7)	Mercury	180	% Recovery		MT.1999.525-7	03/10/99
		Test: EPA 300.0					
W9939	W9939-005	Chloride	104	% Recovery		MW.1999.231-46	02/26/99
	W9939-005	Fluoride	103	% Recovery		MW.1999.231-46	

*** explanation of codes**

D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

W9939	W9939-005	Nitrate, as N	103	% Recovery		MW.1999.231-46	02/26/99
	W9939-005	Nitrite, as N	106	% Recovery		MW.1999.231-46	
	W9939-005	Orthophosphate, as P	107	% Recovery		MW.1999.231-46	
	W9939-005	Sulfate	101	% Recovery		MW.1999.231-46	

QC Type **MSD: Matrix Spike Duplicate Accuracy** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 245.1 CVAA					
M99295	M99295(6)	Mercury	176	% Recovery		MT.1999.525-6	03/10/99
		Test: EPA 300.0					
W9939	W9939-006	Chloride	104	% Recovery		MW.1999.231-47	02/26/99
	W9939-006	Fluoride	102	% Recovery		MW.1999.231-47	
	W9939-006	Nitrate, as N	103	% Recovery		MW.1999.231-47	
	W9939-006	Nitrite, as N	107	% Recovery		MW.1999.231-47	
	W9939-006	Orthophosphate, as P	106	% Recovery		MW.1999.231-47	
	W9939-006	Sulfate	101	% Recovery		MW.1999.231-47	

QC Type **MSD: Matrix Spike Duplicate Precision** QC Matrix **WATER**

QC Group	Run ID		Result	Units	*	Sequence	Run Date
		Test: EPA 245.1 CVAA					
M99295	M99295(6)	Mercury	2	RPD		MT.1999.525-6	03/10/99
		Test: EPA 300.0					
W9939	W9939-006	Chloride	< 1	RPD		MW.1999.231-47	02/26/99
	W9939-006	Fluoride	< 1	RPD		MW.1999.231-47	
	W9939-006	Nitrate, as N	< 1	RPD		MW.1999.231-47	
	W9939-006	Nitrite, as N	< 1	RPD		MW.1999.231-47	
	W9939-006	Orthophosphate, as P	< 1	RPD		MW.1999.231-47	
	W9939-006	Sulfate	< 1	RPD		MW.1999.231-47	

ATTACHMENT 8.0

Geologic Log and Well Construction Information

Mortandad Canyon Monitoring Wells

MCO-8.2, MCO-13, and MCO-7A

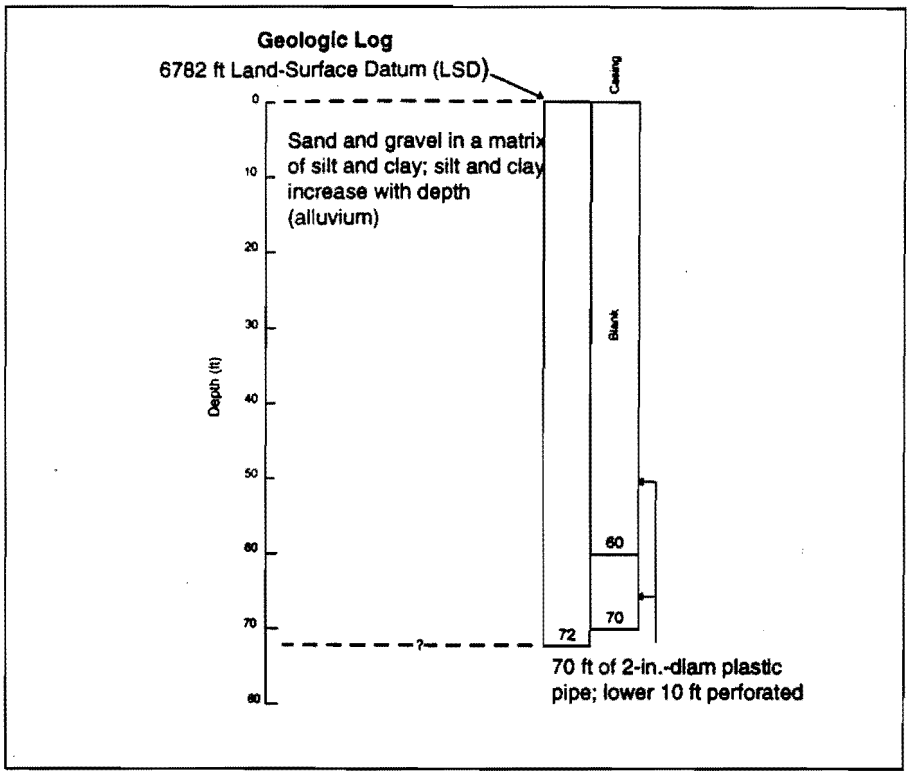

Fig. VI-O. Mortandad Canyon observation well MCO-8.2, completed November 1961, water level 59.2 ft (Purtymun 1964).

