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1	1	Cog. Eng - EQ Le	<i>[Signature]</i>	1/29/98				Operations - JE Geary	<i>[Signature]</i>		
1	1	Cog. Mgr - BH VonBargen/RJ Nicklas	<i>[Signature]</i>	1/29/98							
1	1	QA - MJ Warn	<i>[Signature]</i>	1/29/98							
1	1	Safety - MW Clayton	<i>[Signature]</i>	1/29/98							
1	1	Env - DL Flyckt	<i>[Signature]</i>	1/30/98							

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AUTHORIZATION BASES REVIEW FORM

Part A:

REFERENCE ITEM # HNF-2154, Rev. 0 Proposed Change/DiscoveryAPPROVAL DESIGNATOR EQTITLE 200 AREA EFFLUENT TREATMENT FACILITY PROCESS CONTROL PLAN 98-02

DESCRIPTION The Process Control Plan (PCP) provides a description of the background information, key objectives, and operating criteria defining Effluent Treatment Facility (ETF) Campaign 98-02. Approximately 18 million gallons of groundwater from the Hanford 200-UP-1 Site will be treated at ETF.

Originator Signature 1/29/98
Date

Part B:

Does the referenced item:

(check one)

- A. Increase risk from a hazard - to the workers &/or public beyond that previously analyzed, evaluated, and documented in the Authorization Bases? NO X Yes/Maybe___
- B. Reduce the reliability or effectiveness of features, controls, procedures, or processes used to mitigate hazards? NO X Yes/Maybe___
- C. Introduce a hazard not evaluated in the Authorization Bases? NO X Yes/Maybe___
- D. Reflect new information on existing hazards beyond that currently documented in the Authorization Bases? NO X Yes/Maybe___

DETERMINATION BASES:

The 200 Area Effluent Treatment Facility Auditable Safety Analysis (ASA), WHC-SD-ETF-ASA-001, (Rev 3) allows new/other waste streams to be processed within the ETF, and provides for use of alternate process configurations. Processing of UP-1 groundwater falls under the scope of the revised ASA.

Hazard analysis of the new groundwater transfer line between the UP-1 site and LERF is covered in the Groundwater Transfer System Final Hazard Category Determination, HNF-SD-LWPF-SAD-001, Rev. 0.

The Health and Safety Plan (HASP), HNF-IP-0931 Section 20, provides an overview of expected hazards, evaluation methods, and management controls used to maintain all exposures to environmental and occupational health and safety hazards As Low As Reasonably Achievable (ALARA).

The PCP provides for treatment of groundwater from the 200-UP-1 Site within the scope of the authorization basis for the 200 Area ETF.

Potential Impact, No Impact,
Item Remains Open ABR Closed

☐☒

Authorization Bases Evaluator 1/29/98
Date

☐☐

200 AREA EFFLUENT TREATMENT FACILITY PROCESS CONTROL PLAN 98-02

E. Q. Le

Waste Management Federal Services of Hanford, Richland, WA 99352
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Abstract: The document provides a description of background
information, key objectives, and operating criteria defining ETF
Campaign 98-02.

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Release Approval

1/30/98
Date

Approved for Public Release

**200 AREA EFFLUENT TREATMENT FACILITY
PROCESS CONTROL PLAN**

98-02

January 29, 1998

WASTE MANAGEMENT FEDERAL SERVICES OF HANFORD

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LIST OF TERMS

$\mu\text{g/L}$	micrograms per liter
$\mu\text{mho/cm}$	micromhos per centimeter
ARM	Area Radiation Monitor
BAT/AKART	best available technology/all known, available and reasonable treatment
CAM	Continuous Air Monitor
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	Hanford Site 200 Area Effluent Treatment Facility
HLAN	Hanford local area network
IRA	Interim Remedial Action
IX	Ion Exchange
LERF	Liquid Effluent Retention Facility
LIMS	Laboratory Information Management System
MCS	Monitor and Control System
mg/L	milligrams per liter
MTT	main treatment train
pCi/L	picocuries per liter
PCP	Process control plan
POP	Plant operating procedure
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RO	Reverse Osmosis
TSS	total suspended solids
SALDS	State-approved land disposal site
SAS	Special Analytical Services
STT	Secondary treatment train
SWRT	Secondary Waste Receiver Tank
WSCF	Waste Sampling and Characterization Facility

1.0 INTRODUCTION

This Process Control Plan (PCP) provides a description of the background information, key objectives, and operating criteria defining Effluent Treatment Facility (ETF) Campaign 98-02 as required per HNF-IP-0931 Section 37, "Process Control Plans".

Campaign 98-02 is expected to process approximately 18 millions gallons of groundwater with an assumption that the UP-1 groundwater pump will be shut down on June 30, 1998. This campaign will resume the UP-1 groundwater treatment operation from Campaign 97-01. The Campaign 97-01 was suspended in November 1997 to allow RCRA waste in LERF Basin 42 to be treated to meet the "Land Disposal Restriction Clean Out" requirements.

The decision to utilize ETF as part of the selected interim remedial action of the 200-UP-1 Operable Unit is documented by the *Declaration of the Record of Decision*, (Ecology, EPA and DOE 1997). The treatment method was chosen in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) as amended by the *Superfund Amendments and Reauthorization Act of 1986* (SARA), the *Hanford Federal Facility Agreement and Consent Order* (known as the Tri-Party Agreement or TPA), and to the extent practicable, the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP).

2.0 CAMPAIGN OBJECTIVE

The primary objective of ETF Campaign 98-02 is to successfully treat the UP-1 groundwater at a rate necessary to support the UP-1 Interim Remedial Action (IRA) objectives. Liquid level measurements in LERF Basin 43 will be used as a measure of success to this campaign objective. Based on ETF feed flow rate of 85 gpm and 18 millions processable volume of groundwater, the campaign duration is estimated to be approximately 176 days including planned maintenance outages. Campaign duration may be adjusted as necessary to support UP-1 IRA programmatic changes.

A Performance Agreement (PA WM 4.1.1) has been established for ETF operation during this campaign. To achieve this PA, groundwater from LERF Basin 43 must be pumped to the ETF at an average flow rate of at least 65 gpm throughout the campaign.

Groundwater extracted from the 200-UP-1 extraction wells is being pumped via an underground pipeline to the LERF prior to treatment at ETF. Studies have indicated the extraction of one pore volume of groundwater from the UP-1 capture zone at a pumping rate of 50 gpm will meet IRA objectives (6/30/98). The goal of the UP-1 IRA is to reduce the groundwater uranium and technetium-99 concentrations to below ten times the cleanup level and to reduce contaminant mass (including nitrate and carbon-tetrachloride co-contaminants) such that potential downgradient risks are reduced (Ecology, EPA and DOE 1997).

Major activities required during Campaign 98-02 are as follows:

- Continued transfer of the groundwater from the UP-1 Operable Unit to the Liquid Effluent Retention Facility (LERF) Basin 43 and then to ETF.
- Reduce or remove contaminants in groundwater to levels that meet criteria established in the environmental permits.
- Handle, package, and transport secondary solid waste to the Environmental Restoration Disposal Facility (ERDF) in an environmentally compliant manner.
- Discharge the treated effluent to a State Approved Land Disposal Site (SALDS).

3.0 FEED DESCRIPTION

3.1 UP-1 Groundwater History

Between 1951 and 1968, U-Plant process wastewater consisting primarily of dilute nitric acid containing uranium, technetium-99, and other fission products, was discharged to the soil column in the 200 West Area of the Hanford Site. Process water from Z-Plant containing high concentrations of carbon tetrachloride was also discharged to the soil column. Subsequently, these contaminants have reached the groundwater and may present a danger to public health, welfare and the environment.

3.2 UP-1 Groundwater Composition

The groundwater was recently sampled from LERF Basin 43 on October 15 and November 13 1997. Of the 65 analytes listed below in Table 1 (Appendix F), only eight constituents exceeded SALDS discharge requirements. The constituents that exceeded the SALDS discharge requirements are: carbon tetrachloride, uranium, sulfate, nitrate, gross alpha, gross beta, technetium-99, and total dissolved solids. The constituents in the groundwater may change as the campaign progresses. This is dependent upon plume concentrations and movement toward the extraction well at the UP-1 site. The levels of constituents listed in Appendix F represent feed concentrations during the initial phases of the campaign. A Laboratory Data Summary Report of the groundwater in LERF Basin 43 is provided in Appendix G.

A total of 14 million gallons of groundwater has been processed through ETF during Campaign 97-01. Approximate 17.3 Kg of Uranium and 1.51E-01 Curie of Tc-99 were removed after the end of Campaign 97-01. Based on the characterization data on the groundwater, uranium and Tc-99 concentrations are slightly decreasing.

4.0 BACKGROUND

4.1 ETF Configurations

ETF has two configurations to process water through the plant depending on the chemical characteristic of the feed. ETF configuration 1 is designed to handle wastewaters with chemical characteristics similar to the 242-A evaporator process condensate. ETF configuration 2 is designed to handle waste water with high nitrate and organic levels. Since the ground water data has showed reduced organic concentrations below permit limits, configuration 1 will be used to process the solution. Additionally, configuration 1 was proven adequate for processing ground water in Campaign 97-01.

4.2 ETF Configuration 1 Description

FIGURE 1

Under Configuration 1, the MTT process begins with a prefilter for removal of coarse suspended solids, followed by the surge tank where the pH of the waste stream is adjusted. Next, the waste stream is filtered to remove any additional suspended solids introduced at the surge tank. The process water is then exposed to ultraviolet light, which provides a general sterilization effect that reduces biogrowth contamination in downstream equipment including the Fine Filter, the Degasification Column, and the Reverse Osmosis membranes.

Sulfuric acid is then added, which converts carbonate and bicarbonate ions to carbon dioxide for subsequent removal in the degasification column. When the Surge Tank is dosed with hydrogen peroxide to kill accumulated biogrowth, the combination of UV lamp radiation and catalytic action within the Peroxide Decomposer Modules will destroy the residual peroxide. Residual hydrogen peroxide, if present, can be destroyed to acceptance levels for the RO membranes downstream via a granular activated charcoal medium in decomposer columns. These columns can be bypassed for periods of time in the event of pluggage.

A third filtration stage removes fine suspended solids. Next, dissolved carbon dioxide and other gases are removed by a degasification column. The resulting gas stream is directed to the facility offgas system. The process water then passes through a two-stage reverse osmosis (RO) unit, which removes dissolved solids. Additional dissolved solids and radionuclides are removed by mixed-bed ion exchange (IX) columns and the process water is discharged to a verification (holding) tank.

The MTT treated process water is stored in a verification tank until sample analyses confirm that release is permissible.

The ETF secondary treatment train (STT) provides for the collection and processing of the waste materials separated from the MTT process flow stream. Flow streams from MTT include: fine filter backwash, RO reject stream, ion exchange regeneration waste, and liquid from the sumps.

Waste collected in either of the two secondary waste receiving tanks is pH adjusted then batch fed to the evaporator recirculation loop. The liquid waste is heated to vaporization temperature. The vapor passes through an entrainment separator where the resulting liquid droplets and solids are separated from the vapor phase. The vapor is compressed and passes through the evaporator heater where it releases its energy and condenses. The condensate is then returned to the surge tank. As water leaves the secondary waste stream in the vapor phase, the boiling point of the evaporator concentrate within the vapor body increases to a pre-determined value that triggers a momentary discharge of waste concentrate to one of two concentrate receiving tanks. Discharged material is then replaced in the evaporator by additional secondary waste receiving tank batch feed.

Secondary waste concentrate may require bulking and pH adjustment, and is then batch fed to the thin film dryer. The water fraction of the feed is evaporated by auxiliary steam heat and flows through the vapor outlet to a spray condenser. The spray condenser separates entrained vapor and solid waste and also condenses the vapor. The resulting distillate is returned to the surge tank. The powdered solid material is mechanically removed from the dryer cylinder walls and deposited into 55-gallon drum storage containers.

4.3 LERF

The LERF consists of three identical surface-recessed holding basins. Each basin features primary and secondary liner with floating cover, a leachate collection system, and a pump transfer system. Currently Basin 43 and 44 are permitted to hold up to 7.8 million gallons each as long as contingency space is reserved for any RCRA waste stored in Basin 42. Basin 42 is authorized to contain up to 6.5 million gallons. Basin 43 currently contains approximately seven millions gallons of groundwater. Maintaining adequate space in the LERF basins (through processing at ETF) will be of key importance to the UP-1 pumping effort.

The groundwater from LERF Basin 43 will be transferred to ETF via the 3" line. This configuration will allow receipt of waste water at the load in station and transfer to Basin 44 while Campaign 98-02 is in progress. Periodic surveillance of the transfer line will be performed during the campaign.

5.0 STARTUP SEQUENCE

This PCP is written with the understanding that pre-campaign activities such as RCRA Waste Cleanout in Process Memo #LW97-148 has been completed. The sludge removal operation on Concentrate Tank B will continue in conjunction with commencement of Campaign 98-02. However, all sludge in the Concentrate Tank B will be removed prior to receiving Evaporator brine. RCRA satellite drums from Campaign 97-01 will be closed. The RCRA and CERCLA drums will be segregated in the storage area until all RCRA drums are removed.

Plant operating procedure POP-60-002, *Integrated MTT Operation In Configuration 1* (WMH, 1997a) will be used to initiate the MTT startup. Utility support systems are verified to be in service as listed in the MTT plant operating procedure(s). Further startup prerequisites include confirmation of required tank levels, RO bank preparation, polisher preparation, and secondary waste receiving tank availability. The Monitor and Control System (MCS) is continuously powered up and features an uninterruptable power supply; thus, the system is already in service.

When all MTT preparatory steps are complete, main treatment train operation will commence. The MTT will be operated between 65-120 gallons per minute unless the equipment condition dictates otherwise.

Prior to MTT startup, the secondary waste receiving tank(s) will be aligned to receive waste material in accordance with POP-60I-008 (WMH, 1997d). The evaporator will be started in accordance with POP-60I-003 (WMH, 1997c) when sufficient receiving tank waste inventory is generated. The planned processing flow rate is 20 - 25 gallons/minute.

A process memo will be issued to address the startup and operation of the Main Treatment Train for processing groundwater Campaign 98-02.

6.0 PROCESS CONTROL INFORMATION

6.1 pH Adjustment

The feed (groundwater) solution has pH of 8. The pH of solution in the Surge tank will be adjusted to 5.5 to 6.5. The 92 wt% sulfuric acid will be aligned to Surge Tank for pH adjustment to minimize the volume of acid added. Due to a slow response (long time delay) of the Surge tank pH adjustment automatic control system, operators will manually input a desired chemical injection rate based on surge tank pH observations.

The pH adjust tank will be operated at 4.75 - 5.0. Experience from processing groundwater during Campaign 97-01 showed that the pH adjust tank pH of 4.75 - 5.0 is critical for efficient operation of the RO system since it dictates the 1st RO feed pH. In addition, at this pH, the carbon dioxide is mostly removed by the degas column and calcium carbonate fouling of the degas column packing and RO is minimized. The 1st RO feed pH will be controlled to 6.0 - 6.9 to provide high nitrate rejection of the RO.

