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**Carbonate and Citric Acid Leaching
of Uranium from Uranium-
Contaminated Soils:
Pilot-Scale Studies (Phase II)**

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MANAGED BY
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FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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Chemical Technology Division

**CARBONATE AND CITRIC ACID LEACHING OF URANIUM
FROM URANIUM-CONTAMINATED SOILS:
PILOT-SCALE STUDIES (PHASE II)**

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ACRONYMS

ANOVA	Analysis of variance
CBD	Sodium citrate–sodium bicarbonate–sodium dithionite
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRU	CERCLA/RCRA Unit
DOE	Department of Energy
EM	Environmental Management
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration and Management Corporation
FFCA	Federal Facilities Compliance Agreement
FMPC	Feed Materials Production Center
H _A	Alternative hypothesis
H ₀	Null hypothesis
ID	Integrated Demonstration
IT	International Technology Corporation
ORNL	Oak Ridge National Laboratory
OTD	Office of Technology Development
pCi	Picocuries
ppm	Parts per million by weight, on a dry basis unless otherwise indicated (mg/kg)
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial investigation/feasibility study
SARA	Superfund Amendments and Reauthorization Act
SEM	Standard error of the mean
SNK	Student-Newman-Keuls statistical test
USID	Uranium in Soils Integrated Demonstration
α	$(1 - \alpha)$ = confidence level for the t-test
β	$(1 - \beta)$ = power of the t-test

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EXECUTIVE SUMMARY

To help meet the Department of Energy (DOE) cleanup goals of the nuclear waste sites such as the Fernald Environmental Management Project (FEMP) in Ohio, one program initiated by the Office of Technology Development (OTD) of DOE was the Integrated Demonstration (ID) of technologies program. The ID program focuses on improving/validating technologies by demonstrating effectiveness, cost savings, risk reduction potential, site applicability, and regulatory and public acceptance. Once such technologies have been demonstrated to embody the above criteria, efforts are then made for the technologies to be transferred for implementation throughout the DOE and the private sector.

One of the major problems facing the DOE Environmental Restoration Program is the remediation of uranium-contaminated soils. In response to this problem, OTD initiated the Uranium in Soils Integrated Demonstration (USID) program to evaluate and compare the versatility, efficiency, and economics of various technologies for the characterization and remediation of uranium-contaminated soils. The FEMP was selected as the host site for the USID program based on its past operating history and known environmental problems. In support of the USID program, soil leaching was to be evaluated at the pilot scale as a viable technology for remediation of contaminated soils at FEMP.

As part of the remedial investigation/feasibility study (RI/FS) for the Fernald facility, treatability studies directed at leaching uranium from several soil samples from the Fernald site were conducted by the International Technology Corporation (IT). Also, as part of the remedial technology selection process of the RI/FS, the Fernald Environmental Restoration and Management Corporation (FERMCO — the site manager for FEMP) CERCLA*/RCRA† Unit 5 constructed and installed a pilot-scale test unit for soil decontamination at Fernald (CRU5 — the technical strategy adopted by the CERCLA program divides the site into distinct operable units, the management team for each unit being known as a CRU). FERMCO CRU5 performed batch leaching studies using the test unit with the support of IT as the final phase of the RI/FS.

Under the USID program, the Oak Ridge National Laboratory (ORNL) has also carried out bench-scale studies on the leaching of uranium from soils. These studies have included tests with various leachants and pretreatment/leachant combinations. The results of the ORNL studies are summarized in the Phase II test plan.¹ After completion of the CRU5 work, modifications were made to the Fernald test unit and Phase II leaching studies were then conducted. The experimental design of these pilot-scale tests was based on the ORNL bench-scale results. Operations were performed by FERMCO and ORNL personnel.

The Phase II studies were an outgrowth of the integration of the pilot-scale work of CRU5 and the USID in 1991. The integration of the two programs' operations was organized into three phases. These are as follows:

- PHASE I This is the FERMCO CRU5 portion of the soil decontamination studies on the Fernald test unit, cited above.
- PHASE II This phase was conducted by the USID group with the support of ORNL, CRU5, and the FERMCO treatability group. This report describes the results of the PHASE II CRU5/USID batch soil leaching treatability studies. Data from this phase may be made available for CRU5 to use in the RI/FS.

* Comprehensive Environmental Response, Compensation, and Liability Act.

† Resource Conservation and Recovery Act.

PHASE III This phase was also to have been conducted by the USID group, with the same supporting organizations as Phase II. Plans were that the tests will be leaching studies with the Fernald test unit configuration modified to run in a continuous soil processing mode. This phase was canceled.

The ultimate goal of this project was to develop data on the efficiency and operability of the soil decontamination process that can be used for the design of a full-scale system. The purpose of the Phase II tests on the Fernald test unit was to assess the performance of selected leaching media and engineering process design for removal of uranium from soils in a pilot-scale unit. For the goal to be accomplished, there were several specific project objectives to be satisfied.