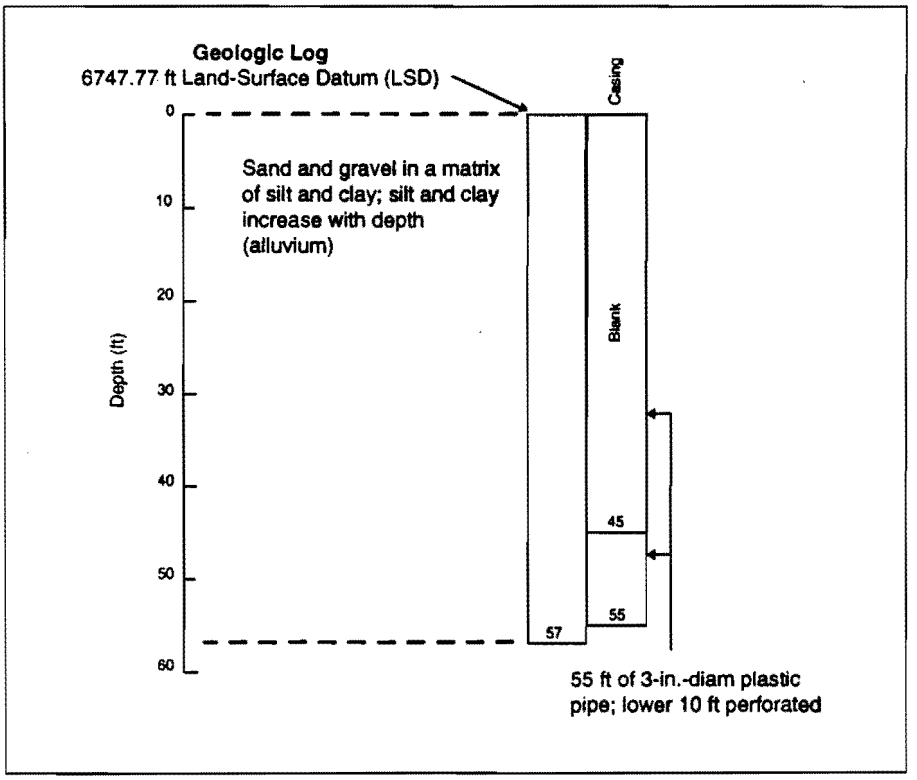

Fig. VI-P. Mortandad Canyon observation well MCO-9, completed November 1961, dry (Purtymun 1964).

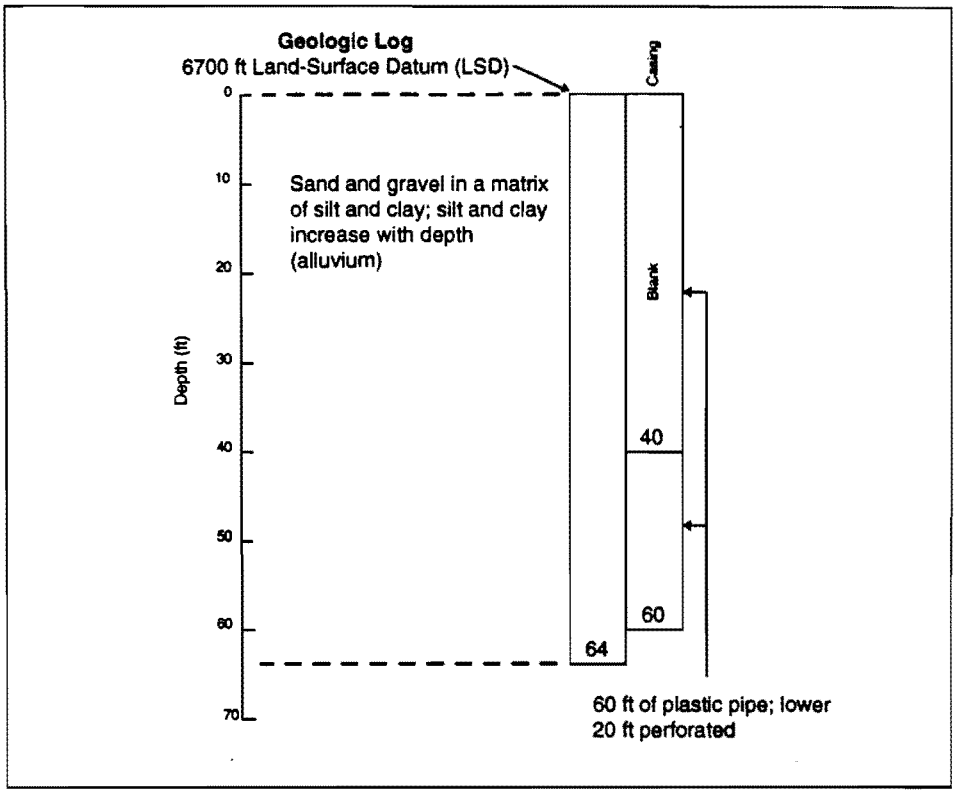

Fig. VI-T. Mortandad Canyon observation well, MCO-12, completed November 1961, dry; June 1971, well was dry, casing was pulled, well was abandoned, plugged, and relocated to the north about 12 ft (Purtymun 1964).