6.2 Filtration

Significant problems with rough and fine filter plugging in the past has lead to the installation of auxiliary rough and fine filters. The new cartridge-type filters are configured to allow filter media exchange when unacceptable fouling has occurred. The auxiliary filters minimize process downtime due to filter maintenance. In this campaign, the Rough filter will be used as backup to the Auxiliary Fine filter.

Manual filter backwashes will be performed for the Rough and Fine filters every 24 hours of MTT operation. Mandatory backwashing of the Rough and Fine filter units will be performed when differential pressure is about 30 psid.

The Auxiliary Rough filters will be changed out typically before differential pressure (DP) reaches 40 psid. The decomposer bag filter changeout will be performed when the DP reaches 40 psid or whenever MTT flow rate is adversely effected. The Auxiliary Fine filters (AFF) unit can be placed in operation in lieu of Rough filter when needed.

6.3 Biological Fouling Control

Additional measures to control bacteria growth in the surge tank and rough filter will be performed during process downtime by recirculation of the surge tank's contents and dosing with hydrogen peroxide or biocides, as needed. A separate line has been installed for peroxide addition to the surge tank. Also, periodic chemical cleaning/disinfecting of the rough and fine filters will be performed to prevent excessive slime buildup. Prestart sanitizing of some MTT vessels may be performed to prevent biological fouling. After the campaign has started, periodic MTT sanitizing is required. The MTT will be shutdown periodically for overall treatment train sanitizing. Bacteria control will be performed during MTT operation and during unexpected shutdowns. A separate process memo will be issued to outline the steps for controlling bacteria and periodic sanitizing in the MTT vessels.

6.4 UV Oxidation/Peroxide Decomposer Modules

No organic destruction is required other than carbon tetrachloride which is removed by degas column. Therefore, hydrogen peroxide injection is not required. During UP-1 groundwater Campaign 98-02, the UV lamps will be operated to provide a general sterilization effect that reduces biogrowth contamination in downstream equipment including the Fine Filter, the Degasification Column, and the Reverse Osmosis (RO) membranes. The number of selected UV/OX chambers and lamps will be dependent upon the MTT process flow rate, as per approved plant operating procedures.

The quartz tubes that house the UV lamps require periodic cleaning to remove deposited contaminants that block transmittance of UV light into the process stream. Vendor-installed automatic tube cleaning shuttles were removed from the UV/OX units during 1996 to eliminate a root cause of quartz tube breakage, and there are no plans to reinstall them at this time. Subsequent operating experience gained during UP-1 groundwater Campaign 97-01 indicates that quartz tubes need to be removed and cleaned approximately every two to three months of UV/OX unit operation to maintain optimum UV light transmittance. The primary contaminant found to date is reddish iron oxide particulate, which is easily wiped from the tubes using lint-free cloth and isopropyl alcohol.

As hydrogen peroxide will not be continuously injected during UP-1 groundwater processing, the Peroxide Decomposer Modules (PDMs) will remain off-line except when the Surge Tank is dosed with peroxide to kill accumulated biogrowth. During the relatively brief periods of Surge Tank peroxide dosing, the combination of UV lamp radiation and catalytic action within the PDMs will destroy the residual peroxide to levels acceptable for the RO membranes downstream. This will be verified by shiftly sampling and analysis of the PDM outlet peroxide concentration during periods of Surge Tank peroxide dosing. The decomposer will be placed in operation during peroxide dosing until sample results indicate residual peroxide levels are acceptable.

The PDMs currently contain beds of Calgon Centaur 12x40 mesh granular activated carbon that was installed prior to UP-1 groundwater Campaign 97-01. Continued use of these carbon beds is justified by their acceptable peroxide destruction performance during ETF PC Campaign 98-01.

6.5 Degasification

The primary purpose of the degasification system is to strip the carbon dioxide from the process stream caused by the pH shifted carbonate/CO2 equilibrium and organic destruction.

6.6 Reverse Osmosis

Operating experience gained during UP-1 groundwater Campaign 97-01 indicates that fouling RO membranes is low when the minimum RO reject flow is 15 gpm. This equates to a MTT flow of 75 gpm at 20% water recovery. Any MTT flow below 75 gpm will result in 15 gpm of RO Reject flow. The RO should be able to efficiently process 15 - 25.5 gpm of concentrated reject for MTT flow rates from 50 - 170 gpm. However, the overall MTT best performance flow is around 120 gpm. RO operational efficiency will be determined by monitoring of RO permeate conductivities.

Because of the high silica content in the groundwater, a scale inhibitor will also be added to the process stream to reduce the difficult-to-remove silica scaling. Potential biogrowth scaling and uranium fouling are anticipated during the campaign, thus frequent RO membrane cleaning may be necessary. RO cleaning experience from Campaign 97-01 indicating that a MC-4/MC-1/Caustic EDTA cleaning regimen is best. Process control samples will be collected as needed to monitor the level of scale forming constituents.

6.7 Evaporation

Modifications to the evaporator system have been made due to higher RO reject flow anticipated compared to Process Condensate Campaigns. Two SWRT feed pumps and the evaporator distillate pump have been replaced with pumps of increased capacity. The changes already improve the operation of the SWRT system and increase the evaporator processing rate to between 20 and 25 gpm.

The evaporator feed pH will be adjusted to a pH of 6 - 8 to minimize the formation of magnesium silicate scale and for corrosion protection. The major chemical constituents in the evaporator feed are sodium, calcium, nitrate, and sulphate. To optimize feed for the Dryer, the dissolved solids in the evaporator will be kept at 25 wt%.

Inspection of evaporator system components during Campaign 97-01 showed no visual signs of corrosion, therefore it is assumed the high chloride levels in the STT have not created a problem. During this groundwater Campaign 98-02, sodium sulfite will be added to SWRTs to scavenge dissolved oxygen in the evaporator feed in order to minimize potential corrosion in STT systems.

Experience from processing groundwater during Campaign 97-01 showed that approximately 10 wt% of evaporator brine ($SpG = 1.2$, $Bp = 215.25^{\circ}F$) is undissolved solids (primarily $CaSO_4$). High levels of calcium sulfate will result in severe dryer fouling followed by blade breakage. For successful operation of the dryer, the level of calcium sulfate is kept to ≤ 3 wt% (dry powder basis).

To reduce the level of calcium sulfate in the dryer feed, sedimentation of evaporator brine in Concentrate Tank B will be performed. The Concentrate Tank B recirculation pump will not operate to allow particulate calcium sulfate to settle to the bottom of the tank. The supernate is then batch transferred to Concentrate Tank A for dryer feed makeup using a submersible pump. The settled solids are periodically removed to 55 gallon drums using an air operated pump. The solids are then allowed to settle in the drums and the supernate is recycled to SWRTs via Sump 1. The settled solids in the drum are allowed to be dried by natural air convection, and then mixed with dry absorbent to remove potential free liquid and also fill void space in the drums prior to shipment to ERDF for disposal.

In order to minimize unnecessary health and safety risks associated with the current practice of removing settled solids in Concentrate Tank B, a hydrocyclone system has been proposed to remove undissolved solids in the evaporator brine. The hydrocyclone removes suspended solids based on the centrifugal force principle. If funded, plans are to install the hydrocyclone sometime during Campaign 98-02.

6.8 Drying/Drum Handling

Based on experience gained from groundwater Campaign 97-01, the sodium nitrate level in the dryer feed will be adjusted to 20 dry weight percent by bulking dryer feed with sodium sulphate (adding NaOH and H_2SO_4). High $NaNO_3$ levels in the dryer feed will potentially foul and break dryer blades. The dryer feed pH will be controlled at 10 - 11 to preclude the formation of magnesium nitrate hexahydrate which would result in dryer plugging problems. The mostly colloidal $Mg(OH)_2$ will be kept in suspension through mechanical mixing prior to and during feeding to the Dryer.

It is estimated that a total of 753 powder drums (plus 141 $CaSO_4$ drums from CT B settled solids collection) will be generated during this campaign. Sampling of the powder will be performed as required for solid waste disposition and results will be reported in the post run document. The number of powder drums estimated for the campaign can be found in Appendix C.

Drum powder will be sampled at the begin of the campaign for radionuclide characterization and to verify that the powder is within the waste profile. The process will be monitored for changes which could affect powder characteristics. An evaluation will then be made if this change is significant enough to collect samples. Sampling directions will be provided as required per process memos.

6.9 VOG Filters

The presence of carbon tetrachloride in the UP-1 groundwater will necessitate monitoring and occasional changeout of the vessel offgas carbon absorbers. This is particularly important since the carbon tetrachloride will be stripped by the degasification column. A carbon tetrachloride removal efficiency of 90% is required to stay under the small quantity emission (SQE) limit of 10 lbs/year (Ecology, 1996). To ensure an average carbon filter removal efficiency of at least 90%, the MCS totalizer calculates carbon tetrachloride breakthrough in the carbon filters. The totalizer is modeled after vendor data, and utilizes stack air flow, groundwater feed flow, and groundwater carbon tetrachloride concentration to calculate filter loading. The totalizer has two alarms, one to give notice that the carbon filter will need replacement, and another that will require the operators to shut down the system before the efficiency has dropped to 80% (90% average efficiency).

Current carbon tetrachloride levels in groundwater at a processing rate of 85 gpm indicate that filter changeout will need to occur approximately every 8 months (240 days). Since the existing VOG filter is currently loaded 22 percent, the carbon filter replacement is anticipated to be 174 days after Campaign 98-02 has commenced. The total estimated carbon tetrachloride released to the atmosphere will be monitored during the course of Campaign 98-02. Release results will be documented in the post-campaign process evaluation report.

6.10 Polishers

Operating experience gained during groundwater Campaign 97-01 indicates that the polisher has an average capacity of 10 million umhos-cm⁻¹ gal. Assuming that RO permeate conductivity is 5 umhos/cm and IX feed rate is 94 gpm (based on Campaign 97-01), the polisher regeneration cycle estimated to be 2.16 million gallons of groundwater processed or every 15 days. Polisher regeneration calculations can be found in Appendix E.

7.0 SAFETY CONSIDERATIONS

7.1 Rad Con

The basis for the 200A Liquid Waste Processing Facilities (LWPF) Radiological Control Program is the *Radiation Protection Program Implementation of Title 10 Code of Federal Regulations Part 835*, (HNF-SP-1145). This document presents a graded approach to implementation of requirements found in 10 CFR 835. In addition to this document, 200A LWPF is contractually bound to implementation of the *Hanford Site Radiological Control Manual* (HSRCM-1).

Implementation of radiation protection requirements is accomplished using multiple levels of procedures. Project Hanford Procedures contains radiation protection policies and programs all PHMC contractors must abide by. At the working level, radiation protection procedures are developed on a site wide basis or as facility specific procedures depending upon the need for consistency.

Area Radiation Monitors (ARM's) will not be required during groundwater processing Campaign 98-02 due to the low concentrations of gamma emitters in the feed. Additionally, the current source term does not meet workplace air

sampling criteria requiring Continuous Air Monitors (CAM's). Based on measurements on drums in the groundwater Campaign 97-01, the dose rates from drums of powder will be acceptably low.

7.2 OSHA/Industrial Safety

During Campaign 98-02, Industrial Hygiene will be collecting both bulk samples of the dry solid waste and air samples of particulates generated during operations in the dryer room. This sampling will be conducted near the beginning of the campaign. The bulk samples will be analyzed to determine the presence and concentration of regulated toxic waste components. An analysis of the reported concentrations will then be performed to see if there is reasonable potential for airborne concentrations of the regulated constituents to exceed the applicable employee exposure limits. The results of that analysis will then be utilized to determine which, if any, of the toxic constituents will need to be quantified via subsequent air sampling and employee personnel exposure monitoring. Air sampling will also be done to determine total dust concentrations during operations in the dryer room (and other areas if need is indicated) for comparison with nuisance dust applicable exposure limits. All air sampling results will be used to determine appropriate levels of personal protective equipment to be used by exposed/potentially exposed employees.

Employee exposure monitoring for physical agents such as noise and control measures for industrial safety concerns, will be based on the results of routine hazard assessment activities.

7.3 Radiological Inventory

The Effluent Treatment Facility (ETF) is operated as a Radiological Facility. Documentation of the ETF designation as a Radiological facility can be found in *Hazard Categorization Report for the 200 Area Effluent Treatment Facility* (Koerner, 1995). Categorization was based upon a maximum expected source term determined from the facility's design basis and characterization data from 242-A Process Condensate (PC). The hazard category report together with the *Auditable Safety Analysis* (ASA) (Crane, 1997) forms the basis for establishing procedural control over the radiological inventory at the ETF.

Radionuclide inventory control for UP-1 groundwater processing at the ETF was accomplished by obtaining characterization data of the feed stream for radionuclide inventory and calculating a maximum allowable feed batch volume. The feed batch volume was sized such that the ETF radionuclide inventory never exceeds a Category 3 sum-of-fractions of 0.8 (limit = < 1.0). The estimated maximum feed batch volume for Campaign 98-02 was calculated to be 1.4 billion gallons, which is considerably greater than the 18-million gallon anticipated processing volume. Since the total feed volume is much less than the maximum allowable batch volume, no volume restrictions are in effect. Feed volume received will be tracked, however, to maintain a record of facility radionuclide inventory.

Procedural instructions used for calculating radiological inventory are contained in *ETF Radionuclide Inventory Management*, (HNF, 1997c). Calculations of radionuclide inventory are stored as a lifetime Quality Assurance Record per WHC-CM-3-5, *Document Control and Records Management Manual*. The radionuclides inventory calculation for this campaign is kept on file at 200 Area LWPF Records Control Center.

7.4 ETF Fissile Material Inventory

It is required that total fissile material inventory in the facility is controlled to less than 15 g in order to maintain facility classification as an "Exempt Facility", as required per HNF-IP-093 Section 12, "Inventory of Fissile Material Within The 200 Area ETF".

The fissile isotopes of primary concern include Pu-239, U-233, and U-235. When calculating fissile material mass, an U-235 enrichment of less than one weight percent can be excluded in the fissile material inventory calculations (HNF, 1997C). Since uranium solution dealing with spent N Reactor fuel is ≤ 1 wt%, the U-235 mass in the groundwater campaign feed would be exempt from fissile material inventory. Pu-239 and U-233 are included in the fissile material inventory regardless of their enrichment.

The total fissile inventory for ETF in Campaign 98-02 was estimated to be a maximum of $2.46\text{E-}04$ g of fissile material which is well below the Exempt Facility Classification limit of 15 g fissile material. ETF fissile material inventory calculation can be found in Appendix D.