- The soil leaching process should produce a clean soil that has an uranium concentration level equal to or less than 52 ppm, the initial technology screening level adopted by the USID.
- The soil leaching process should decontaminate the soil without seriously degrading the soil's physicochemical characteristics (that might require its management or disposal as a waste) or generating a secondary waste form that is difficult to manage and/or dispose.
- Soil leaching tests, previously performed on the bench scale, should be demonstrated at the pilot scale. These results will be useful for full-scale application of the technology.
- The results of the CRU5/USID Phases II and III are to be shared with CRU5 and incorporated in the CRU5 RI, as applicable.

The Fernald test unit was operated in a batch mode to demonstrate the removal of uranium from two contaminated soils. These soils had been taken from near the waste incinerator and near the plant 1 storage pad. The soils had been stored as unmodified soils and blended soils. The blended soils, which had been sifted and then processed in a concrete mixer to obtain homogeneity, were used for the final four tests of Phase II. For use in the rest of the Phase II tests, the unmodified soils were screened and then processed through a ribbon blender.

In the Phase II operations of the Fernald test unit, a drum of soil was processed in each test. The standard processing sequence involved (1) removal of coarse material from the soil in a trommel and a vibrating screen, (2) centrifuging the soil slurry to produce a nominal 20- μ m size cut, (3) treating the coarse soil fraction in an attrition scrubber, and (4) recombining the two soil fractions and leaching with chemicals in a stirred reactor. This was followed by liquid/solid separation by centrifuging the reactor slurry and then rinsing the centrifuge wet cake to remove residual spent leaching solution from the treated soil.

The experimental design in the Phase II Test Plan consisted of 24 tests. Tests 0 through 19 were to be run and the test data analyzed before proceeding with the remaining tests. From the results of the analyses of the pilot-scale data for these first 20 tests and data from concurrent bench-scale tests, "optimum" operating conditions were to be selected for the final four tests.

In Tests 0 through 19, leaching tests were to be run with up to four different leaching agents on each of the two Fernald soils. These leachants, which were used in previous bench-scale studies, were sodium carbonate/sodium bicarbonate (with potassium permanganate in the incinerator soil tests), sodium citrate/sodium bicarbonate/sodium dithionite (CBD), citric acid, and sulfuric acid. Because of modifications required to the Fernald test unit, the two CBD tests were not run. Also, the two sulfuric acid tests were not run because it was determined that adequate data had been

generated in the Phase I tests. In addition to studying the effect of type of leachant on uranium removal, the experimental design included replicate tests to measure experimental variances and tests to determine the effects of leaching temperature and attrition scrubbing on uranium removal.

The analysis of the data generated in the Phase II tests included material balance calculations for solids and uranium using the analytical and process data. To check for consistency and to better characterize potential losses, three different material balances were made for each test; two were intermediate material balances (around certain sections of the pilot plant) and the third was an overall material balance taken around the entire pilot plant. The kinetics of the leaching reaction was examined by determining the percent of uranium leached from the soil as a function of time in the reactor. Statistical analyses were made to compare the uranium decontamination levels achieved in the tests with the technology screening level and to determine the effects of leachant type, attrition scrubbing, and reaction temperature on uranium leaching efficiency.

Based on the results of the analyses of the experimental data, the conclusions from the USID Phase II studies on the Fernald test unit are as follow:

- The preliminary decontamination target level of 52 ppm uranium was not achieved with either the incinerator area or the storage pad soil.
- In the replicated tests in the experimental design, the average uranium levels in the treated soil that were achieved with carbonate as leachant were 132 and 123 ppm for the storage pad soil and the incinerator area soil, respectively. In the final tests run under "optimum" operating conditions, uranium levels less than 100 ppm were attained. However, because of the lower uranium concentrations in the feed soils, no conclusion can be drawn about an effect of operating conditions.
- The average percent uranium decontamination was 92% for the storage pad soil and 83% for the incinerator area soil.
- Attrition scrubbing had no significant effect on decontamination efficiency.
- Increased reaction temperature significantly increased uranium decontamination for the incinerator area soil. No effect of temperature was observed for the storage pad soil.
- The rates of uranium leaching with carbonate and with citric acid are reasonably fast; within 30–60 min, the uranium removal is 90% or more of that reached at the end of the 120-min reaction period.
- Citric acid was apparently not as effective as sodium carbonate/sodium bicarbonate for leaching the incinerator area soil. However, the comparison was confounded by a significantly higher uranium concentration in the feed soil that was used in the citric acid test. Thus, no conclusion is made concerning the effect of leaching agent in the incinerator soil tests. For the storage pad soil, there was no significant difference between the two leaching agents.

Based on the results from the USID Phase II tests, recommendations for the design and operation of a soil leaching process for uranium decontamination are as follow:

- Perform bench-scale studies to establish whether or not successive leaching steps improve overall leaching efficiency.
- Exclude attrition scrubbing from the soil leaching process, as this unit operation has no significant beneficial effect on leaching efficiency.
- Operate the leaching reactor(s) at 40°C.
- Specify a residence time of at least 1 hr in the design of a soil leaching process.