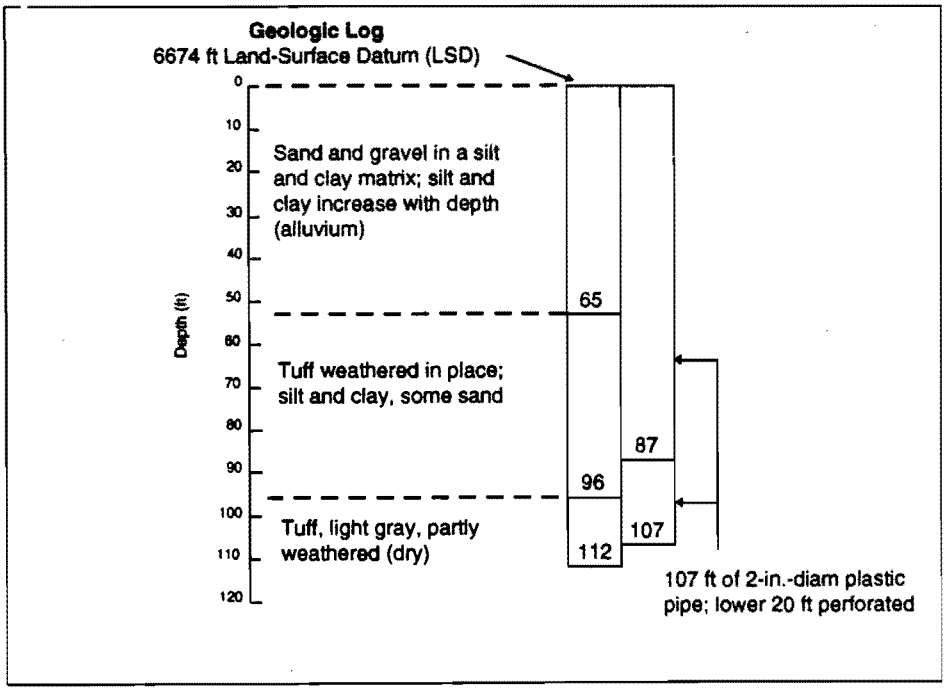

Fig. VI-U. Mortandad Canyon observation well MCO-13, completed July 1970, dry (Purtymun 1970).

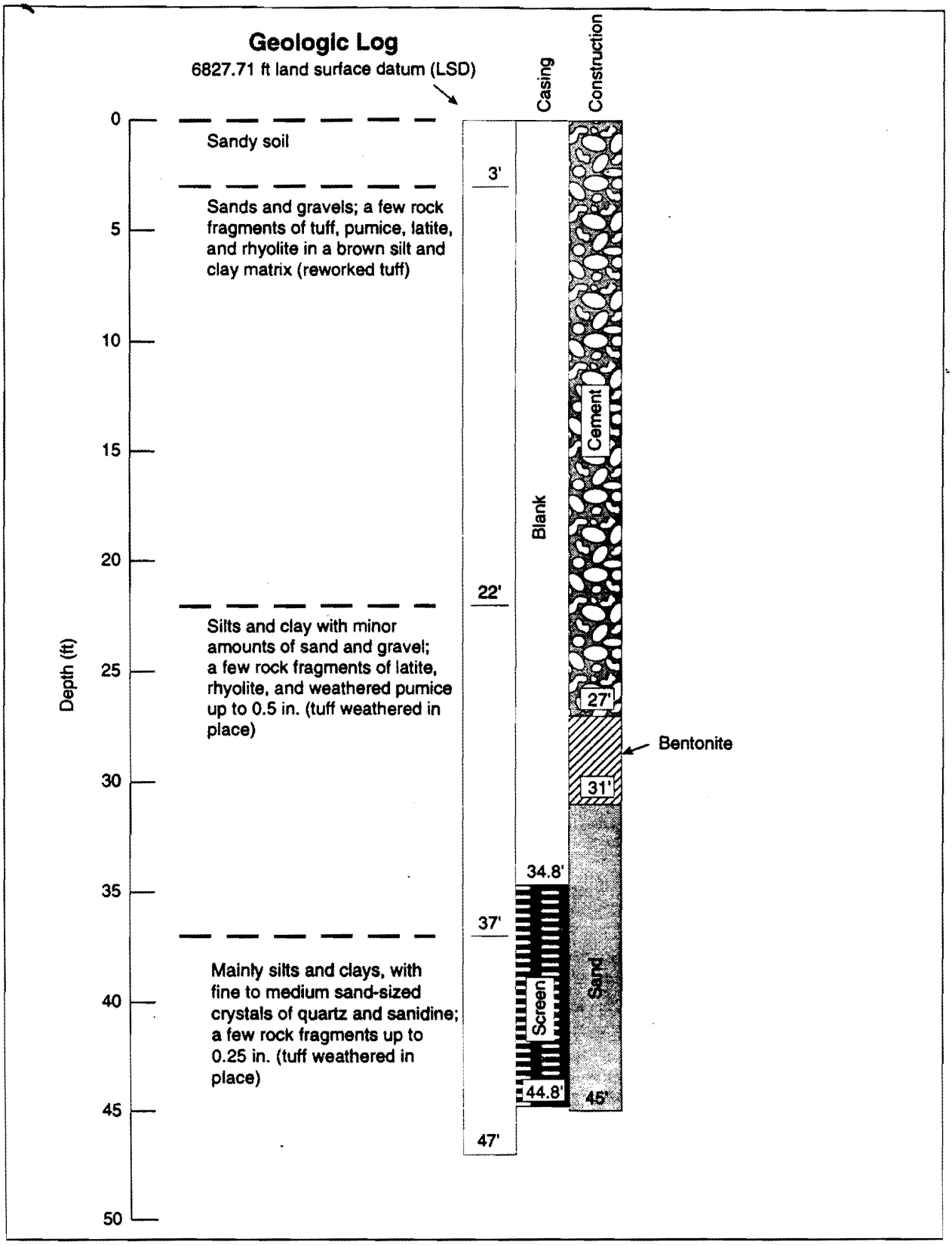

Fig. VIII-O. Mortandad Canyon observation well MCO-7A, completed November 1989, water level 35.2 ft (Purtymun and Stoker 1990).