8.0 PRODUCT/WASTE DISPOSITION

8.1 Verification Tanks

To assure that a verification tank cannot be discharged to the SALDS prior to approval, the verification tank discharge manifold piping isolation valves 60H-103 and 60H-104, immediately downstream of transfer pumps 60H-P-2A and 60H-P-2B, respectively, will be closed and administratively controlled via Plant Operating Procedure POP-60H-001. The verification tank water quality shall conform to the release criteria set forth in State Waste Discharge Permit No. 4500 (Ecology, 1997) and the Hazardous Waste Exclusion (Delisting) (EPA, 1995).

The discharge criteria from the State Waste Discharge Permit and the approved delisting are summarized in an attachment to POP-60H-001 "Attachments Verification Tank Release Approved Form (WMH, 1997b)." This document describes the procedure for ensuring that these criteria are met in the verification tanks before the effluent is discharged to the SALDS.

8.2 State Approved Land Disposal Site

The SALDS is a gravel-filled drainfield located in the 600 Area (north of the 200 West Area) where slow local groundwater migration is present. The ETF effluent will be discharged into the SALDS via underground piping from the ETF verification (holding) tank(s).

8.3 Solid Waste Disposition

For Campaign 98-02, the solid waste from the ETF process, which includes drums of concentrated dry product and operations/maintenance waste, are CERCLA wastes. These will be managed at the ETF in accordance with the substantive requirements of RCRA. This waste will be disposed of as a CERCLA waste in the ERDF after meeting criteria specified in the *Environmental Restoration Disposal Facility Waste Acceptance Criteria* (BHI, 1996).

8.4 Stack Emissions

8.4.1 Radiological Air Emissions - ETF/LERF radiological air emissions are administratively controlled by limiting the quantity of radionuclides processed annually through the facility as described in the current Notice of Construction (WDOH, 1997). The total inventory was calculated for Campaign 98-02 using the latest data from LERF Basin 43 samples. It is estimated that a total of 0.23 Ci will be processed through ETF during Campaign 98-02. Combining with the total of 81.6 curies during ETF Campaigns 97-01 and 98-01 (Willett, 1997), the total quantity of radionuclides processed will be 81.8 curies for the last 365 days. This is well below the annual inventory limit of 3,450 curies (WDOH, 1997) which has been calculated to cause 0.025 mrem/yr for abated offsite dose via stack emissions. Estimation of the quantity of radionuclides processed through Campaign 98-02 can be found in the Appendix A.

8.4.2 Vessel Vent Organic Discharge Limits - The organic compounds detected in the feed (appendix G) were used to estimate organic emissions and verify they do not exceed the Hanford Site RCRA volatile emission limit of 3 lbs/hr or 3.1 tons/yr of total organics for Hanford Site (DOE/RL, 1997b), the ETF specific limits of 0.50 gm/min and 581 lbs/yr (Ecology 1996), and the small quantity emission limit of 10 lbs/yr of carbon tetrachloride.

Based on 18 million gallons processable volume and 30 ppb carbon tetrachloride in the campaign groundwater feed, it is estimated that 0.45 lbs of carbon tetrachloride will be released during Campaign 98-02. Combining with the total carbon tetrachloride of 0.31 lbs released during Campaign 97-01, the total carbon tetrachloride emission of 0.71 lbs/yr will be discharged for the last 365 days, which is less than the 10 lbs/yr carbon tetrachloride small quantity emission limit.

Assuming a maximum feed flow rate of 150 gpm and that all organics were discharged by the VOG system, it is estimated that a total of 1.35 lbs of organics will be released into the environment during the campaign at a maximum emission rate of 6.75E-04 lbs/hr. This equals 0.005 gm/min, which is less than 0.5 gm/min limit in the Notice of Construction (NOC, Ecology 1996). The total organic release from ETF during the last 12 months (Campaigns 97-01, 98-01, and 98-02) is 149 lbs, which is less than the 581 lbs/yr limit in the NOC. The only two facilities subject to the RCRA organic emission limits (40 CFR 265, Subpart AA) are the 200 Area ETF and the 242-A Evaporator. A total of 148 lbs of organics were calculated to have emitted from these facilities (Willett, 1997) this year. Adding the 1.35 lbs emitted from the upcoming campaign, a total of 149 lbs organic will be emitted in the last 12 months. This is less than limit of 3.1 tons/yr. A revised estimate will be performed and reported in the post run document when accurate feed flow rate and total volume processed are obtained. The total organics and carbon tetrachloride emission calculations can be found in Appendix B.

8.4.3 Ammonia Discharge - The annual ammonia discharge limit for ETF is 2.41 lbs/yr per the Notice of Construction (Ecology, 1996). Since ammonia was less a than detectable quantity in the laboratory analysis, insignificant ammonia will be discharge into the environment.

9.0 SAMPLING REQUIREMENTS

9.1 ETF Compliance Sampling

Treated waste water samples will be collected from the verification recirculation line, valve # 60H-008. These samples will be used to determine whether a verification tank is acceptable for discharge to SALDS. As a backup, the in-line samplers can be used instead of the recirculation line sampling. Sampling will be performed in accordance with POP-65J-002 (WMH, 1997e).

Samples of the treated waste water will be transferred to the Waste Sampling and Characterization Facility (WSCF) laboratory. All analyses will be performed in accordance with the *Waste Analysis Plan for the 200 Area Effluent Treatment Facility and the Liquid Effluent Retention Facility*, (DOE/RL, 1997a). Additionally, the analysis will be performed in accordance with the *Quality Assurance Program Plan for the Waste Sampling and Characterization Facility*, (HNF, 1997a) and the *200 Area Liquid Effluent Facilities Quality Assurance Project Plan*, (HNF, 1997d).

Sample results will be reported on the Laboratory Information Management System (LIMS) and transferred to Liquid Effluent Monitoring Information System (LEMIS) where the information can be accessed by ETF personnel.

9.2 Process Control Sampling

Process control sampling will be performed as necessary during the campaign to assess unit operation performance. Most analyses performed on process control samples will be done at the ETF sample prep room using portable test kits (Chemetrics, Hach, test strips, etc.) by LWPF personnel. Samples will be taken to WSCF or Special Analytical Services (SAS). Specific sampling direction will be specified by Process Memo. Listed are some of the process control samples that will be taken during Campaign 98-02:

<u>Sample Point</u>	<u>Analysis</u>	<u>Frequency</u>
Surge Recycle	bioscan	Weekly
UV/OX outlet	bioscan	Monthly
Aux rough filter inlet	bioscan	Monthly
Rough filter out/UV in	bioscan	Monthly
Decomposer out/Fine Filter in	bioscan	Monthly
Fine filter outlet	bioscan	Monthly
Aux. rough filter outlet	As requested	As requested
Rough filter out/UV inlet	As requested	As requested
Decomposer inlet	As requested	As requested
2nd RO Perm.out/IX inlet	As requested	As requested
1st IX outlet	As requested	As requested
Decomposer inlet	As requested	As requested
Evaporator brine	As requested	As requested
Cooling Towers	bact. dip slide, bioscan	Weekly

The Process control samples listed in this section represents only an initial estimate of sampling required for Campaign 98-02. Process control sampling is expected to change as operating experience is gained during the course of the campaign. A process memo will be provided to address the frequency, method of testing to the sample point, as applicable.

9.3 Solid Waste Sampling

The ETF produces a mixed waste powder that will be transferred to the Environmental Restoration Disposal Facility (ERDF) for this campaign. A method that may be used to collect data for solid waste composition is to collect dry powder samples directly from the drums. These samples are analyzed by WSCF and the data used to characterize the solid waste for disposal.

10.0 INDEX OF TECHNICAL OPERATING CONTROLS

10.1 Process Flowsheet

The design basis for processing UP-1 groundwater at ETF is documented in *Flowsheet Document, UP-1 Groundwater Processing at 200 Area ETF*, (Rust, 1996). The flowsheet document contains process flow description, design assumptions and calculations, potential problems, and a description of equipment upgrades. Process adjustments modification or enhancements have been implemented based on previous operating experience gained in Campaign 97-01.

10.2 Operating Procedures

Key plant operating procedures have been developed for groundwater processing and are available on HLAN under PROCINFO. A summary of several key procedures used during Campaign 98-02 is provided below:

POP-60-002	Contains instructions for startup, shutdown, purge and operate the Main Treatment Train using the Monitor and Control System (MCS). (for Configuration 1)
POP-60H-001	Provides instructions for startup, normal operation, and shutdown of the Verification System. The Verification System includes the verification tanks, transfer pumps, return pump and related piping, valves, and instrumentation.
POP-60I-003	Contains instructions for operation of the Evaporator System, Anti-foam System, Vapor Compressor, and Evaporator Boiler System.
POP-60I-008	Provides instructions for operating Secondary Waste Receiving Tanks (SWRT) in Startup, Receiving, pH Adjustment, Feeding, Flushing, and lay-up modes.
POP-60J-001	Thin Film dryer instructions for startup, run, flushing, shutdown, and layup are contained in this procedure.
POP-60I-002	Provides instructions for operating Concentrate Tanks in startup, receiving, pH adjustment, feeding, flushing and lay-up modes.

10.3 Relevant Safety Documents

A review and evaluation of the facility's design and operation relevant to safety is provided in the *200 Area Effluent Treatment Facility Auditable Safety Analysis Report (ASA)* (Crane, 1997). The ASA was prepared for the operation of the 200 Area Effluent Treatment Facility (ETF), in accordance with the requirements of U.S. Department of Energy (DOE) Standard 5502-94, *Hazard Baseline Documentation*, DOE Standard 1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, and DOE Order 5481.1B, *Safety Analysis and Review System*.

10.4 Environmental/Regulatory Documentation

The *State Waste Discharge Permit No. ST 4500* (Ecology, 1995) provides authorization to discharge treated wastewater to the SALDS infiltration gallery. The permit includes discharge limitations, analytical requirements, conditions of operation, fees, record keeping and other information required for discharges to SALDS.

Authorization to exclude certain wastes at Hanford facilities for being listed hazardous wastes is provided in the *Final Approval for Delisting to the U.S. Department of Energy*, (EPA, 1995). Based on careful analyses, EPA has concluded that the disposal of certain wastes, after treatment, will not adversely affect human health or the environment. The Delisting includes treatment levels which must be achieved in order to not be classified as a "listed waste".

The authorization to discharge radioactive air emissions was modified to allow the processing of wastes with higher radionuclides levels. Authorization by DOH was obtained in 200 Area Effluent Treatment Facility, Load-In Station, and Liquid Effluent Treatment Facility Potential-to-Emit Increase (WDOH, 1997) at the Routine Technical Assistance Meeting on January 14, 1997. The authorization to discharge nonradioactive air emissions was requested in Modification to the Notice of Construction (NOC) Approval Order for the 200 Area Effluent Treatment Facility (ETF) (Ecology, 1996) and was approved by Ecology on October 16, 1996.

The *Declaration Of The Record Of Decision* (Ecology, EPA and DOE 1997) decision document presents the selected Interim Remedial Action (IRA) for the U.S. Department of Energy (U.S. DOE) Hanford 200-UP-1 Operable Unit (OU), 200 Area, Hanford Site, Benton County, Washington. The IRA was chosen in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act of 1986* (SARA), the *Hanford Federal Facility Agreement and Consent Order* (also known as the Tri-Party Agreement, or TPA), and to the extent practicable, the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP). The State of Washington concurs with this selected remedy.

The Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility (DOE-RL, 1997) was submitted to Ecology in July 1997. Approval from Ecology to operate under a final status permit is expected in early CY-98.

11.0 REFERENCES

- BHI, 1996, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Bechtel Hanford Inc., Richland, Washington.
- Crane, 1997, *200 Area Effluent Treatment Facility Auditable Safety Analysis Report*, WHC-SD-ETF-ASA-001, Rev. 2a, Waste Management Federal Services of Hanford, Richland, Washington.
- DOE, 1990, *Radiation Protection of the Public*, DOE Order 5400.5, U.S. Department of Energy, Washington, D.C.
- DOE Standard 1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, U.S. Department of Energy, Washington, D.C.
- DOE/RL, 1997a, *Waste Analysis Plan for the 200 Area Effluent Treatment Facility and the Liquid Effluent Retention Facility*, DOE/RL-97-03, Appendix 3a.
- DOE/RL, 1997b, *Hanford Facility Dangerous Waste Permit Application, Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility*, DOE/RL-97-03 (Rev. 0)
- Ecology, EPA and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
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- Guthrie, 1997, *200 Area Effluent Treatment Facility Process Control Plan 97-01*, HNF-SD-ETF-PCP-004, Rev. 0, Waste Management Federal Services of Hanford, Richland, Washington.
- HNF, 1997a, *Quality Assurance Program Plan for the Waste Sampling and Characterization Facility*, HNF-SD-CP-QAPP-0017, Waste Management Federal Services of Hanford, Richland, Washington.
- HNF, 1997b, *200 Area LEF Conduct of Operations*, WHC-IP-0932, Waste Management Federal Services of Hanford, Richland, Washington.
- HNF, 1997c, *ETF Radionuclide Inventory Management*, WHC-IP-0931 Section 12, Waste Management Federal Services of Hanford, Richland, Washington.

- Koerner, J. A., 1995, *Hazard Categorization Report for the 200 Area Effluent Treatment Facility*, WHC-SD-C018H-HC-002, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Resource Conservation and Recovery Act of 1976 (RCRA)*, 42 USC 6901, et seq.
- Rust, 1996 *UP-1 Groundwater Processing at 200 Area ETF*, WHC-SD-OPS-PC-001, Flowsheet Document, Rust Federal Services of Hanford, Richland, Washington.
- HNH, 1997d, *200 Area Liquid Effluent Facilities Quality Assurance Project Plan*, HNF-SD-LEF-QAPP-002, Waste Management Federal Services of Hanford, Richland, Washington.
- Willett, 1997, *200 Area Effluent Treatment Facility Process Control Plan 98-01*, HNF-1779, Rev. 0, Waste Management Federal Services of Hanford, Richland, Washington.
- WDOH, 1997, *200 Area Effluent Treatment Facility & Load-In Station and Liquid Effluent Treatment Facility Potential-to-Emit Increase Routine Technical Assistance Meeting*, January 14, 1997, Washington State Department of Health, Spokane, Washington.
- WMH, 1997a *Integrated MTT Operation In Configuration 1*, Plant Operating Procedure POP-60-002, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997b, *Verification System Operations*, Plant Operating Procedure POP-60H-001, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997c, *Evaporator System Operation*, Plant Operating Procedure POP-60I-003, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997d, *Secondary Waste Receiving Tank Operation*, Plant Operating Procedure POP-60I-008, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997e, *ETF Environmental and Process Sampling Operation*, Plant Operating Procedure POP-65J-002, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997f, *Activated Carbon Testing for the 200 Area Effluent Treatment Facility*, HNF-SD-LEF-TI-004, Waste Management Federal Services of Hanford, Richland, Washington.
- WMH, 1997g, *Thin Film Dryer Operation*, Plant Operating Procedure POP-60J-001, Waste Management Federal Services of Hanford, Richland, Washington.