Although the preliminary decontamination target level of 52 ppm uranium was not achieved in the pilot plant tests, a significant portion of uranium was removed from the soils. The uranium remaining in the soil likely exists in a more refractory form. Because of the lower uranium concentrations and the apparent decreased mobility of the uranium, the soil leaching process may well produce a treated soil capable of meeting levels developed from risk-based analyses.

1. INTRODUCTION

1.1 DOCUMENT PURPOSE

The purpose of this document is to describe the results of the soil decontamination demonstration conducted at the Fernald Environmental Management Project (FEMP) site by the Fernald Environmental Restoration and Management Corporation (FERMCO) and the Oak Ridge National Laboratory (ORNL). This demonstration, which began in November 1993 and ended in October 1994, involved the removal of uranium from contaminated soil sampled from two FEMP sites. The demonstration was conducted so as to meet the requirements of the Fernald Site Integrated Demonstration program, as well as all environmental, safety, and health requirements of the site.

1.2 INTEGRATED DEMONSTRATION PROJECT DESCRIPTION

To help meet the Department of Energy (DOE) cleanup goals for nuclear waste sites such as the FEMP, the Director of Environmental Restoration and Waste Management initiated the Office of Technology Development (OTD). One program formed by OTD was the Integrated Demonstration (ID) program. The ID program focuses on improving/validating technologies by demonstrating effectiveness, cost savings, risk reduction potential, site applicability, and regulatory and public acceptance.

The FEMP was selected to host an ID program. The FEMP, previously known as the Feed Materials Production Center (FMPC), is a contractor-operated federal facility for the remediation of a site which produced high purity uranium metal for the DOE. As such, this ID program, known as the Uranium in Soil Integrated Demonstration (USID) program, will address the issues from

"cradle to grave" surrounding the characterization and remediation of uranium-contaminated soils, specifically soils with a high clay/silt content. Reduction of contaminated soil quantity, through the coupling of real time analysis and precise excavation, along with decontamination techniques applicable to high clay/silt soils are the major technology areas. Secondary waste reduction, cost optimization, risk reduction, and user applicability are other important elements in this USID.

Soil leaching is one of the technologies identified as a viable option for remediation of contaminated soils at Fernald.² As part of a remedial investigation/feasibility study (RI/FS) for the Fernald facility, lab-scale treatability studies directed at leaching uranium from several soil samples from the Fernald site were conducted by the International Technology Corporation (IT).³ Also, as part of the remedial technology selection process of the RI/FS, FERMCO, the FEMP facility contractor, constructed a pilot-scale test unit for soil decontamination. This facility included several engineering unit operations such as size separation, particle attrition, reaction, filtration, and centrifugation, along with various pumps and storage and holding tanks. The FERMCO CRU5 installed the test unit at Fernald, and FERMCO with the support of IT carried out pilot-scale leaching studies on Fernald soils using leaching agents selected from the treatability studies.

In support of the USID, ORNL has also been involved in studies on the leaching of uranium from soils.^{4,5} Based on the results of these studies, leaching agents were identified for testing on the Fernald test unit. Modifications were made to the Fernald test unit, and Phase II leaching studies were then conducted. The experimental design of these pilot-scale tests was based on the ORNL bench-scale results. Operations were performed by FERMCO and ORNL personnel.

The Phase II studies were an outgrowth of the integration of the pilot-scale work of CRU5 and the USID in 1991. The pilot-scale work of CRU5 and the USID was integrated in 1991. The integrated operations of the two programs was organized into three phases:

- PHASE I This is the FERMCO CRU5 portion of the soil decontamination studies, detailed above. This phase included the Fernald test unit initial constructions and start-up.
- PHASE II This phase was conducted by the USID group with the support of ORNL, CRU5, and the FERMCO treatability group. As in Phase I, batch leaching tests were to be performed on the Fernald test unit. Process modifications were made for Phase II operation. The existing Fernald test unit equipment remained the same; routing and the sequence of use of the equipment comprised the process modifications. This report details the results of PHASE II CRU5/USID batch soil leaching studies on the Fernald test unit. Data from this phase may be made available for CRU5 to use in the RI/FS.
- PHASE III This phase was to be conducted by the USID group, with the same supporting organizations as in Phase II. Plans were that the tests will be leaching studies with the Fernald test unit modified to run in a continuous soil processing mode. This phase was canceled.

1.3 HOST SITE DESCRIPTION AND NEED FOR URANIUM REMEDIATION

A detailed description of the FEMP is given in the Phase II work plan.¹ The Federal Facilities Compliance Agreement (FFCA) that was entered into and the RI/FS which is in progress pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), are also discussed. The technical strategy adopted by the CERCLA program divides the site into five distinct operable units.