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

Observation Wells	Date Completed	Depth Drilled (ft)	Depth Completed (ft)	Depth 1991	Water Levels At Completion (ft)	Water Levels At Present Date	Water Levels (ft)	Elevation Land-Surface Datum (LSD) (ft)	Top of Casing (Measuring Point) to Land Surface Datum	Remarks
MCO-1 1991	11/60	8	8	—	2.8	—	—	7153	—	Unable to locate in
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.

ATTACHMENT 9.0

TABLE 1. Mortandad Canyon Test Well (TW)-8 Chemical Quality of Ground Water for 1998

TABLE 2. Mortandad Canyon Monitoring Alluvial Ground Water Quality for 1998 and 1999 MCO-3, MCO-4B, MCO-6, and MCO-7

Mortandad Canyon Test Well (TW) - 8
Chemical Quality of Ground Water for 1998

SAMPLE DATE	SUITE	ANALYTE	RESULT	UNCERTAINTY	UNITS
9/2/98	Gen_Inorg	Cl	3.50	0.50	mg/L
9/2/98	Gen_Inorg	Cl	3.60	0.50	mg/L
9/2/98	Gen_Inorg	CN	< 0.01	0.01	mg/L
9/2/98	Gen_Inorg	CN	< 0.01	0.01	mg/L
9/2/98	Gen_Inorg	F	0.15	0.02	mg/L
9/2/98	Gen_Inorg	F	0.15	0.02	mg/L
9/2/98	Gen_Inorg	NO3-N	0.26	0.03	mg/L
9/2/98	Gen_Inorg	NO3-N	0.28	0.03	mg/L
9/2/98	Gen_Inorg	pH	7.45	0.10	pH
9/2/98	Gen_Inorg	pH	7.53	0.10	pH
9/2/98	Gen_Inorg	TDS	144	14	mg/L
9/2/98	Gen_Inorg	TDS	140	14	mg/L
9/2/98	Metals	Ag	< 10	0	ug/l
9/2/98	Metals	Ag	< 10	0	ug/l
9/2/98	Metals	Al	< 50	50	ug/l
9/2/98	Metals	Al	< 50	50	ug/l
9/2/98	Metals	As	< 2	2	ug/L
9/2/98	Metals	As	< 2	2	ug/L
9/2/98	Metals	B	25	20	ug/l
9/2/98	Metals	B	33	20	ug/l
9/2/98	Metals	Ba	8	1	ug/l
9/2/98	Metals	Ba	8	2	ug/l
9/2/98	Metals	Be	< 3	2	ug/l
9/2/98	Metals	Be	< 3	2	ug/l
9/2/98	Metals	Cd	< 7	7	ug/l
9/2/98	Metals	Cd	< 7	7	ug/l
9/2/98	Metals	Co	< 8	8	ug/l
9/2/98	Metals	Co	< 8	8	ug/l
9/2/98	Metals	Cr	< 7	7	ug/l
9/2/98	Metals	Cr	< 7	7	ug/l
9/2/98	Metals	Cu	< 10	10	ug/l
9/2/98	Metals	Cu	< 10	10	ug/l
9/2/98	Metals	Fe	117	20	ug/l
9/2/98	Metals	Fe	135	20	ug/l
9/2/98	Metals	Hg	< 0.2	0.03	ug/L
9/2/98	Metals	Hg	< 0.2	0.03	ug/L
9/2/98	Metals	Mn	5	2	ug/l
9/2/98	Metals	Mn	4	3	ug/l
9/2/98	Metals	Mo	< 30	30	ug/l
9/2/98	Metals	Mo	< 30	30	ug/l
9/2/98	Metals	Ni	< 20	20	ug/l
9/2/98	Metals	Ni	< 20	20	ug/l
9/2/98	Metals	Pb	5	3	ug/L
9/2/98	Metals	Pb	5	3	ug/L
9/2/98	Metals	Se	< 2	2	ug/L
9/2/98	Metals	Se	< 2	2	ug/L
9/2/98	Metals	Zn	665	67	ug/l
9/2/98	Metals	Zn	709	71	ug/l