APPENDIX A

ESTIMATED RADIOLOGICAL AIR EMISSION FOR CAMPAIGN 98-02

200 AREA EFFLUENT TREATMENT FACILITY FOR GROUNDWATER CAMPAIGN 98-02

ETF PROCESSING RATE	85	GALLONS PER MINUTE							
CAMPAIGN DURATION TIME	176	DAYS							
PLANT CAPACITY FACTOR	85.00%								
TOTAL CAMPAIGN VOLUME	18,000,000	GALLONS							
NUMBER OF HEPA FILTERS	1								
HEPA FILTER EFFICIENCY	99.95%								
RADIONUCLIDES	CONCENTRATION pCi/Liter	TOTAL CURIES	RELEASE FRACTION 40CFR61	TOTAL UNABATED RELEASE, Ci	TOTAL ABATED RELEASE, Ci	CAP 88 OFFSITE DOSE FACTOR mrem/Ci	TOTAL UNABATED OFFSITE DOSE, mrem/campaign	TOTAL ABATED OFFSITE DOSE, mrem/campaign	PERCENT OF OFFSITE DOSE
H-3	5.80E+02	3.95E-02	1.00E-03	3.95E-05	1.98E-08	2.19E-05	8.65E-10	4.33E-13	0.0024%
C-14	2.40E+00	1.64E-04	1.00E-03	1.64E-07	8.18E-11	2.62E-03	4.28E-10	2.14E-13	0.0012%
Na-22	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	1.94E-02	0.00E+00	0.00E+00	0.0000%
K-40	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	2.60E-02	0.00E+00	0.00E+00	0.0000%
Mn-54	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	5.51E-03	0.00E+00	0.00E+00	0.0000%
Co-60	6.55E+00	4.46E-04	1.00E-03	4.46E-07	2.23E-10	2.90E-02	1.29E-08	6.47E-12	0.0352%
Zn-65	1.46E+01	9.55E-04	1.00E-03	9.55E-07	4.97E-10	9.33E-03	9.28E-09	4.64E-12	0.0252%
Se-79	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	4.38E-02	0.00E+00	0.00E+00	0.0000%
Sr-90	4.20E+00	2.86E-04	1.00E-03	2.86E-07	1.43E-10	4.38E-02	1.25E-08	6.27E-12	0.0341%
Nb-94	6.86E+00	4.67E-04	1.00E-03	4.67E-07	2.34E-10	2.98E-02	1.21E-08	6.03E-12	0.0328%
Zr-95	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	2.65E-03	0.00E+00	0.00E+00	0.0000%
Tc-99	2.40E+03	1.64E-01	1.00E-03	1.64E-04	8.18E-08	1.09E-03	1.78E-07	8.91E-11	0.4842%
Ru-106	6.20E+01	4.22E-03	1.00E-03	4.22E-06	2.11E-09	2.00E-02	8.45E-08	4.22E-11	0.2295%
Sb-125	2.03E+01	1.38E-03	1.00E-03	1.38E-06	6.92E-10	4.15E-03	5.74E-09	2.87E-12	0.0156%
I-129	4.90E+00	3.34E-04	1.00E-03	3.34E-07	1.67E-10	2.91E-01	9.72E-08	4.86E-11	0.2639%
Cs-134	7.81E+00	5.32E-04	1.00E-03	5.32E-07	2.66E-10	3.13E-02	1.67E-08	8.33E-12	0.0452%
Cs-137	7.24E+00	4.93E-04	1.00E-03	4.93E-07	2.47E-10	2.39E-02	1.18E-08	5.90E-12	0.0320%
Ce-144	4.63E+01	3.15E-03	1.00E-03	3.15E-06	1.58E-09	1.37E-02	4.32E-08	2.16E-11	0.1174%
Eu-154	1.85E+01	1.26E-03	1.00E-03	1.26E-06	6.30E-10	1.82E-02	2.29E-08	1.15E-11	0.0623%
Eu-155	2.21E+01	1.51E-03	1.00E-03	1.51E-06	7.53E-10	1.85E-03	2.79E-09	1.39E-12	0.0076%
Ra-226	2.70E-01	1.84E-05	1.00E-03	1.84E-08	9.20E-12	5.45E-01	1.00E-08	5.01E-12	0.0272%
U-233	2.90E-04	1.98E-08	1.00E-03	1.98E-11	9.88E-15	3.23E+00	6.38E-11	3.19E-14	0.0002%
U-234	8.50E+01	5.79E-03	1.00E-03	5.79E-06	2.90E-09	3.19E+00	1.85E-05	9.24E-09	50.1907%
U-235	3.31E+00	2.26E-04	1.00E-03	2.26E-07	1.13E-10	2.96E+00	6.68E-07	3.34E-10	1.8136%
U-236	3.00E+00	2.04E-04	1.00E-03	2.04E-07	1.02E-10	3.02E+00	6.17E-07	3.09E-10	1.6769%
U-238	8.35E+01	5.69E-03	1.00E-03	5.69E-06	2.84E-09	2.84E+00	1.62E-05	8.08E-09	43.8953%
Np-237	3.10E-02	2.11E-06	1.00E-03	2.11E-09	1.06E-12	1.19E+01	2.51E-08	1.26E-11	0.0683%
Pu-238	1.20E-01	8.18E-06	1.00E-03	8.18E-09	4.09E-12	8.02E+00	6.56E-08	3.28E-11	0.1781%
Pu-239/240	7.80E-02	5.31E-06	1.00E-03	5.31E-09	2.66E-12	8.67E+00	4.61E-08	2.30E-11	0.1252%
Pu-241	3.20E+00	2.18E-04	1.00E-03	2.18E-07	1.09E-10	1.38E-01	3.00E-08	1.50E-11	0.0816%
Am-241	2.00E-01	1.36E-05	1.00E-03	1.36E-08	6.81E-12	1.31E+01	1.79E-07	8.93E-11	0.4850%
Cm-244	5.40E-02	3.68E-06	1.00E-03	3.68E-09	1.84E-12	6.94E+00	2.55E-08	1.28E-11	0.0694%
TOTAL FOR CAMPAIGN		2.30E-01		2.30E-04	1.15E-07		3.68E-05	1.84E-08	100.00%

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APPENDIX B

ESTIMATED ORGANIC DISCHARGE FOR CAMPAIGN 98-02

TOTAL ORGANIC/CARBON TETRACHLORIDE DISCHARGE CALCULATION

- ASSUMPTIONS:** 1) 18 millions gallons of groundwater for campaign 98-02
 2) 90% carbon tetrachloride removal by VOG adsorber

CONSTITUENTS	CONCENTRATION (ug/L)	TOTAL WEIGHT ¹ (lbs/cmpgn)	TOTAL DISCHARGE ² (lbs/cmpgn)
CARBON TET.	30	4.50	0.45
CHLOROFORM	4	0.60	0.60
TRICHLOROETHENE	2	0.30	0.30
TOTAL DISCHARGE QUANTITY FOR CAMPAIGN			1.35

¹Total weight = Conc. (ug/L) * (1.0E-09 L/ug) * (1.8E+07 gal) * (8.33 lbs/gal)

²Total discharge quantity = Total weight (lbs/cmpgn) * (1 - VOG_{removal efficiency})

TOTAL ORGANIC EMISSION RATE CALCULATION

- ASSUMPTIONS:** 1) Maximum ETF process flow is 150 gpm
 2) 90% carbon tetrachloride removal by VOG absorber

CONSTITUENTS	CONCENTRATION (ug/L)	FLOWRATE ¹ (lbs/hr)	EMISSION RATE ² (lbs/hr)
CARBON TET.	30	2.25E-03	2.25E-04
CHLOROFORM	4	3.00E-04	3.00E-04
TRICHLOROETHENE	2	1.50E-04	1.50E-04
EMISSION RATE FOR CAMPAIGN			6.75E-04

¹Flowrate = Conc. (ug/L) * (1.0E-09 L/ug) * (150 gal/min) * (60 min/hr)
 * (8.33 lbs/gal)

²Emission Rate = flowrate (lbs/hr) * (1 - VOG_{removal efficiency})

APPENDIX C

**ESTIMATED NUMBER OF POWDER DRUMS PRODUCED
FOR CAMPAIGN 98-02**

NUMBER OF POWDER DRUMS PRODUCED

- ASSUMPTIONS:
- 1) 18 millions gallons of groundwater for campaign 98-02
 - 2) All CaSO_4 precipitates out in a concentrate tank
 - 3) NaNO_3 in brine will be reduced to 20 dry weight percent (14.6 WT% NO_3) by adding Na_2SO_4
 - 4) A drum will contain approximately 400 lbs of powders

CONSTITUENTS	CONCENTRATION (ug/L)	SOLID PRODUCT ¹ (lbs/cmpgn)	TFD FEED ² (lbs/cmpgn)
Total Solids	625000	9.37E+04	7.71E+04
Nitrate	293614	4.40E+04	4.40E+04
Calcium	111000	1.66E+04	0

¹Solid = Conc. (ug/L) * (1.0E-09 L/ug) * (1.8E+07 gal) * (8.33 lbs/gal)

²TFD FEED (total solids) = TS in brine - calcium in brine

Nitrate dry weight percent before Na_2SO_4 bulking:

$$\text{Dry wt\% NO}_3 = 4.40\text{E}+04 \text{ lbs NO}_3 / (7.71\text{E}+04 \text{ lbs solids}) * 100\%$$

$$= 57 \text{ wt\% NO}_3$$

Nitrate dry weight percent after Na_2SO_4 bulking:

Adding 2.25E+05 lbs of Na_2SO_4

$$\text{Dry wt\% NO}_3 = 4.40\text{E}+04 \text{ lbs NO}_3 / (7.71\text{E}+04 \text{ lbs solids} + 2.25\text{E}+05 \text{ lbs Na}_2\text{SO}_4) * 100\% = 14.6 \text{ wt\% NO}_3$$

Number of powder drums produced per campaign

$$\text{Total drums produced} = 4.40\text{E}+04 \text{ lbs NO}_3 \div (0.146 \text{ lbs NO}_3/\text{lbs solids} * 400 \text{ lbs solids})$$

$$= 753 \text{ drums/cmpgn}$$

Number of calcium sulfate drums from CT B per campaign

$$\text{Total CaSO}_4 \text{ produced} = 1.66\text{E}+04 \text{ lbs Ca} * (136/40) = 5.66\text{E}+04 \text{ lbs}$$

$$\text{Total CaSO}_4 \text{ drums} = 5.66\text{E}+04 \text{ lbs} / (400 \text{ lbs/drum}) = 141 \text{ drums/cmpgn}$$

APPENDIX D

ETF FISSILE MATERIAL INVENTORY

ETF FISSILE CALCULATION

ETF Exempt limit < 15 g

$$\begin{aligned}
 \text{Fissile}(g) = & \left[\frac{\text{Pu}^{239}(\text{pCi/L}) \times 1\text{E-}12(\text{Ci/pCi})}{6.2\text{E-}02(\text{Ci/g})} \right. \\
 & + U_{gr}(\text{ug/L}) \times 1\text{E-}06(\text{g/ug}) \times 1.077\text{E-}10] \\
 & \times \text{Volume}(\text{gal}) \times 3.785(\text{L/gal})
 \end{aligned}$$

Parameter	Pu ²³⁹ (pCi/L)	U _{gross} (ug/L)	Volume (gal)	Fissile (g)
GW Campaign 98-02	7.80E-02	2.54E+02	1.80E+07	8.76E-05
ETF (PC cmpgn 98-01) ¹	1.10E+00	5.45E+01	2.36E+06	1.59E-04
TOTAL ETF FISSILE INVENTORY				2.46E-04

¹Assumed that all fissile material in PC Campaign 98-01 were solidified in the existing powder drums in ETF.

APPENDIX E

POLISHER REGENERATION CALCULATION

POLISHER REGENERATION CALCULATION

- Assumptions: (1) IX average capacity = $1.00\text{E}+07$ umhos-cm⁻¹ gal
(2) RO permeate conductivity = 5 umhos/cm (based on Campaign 97-01)
(3) IX feed rate = 94 gpm (based on Campaign 97-01)

$$\begin{aligned}\text{No. Days per IX Regen} &= (1.00\text{E}+07 \text{ umhos-cm}^{-1} \text{ gal} \div 5 \text{ umhos/cm} \\ &\quad \div 94 \text{ gal/min} \div 1440 \text{ min/dy}) \\ &= 15 \text{ dys}\end{aligned}$$

$$\begin{aligned}\text{LERF-ETF volume per IX Regen} &= 15 \text{ dys} * 100 \text{ gal/min} * 1440 \text{ min/dy} \\ &= 2.16\text{E}+06 \text{ gal}\end{aligned}$$

APPENDIX F

**GROUNDWATER (LERF BASIN 43) SAMPLE RESULTS
COMPARISON WITH RELEASE LIMIT
FOR CAMPAIGN 98-02**

UP-1 GROUNDWATER DATA FROM LERF BASIN 43 COMPARISON WITH RELEASE LIMITS					
Parameter	Units	Sample Data	Release Limits	Limit Source (See notes)	Below Limits? (Y/N)
VOLATILE ORGANIC COMPOUNDS					
Acetone	ug/L	undetected	40,000	2	Yes
Benzene	ug/L	undetected	5	1	Yes
1-Butanol	ug/L	undetected	40,000	2	Yes
Carbon tetrachloride	ug/L	30	5	1	NO
Chlorobenzene	ug/L	undetected	1,000	2	Yes
Chloroform	ug/L	4	5	1	Yes
1,2-Dichloroethane	ug/L	undetected	50	2	Yes
1,1-Dichloroethene	ug/L	undetected	70	2	Yes
2-Butanone	ug/L	undetected	200,000	2	Yes
Hexone (2-Hexanone)	ug/L	undetected	30,000	2	Yes
Methylene Chloride	ug/L	undetected	N/A	1	Yes
Tetrachloroethylene	ug/L	undetected	5	1	Yes
Tetrahydrofuran	ug/L	undetected	100	1	Yes
Toluene	ug/L	undetected	10,000	2	Yes
1,1,1-Trichloroethane	ug/L	undetected	2,000	2	Yes
1,1,2-Trichloroethane	ug/L	undetected	5	2	Yes
Trichloroethene	ug/L	2	50	2	Yes
Vinyl Chloride	ug/L	undetected	20	2	Yes
SEMIVOLATILE ORGANIC COMPOUNDS					
Acetophenone	ug/L	undetected	10	1	Yes
Benzyl alcohol	ug/L	undetected	100,000	2	Yes
Cresol	ug/L	undetected	20,000	2	Yes
1,4-Dichlorobenzene	ug/L	undetected	750	2	Yes
N-Nitrosodimethylamine	ug/L	undetected	20	1	Yes
Di-n-octyl phthalate	ug/L	undetected	7,000	2	Yes
Hexachloroethane	ug/L	undetected	60	2	Yes
Naphthalene	ug/L	undetected	10,000	2	Yes
Tributyl phosphate	ug/L	undetected	200	2	Yes