The components of the operable units are as follows:

- Operable Unit 1 — Waste Pits 1– 6, Clearwell, and Burn Pit
- Operable Unit 2 — Other Waste Units (fly ash pile and Solid waste landfill)
- Operable Unit 3 — Production Area
- Operable Unit 4 — Silos 1, 2, 3, and 4
- Operable Unit 5 — Environmental Media

Uranium is the principal soil contaminant of concern at the FEMP, and an acceptable concentration level for uranium in soils has not been established. Consequently, soil decontamination technologies were to be evaluated with respect to a level of 52 ppm, the initial technology screening level adopted by the USID.

Uranium has deposited over the years on the soil from various sources. The stacks in the production area, dust blown from the disposal pits in the Waste Storage Area, and the incinerator in the sewage plant were sources of airborne uranium. Also, soil contamination has resulted from leaks and spills during processing activities in the production areas and from the spreading of contamination by vehicles. The majority of soils containing uranium exceeding 52 ppm are located in the top 0.45 m of surficial material.⁶

One of the major concerns at FEMP relating to uranium contamination in soil is the potential for uranium to be leached from the soil into the Great Miami aquifer immediately below the FEMP site. The potential for such a phenomenon to occur is a real one because of the uranium forms in soil and the soil characteristics. Characterization data have shown that a large fraction (probably >90%) of the uranium in soil exists as the U(VI) or uranyl form. Over the years of plant operation, it appears that a considerable amount of carbonate-based material (namely, limestone containing calcite and dolomite minerals) has been added to the surface soils. Consequently, the pH of soils within the plant are relatively high (pH values on the order of 7.2 to 8.4) compared with native soils adjacent to the plant (pH values ranging from 5.4 to 6.3). These carbonate soils tend to serve as in situ leachants for uranium. For example, dissolution of carbonate minerals yields the CO_3^{2-} anion that form the di- and tri-carbonate anionic complexes with uranyl, such as

and

Both of these uranyl-carbonate complexes are highly mobile in soils, creating a potential plume of uranium-contaminated water that could reach the Great Miami aquifer. Thus, it is critical that the carbonate-soluble fraction of uranium be removed from these soils to protect against uranium contamination of drinking water in the Great Miami aquifer.

2. PROJECT OBJECTIVE AND STRATEGY

The purpose of the tests on the Fernald test unit was to assess the performance of selected soil leaching technologies for removal of uranium using FEMP soils. The ultimate goal of this project was to develop data on the efficiency and operability of the soil decontamination process that can be used for the design of a full-scale system. For this goal to be accomplished, there were several specific project objectives to be satisfied.

- The soil leaching process should produce a soil that has a uranium concentration level equal to or less than an acceptable contamination level. Soil decontamination will be evaluated with respect to (1) a preliminary technology screening level of 52 mg U/kg of soil or (2) revised target levels based on risk assessment data.
- The soil leaching process should also represent an "earth friendly" approach to the treatment of soil. That is, the process should decontaminate the soil without seriously degrading the soil's physical/chemical characteristics or generating waste forms that are difficult to manage and/or dispose.
- The results of bench-scale soil leaching tests should be further demonstrated at the pilot scale. These results will be useful for full-scale application of the technology.
- The results of the CRU5/USID Phases II and III are to be shared with CRU5 and incorporated in the CRU5 RI as time and funding constraints permit.

The Phase II tests on the Fernald test unit were conducted based on the results of soil characterization studies^{5,6} and experimental leaching studies.^{4,5} In the latter studies, leaching agents such as sodium carbonate and citric acid were used to leach uranium from various soil and sediment samples. The objective of these leaching studies was to determine the effectiveness of these treatments in reducing uranium concentrations to acceptable regulatory levels without seriously degrading the physical/chemical characteristics of the soil. The process configuration used for the Phase II tests was based on the following considerations:

- There is no experimental evidence that physical treatment alone, such as treatment with an attrition scrubber and fractionation by particle size, will remove uranium from a particular fraction of Fernald soils (e.g., uranium concentrations in sand, silt, and clay fractions of the storage pad soil and the incinerator site soil at Fernald were all >52 mg/kg, the proposed screening levels for applicable decontamination technologies⁴). Consequently, any successful soil decontamination process will likely depend on a chemical leaching process.
- By using an attrition scrubber to treat the entire soil, high leaching efficiencies were obtained at relatively short residence times in bench-scale studies. The bench-scale studies involved (1) a one-step test in which attritioning and leaching were done simultaneously and (2) a two-step test in which attritioning and leaching were done in sequence.
- In bench-scale studies, the highest uranium removal efficiencies were obtained in a two-step procedure involving scrubbing of a water/soil slurry at a 0.8/1 weight ratio for 15 min, followed by addition of a leaching agent and water to give a 2/1 water-to-soil weight ratio and leaching for 15 min. These results indicated that attrition scrubbing at high solids loadings and leaching at a higher liquid/solids ratio was an effective procedure for uranium removal.
- Multiple rinsings of the leached soil are needed to minimize the amount of spent (i.e., containing dissolved uranium) leaching solution retained by the soil (this procedure is commonly practiced in the uranium milling industry⁷).