Chemical Quality of Ground Water for 1998

SAMPLE DATE	SUITE	ANALYTE	RESULT	UNCERTAINTY	UNITS
36040	Organics	Acenaphthene	< 10		ug/L
36040	Organics	Acenaphthene	< 10		ug/L
36040	Organics	Acenaphthylene	< 10		ug/L
36040	Organics	Acenaphthylene	< 10		ug/L
36040	Organics	Aniline	< 10		ug/L
36040	Organics	Aniline	< 10		ug/L
36040	Organics	Anthracene	< 10		ug/L
36040	Organics	Anthracene	< 10		ug/L
36040	organics	Aroclor 1016	< 2.5		ug/L
36040	organics	Aroclor 1016	< 2.5		ug/L
36040	organics	Aroclor 1221	< 2.5		ug/L
36040	organics	Aroclor 1221	< 2.5		ug/L
36040	organics	Aroclor 1232	< 2.5		ug/L
36040	organics	Aroclor 1232	< 2.5		ug/L
36040	organics	Aroclor 1242	< 2.5		ug/L
36040	organics	Aroclor 1242	< 2.5		ug/L
36040	organics	Aroclor 1248	< 2.5		ug/L
36040	organics	Aroclor 1248	< 2.5		ug/L
36040	organics	Aroclor 1254	< 2.5		ug/L
36040	organics	Aroclor 1254	< 2.5		ug/L
36040	organics	Aroclor 1260	< 2.5		ug/L
36040	organics	Aroclor 1260	< 2.5		ug/L
36040	organics	Aroclor 1262	< 2.5		ug/L
36040	organics	Aroclor 1262	< 2.5		ug/L
36040	Organics	Azobenzene	< 10		ug/L
36040	Organics	Azobenzene	< 10		ug/L
36040	Organics	Benzidine [m-]	< 50		ug/L
36040	Organics	Benzidine [m-]	< 50		ug/L
36040	Organics	Benzo[a]anthracene	< 10		ug/L
36040	Organics	Benzo[a]anthracene	< 10		ug/L
36040	Organics	Benzo[a]pyrene	< 10		ug/L
36040	Organics	Benzo[a]pyrene	< 10		ug/L
36040	Organics	Benzo[b]fluoranthene	< 10		ug/L
36040	Organics	Benzo[b]fluoranthene	< 10		ug/L
36040	Organics	Benzo[g,h,i]perylene	< 10		ug/L
36040	Organics	Benzo[g,h,i]perylene	< 10		ug/L
36040	Organics	Benzo[k]fluoranthene	< 10		ug/L
36040	Organics	Benzo[k]fluoranthene	< 10		ug/L
36040	Organics	Benzoic acid	< 50		ug/L
36040	Organics	Benzoic acid	< 50		ug/L
36040	Organics	Benzyl alcohol	< 10		ug/L
36040	Organics	Benzyl alcohol	< 10		ug/L
36040	Organics	Bis(2-chloroethoxy)methane	< 10		ug/L
36040	Organics	Bis(2-chloroethoxy)methane	< 10		ug/L
36040	Organics	Bis(2-chloroethyl)ether	< 10		ug/L
36040	Organics	Bis(2-chloroethyl)ether	< 10		ug/L
36040	Organics	Bis(2-chloroisopropyl)ether	< 10		ug/L
36040	Organics	Bis(2-chloroisopropyl)ether	< 10		ug/L
36040	Organics	Bis(2-ethylhexyl)phthalate	< 10		ug/L
36040	Organics	Bis(2-ethylhexyl)phthalate	< 10		ug/L

Chemical Quality of Ground Water for 1998

SAMPLE DATE	SUITE	ANALYTE	RESULT	UNCERTAINTY	UNITS
36040	Organics	Bromophenylphenyl ether [4-]	< 10		ug/L
36040	Organics	Bromophenylphenyl ether [4-]	< 10		ug/L
36040	Organics	Butyl benzyl phthalate	< 10		ug/L
36040	Organics	Butyl benzyl phthalate	< 10		ug/L
36040	Organics	Chloro-3-methylphenol [4-]	< 10		ug/L
36040	Organics	Chloro-3-methylphenol [4-]	< 10		ug/L
36040	Organics	Chloroaniline [4-]	< 10		ug/L
36040	Organics	Chloroaniline [4-]	< 10		ug/L
36040	Organics	Chloronaphthalene [2-]	< 10		ug/L
36040	Organics	Chloronaphthalene [2-]	< 10		ug/L
36040	Organics	Chlorophenol [o-]	< 10		ug/L
36040	Organics	Chlorophenol [o-]	< 10		ug/L
36040	Organics	Chlorophenylphenyl ether [4-]	< 10		ug/L
36040	Organics	Chlorophenylphenyl ether [4-]	< 10		ug/L
36040	Organics	Chrysene	< 10		ug/L
36040	Organics	Chrysene	< 10		ug/L
36040	Organics	Di-n-butyl phthalate	< 10		ug/L
36040	Organics	Di-n-butyl phthalate	< 10		ug/L
36040	Organics	Di-n-octyl phthalate	< 10		ug/L
36040	Organics	Di-n-octyl phthalate	< 10		ug/L
36040	Organics	Dibenzo[a,h]anthracene	< 10		ug/L
36040	Organics	Dibenzo[a,h]anthracene	< 10		ug/L
36040	Organics	Dibenzofuran	< 10		ug/L
36040	Organics	Dibenzofuran	< 10		ug/L
36040	Organics	Dichlorobenzene (1,2) [o-]	< 10		ug/L
36040	Organics	Dichlorobenzene (1,2) [o-]	< 10		ug/L
36040	Organics	Dichlorobenzene (1,3) [m-]	< 10		ug/L
36040	Organics	Dichlorobenzene (1,3) [m-]	< 10		ug/L
36040	Organics	Dichlorobenzene (1,4) [p-]	< 10		ug/L
36040	Organics	Dichlorobenzene (1,4) [p-]	< 10		ug/L
36040	Organics	Dichlorobenzidine [3,3'-]	< 20		ug/L
36040	Organics	Dichlorobenzidine [3,3'-]	< 20		ug/L
36040	Organics	Dichlorophenol [2,4-]	< 10		ug/L
36040	Organics	Dichlorophenol [2,4-]	< 10		ug/L
36040	Organics	Diethyl phthalate	< 10		ug/L
36040	Organics	Diethyl phthalate	< 10		ug/L
36040	Organics	Dimethyl phthalate	< 10		ug/L
36040	Organics	Dimethyl phthalate	< 10		ug/L
36040	Organics	Dimethylphenol [2,4-]	< 10		ug/L
36040	Organics	Dimethylphenol [2,4-]	< 10		ug/L
36040	Organics	Dinitrophenol [2,4-]	< 50		ug/L
36040	Organics	Dinitrophenol [2,4-]	< 50		ug/L
36040	Organics	Dinitrotoluene [2,4-]	< 10		ug/L
36040	Organics	Dinitrotoluene [2,4-]	< 10		ug/L
36040	Organics	Dinitrotoluene [2,6-]	< 10		ug/L
36040	Organics	Dinitrotoluene [2,6-]	< 10		ug/L
36040	Organics	Fluoranthene	< 10		ug/L
36040	Organics	Fluoranthene	< 10		ug/L
36040	Organics	Fluorene	< 10		ug/L
36040	Organics	Fluorene	< 10		ug/L