UP-1 GROUNDWATER DATA FROM LERF BASIN 43 COMPARISON WITH RELEASE LIMITS					
Parameter	Units	Sample Data	Release Limits	Limit Source (See notes)	Below Limits? (Y/N)
TOTAL METALS					
Antimony	ug/L	undetected	60	2	Yes
Arsenic	ug/L	2.4	15	1	Yes
Barium	ug/L	108	20,000	2	Yes
Beryllium	ug/L	undetected	40	1	Yes
Cadmium	ug/L	undetected	7.5	1	Yes
Chromium	ug/L	3.9	20	1	Yes
Copper	ug/L	0.5	70	1	Yes
Lead	ug/L	undetected	38	1	Yes
Mercury	ug/L	undetected	2	1	Yes
Nickel	ug/L	undetected	1,000	2	Yes
Selenium	ug/L	5.3	500	2	Yes
Silver	ug/L	5	2,000	2	Yes
Vanadium	ug/L	23	2,000	2	Yes
Uranium	ug/L	254	48	5	NO
Zinc	ug/L	undetected	100,000	2	Yes
ANIONS					
Chloride	ug/L	18,200	250,000	1	Yes
Fluoride	ug/L	300	40,000	2	Yes
Nitrate (as N)	ug/L	66,300	3,800	1	NO
Nitrite (as N)	ug/L	undetected	100	1	Yes
Sulfate	ug/L	49,800	10,000	1	NO
RADIONUCLIDES					
Gross Alpha	pCi/L	90	1.5	4	NO
Gross Beta	pCi/L	1200	50	4	NO
Cerium-144	pCi/L	undetected	280	3	Yes
Cesium-134	pCi/L	undetected	80	3	Yes
Cesium-137	pCi/L	undetected	120	3	Yes
Cobalt-60	pCi/L	undetected	200	3	Yes
Europium-154	pCi/L	undetected	800	3	Yes
Europium-155	pCi/L	undetected	4,000	3	Yes
Niobium-94	pCi/L	undetected	1,200	3	Yes
Ruthenium-103	pCi/L	undetected	2,000	3	Yes
Ruthenium-106	pCi/L	undetected	240	3	Yes
Strontium-90	pCi/L	4.2	40	3	Yes
Technetium-99	pCi/L	2200	900	5	NO
Tin-113	pCi/L	undetected	2,000	3	Yes
Tritium	pCi/L	580	--	--	N/A

UP-1 GROUNDWATER DATA FROM LERF BASIN 43 COMPARISON WITH RELEASE LIMITS					
Parameter	Units	Sample Data	Release Limits	Limit Source (See notes)	Below Limits? (Y/N)
OTHER ANALYSES					
Ammonia (as N)	mg/L	undetected	0.830	1	Yes
Nitrogen Kjeldahl total	mg/L	undetected	0.600	1	Yes
Cyanide	mg/L	0.0081	2	2	Yes
Total dissolved solids	mg/L	625	380	1	NO
Total organic carbon	mg/L	undetected	1.1	1	Yes
Total suspended solids	mg/L	undetected	4	1	Yes
Specific conductivity	umho/cm	909	--	--	N/A

NOTES: (1) Ecology Permit No. ST 4500, dated 6/26/95 (Ecology 1995)
 (2) EPA Delisting Approval, dated 6/7/95 (EPA 1995)
 (3) DOE Order 5400.5 (4% of DCG's)(DOE 1990)
 (4) Water Quality Standards, WAC 173-200-040
 (5) Record of Decision (Ecology, EPA and DOE, 1997)

APPENDIX G

**GROUNDWATER (LERF BASIN 43) ANALYTICAL DATA
FOR CAMPAIGN 98-02**

Liquid Effluent Monitoring Info System

Report : LABORATORY DATA SUMMARY REPORT

Filename : LE4460R1.1is

Run By : W41429

Report Date : 01/29/1998 07:59

Total Pages : 15

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| Parameter values |

SAP	:	%
Location	:	INFLUENT SAMPLE LERF BASIN 43
CAS #	:	%
Include QA Samples	:	N
Include Named TICs	:	N
Begin Date Range	:	01/01/1992
End Date Range	:	01/29/1998

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Liquid Effluent Monitoring Info System
 LABORATORY DATA SUMMARY REPORT
 WASTE ANALYSIS PLAN FOR ETF AND LERF
 01/01/1992 thru 01/29/1998

Sample Location: INFLUENT SAMPLE LERF BASIN 43

Constituent Name	CAS #	Method	Samp Purp	Tech.	Date Sampled	Result	Units	Lab Q1fr	Val Q1fr
ACENAPHTHENE	83-32-9	SW-846 8270B	PR	GRAB	10/15/1997	.9 ug/L		U	
			PR	GRAB	07/23/1997	.9 ug/L		U	
			PR	GRAB	04/23/1997	.9 ug/L		U	
ACETONE	67-64-1	SW-846 8260A	PR	GRAB	11/13/1997	1.6 ug/L		U	
			PR	GRAB	10/15/1997	1.6 ug/L		U	
			PR	GRAB	07/23/1997	1.6 ug/L		U	
			PR	GRAB	04/23/1997	1.6 ug/L		U	
		SW-846 8260A-MOD	PR	GRAB	06/25/1997	10 ug/L		U	
			PR	GRAB	05/28/1997	2.5 ug/L		U	
			PR	GRAB	05/21/1997	2.5 ug/L		U	
			PR	GRAB	05/14/1997	10 ug/L		U	
			PR	GRAB	05/07/1997	10 ug/L		U	
			PR	GRAB	04/29/1997	10 ug/L		U	
ACETOPHENONE	98-86-2	SW-846 8270B	PR	GRAB	10/15/1997	.3 ug/L		U	
			PR	GRAB	07/23/1997	.3 ug/L		U	
			PR	GRAB	04/23/1997	.3 ug/L		U	
BENZENE	71-43-2	SW-846 8260A	PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	5 ug/L		U	
			PR	GRAB	08/14/1997	10 ug/L		U	
			PR	GRAB	06/25/1997	10 ug/L		U	
			PR	GRAB	05/28/1997	10 ug/L		U	
			PR	GRAB	05/21/1997	10 ug/L		U	
			PR	GRAB	05/14/1997	2.5 ug/L		U	
			PR	GRAB	05/07/1997	2.5 ug/L		U	
			PR	GRAB	04/29/1997	2.5 ug/L		U	
BENZYL ALCOHOL	100-51-6	SW-846 8270B	PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
1-BUTANOL	71-36-3	SW-846 8260A	PR	GRAB	11/13/1997	190 ug/L		U	
			PR	GRAB	10/15/1997	190 ug/L		U	
			PR	GRAB	07/23/1997	190 ug/L		U	
			PR	GRAB	04/23/1997	190 ug/L		U	
2-BUTANONE	78-93-3	SW-846 8260A	PR	GRAB	11/13/1997	1.5 ug/L		U	
			PR	GRAB	10/15/1997	1.5 ug/L		U	
			PR	GRAB	07/23/1997	1.5 ug/L		U	
			PR	GRAB	04/23/1997	1.5 ug/L		U	
		SW-846 8260A-MOD	PR	GRAB	05/28/1997	10 ug/L		U	
			PR	GRAB	05/21/1997	10 ug/L		U	
			PR	GRAB	05/14/1997	10 ug/L		U	
			PR	GRAB	05/07/1997	10 ug/L		U	
			PR	GRAB	04/29/1997	10 ug/L		U	
2-BUTOXYETHANOL	111-76-2	SW-846 8270B	PR	GRAB	10/15/1997	.9 ug/L		U	
			PR	GRAB	07/23/1997	.9 ug/L		U	
			PR	GRAB	04/23/1997	.9 ug/L		U	
CARBON DISULFIDE	75-15-0	SW-846 8260A	PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
CARBON TETRACHLORIDE	56-23-5	SW-846 8260A	PR	GRAB	11/13/1997	30 ug/L		U	
			PR	GRAB	10/15/1997	25 ug/L		U	
			PR	GRAB	07/23/1997	21 ug/L		U	
			PR	GRAB	04/23/1997	29 ug/L		U	

Liquid Effluent Monitoring Info System
LABORATORY DATA SUMMARY REPORT
WASTE ANALYSIS PLAN FOR ETF AND LERF
01/01/1992 thru 01/29/1998

Sample Location: INFLUENT SAMPLE LERF BASIN 43

Constituent Name	CAS #	Method	Samp Purp	Tech.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	29.7	ug/L		
			PR	GRAB	08/14/1997	17	ug/L		
			PR	GRAB	06/25/1997	20	ug/L		
			PR	GRAB	06/18/1997	34	ug/L		
			PR	GRAB	06/12/1997	33.7	ug/L		
			PR	GRAB	06/05/1997	34.6	ug/L		
			PR	GRAB	05/28/1997	14.2	ug/L		
			PR	GRAB	05/21/1997	10	ug/L		U
			PR	GRAB	05/14/1997	10	ug/L		U
			PR	GRAB	05/07/1997	50	ug/L		
4-CHLORO-3-METHYLPHENOL	59-50-7	SW-846 8270B	PR	GRAB	04/29/1997	20	ug/L		
			PR	GRAB	10/15/1997	.9	ug/L		U
			PR	GRAB	07/23/1997	.9	ug/L		U
			PR	GRAB	04/23/1997	.9	ug/L		U
CHLOROBENZENE	108-90-7	SW-846 8260A	PR	GRAB	11/13/1997	1.2	ug/L		U
			PR	GRAB	10/15/1997	1.2	ug/L		U
			PR	GRAB	07/23/1997	1.2	ug/L		U
			PR	GRAB	04/23/1997	1.2	ug/L		U
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	5	ug/L		U
			PR	GRAB	08/14/1997	10	ug/L		U
			PR	GRAB	06/25/1997	10	ug/L		U
			PR	GRAB	05/28/1997	2.5	ug/L		U
			PR	GRAB	05/21/1997	2.5	ug/L		U
			PR	GRAB	05/14/1997	10	ug/L		U
			PR	GRAB	05/07/1997	10	ug/L		U
		67-66-3	PR	GRAB	04/29/1997	10	ug/L		U
			PR	GRAB	11/13/1997	4	ug/L		J
			PR	GRAB	10/15/1997	4	ug/L		J
CHLOROFORM	267-61-8	SW-846 8260A	PR	GRAB	07/23/1997	4	ug/L		J
			PR	GRAB	04/23/1997	4	ug/L		J
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	5.58	ug/L		
			PR	GRAB	08/14/1997	10	ug/L		U
			PR	GRAB	06/25/1997	10	ug/L		U
			PR	GRAB	06/18/1997	2.5	ug/L		U
			PR	GRAB	06/12/1997	4.3	ug/L		
			PR	GRAB	06/05/1997	4.3	ug/L		
			PR	GRAB	05/28/1997	2.5	ug/L		U
			PR	GRAB	05/21/1997	2.5	ug/L		U
			PR	GRAB	05/14/1997	2.5	ug/L		U
			PR	GRAB	05/07/1997	2.5	ug/L		U
2-CHLOROPHENOL	95-57-8	SW-846 8270B	PR	GRAB	04/29/1997	.28	ug/L		
			PR	GRAB	10/15/1997	.9	ug/L		U
			PR	GRAB	07/23/1997	.9	ug/L		U
			PR	GRAB	04/23/1997	.9	ug/L		U
1,4-DICHLOROBENZENE	106-46-7	SW-846 8260A	PR	GRAB	11/13/1997	1	ug/L		U
			PR	GRAB	10/15/1997	1	ug/L		U
			PR	GRAB	07/23/1997	1	ug/L		U
			PR	GRAB	04/23/1997	1	ug/L		U
		SW-846 8260A-MOD	PR	GRAB	06/25/1997	10	ug/L		U
			PR	GRAB	04/29/1997	0	ug/L		
			PR	GRAB	04/23/1997	10	ug/L		
			PR	GRAB	04/16/1997	10	ug/L		
			PR	GRAB	04/09/1997	10	ug/L		
		SW-846 8270B	PR	GRAB	10/15/1997	2.5	ug/L		U
			PR	GRAB	07/23/1997	2.5	ug/L		U

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Liquid Effluent Monitoring Info System
LABORATORY DATA SUMMARY REPORT
WASTE ANALYSIS PLAN FOR ETF AND LERF
01/01/1992 thru 01/29/1998

Sample Location: INFLUENT SAMPLE LERF BASIN 43

Constituent Name	CAS #	Method	Samp Purp	Date Tech.	Date Sampled	Result Units	Lab Qlfr	Val Qlfr
1,2-DICHLOROETHANE	107-06-2	SW-846 8260A	PR	GRAB	04/23/1997	2.5 ug/L	U	
			PR	GRAB	11/13/1997	1 ug/L	U	
			PR	GRAB	10/15/1997	1 ug/L	U	
			PR	GRAB	07/23/1997	1 ug/L	U	
			PR	GRAB	04/23/1997	1 ug/L	U	
	SW-846 8260A-MOD		PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
1,1-DICHLOROETHANE	75-34-3	SW-846 8260A	PR	GRAB	11/13/1997	1.1 ug/L	U	
			PR	GRAB	10/15/1997	1.1 ug/L	U	
			PR	GRAB	07/23/1997	1.1 ug/L	U	
			PR	GRAB	04/23/1997	1.1 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
	SW-846 8260A-MOD		PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	1.2 ug/L	U	
1,1-DICHLOROETHENE	75-35-4	SW-846 8260A	PR	GRAB	10/15/1997	1.2 ug/L	U	
			PR	GRAB	07/23/1997	1.2 ug/L	U	
			PR	GRAB	04/23/1997	1.2 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
	SW-846 8260A-MOD		PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	1 ug/L	U	
			PR	GRAB	10/15/1997	1 ug/L	U	
1,2-DICHLOROETHENE (TOTAL)	540-59-0	SW-846 8260A	PR	GRAB	07/23/1997	1 ug/L	U	
			PR	GRAB	04/23/1997	1 ug/L	U	
			PR	GRAB	06/25/1997	10 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
	SW-846 8260A-MOD		PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	10/15/1997	1.3 ug/L	U	
			PR	GRAB	07/23/1997	1.3 ug/L	U	
2,4-DINITROTOLUENE	121-14-2	SW-846 8270B	PR	GRAB	10/15/1997	2.8 ug/L	U	
			PR	GRAB	04/23/1997	2.8 ug/L	U	
	67-72-1	SW-846 8270B	PR	GRAB	10/15/1997	2.8 ug/L	U	
			PR	GRAB	07/23/1997	2.8 ug/L	U	
2-HEXANONE	591-78-6	SW-846 8260A	PR	GRAB	04/23/1997	2.8 ug/L	U	
			PR	GRAB	11/13/1997	2.8 ug/L	U	
			PR	GRAB	10/15/1997	2.8 ug/L	U	
			PR	GRAB	07/23/1997	2.8 ug/L	U	
4-METHYL-2-PENTANONE	108-10-1	SW-846 8260A	PR	GRAB	04/23/1997	2.8 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	2.3 ug/L	U	
			PR	GRAB	10/15/1997	2.3 ug/L	U	