In the process configuration developed for Phase II operation, tests were run in which either the entire soil or a coarse soil fraction was pretreated in an attrition scrubber and then subjected to leaching in a stirred tank. This was followed by liquid/solid separation by centrifugation and then rinsing to remove the spent leaching solution from the treated soil.

The Fernald test unit was operated in a batch mode in Phase II. Phase III plans included soil leaching in a continuous mode.

3. TREATABILITY SOIL DESCRIPTION

Two FEMP soils were selected for this demonstration. The soils were collected from the Sewage Treatment Plant/Waste Incinerator area and the Plant 1 Pad area. The following describes the two soils and the method of preparation for their use in the pilot-scale tests.

3.1 SEWAGE TREATMENT PLANT/WASTE INCINERATOR AREA (INCINERATOR SOIL)

The Sewage Treatment Plant, associated facilities, and the abandoned solid waste incinerator are located on the eastern property line of the FEMP reservation. The incinerator is located in the northwest corner of the Sewage Treatment Area. This incinerator was operated from November 1954 through December 1979. The incinerator was used to burn contaminated and uncontaminated combustible trash during its period of operation.

Surface radiological measurements and limited soil samples collected in the vicinity of these facilities indicated the presence of localized elevated concentrations of radionuclides.⁶ As a result of the RI/FS sampling activities, the concentration of ²³⁸U in surface soils was found to range from 1.8 to 25,670 pCi/g. In addition to surface soil samples, there was a limited number of core samples taken in this area as part of the RI/FS. The results indicated that uranium contamination is limited to the upper reaches of the soil column—only one sample exceeded 100 pCi/g, which was taken from a depth of 0.45–0.91 m. FEMP RCRA determination procedures have established that the USID incinerator area soils are non-RCRA.

3.2 PLANT 1 PAD (STORAGE PAD SOIL)

During the production years at the FEMP, the Plant 1 Pad was used to temporarily store various residues from the production plants, raw ore, and material from other DOE sites. After Plants 2/3 and 8 were shut down, the pad was used as a permanent storage area for the residues. The Plant 1 Pad did not have a containment barrier until the late 1980s. Numerous releases of material from deteriorated drums and accidental spills occurred throughout operational history of the pad. The lack of containment allowed released material to wash off the pad during rainstorms and routine water spraying of the pad, thereby contaminating the soil on the perimeter of the pad.

The Plant 1 Pad soil has been determined to be a low-level radioactive waste. FEMP RCRA determination procedures have established that the USID Plant 1 Pad soil is neither a RCRA-listed waste nor a RCRA characteristic waste.

3.3 SOIL PREPARATION

Soils were removed from the Waste Incinerator and the Plant 1 Pad areas. Two lots of blended soil were prepared, one lot from each of the areas. After removal from a particular area, the soil was sifted using a 3/4-in. screen to remove gravel fragments and unwanted debris. The sifted soil was then processed in a 5 yd³ concrete mixer to obtain homogeneity. The two lots of blended soil were stored in drums as containerized material, along with metal boxes of unmodified (i.e., not sifted or blended) soils and residues from the blending process.

The soils used in most of the Phase II demonstration tests were taken from the unmodified soils in the metal boxes. Again, two lots of blended soil were prepared, one lot from each of the areas. After removing the metal boxes from storage, drums of each soil were prepared by screening the soil

through a 3/4-in. screen. The screened soil was processed through a ribbon blender to obtain homogeneity and then drummed. The soils blended in this manner were used for all Phase II tests, with the exception of Tests 20, 21, 22, and 25. The soils that had been previously blended in the concrete mixer were used in the four final tests.

In preparing the lots of soil with the ribbon blender, each lot was actually blended in two batches. For the incinerator soil, eight drums were filled from the first batch of blended soil, and nine drums from the second batch. For the storage pad soil, six drums were filled from the first batch and the rest of the drums from the second batch. For each soil, the uranium concentrations in the drums were analyzed to determine if any statistically significant differences between drums existed. This is discussed later.

The soils that had been blended in the concrete mixer (in 1991) were used for Tests 20, 21, and 22 as a demonstration of the best processing method developed in the previous Fernald test unit tests. These soils will be reference soils that will be tested by all USID investigators of soil decontamination technologies. A soil from the storage pad area that contained grass and roots was used for Test 25.

4. FERNALD PILOT-SCALE TEST UNIT

4.1 BACKGROUND

As part of the RI/FS for the Fernald facility, lab-scale treatability studies directed at leaching uranium from several FEMP soil samples were conducted by IT. Also, as part of the remedial technology selection process of the RI/FS, the FERMCO CRU5 constructed and installed a pilot-scale test unit for soil decontamination at Fernald. FERMCO CRU5 performed batch leaching studies using the test unit with the support of IT as the final phase of the RI/FS. These studies were completed in 1993.