Mortandad Canyon Test Well (TW) - 8
Chemical Quality of Ground Water for 1998

SAMPLE DATE	SUITE	ANALYTE	RESULT	UNCERTAINTY	UNITS
36040	Organics	Hexachlorobenzene	< 10		ug/L
36040	Organics	Hexachlorobenzene	< 10		ug/L
36040	Organics	Hexachlorobutadiene	< 50		ug/L
36040	Organics	Hexachlorobutadiene	< 50		ug/L
36040	Organics	Hexachlorocyclopentadiene	< 10		ug/L
36040	Organics	Hexachlorocyclopentadiene	< 10		ug/L
36040	Organics	Hexachloroethane	< 10		ug/L
36040	Organics	Hexachloroethane	< 10		ug/L
36040	Organics	Indeno[1,2,3-cd]pyrene	< 10		ug/L
36040	Organics	Indeno[1,2,3-cd]pyrene	< 10		ug/L
36040	Organics	Isophorone	< 10		ug/L
36040	Organics	Isophorone	< 10		ug/L
36040	Organics	Methyl-4,6-dinitrophenol [2-]	< 50		ug/L
36040	Organics	Methyl-4,6-dinitrophenol [2-]	< 50		ug/L
36040	Organics	Methylnaphthalene [2-]	< 10		ug/L
36040	Organics	Methylnaphthalene [2-]	< 10		ug/L
36040	Organics	Methylphenol [2-]	< 10		ug/L
36040	Organics	Methylphenol [2-]	< 10		ug/L
36040	Organics	Methylphenol [4-]	< 10		ug/L
36040	Organics	Methylphenol [4-]	< 10		ug/L
36040	Organics	Naphthalene	< 10		ug/L
36040	Organics	Naphthalene	< 10		ug/L
36040	Organics	Nitroaniline [2-]	< 20		ug/L
36040	Organics	Nitroaniline [2-]	< 20		ug/L
36040	Organics	Nitroaniline [3-]	< 20		ug/L
36040	Organics	Nitroaniline [3-]	< 20		ug/L
36040	Organics	Nitroaniline [4-]	< 20		ug/L
36040	Organics	Nitroaniline [4-]	< 20		ug/L
36040	Organics	Nitrobenzene	< 10		ug/L
36040	Organics	Nitrobenzene	< 10		ug/L
36040	Organics	Nitrophenol [2-]	< 10		ug/L
36040	Organics	Nitrophenol [2-]	< 10		ug/L
36040	Organics	Nitrophenol [4-]	< 50		ug/L
36040	Organics	Nitrophenol [4-]	< 50		ug/L
36040	Organics	Nitrosodi-n-propylamine [N-]	< 10		ug/L
36040	Organics	Nitrosodi-n-propylamine [N-]	< 10		ug/L
36040	Organics	Nitrosodimethylamine [N-]	< 10		ug/L
36040	Organics	Nitrosodimethylamine [N-]	< 10		ug/L
36040	Organics	Nitrosodiphenylamine [N-]	< 10		ug/L
36040	Organics	Nitrosodiphenylamine [N-]	< 10		ug/L
36040	Organics	Pentachlorophenol	< 50		ug/L
36040	Organics	Pentachlorophenol	< 50		ug/L
36040	Organics	Phenanthrene	< 10		ug/L
36040	Organics	Phenanthrene	< 10		ug/L
36040	Organics	Phenol	< 10		ug/L
36040	Organics	Phenol	< 10		ug/L
36040	Organics	Picoline [2-]	< 10		ug/L
36040	Organics	Picoline [2-]	< 10		ug/L
36040	Organics	Pyrene	< 10		ug/L
36040	Organics	Pyrene	< 10		ug/L