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Constituent Name	CAS #	Method	Samp Purp	Date Tech. Sampled	Result Units	Lab Qlfr	Val Qlfr
METHYLENE CHLORIDE	75-09-2	SW-846 8260A	PR GRAB	07/23/1997	2.3 ug/L	U	
			PR GRAB	04/23/1997	2.3 ug/L	U	
			PR GRAB	05/28/1997	205 ug/L	U	
			PR GRAB	05/21/1997	205 ug/L	U	
			PR GRAB	05/14/1997	10 ug/L	U	
			PR GRAB	05/07/1997	10 ug/L	U	
			PR GRAB	04/29/1997	10 ug/L	U	
			PR GRAB	11/13/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
3-METHYLPHENOL	108-39-4	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	10 ug/L	U	
			PR GRAB	05/21/1997	10 ug/L	U	
			PR GRAB	05/14/1997	10 ug/L	U	
			PR GRAB	05/07/1997	10 ug/L	U	
			PR GRAB	04/29/1997	10 ug/L	U	
			PR GRAB	10/15/1997	1.3 ug/L	U	
			PR GRAB	07/23/1997	1.3 ug/L	U	
			PR GRAB	04/23/1997	1.3 ug/L	U	
			PR GRAB	10/15/1997	1 ug/L	U	
2-METHYLPHENOL	95-48-7	SW-846 8270B	PR GRAB	07/23/1997	1 ug/L	U	
			PR GRAB	04/23/1997	1 ug/L	U	
			PR GRAB	10/15/1997	2.5 ug/L	U	
			PR GRAB	07/23/1997	2.5 ug/L	U	
			PR GRAB	04/23/1997	2.5 ug/L	U	
			PR GRAB	10/15/1997	1.8 ug/L	U	
			PR GRAB	07/23/1997	1.8 ug/L	U	
			PR GRAB	04/23/1997	1.8 ug/L	U	
			PR GRAB	10/15/1997	.8 ug/L	U	
			PR GRAB	07/23/1997	.8 ug/L	U	
NAPHTHALENE	91-20-3	SW-846 8270B	PR GRAB	04/23/1997	.8 ug/L	U	
			PR GRAB	05/28/1997	.8 ug/L	U	
			PR GRAB	10/15/1997	1 ug/L	U	
			PR GRAB	07/23/1997	1 ug/L	U	
			PR GRAB	04/23/1997	1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
4-NITROPHENOL	100-02-7	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
N-NITROSODI-N-PROPYLAMINE	621-64-7	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
N-NITROSODIMETHYLAMINE	62-75-9	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
DI-N-OCTYL PHTHALATE	117-84-0	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
PENTACHLOROPHENOL	87-86-5	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
2-PENTANONE	107-87-9	SW-846 8260A	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
PHENOL	108-95-2	SW-846 8270B	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
PROPIONITRILE	107-12-0	SW-846 8260A	PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	05/28/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	
			PR GRAB	04/23/1997	1.1 ug/L	U	
			PR GRAB	10/15/1997	1.1 ug/L	U	
			PR GRAB	07/23/1997	1.1 ug/L	U	

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Constituent Name	CAS #	Method	Samp Purp	Tech.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
PYRENE	129-00-0	SW-846 8260A-MOD	PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
			PR	GRAB	06/25/1997	10 ug/L		U	
			PR	GRAB	05/28/1997	10 ug/L		U	
			PR	GRAB	05/21/1997	10 ug/L		U	
			PR	GRAB	05/14/1997	10 ug/L		U	
			PR	GRAB	05/07/1997	10 ug/L		U	
			PR	GRAB	04/29/1997	10 ug/L		U	
			PR	GRAB	10/15/1997	.8 ug/L		U	
			PR	GRAB	07/23/1997	.8 ug/L		U	
TETRACHLOROETHYLENE	127-18-4	SW-846 8260A	PR	GRAB	04/23/1997	.8 ug/L		U	
			PR	GRAB	11/13/1997	1.2 ug/L		U	
			PR	GRAB	10/15/1997	1.2 ug/L		U	
			PR	GRAB	07/23/1997	1.2 ug/L		U	
			PR	GRAB	04/23/1997	1.2 ug/L		U	
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	5 ug/L		U	
			PR	GRAB	08/14/1997	10 ug/L		U	
			PR	GRAB	06/25/1997	10 ug/L		U	
			PR	GRAB	05/28/1997	2.5 ug/L		U	
			PR	GRAB	05/21/1997	2.5 ug/L		U	
			PR	GRAB	05/14/1997	2.5 ug/L		U	
TETRAHYDROFURAN	109-99-9	SW-846 8260A	PR	GRAB	05/07/1997	2.5 ug/L		U	
			PR	GRAB	04/29/1997	2.5 ug/L		U	
			PR	GRAB	11/13/1997	2 ug/L		U	
			PR	GRAB	10/15/1997	2 ug/L		U	
			PR	GRAB	07/23/1997	2 ug/L		U	
			PR	GRAB	04/23/1997	2 ug/L		U	
			PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
TOLUENE	108-88-3	SW-846 8260A	PR	GRAB	09/10/1997	5 ug/L		U	
			PR	GRAB	08/14/1997	10 ug/L		U	
			PR	GRAB	06/25/1997	10 ug/L		U	
			PR	GRAB	05/28/1997	10 ug/L		U	
			PR	GRAB	05/21/1997	10 ug/L		U	
			PR	GRAB	05/14/1997	2.5 ug/L		U	
			PR	GRAB	05/07/1997	2.5 ug/L		U	
			PR	GRAB	04/29/1997	2.5 ug/L		U	
			PR	GRAB	10/15/1997	2.1 ug/L		U	
			PR	GRAB	07/23/1997	2.1 ug/L		U	
TOTAL CRESOL	1319-77-3	SW-846 8270B	PR	GRAB	04/23/1997	2.1 ug/L		U	
			PR	GRAB	10/15/1997	.3 ug/L		U	
			PR	GRAB	07/23/1997	.3 ug/L		U	
			PR	GRAB	04/23/1997	.3 ug/L		U	
			PR	GRAB	10/15/1997	2.3 ug/L		U	
			PR	GRAB	07/23/1997	2.3 ug/L		U	
			PR	GRAB	04/23/1997	2.3 ug/L		U	
			PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
TRIBUTYL PHOSPHATE	126-73-8	SW-846 8270B	PR	GRAB	04/23/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	.3 ug/L		U	
			PR	GRAB	07/23/1997	.3 ug/L		U	
			PR	GRAB	04/23/1997	.3 ug/L		U	
			PR	GRAB	10/15/1997	2.3 ug/L		U	
			PR	GRAB	07/23/1997	2.3 ug/L		U	
			PR	GRAB	04/23/1997	2.3 ug/L		U	
			PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
1,2,4-TRICHLOROBENZENE	120-82-1	SW-846 8270B	PR	GRAB	04/23/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	2.3 ug/L		U	
			PR	GRAB	07/23/1997	2.3 ug/L		U	
			PR	GRAB	04/23/1997	2.3 ug/L		U	
			PR	GRAB	11/13/1997	1 ug/L		U	
			PR	GRAB	10/15/1997	1 ug/L		U	
			PR	GRAB	07/23/1997	1 ug/L		U	
			PR	GRAB	04/23/1997	1 ug/L		U	
			PR	GRAB	09/10/1997	5 ug/L		U	
			PR	GRAB	08/14/1997	10 ug/L		U	
1,1,1-TRICHLOROETHANE	71-55-6	SW-846 8260A	PR	GRAB	06/25/1997	10 ug/L		U	

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Constituent Name	CAS #	Method	Sample Purp	Techn.	Date Sampled	Result Units	Lab Q1fr	Val Q1fr
1,1,2-TRICHLOROETHANE	79-00-5	SW-846 8260A	PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	1.7 ug/L	U	
			PR	GRAB	10/15/1997	1.7 ug/L	U	
			PR	GRAB	07/23/1997	1.7 ug/L	U	
			PR	GRAB	04/23/1997	1.7 ug/L	U	
		SW-846 8260A-MOD	PR	GRAB	09/10/1997	5 ug/L	U	
			PR	GRAB	08/14/1997	10 ug/L	U	
			PR	GRAB	06/25/1997	10 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	.68 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
TRICHLOROETHENE	79-01-6	SW-846 8260A	PR	GRAB	11/13/1997	2 ug/L	J	
			PR	GRAB	10/15/1997	2 ug/L	J	
			PR	GRAB	07/23/1997	2 ug/L	J	
			PR	GRAB	04/23/1997	2 ug/L	J	
		SW-846 8260A-MOD	PR	GRAB	06/12/1997	6.3 ug/L		
			PR	GRAB	06/05/1997	5.9 ug/L		
			PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
VINYL CHLORIDE	75-01-4	SW-846 8260A	PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	.6 ug/L	U	
			PR	GRAB	10/15/1997	.6 ug/L	U	
			PR	GRAB	07/23/1997	.6 ug/L	U	
			PR	GRAB	04/23/1997	.6 ug/L	U	
		SW-846 8260A-MOD	PR	GRAB	05/28/1997	10 ug/L	U	
			PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	10 ug/L	U	
XYLENE (TOTAL)	1330-20-7	SW-846 8260A	PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	11/13/1997	1 ug/L	U	
			PR	GRAB	10/15/1997	1 ug/L	U	
			PR	GRAB	07/23/1997	1 ug/L	U	
			PR	GRAB	04/23/1997	1 ug/L	U	
		SW-846 8260A-MOD	PR	GRAB	05/14/1997	10 ug/L	U	
			PR	GRAB	05/07/1997	10 ug/L	U	
			PR	GRAB	04/29/1997	10 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
ALUMINUM	7429-90-5	SW-846 6010A	PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	2.5 ug/L	U	
			PR	GRAB	05/07/1997	2.5 ug/L	U	
			PR	GRAB	04/29/1997	2.5 ug/L	U	
			PR	GRAB	01/07/1998	25.3 ug/L	U	
			PR	GRAB	10/15/1997	26 ug/L		
			PR	GRAB	07/23/1997	46 ug/L		
			PR	GRAB	04/23/1997	49 ug/L		
			PR	GRAB	08/14/1997	10 ug/L	U	
			PR	GRAB	05/28/1997	10 ug/L	U	
ANTIMONY	7440-36-0	EPA-600 200.8	PR	GRAB	05/21/1997	10 ug/L	U	
			PR	GRAB	05/14/1997	2.5 ug/L	U	
			PR	GRAB	05/07/1997	2.5 ug/L	U	
			PR	GRAB	04/29/1997	2.5 ug/L	U	

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Constituent Name	CAS #	Method	Samp Purp	Tech	Date Sampled	Result Units	Lab Q1fr	Val Q1fr
		SW-846 6010A	PR	GRAB	01/07/1998	45.1 ug/L	U	
			PR	GRAB	10/15/1997	46 ug/L	U	
			PR	GRAB	07/23/1997	46 ug/L	U	
			PR	GRAB	04/23/1997	79 ug/L	U	
ARSENIC	7440-38-2	EPA-600 200.8	PR	GRAB	01/07/1998	2.2 ug/L		
			PR	GRAB	10/15/1997	2.4 ug/L	B	
			PR	GRAB	07/23/1997	2.3 ug/L		
			PR	GRAB	04/23/1997	2.2 ug/L		
BARIUM	7440-39-3	SW-846 6010A	PR	GRAB	01/07/1998	96.7 ug/L		
			PR	GRAB	10/15/1997	108 ug/L		
			PR	GRAB	07/23/1997	103 ug/L		
			PR	GRAB	04/23/1997	102 ug/L		
BERYLLIUM	7440-41-7	SW-846 6010A	PR	GRAB	01/07/1998	4.4 ug/L	U	
			PR	GRAB	10/15/1997	5 ug/L	U	
			PR	GRAB	07/23/1997	5 ug/L	U	
			PR	GRAB	04/23/1997	5 ug/L	U	
CADMIUM	7440-43-9	EPA-600 200.8	PR	GRAB	01/07/1998	.2 ug/L		
			PR	GRAB	10/15/1997	.2 ug/L	U	
			PR	GRAB	07/23/1997	.2 ug/L	U	
			PR	GRAB	04/23/1997	.2 ug/L	U	
CALCIUM	7440-70-2	SW-846 6010A	PR	GRAB	01/07/1998	101000 ug/L	J	
			PR	GRAB	10/15/1997	111000 ug/L		
			PR	GRAB	07/23/1997	112000 ug/L	J	
			PR	GRAB	04/23/1997	104000 ug/L		
CHROMIUM	7440-47-3	EPA-600 200.8	PR	GRAB	01/07/1998	4.3 ug/L		
			PR	GRAB	10/15/1997	3.9 ug/L		
			PR	GRAB	07/23/1997	3.9 ug/L		
			PR	GRAB	04/23/1997	6.2 ug/L		
COBALT	7440-48-4	SW-846 6010A	PR	GRAB	01/07/1998	6.6 ug/L	U	
			PR	GRAB	10/15/1997	7 ug/L	U	
			PR	GRAB	07/23/1997	7 ug/L	U	
			PR	GRAB	04/23/1997	7 ug/L	U	
COPPER	7440-50-8	EPA-600 200.8	PR	GRAB	01/07/1998	.4 ug/L	U	
			PR	GRAB	10/15/1997	.5 ug/L		
			PR	GRAB	07/23/1997	.6 ug/L		
			PR	GRAB	04/23/1997	1.3 ug/L		
IRON	7439-89-6	SW-846 6010A	PR	GRAB	01/07/1998	11.8 ug/L	B	
			PR	GRAB	10/15/1997	9 ug/L		
			PR	GRAB	07/23/1997	28 ug/L		
			PR	GRAB	04/23/1997	48 ug/L		
LEAD	7439-92-1	EPA-600 200.8	PR	GRAB	01/07/1998	.2 ug/L	U	
			PR	GRAB	10/15/1997	.2 ug/L	U	
			PR	GRAB	07/23/1997	.2 ug/L	U	
			PR	GRAB	04/23/1997	.2 ug/L	U	
MAGNESIUM	7439-95-4	SW-846 6010A	PR	GRAB	01/07/1998	34100 ug/L		
			PR	GRAB	10/15/1997	36000 ug/L		
			PR	GRAB	07/23/1997	34700 ug/L		
			PR	GRAB	04/23/1997	34100 ug/L		
MANGANESE	7439-96-5	SW-846 6010A	PR	GRAB	01/07/1998	4.4 ug/L	U	
			PR	GRAB	10/15/1997	5 ug/L	U	
			PR	GRAB	07/23/1997	5 ug/L	U	
			PR	GRAB	04/23/1997	5 ug/L	U	
MERCURY	7439-97-6	EPA-600 200.8	PR	GRAB	01/07/1998	.1 ug/L	U	
			PR	GRAB	10/15/1997	.1 ug/L	U	
			PR	GRAB	07/23/1997	.1 ug/L	B	