After completion of the CRU5 work, process modifications were made to the Fernald test unit for the Phase II studies. The same equipment was used; however, routing and the sequence of use of the equipment were modified. The Phase II uranium leaching tests with Fernald soils were then conducted by FERMCO and ORNL personnel.

4.2 TEST UNIT DESCRIPTION

Figure 1 shows the process flow diagram for the Fernald test unit as modified for Phase II. The process configuration illustrated was used for all replicated tests, as described in Sect. 5. This process configuration was based on the results of bench-scale studies and a conceptual design for a commercial-scale soil leaching process. In other tests, modifications were made to the process flow scheme to study the effects of process variables. Modifications were also made during the Phase II testing primarily to improve operations. These modifications are discussed later. During batch operation of the Fernald test unit, the same piece of equipment could be used in different steps.

Fig. 1. Process flow diagram of soil leaching test unit used for Phase II

For example, whereas the Fernald test unit equipment included only one centrifuge and one vibrating screen, Fig. 1 shows that each of these two pieces of equipment was used in more than one process step. This is of particular significance in the case of the centrifuge, as discussed later. The operation of the Fernald test unit in the standard configuration of Fig. 1 is outlined below.

In the batch operation of the Fernald test unit, ~350 lb from a feed soil drum was processed in each experimental test. The first step was to manually transfer the feed soil from the drum to a conveyor. The soil was continuously fed into a trommel screen to remove > 4.75-mm material. This large size material was made up primarily of small rocks or pebbles. The slurry from the trommel, which consisted of < 4.75-mm material and the water that was injected at high pressure (1000 psig) into the trommel, was collected in a surge drum that was equipped with a mixer.

The slurry produced in the trommel operation was continuously pumped from the surge drum to a vibrating screen deck, which contained a 2-mm screen and a 0.3-mm screen. The material in the 0.3- to 4.75-mm size range was removed in the screen deck and collected for use later in the process. The material on the 0.3-mm screen was removed along with the material on the 2-mm screen to avoid processing particles greater than 2-mm through the centrifuge. Because the 2-mm screen was a Harpscreen[®] which had wires running in only one direction rather than two, some of the >2-mm material passed through to the 0.3-mm screen. The slurry, which now contained <0.3-mm material, drained from the vibrating screen deck into a mixing tank.

Water was added to the slurry in the mixing tank to adjust the slurry volume to ~350 gal (~10 wt% solids). The slurry in the mixing tank was then processed through the continuous centrifuge. The centrifuge was operated at conditions determined in Phase I to produce a nominal 20- μ m-size cut. The centrifuge wet cake, which consisted of the coarse soil fraction (20 μ m to 0.3 mm), was combined with the 0.3- to 4.75-mm material that had been collected from the screen deck. The centrate was collected in a surge tank and then transferred to the leaching reactor. The

centrifuge heel (material collected when the centrifuge was stopped, as described later) was also added to the leaching reactor.

For most tests, the wet solids from the centrifuge operation were treated in an attrition scrubber for a residence time of 15 min. Attrition scrubbers process high solids content slurries; scrubbing, polishing, and disintegration of the solid particles result from grain-to-grain contact. The particle contact occurs as the slurry is pumped within the scrubber by two impellers mounted on a common shaft. The impellers, which have opposite pitches, are rotated in a direction to produce upward pumping by the bottom impeller and downward pumping by the top impeller. After attrition scrubbing, the treated solids were added to the centrate and the centrifuge heel in the leaching reactor. The leaching agent was added directly to the stirred reactor in powder or granular form. The soil was then leached in the reactor for 2 hr. At the beginning of and during the leaching step, samples of the slurry were taken so that the uranium leaching efficiency could be determined as a function of time.

Upon completion of the leaching step, the reactor slurry was pumped through the vibrating screen deck (which had been thoroughly rinsed after processing the feed soil), to remove any 0.3- to 4.75-mm material, and into the centrifuge feed tank. The slurry was then processed through the centrifuge to separate the treated solids from the leaching solution. The centrifuge was operated at the same conditions as before, except that a polymer solution was continuously injected into the centrifuge feed to maximize solids recovery.

The solids recovered from centrifuging the treated slurry were subjected to a rinse cycle to remove residual leaching solution. The rinse cycle involved returning the centrifuge solids to the mixing tank, adding process water to adjust the slurry volume to 350 gal, and feeding the slurry, with polymer injection, to the centrifuge. As the last processing step, the recovered solids were subjected to a second identical rinse cycle to produce a final treated soil.

4.3 CENTRIFUGE OPERATION

Because of a potential for cross-contamination, as discussed below, the centrifuge operation, in particular the production of the centrifuge heel, is described here. To help visualize the operation, Fig. 2 shows a schematic of the centrifuge. The centrifuge heel was residual material that discharged through the wet cake outlet port upon shutdown of the centrifuge. This material, referred to as a liquid pool, was held on the centrifuge wall by centrifugal force while the centrifuge was running (the depth of the liquid pool was determined by adjustable liquid overflow weirs). When the centrifuge stopped, the material dropped to the bottom of the centrifuge and overflowed through the wet cake and the centrate outlet ports, with the majority of the material passing through the wet cake port (before the centrifuge was stopped, the wet cake collection drum was replaced by the centrifuge heel collection drum).