Chemical Quality of Ground Water for 1998

SAMPLE DATE	SUITE	ANALYTE	RESULT	UNCERTAINTY	UNITS
36040	Organics	Pyridine	< 10		ug/L
36040	Organics	Pyridine	< 10		ug/L
36040	Organics	Trichlorobenzene [1,2,4-]	< 10		ug/L
36040	Organics	Trichlorobenzene [1,2,4-]	< 10		ug/L
36040	Organics	Trichlorophenol [2,4,5-]	< 10		ug/L
36040	Organics	Trichlorophenol [2,4,5-]	< 10		ug/L
36040	Organics	Trichlorophenol [2,4,6-]	< 10		ug/L
36040	Organics	Trichlorophenol [2,4,6-]	< 10		ug/L
9/2/98	Rad	U	0.53	0.06	ug/L
9/2/98	Rad	U	0.41	0.05	ug/L

TABLE 2

Mortandad Canyon
Alluvial Ground Water Monitoring
Sample Type: water, filtered
Units: mg/L

	Sample Date: October, 1999					Sample Date: December, 1998					Sample Date: February, 1999				
Location	**NO3-N**	**TKN**	**NH3**	**TDS**	**F**	**NO3-N**	**TKN**	**NH3**	**TDS**	**F**	**NO3-N**	**TKN**	**NH3**	**TDS**	**F**
MCO-3	29.1	0.6	<0.2	507	1.1	36.4	0.7	<0.2	713	1.0	41.9	0.5	<0.2	595	0.9
MCO-4B	16.1	0.4	<0.2	355	1.3	14.0	0.6	<0.2	343	1.4	37.8	0.4	<0.2	505	1.0
MCO-6	13.7	0.4	<0.2	350	1.7	14.8	0.6	<0.2	374	1.7	17.0	0.4	<0.2	357	1.4
MCO-6 duplicate	NA	NA	NA	NA	NA	15.0	0.6	<0.2	378	1.6	17.8	0.4	<0.2	362	1.4
MCO-7	16.0	0.4	<0.2	355	1.7	14.0	0.6	<0.2	368	1.8	13.8	0.3	<0.2	354	1.7

Notes:
NA means that no duplicate sample was collected during this sampling event.

ATTACHMENT 10.0

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

Revision No. 2. March 1999

Table 3.0. Proposed Monitoring Plan for the RLWTF Ground Water Discharge Plan Application [Revision 2. March 1999].

LOCATION	PARAMETER	NOTES	FREQUENCY
Discharge Point	Volume, in gallons	8	Per batch
RLWTF Effluent Tank	NO3-N, F, TDS	7, 8	1/week
Raw Feed Sample Tap (influent)	Organics	6, 9	1/week
RLWTF Effluent Tank	Health, Secondary, Irrigation Stds	3, 4, 5, 7, 8	1/month
NPDES Sampling Tap	Radiochemistry	2, 8	1/month
MCO-3, 4B, 5, 6, 7A, 7.5, 8.2, 13	Total Nitrogen, F, TDS, Water Level	1, 8	Quarterly
TW-8	Total Nitrogen, F, TDS	1, 8	Quarterly
MCO-6	Health, Secondary, Irrigation Stds	3, 4, 5, 8	Quarterly
MCO-3, 4B, 5, 6, 7A, 7.5, 8.2, 13	Radiochemistry	2, 9	Annual
MCO-3, 4B, 5, 6, 7A, 7.5, 8.2, 13	Health, Secondary, Irrigation Stds	3, 4, 5, 9	Annual
MCO-3, 4B, 5, 6, 7A, 7.5, 8.2, 13	Organics	6, 9	1 per 3 Years
TW-8	Radiochemistry	2, 9	Annual
TW-8	Health, Secondary, Irrigation Stds	3, 4, 5, 9	Annual
TW-8	Organics	6, 9	1 per 3 Years
GS-1 Gaging Station	Surface Flows	9	Continuous

Notes:

1. Total Nitrogen: TKN, Ammonia, NO3-N.
2. Radiochemistry (3103 A): Combined Ra-226 & Ra-228.
3. Health Standards (3103 A.): Ag, As, Ba, Cd, CN, Cr, F, Hg, NO3, Pb, Se, U.
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. Flow proportioned composite sample from each treatment batch.
8. Data reported to NMED quarterly.
9. Data reported to NMED annually.
10. This Monitoring Plan includes only those wells available for sampling in March 1999. Future wells will be added to the Monitoring Plan as requested by the NMED GWQB.

ATTACHMENT 11.0

Location of Proposed Mortandad Canyon Bandelier Tuff Wells MCOBT-4.4 and MCOBT-8.5

Mortandad Canyon Work Plan
September 1997

- The three new regional aquifer wells and the existing well TW-8 completed in the regional aquifer will be sampled for analyses of low-level tritium and other chemical species to further evaluate impacts of Laboratory-derived contaminants on the regional aquifer. These analyses will also be used to test the hypothesis of mixing of young water (derived from shallow sources) with old water (regional aquifer) in Mortandad Canyon.

- Recommendations will be made regarding corrective measures to groundwater zones and monitoring strategies for the ER Project and/or Laboratory environmental surveillance.

Proposed alluvial wells, Bandelier Tuff wells, and regional aquifer wells are listed in Table 7.3.3-1, Table 7.3.3-2, and Table 7.3.3-3, respectively. Locations of the wells are shown in Figure 7.3.3-1 and Figure 7.3.3-2 (and also in Figure A-2 in Appendix A of this work plan).