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Constituent Name	CAS #	Method	Samp Purp	Techn	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
NICKEL	7440-02-0	SW-846 6010A	PR	GRAB	04/23/1997	.1	ug/L	U	
			PR	GRAB	01/07/1998	12.1	ug/L	U	
			PR	GRAB	10/15/1997	13	ug/L	U	
			PR	GRAB	07/23/1997	13	ug/L	U	
POTASSIUM	7440-09-7	SW-846 6010A	PR	GRAB	04/23/1997	18	ug/L	U	
			PR	GRAB	01/07/1998	5980	ug/L	J	
			PR	GRAB	10/15/1997	7060	ug/L		
			PR	GRAB	07/23/1997	6070	ug/L		
SELENIUM	7782-49-2	EPA-600 200.8	PR	GRAB	04/23/1997	6230	ug/L		
			PR	GRAB	01/07/1998	4	ug/L		
			PR	GRAB	10/15/1997	5.3	ug/L		
			PR	GRAB	07/23/1997	5.4	ug/L		
SILICON	7440-21-3	KIT-SILICA	PR	GRAB	04/23/1997	5.2	ug/L		
			PR	GRAB	08/14/1997	20000	ug/L		
			PR	GRAB	07/09/1997	11200	ug/L		
			PR	GRAB	06/25/1997	20200	ug/L		
			PR	GRAB	06/18/1997	19400	ug/L		
			PR	GRAB	06/12/1997	21500	ug/L		
			PR	GRAB	05/28/1997	19900	ug/L		
			PR	GRAB	05/21/1997	16600	ug/L		
			PR	GRAB	05/14/1997	17200	ug/L		
			PR	GRAB	05/07/1997	24300	ug/L		
			PR	GRAB	01/07/1998	23900	ug/L	J	
			PR	GRAB	11/13/1997	22500	ug/L	J	
			PR	GRAB	10/15/1997	23500	ug/L		
			PR	GRAB	07/23/1997	21300	ug/L		
SILVER	7440-22-4	SW-846 6010A	PR	GRAB	04/23/1997	24300	ug/L		
			PR	GRAB	09/10/1997	45480	ug/L		
			PR	GRAB	08/14/1997	20800	ug/L		
			PR	GRAB	01/07/1998	4.4	ug/L	UJ	
			PR	GRAB	10/15/1997	5	ug/L	UJ	
			PR	GRAB	07/23/1997	5	ug/L	UJ	
			PR	GRAB	04/23/1997	7	ug/L	UJ	
			PR	GRAB	01/07/1998	26500	ug/L		
			PR	GRAB	10/15/1997	26700	ug/L		
			PR	GRAB	07/23/1997	26300	ug/L		
THALLIUM	7440-28-0	SW-846 6010A	PR	GRAB	04/23/1997	25600	ug/L		
			PR	GRAB	01/07/1998	79.2	ug/L	U	
			PR	GRAB	10/15/1997	80	ug/L	U	
			PR	GRAB	07/23/1997	80	ug/L	U	
TITANIUM	7440-32-6	SW-846 6010A	PR	GRAB	04/23/1997	151	ug/L	U	
			PR	GRAB	01/07/1998	4.4	ug/L	U	
			PR	GRAB	10/15/1997	5	ug/L	U	
			PR	GRAB	07/23/1997	5	ug/L	U	
URANIUM (TOTAL)	7440-61-1	EPA-600 200.8	PR	GRAB	04/23/1997	5	ug/L	U	
			PR	GRAB	01/07/1998	296	ug/L		
			PR	GRAB	11/13/1997	254	ug/L		
			PR	GRAB	10/15/1997	250	ug/L		
			PR	GRAB	07/23/1997	261	ug/L		
			PR	GRAB	04/23/1997	360	ug/L		
VANADIUM	7440-62-2	SW-846 6010A	PR	GRAB	09/10/1997	196	ug/L	U	
			PR	GRAB	08/14/1997	320	ug/L		
			PR	GRAB	01/07/1998	8.49	ug/L		
			PR	GRAB	10/15/1997	23	ug/L		
			PR	GRAB	07/23/1997	19	ug/L		

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Constituent Name	CAS #	Method	Samp Purp	Techn.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
ZINC	7440-66-6	SW-846 6010A	PR	GRAB	04/23/1997	17	ug/L		
			PR	GRAB	01/07/1998	12.7	ug/L	J	
			PR	GRAB	10/15/1997	5	ug/L	U	
			PR	GRAB	07/23/1997	5	ug/L	U	
GROSS ALPHA	12587-46-1	GROSS-ALPHA (DGPC)	PR	GRAB	04/23/1997	6	ug/L	U	
			PR	GRAB	01/07/1998	100	pCi/L		
			PR	GRAB	10/15/1997	90	pCi/L		
			PR	GRAB	07/23/1997	83	pCi/L		
GROSS BETA	12587-47-2	GROSS-BETA (DPC)	PR	GRAB	04/23/1997	120	pCi/L		
			PR	GRAB	01/07/1998	1500	pCi/L		
			PR	GRAB	10/15/1997	1200	pCi/L		
			PR	GRAB	07/23/1997	1400	pCi/L		
TRITIUM	10028-17-8	H3LOWLSC	PR	GRAB	04/23/1997	1400	pCi/L		
			PR	GRAB	01/07/1998	410	pCi/L		
			PR	GRAB	10/15/1997	580	pCi/L		
			PR	GRAB	07/23/1997	38000	pCi/L		
CARBON-14	14762-75-5	C14CHEMLSC	PR	GRAB	04/23/1997	770	pCi/L		
			PR	GRAB	01/07/1998	2.3	pCi/L	U	
			PR	GRAB	10/15/1997	2.4	pCi/L	U	
			PR	GRAB	07/23/1997	2.3	pCi/L	U	
COBALT-60	10198-40-0	GAMMA SCAN	PR	GRAB	04/23/1997	7.4	pCi/L		
			PR	GRAB	01/07/1998	6.07	pCi/L	U	
			PR	GRAB	10/15/1997	6.55	pCi/L	U	
			PR	GRAB	07/23/1997	5.93	pCi/L	U	
ZINC-65	13982-39-3	GAMMA SCAN	PR	GRAB	04/23/1997	7.01	pCi/L	U	
			PR	GRAB	01/07/1998	13.5	pCi/L	U	
			PR	GRAB	10/15/1997	14.6	pCi/L	U	
			PR	GRAB	07/23/1997	13.7	pCi/L	U	
STRONTIUM-90	10098-97-2	STRONTIUM-90 SPEC	PR	GRAB	04/23/1997	13.5	pCi/L	U	
			PR	GRAB	01/07/1998	23	pCi/L		
			PR	GRAB	10/15/1997	4.2	pCi/L		
			PR	GRAB	07/23/1997	2.1	pCi/L		
NIOBIUM-94	14681-63-1	GAMMA SCAN	PR	GRAB	04/23/1997	6	pCi/L		
			PR	GRAB	01/07/1998	6.82	pCi/L	U	
			PR	GRAB	10/15/1997	6.86	pCi/L	U	
			PR	GRAB	07/23/1997	6.82	pCi/L	U	
TECHNETIUM-99	14133-76-7	TC99CHEMLSC	PR	GRAB	04/23/1997	6.86	pCi/L	U	
			PR	GRAB	01/07/1998	2200	pCi/L		
			PR	GRAB	11/13/1997	2400	pCi/L		
			PR	GRAB	10/15/1997	2300	pCi/L		
RUTHENIUM-103	13968-53-1	GAMMA SCAN	PR	GRAB	09/10/1997	2960	pCi/L		
			PR	GRAB	07/23/1997	3000	pCi/L		
			PR	GRAB	04/23/1997	3100	pCi/L		
			PR	GRAB	01/07/1998	6.82	pCi/L	U	
RUTHENIUM-106	13967-48-1	GAMMA SCAN	PR	GRAB	10/15/1997	7.15	pCi/L	U	
			PR	GRAB	07/23/1997	6.69	pCi/L	U	
			PR	GRAB	04/23/1997	7.44	pCi/L	U	
			PR	GRAB	01/07/1998	65.8	pCi/L	U	
TIN-113	13966-06-8	GAMMA SCAN	PR	GRAB	10/15/1997	62	pCi/L	U	
			PR	GRAB	07/23/1997	55.6	pCi/L	U	
			PR	GRAB	04/23/1997	71.1	pCi/L	U	
			PR	GRAB	01/07/1998	8.92	pCi/L	U	
			PR	GRAB	10/15/1997	10.2	pCi/L	U	
			PR	GRAB	07/23/1997	9.23	pCi/L	U	
			PR	GRAB	04/23/1997	8.78	pCi/L	U	

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Constituent Name	CAS #	Method	Samp Purp	Techn.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
ANTIMONY-125	14234-35-6	GAMMA SCAN	PR	GRAB	01/07/1998	20.4	pCi/L	U	
			PR	GRAB	10/15/1997	20.3	pCi/L	U	
			PR	GRAB	07/23/1997	20.5	pCi/L	U	
			PR	GRAB	04/23/1997	21.1	pCi/L	U	
IODINE-129	15046-84-1	I-129 (LEPS)	PR	GRAB	10/15/1997	4.9	pCi/L	U	
			PR	GRAB	07/23/1997	3.6	pCi/L	U	
			PR	GRAB	04/23/1997	4.2	pCi/L	U	
CESIUM-134	13967-70-9	GAMMA SCAN	PR	GRAB	01/07/1998	6.92	pCi/L	U	
			PR	GRAB	10/15/1997	7.81	pCi/L	U	
			PR	GRAB	07/23/1997	7.46	pCi/L	U	
			PR	GRAB	04/23/1997	6.7	pCi/L	U	
CESIUM-137	10045-97-3	GAMMA SCAN	PR	GRAB	01/07/1998	7.76	pCi/L	U	
			PR	GRAB	10/15/1997	7.24	pCi/L	U	
			PR	GRAB	07/23/1997	7.15	pCi/L	U	
			PR	GRAB	04/23/1997	8.04	pCi/L	U	
CERIUM-144	14762-78-8	GAMMA SCAN	PR	GRAB	01/07/1998	46.9	pCi/L	U	
			PR	GRAB	10/15/1997	46.3	pCi/L	U	
			PR	GRAB	07/23/1997	46.6	pCi/L	U	
			PR	GRAB	04/23/1997	47.1	pCi/L	U	
CERIUM/PRASEODYMIUM-144	CE/PR-144	GAMMA SCAN	PR	GRAB	01/07/1998	93.8	pCi/L	U	
			PR	GRAB	10/15/1997	92.5	pCi/L	U	
			PR	GRAB	07/23/1997	93.3	pCi/L	U	
			PR	GRAB	04/23/1997	94.2	pCi/L	U	
EUROPIUM-152	14683-23-9	GAMMA SCAN	PR	GRAB	01/07/1998	22.9	pCi/L	U	
			PR	GRAB	10/15/1997	19.9	pCi/L	U	
			PR	GRAB	07/23/1997	21.3	pCi/L	U	
			PR	GRAB	04/23/1997	23	pCi/L	U	
EUROPIUM-154	15585-10-1	GAMMA SCAN	PR	GRAB	01/07/1998	19	pCi/L	U	
			PR	GRAB	10/15/1997	18.5	pCi/L	U	
			PR	GRAB	07/23/1997	19.4	pCi/L	U	
			PR	GRAB	04/23/1997	18.9	pCi/L	U	
EUROPIUM-155	14391-16-3	GAMMA SCAN	PR	GRAB	01/07/1998	22.1	pCi/L	U	
			PR	GRAB	10/15/1997	22.1	pCi/L	U	
			PR	GRAB	07/23/1997	22.9	pCi/L	U	
			PR	GRAB	04/23/1997	22.6	pCi/L	U	
URANIUM-234	13966-29-5	EPA-600 200.8	PR	GRAB	10/15/1997	85	pCi/L		
		URANIUM (ISOTOPIC)	PR	GRAB	04/23/1997	.02	ug/L		
			PR	GRAB	01/07/1998	84	pCi/L		
			PR	GRAB	10/15/1997	85	pCi/L		
			PR	GRAB	04/23/1997	92	pCi/L		
URANIUM-235	15117-96-1	EPA-600 200.8	PR	GRAB	10/15/1997	3.31	pCi/L		
		URANIUM (ISOTOPIC)	PR	GRAB	04/23/1997	1.89	ug/L		
			PR	GRAB	01/07/1998	6.4	pCi/L		
			PR	GRAB	10/15/1997	6.3	pCi/L		
			PR	GRAB	04/23/1997	7.2	pCi/L		
NEPTUNIUM-237	13994-20-2	PUPRECIP	PR	GRAB	01/07/1998	.046	pCi/L	U	
			PR	GRAB	10/15/1997	.031	pCi/L		
PLUTONIUM-238	13981-16-3	PUPRECIP	PR	GRAB	01/07/1998	.099	pCi/L	U	
			PR	GRAB	10/15/1997	.12	pCi/L		
			PR	GRAB	07/23/1997	.32	pCi/L		
			PR	GRAB	04/23/1997	.012	pCi/L	U	
URANIUM-238	24678-82-8	EPA-600 200.8	PR	GRAB	10/15/1997	83.5	pCi/L		
		URANIUM (ISOTOPIC)	PR	GRAB	04/23/1997	358	ug/L		
			PR	GRAB	01/07/1998	83	pCi/L		
			PR	GRAB	10/15/1997	87	pCi/L		