The centrifuge heel from the first centrifuge operation (prior to the reactor) was combined with the centrate; it did not appear as a separate stream in the material balance calculations. The centrifuge heel that was collected as a by-product stream was a composite from the last three centrifuge operations in each test. Polymer was injected into the centrifuge feed during these operations to maximize solids recovery. The effectiveness of the polymer was evident from the rapid liquid/solid separation observed in the centrifuge feed samples that were taken immediately before the centrifuge. Thus, when the centrifuge feed was shut off and the discharge of wet cake and centrate from the centrifuge had ceased, the liquid pool held on the centrifuge wall, and consequently, the centrifuge heel would be expected to have a low solids content, perhaps comparable with the centrate that had been produced. However, during the Phase II tests, the solids recovered in the centrifuge heel represented a significant fraction of the feed solids.

Fig. 2. Schematic diagram of centrifuge

In addition to the liquid pool, the operation of the centrifuge forms a layer of solids between the scroll and the inner centrifuge wall. Once formed, this layer is thought to be permanent while the centrifuge is running.⁸ However, the unexpected amount of solids in the centrifuge heel suggests that some of this layer is being removed when the centrifuge is stopped. Once centrifugal force is lost, the heel is discharged from the centrifuge within a few seconds. Some of the solids layer could be washed off the wall by the sudden rush of liquid and collected as part of the centrifuge heel.

The use of the centrifuge to process both the feed soil and the treated soil was mentioned previously. To minimize the possible contamination of the treated soil by residual feed soil in the centrifuge, the collection of a centrifuge purge began in Test 18. This purge, which was collected during the centrifuge operation immediately following the leaching reactor operation, began in Test 18. The rationale for using this purge evolved during examination of the solids material balance problem in the initial Phase II tests.

In examining the material balance problem, the effect of solids holdup in the centrifuge was considered. Based on visual observation and experience with manual transfer operations, the centrifuge wet cake produced with polymer addition, as in the case of the treated soil slurry, was more viscous than that without polymer. Thus, variations in the thickness of the solids layer on the centrifuge wall seemed feasible. Due to a lower drag force from the less viscous wet solid, the soil layer on the centrifuge wall could be expected to be thicker when processing the feed soil slurry than when processing the treated soil slurry (except in Tests 14 and 16 in which polymer was added to the feed soil slurry). Consequently, the solids inventory in the centrifuge could increase when processing the feed soil slurry and then decrease when the treated soil was subsequently processed. This cycle would be repeated with each test.

Changes in the thickness of the soil layer on the centrifuge wall conceivably could affect the solids material balance. However, calculations indicated that the effect would not be significant.

A more serious problem, though, appeared to be the potential of contamination of the treated soil by the feed soil. According to the scenario just described, some of the soil layer produced from the feed slurry would be removed by and mixed with the more viscous treated-soil wet cake. The effect could be significant; for example, 1 lb of feed soil containing 0.2% (2000 ppm) uranium would add 0.002% (20 ppm) uranium to 100 lb of treated soil. Several options were considered for reducing this cross-contamination potential. The method selected involved the collection of the first 60 lb of wet cake produced by centrifuging the leaching reactor slurry.

5. SUMMARY OF EXPERIMENTAL AND SAMPLING PLANS

5.1 EXPERIMENTAL DESIGN

The experimental design for the Phase II pilot-scale studies included 24 tests. According to the experimental plan, 20 tests were to be run and the test data analyzed before proceeding with the remaining four tests. Tests 0 through 19 are outlined in Table 1. From the results of the analyses of the pilot-scale data for these first 20 tests and data from concurrent bench-scale tests, "optimum" operating conditions were to be selected for the final four tests. Sections 7 and 8 report the results of Tests 0 through 19, while Tests 20, 21, 22, and 25 are discussed in Sect. 9.

In Tests 0 through 19, leaching tests were to be run with up to four different leaching agents on each of the two Fernald soils. These leachants, which were used in previous bench-scale studies, were sodium carbonate/sodium bicarbonate, sodium citrate/sodium bicarbonate/sodium dithionite (CBD), citric acid, and sulfuric acid. The leaching solution molarities used in the Phase II tests were selected based on ORNL bench-scale results. In the carbonate runs with the incinerator soil, potassium permanganate was added to oxidize uranium (IV) to uranium (VI). Bench-scale tests showed this to be effective with the incinerator soil but not with the storage pad soil.

There were some exceptions to the original experimental design of Table 1. Because of modifications that would have been required to treat gas generated by the reaction of sodium dithionite, the CBD tests were eliminated. Also, the sulfuric acid tests, which were to depend on the results obtained in Phase I pilot-scale testing, were not run. It was determined that the Phase I results were adequate.