TABLE 7.3.3-1

DESCRIPTION OF PROPOSED SURFACE WATER GAGING STATION AND ALLUVIAL/CERRO TOLEDO INTERVAL WELLS[a]

Well Designation[b]	Location[c]
GS-1.3	Proposed gaging station 1000 ft east of GS-1
MCO-3	Proposed replacement well for old MCO-3
MCO-0.6	Proposed observation well west of TA-50 RLWTF outfall
MCO-4B	Existing observation well east of TA-50 RLWTF outfall
TSCO-6A	Proposed well for lower Ten Site Canyon
MCO-7.2	Proposed well between MCO-7 and MCO-8 at sediment traps
MCO-6.8	Proposed well between MCO-6 and MCO-7 below confluence with Ten Site Canyon
MCO-13A and MCO-13B	Proposed wells near MCO-13

a. Alluvial/Cerro Toledo interval wells are listed in order of priority.
b. GS = gaging station, MC = Mortandad Canyon, O = observation, TSC = Ten Site Canyon
c. See Figure 7.3.3-1 for proposed locations.

TABLE 7.3.3-2

DESCRIPTION OF PROPOSED BANDELIER TUFF WELLS

Well Designation[a]	Location[b]
MCOBT-4.4	West of TW-8, near MCWB-4
MCOBT-8.5	East of MCC-8.2

a. MC = Mortandad Canyon, O = observation, BT = Bandelier Tuff
b. See Figure 7.3.3-2 for proposed locations.

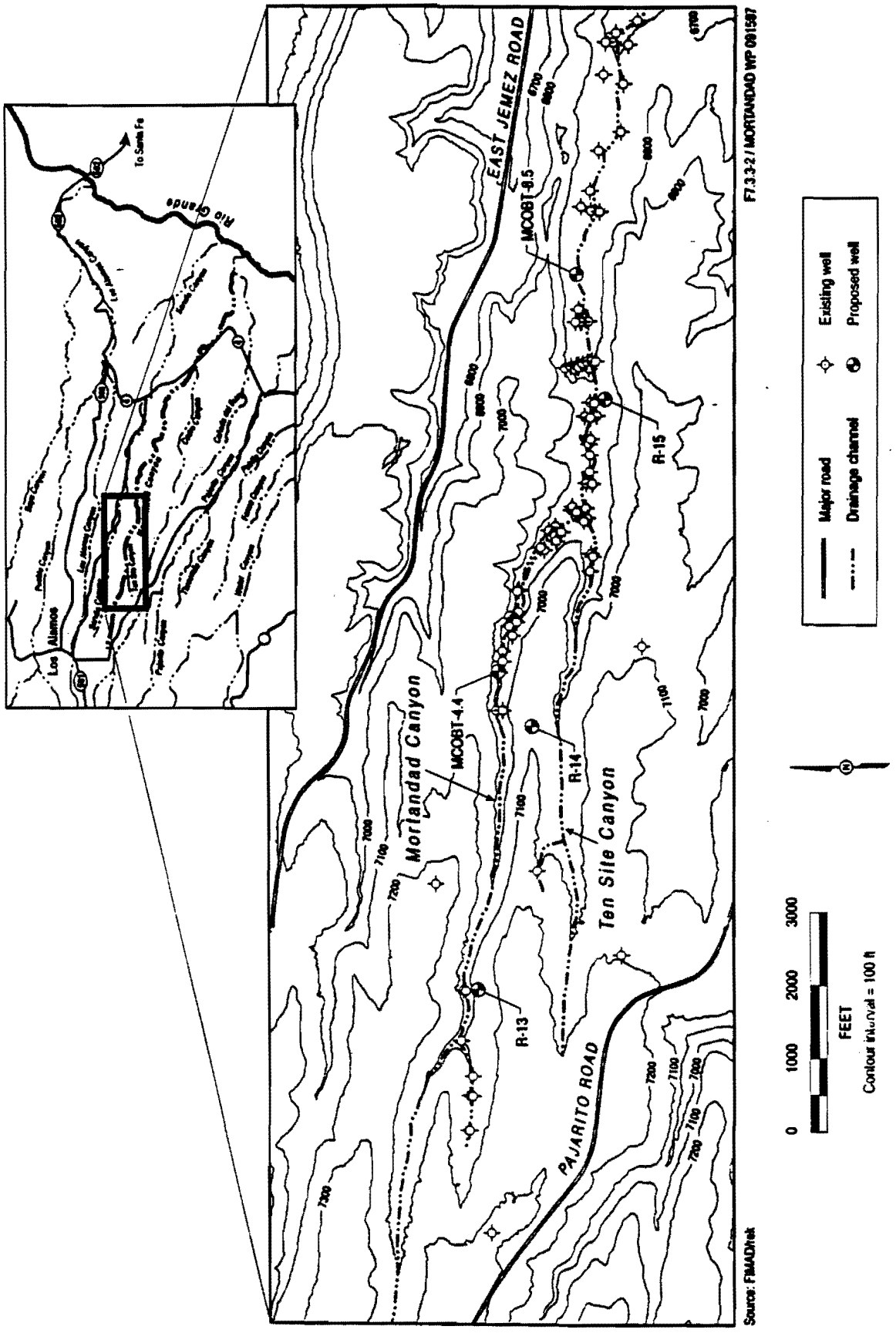

Figure 7.3.3-2. Locations of proposed Bandelier Tuff wells and regional aquifer wells.