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Constituent Name	CAS #	Method	Samp Purp	Techn.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
AMERICIUM-241	14596-10-2	AM/CMPRECIP	PR	GRAB	04/23/1997	94	pCi/L		
			PR	GRAB	01/07/1998	.15	pCi/L		
			PR	GRAB	10/15/1997	.2	pCi/L		
			PR	GRAB	07/23/1997	.16	pCi/L		
			PR	GRAB	04/23/1997	.15	pCi/L		
CURIUM-242	15510-73-3	AM/CMPRECIP	PR	GRAB	01/07/1998	.056	pCi/L	U	
			PR	GRAB	10/15/1997	.083	pCi/L	U	
			PR	GRAB	07/23/1997	.016	pCi/L	U	
			PR	GRAB	04/23/1997	.076	pCi/L	U	
CURIUM-244	13981-15-2	AM/CMPRECIP	PR	GRAB	01/07/1998	.13	pCi/L	U	
			PR	GRAB	10/15/1997	.054	pCi/L	U	
			PR	GRAB	07/23/1997	.016	pCi/L	U	
			PR	GRAB	04/23/1997	.076	pCi/L	U	
PLUTONIUM-239/240	PU-239/240	PUPRECIP	PR	GRAB	01/07/1998	.049	pCi/L		
			PR	GRAB	10/15/1997	.078	pCi/L		
			PR	GRAB	07/23/1997	.031	pCi/L		
			PR	GRAB	04/23/1997	.03	pCi/L	U	
RADIUM-226	13982-63-3	RADIUM-226 (AEA)	PR	GRAB	01/07/1998	.045	pCi/L		
			PR	GRAB	10/15/1997	.27	pCi/L		
			PR	GRAB	07/23/1997	.42	pCi/L		
			PR	GRAB	04/23/1997	.15	pCi/L		
ALKALINITY (MG CaCO3/L)	ALKALINITY	EPA-600 310.1	PR	GRAB	01/07/1998	126	mg/L		
			PR	GRAB	10/15/1997	128	mg/L		
			PR	GRAB	07/23/1997	143	mg/L		
			PR	GRAB	04/23/1997	108.4	mg/L		
AMMONIA (AS N)	7664-41-7	EPA-600 300.7	PR	GRAB	01/07/1998	15	ug/L	U	
			PR	GRAB	10/15/1997	33	ug/L	U	
			PR	GRAB	07/23/1997	33	ug/L	U	
			PR	GRAB	04/23/1997	63	ug/L	U	
BROMIDE	24959-67-9	EPA-600 300.0	PR	GRAB	01/07/1998	.2	mg/L	J	
			PR	GRAB	10/15/1997	.154	mg/L	U	
			PR	GRAB	07/23/1997	.154	mg/L	U	
			PR	GRAB	04/23/1997	.077	mg/L	U	
CHLORIDE	16887-00-6	EPA-600 300.0	PR	GRAB	01/07/1998	19.31	mg/L		
			PR	GRAB	10/15/1997	18.2	mg/L		
			PR	GRAB	07/23/1997	21.8	mg/L		
			PR	GRAB	04/23/1997	19	mg/L		
		EPA-600 300.0-MOD	PR	GRAB	09/10/1997	21.1	mg/L		
CYANIDE	57-12-5	EPA-600 335.3	PR	GRAB	01/07/1998	6.2	ug/L	J	
			PR	GRAB	10/15/1997	8.1	ug/L	J	
			PR	GRAB	07/23/1997	7.7	ug/L	J	
			PR	GRAB	04/23/1997	6.89	ug/L		
FLUORIDE	16984-48-8	EPA-600 300.0	PR	GRAB	01/07/1998	.4	mg/L	J	
			PR	GRAB	10/15/1997	.3	mg/L	J	
			PR	GRAB	07/23/1997	.3	mg/L	J	
			PR	GRAB	04/23/1997	.4	mg/L	J	
FORMATE	FORMATE	EPA-600 300.0	PR	GRAB	01/07/1998	125	ug/L	U	
			PR	GRAB	10/15/1997	125	ug/L	U	
			PR	GRAB	07/23/1997	250	ug/L	U	
			PR	GRAB	04/23/1997	125	ug/L	U	
NITRATE (AS N)	14797-55-8	EPA-600 300.0	PR	GRAB	01/07/1998	62.17	mg/L		
			PR	GRAB	11/13/1997	66.3	mg/L		
			PR	GRAB	10/15/1997	69.2	mg/L		
			PR	GRAB	07/23/1997	75.3	mg/L		
			PR	GRAB	04/23/1997	73.8	mg/L		

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Constituent Name	CAS #	Method	Samp Purp	Tech.	Date Sampled	Result Units	Lab Qlfr	Val Qlfr
NITRITE (AS N)	14797-65-0	EPA-600 300.0-MOD KIT-NITRATE	PR	GRAB	09/10/1997	67.8 mg/L		
			PR	GRAB	08/14/1997	49.3 mg/L		
			PR	GRAB	07/09/1997	62.8 mg/L		
			PR	GRAB	06/25/1997	42 mg/L		
			PR	GRAB	06/18/1997	57 mg/L		
			PR	GRAB	06/12/1997	72.8 mg/L		
			PR	GRAB	05/28/1997	38.5 mg/L		
			PR	GRAB	05/21/1997	38.6 mg/L		
			PR	GRAB	05/14/1997	70.3 mg/L		
			PR	GRAB	05/07/1997	48.8 mg/L		
			PR	GRAB	04/29/1997	50.2 mg/L		
			PR	GRAB	04/23/1997	52.2 mg/L		
			PR	GRAB	04/16/1997	56.2 mg/L		
			PR	GRAB	04/09/1997	48 mg/L		
			PR	GRAB	04/02/1997	74 mg/L		
			PR	GRAB	01/07/1998	.012 mg/L		U
			PR	GRAB	10/15/1997	.024 mg/L		U
NITROGEN TOTAL (TKN)	N-KJELDAHL	EPA-600 351.2	PR	GRAB	07/23/1997	.024 mg/L		U
			PR	GRAB	04/23/1997	.012 mg/L		U
			PR	GRAB	10/15/1997	.133 mg/L		U
			PR	GRAB	07/23/1997	.133 mg/L		U
PH MEASUREMENT	PH	EPA-600 150.1	PR	GRAB	04/23/1997	.133 mg/L		U
			PR	GRAB	01/07/1998	7.97 pH		
			PR	GRAB	11/13/1997	8 pH		
			PR	GRAB	10/15/1997	8.11 pH		
			PR	GRAB	07/23/1997	8.082 pH		
			PR	GRAB	04/23/1997	7.983 pH		
			PR	GRAB	09/10/1997	7 pH		
			PR	GRAB	08/14/1997	8.1 pH		
			PR	GRAB	07/09/1997	8.1 pH		
			PR	GRAB	06/25/1997	7.8 pH		
	EPA-600 150.1-MOD		PR	GRAB	06/18/1997	7.5 pH		
			PR	GRAB	06/12/1997	7.7 pH		
			PR	GRAB	05/28/1997	7.9 pH		
			PR	GRAB	05/21/1997	7.9 pH		
			PR	GRAB	05/14/1997	7.8 pH		
			PR	GRAB	05/07/1997	7.9 pH		
			PR	GRAB	04/29/1997	7.8 pH		
			PR	GRAB	04/23/1997	7.7 pH		
			PR	GRAB	04/16/1997	7.8 pH		
			PR	GRAB	04/09/1997	7.8 pH		
PHOSPHATE	14265-44-2	EPA-600 300.0	PR	GRAB	04/02/1997	8 pH		
			PR	GRAB	01/07/1998	.06 mg/L		U
			PR	GRAB	10/15/1997	.12 mg/L		U
			PR	GRAB	07/23/1997	1.26 mg/L		U
			PR	GRAB	04/23/1997	3.06 mg/L		U
SILICA (SILICON DIOXIDE)	7631-86-9	EPA-600 300.0-MOD KIT-SILICA	PR	GRAB	09/10/1997	.44 mg/L		U
			PR	GRAB	08/14/1997	43.9 mg/L		
			PR	GRAB	07/09/1997	24 mg/L		
			PR	GRAB	06/25/1997	43.1 mg/L		
			PR	GRAB	06/18/1997	41.4 mg/L		
			PR	GRAB	06/12/1997	45.9 mg/L		
			PR	GRAB	05/28/1997	42.6 mg/L		
			PR	GRAB	05/21/1997	35.4 mg/L		
			PR	GRAB	05/14/1997	36.7 mg/L		

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Liquid Effluent Monitoring Info System
LABORATORY DATA SUMMARY REPORT
WASTE ANALYSIS PLAN FOR ETF AND LERF
01/01/1992 thru 01/29/1998

Sample Location: INFLUENT SAMPLE LERF BASIN 43

Constituent Name	CAS #	Method	Samp Purp	Tech.	Date Sampled	Result	Units	Lab Qlfr	Val Qlfr
SPECIFIC CONDUCTIVITY	CONDUCT	EPA-600 120.1	PR	GRAB	05/07/1997	52	mg/L		
			PR	GRAB	04/29/1997	34.6	mg/L		
			PR	GRAB	04/23/1997	27.2	mg/L		
			PR	GRAB	04/16/1997	34.3	mg/L		
			PR	GRAB	04/09/1997	30.9	mg/L		
			PR	GRAB	04/02/1997	37.4	mg/L		
			PR	GRAB	01/07/1998	909	umhos/cm		
			PR	GRAB	11/13/1997	923	umhos/cm		
			PR	GRAB	10/15/1997	932	umhos/cm		
			PR	GRAB	07/23/1997	964	umhos/cm		
			PR	GRAB	04/23/1997	987	umhos/cm		
		EPA-600 120.1-MOD	PR	GRAB	09/10/1997	951	umhos/cm		
			PR	GRAB	08/14/1997	962	umhos/cm		
			PR	GRAB	07/09/1997	1010	umhos/cm		
			PR	GRAB	06/25/1997	993	umhos/cm		
			PR	GRAB	06/18/1997	1000	umhos/cm		
			PR	GRAB	05/28/1997	1007	umhos/cm		
			PR	GRAB	05/21/1997	1016	umhos/cm		
			PR	GRAB	05/14/1997	935	umhos/cm		
			PR	GRAB	05/07/1997	932	umhos/cm		
			PR	GRAB	04/29/1997	972	umhos/cm		
SULFATE	14808-79-8	EPA-600 300.0	PR	GRAB	04/23/1997	966	umhos/cm		
			PR	GRAB	04/16/1997	974	umhos/cm		
			PR	GRAB	04/09/1997	953	umhos/cm		
			PR	GRAB	04/02/1997	1062	umhos/cm		
			PR	GRAB	01/07/1998	46.63	mg/L		
			PR	GRAB	10/15/1997	49.8	mg/L		
			PR	GRAB	07/23/1997	50.7	mg/L		
			PR	GRAB	04/23/1997	48.1	mg/L		
			PR	GRAB	09/10/1997	49.2	mg/L		
			PR	GRAB	01/07/1998	639000	ug/L		
TOTAL DISSOLVED SOLIDS	TDS	EPA-600 160.1	PR	GRAB	11/13/1997	625000	ug/L		
			PR	GRAB	10/15/1997	671000	ug/L		
			PR	GRAB	07/23/1997	672000	ug/L		
			PR	GRAB	04/23/1997	706000	ug/L		
			PR	GRAB	09/10/1997	472000	ug/L		J
		EPA-600 160.1-MOD	PR	GRAB	11/13/1997	.3	mg/L	U	
			PR	GRAB	10/15/1997	.3	mg/L	U	
			PR	GRAB	09/10/1997	.0088	mg/L		
			PR	GRAB	07/23/1997	.3	mg/L	U	
			PR	GRAB	04/23/1997	.3	mg/L	U	
TOTAL ORGANIC CARBON	TOC	SW-846 9060	PR	GRAB	01/07/1998	200	ug/L	U	
			PR	GRAB	11/13/1997	200	ug/L	U	
			PR	GRAB	10/15/1997	200	ug/L	U	
			PR	GRAB	07/23/1997	200	ug/L	U	
			PR	GRAB	04/23/1997	10400	ug/L		
			PR	GRAB	09/10/1997	2000	ug/L		J
			PR	GRAB	08/14/1997	1250	ug/L	U	
			PR	GRAB	07/09/1997	11000	ug/L	U	
			PR	GRAB	06/25/1997	.4000	ug/L		
			PR	GRAB	06/18/1997	0	ug/L		
TOTAL SUSPENDED SOLIDS	TSS	EPA-600 160.2	PR	GRAB	06/12/1997	0	ug/L		
			PR	GRAB	05/28/1997	3000	ug/L		
			PR	GRAB	05/21/1997	4000	ug/L		
			PR	GRAB	05/14/1997	5000	ug/L		
		EPA-600 160.2-MOD	PR	GRAB	09/10/1997	1250	ug/L	U	
			PR	GRAB	08/14/1997	1250	ug/L	U	
			PR	GRAB	07/09/1997	11000	ug/L		
			PR	GRAB	06/25/1997	.4000	ug/L		
			PR	GRAB	06/18/1997	0	ug/L		
			PR	GRAB	06/12/1997	0	ug/L		

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Liquid Effluent Monitoring Info System
LABORATORY DATA SUMMARY REPORT
WASTE ANALYSIS PLAN FOR ETF AND LERF
01/01/1992 thru 01/29/1998

Sample Location: INFLUENT SAMPLE LERF BASIN 43

Constituent Name	CAS #	Method	Samp		Date Sampled	Result Units	Lab	Val
			Purp	Tech.			Q1fr	Q1fr
			PR	GRAB	05/07/1997	4000 ug/L		
			PR	GRAB	04/29/1997	3000 ug/L		
			PR	GRAB	04/23/1997	3000 ug/L		
			PR	GRAB	04/16/1997	3000 ug/L		
			PR	GRAB	04/09/1997	3000 ug/L		
			PR	GRAB	04/02/1997	4000 ug/L		

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Liquid Effluent Monitoring Info System
LABORATORY DATA SUMMARY REPORT

Error Message: No conversion of PCI/L to UG/L : Constituent URANIUM-234
Error Message: No conversion of UG/L to PCI/L : Constituent URANIUM-235
Error Message: No conversion of UG/L to PCI/L : Constituent URANIUM-238

SAMPLE PURPOSE CODES

Samp	QA Purp	Description
Y BL	BLANK	
Y CS	POL CHECK STANDARD	
Y DF	DUPLICATE FILTERED	
Y DP	DUPLICATE	
Y EB	EQUIP BLANK	
Y FB	FIELD BLANK	
N PF	PRIMARY FILTERED	
N PR	PRIMARY	
N RR	RERUN	
N SP	SPLIT	
Y TB	TRIP BLANK	
N UN	UNKNOWN	

LAB QUALIFIER CODES

Lab	Qlfr	Description
B		Detected in sample and blank
J		Estimated value
U		Analyzed but not detected

VALIDATION QUALIFIER CODES

Val	Qlfr	Description
J		Analyzed and detected, estimate

SAMPLE TECHNIQUE CODES

Tech.	Description
GRAB	GRAB

DISTRIBUTION SHEET

To Distribution	From 200 Area LWPF Technical Process Support	Page 1 of 1
		Date 4/29/97
Project Title/Work Order HNF-2154, Rev 0 200 Area Effluent Treatment Facility Process Control Plan 98-02		EDT No. 621498
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
------	------	-----------------------------	-----------	------------------------------	-----------------

W. J. Bachman	S6-71	X			
M. J. Brown	S6-72	X			
M. J. Clayton	L6-05	X			
A. F. Crane	S6-72	X			
D. S. Cunningham	S6-72	X			
D. L. Flyckt	S6-71	X			
J. E. Geary	S6-71	X			
R. M. Gordon	S7-55	X			
M. D. Guthrie	S6-72	X			
R. J. Huth	S6-72	X			
E. Q. Le	S6-72	X			
L. L. Lin	S6-72	X			
D. W. Lindsey	S6-71	X			
K. J. Lueck	S6-72	X			
R. Marby	S6-71	X			
E. A. McNamar	S6-72	X			
R. J. Nicklas	S6-72	X			
P. M. Olson	S6-72	X			
J. M. Petty	S6-74	X			
D. E. Scully	S6-72	X			
N. J. Sullivan	S6-72	X			
D. A. Vasquez	S6-74	X			
B. H. Von Bargaen	S6-72	X			
R. N. Wagner	S6-72	X			
M. J. Warn	S6-71	X			
S. T. Willet	S6-72	X			
D. J. Williams	S7-41	X			