Nine tests (Tests 2, 3, 4, 5, 6, 7, 8, 15, and 19) in Table 1 were run at the standard set of operating conditions outlined in Sect. 4. As indicated in Table 1, replicates were run on each of the

Table 1. Summary of conditions for Phase II batch tests

Test	Soil	Reagent ^a	Replicate ^b	Size Separation ^c	Attrition ^d	Comments
0	Incinerator	Carbonate	N	Fractionated	Water only	Collected samples at start and after each 15 min of attrition scrubbing for 1 hr.
1	Incinerator	Carbonate	N	Fractionated	None	Fractionated but not required since attrition scrubber was not used.
2	Incinerator	Carbonate	R	Fractionated	Water only	
3	Incinerator	Carbonate	R	Fractionated	Water only	
4	Storage pad	Carbonate	R	Fractionated	Water only	
5	Storage pad	Carbonate	R	Fractionated	Water only	
6	Storage pad	Carbonate	R	Fractionated	Water only	
7	Incinerator	Citric acid	N	Fractionated	Water only	
8	Storage pad	Citric acid	N	Fractionated	Water only	
9	Incinerator	CBD	N	Fractionated	Water only	Test was not run.
10	Storage pad	CBD	N	Fractionated	Water only	Test was not run.
11	Incinerator	Sulfuric acid	N	Fractionated	Water only	Test was not run.
12	Storage pad	Sulfuric acid	N	Fractionated	Water only	Test was not run.
13	Incinerator	Carbonate	N	Fractionated	With carbonate	
14	Incinerator	Carbonate	N	None	With carbonate	Polymer used in centrifuge before attrition.
15	Incinerator	Carbonate	R	Fractionated	Water only	
16	Storage pad	Carbonate	N	None	With carbonate	Polymer used in centrifuge before attrition.
17	Storage pad	Carbonate	N	Fractionated	Water only	40°C
18	Incinerator	Carbonate	N	Fractionated	Water only	40°C
19	Storage pad	Carbonate	R	Fractionated	Water only	Incorporated improved operating procedures.

^a Sodium carbonate/sodium bicarbonate at 0.25 M total carbonate (0.02 g KMnO₄/g soil in incinerator tests); citric acid at 0.2 M.

^b N = test not replicated; R = replicate test.

^c Fractionated—soil separated into two size fractions with centrifuge before attrition scrubbing.

^d Attrition scrubbing with water only or with carbonate added; None — no attrition scrubbing.

Fernald soils using carbonate as the leachant. For each soil, the results from the replicate runs were used to calculate statistical parameters to be used for the comparison of the decontamination levels with the technology screening level. The parameters were also used to determine if attrition scrubbing or reaction temperature significantly affected decontamination level.

Test 0 was intended to be an initial run to check out the system operation. However, this test was not conducted until later because the drums of incinerator soil were not available at the start of operations. Test 0 operations followed the standard procedure, with the exception that the attrition scrubber residence time was 1 hr. During the attrition scrubber operation, samples were collected at the start and after each 15-min period. These samples were shipped to ORNL to determine the effect of attrition scrubbing on particle-size distribution and carbonate leaching efficiency.

The following six tests were included to determine the effects of temperature and the attrition scrubber on leaching efficiency. All six runs were made with sodium carbonate. The conditions for these runs are described below:

- Test 1. Leaching reactor only: The attrition scrubber was bypassed in this test. Although not required, the slurry from the trommel was centrifuged and the centrate and the wet cake were transferred directly to the leaching reactor. When this test was initiated, intentions were to use the attrition scrubber. However, after the first centrifuge operation had been completed, it was learned that the new attrition scrubber was scheduled for installation. The decision was made to bypass the attrition scrubber in this test so that the new scrubber could be used in the remaining tests.
- Test 13 Attrition scrubbing of a coarse soil fraction in the presence of sodium carbonate: The standard operating conditions were used for this test, with the exception that sodium carbonate was added to the attrition scrubber feed.
- Tests 14 & 16 Attrition scrubbing of the total soil in the presence of sodium carbonate: The procedure for these tests was the same as that for Test 13, with the exception that flocculant was injected into the centrifuge feed (during the centrifuge operation before the attrition scrubber) to maximize the recovery of solids.
- Tests 17 & 18 Leaching at elevated temperature: The standard operating conditions were used for these tests, with the exception that the leaching reactor was operated at 40°C.

As discussed previously, in addition to these modifications of the standard procedure to determine effects of process variables, other modifications were made while carrying out Tests 0 through 19 to improve operations. These modifications are discussed in Sect. 7. The "optimum" operating conditions for the final four tests are described in Sect. 9.

5.2 SAMPLING AND ANALYSIS PLAN AND PROCESS DATA ACQUISITION

The Sampling and Analysis Plan developed for the Phase II batch experiments is included in the Phase II test plan.¹ Samples were taken of feed, intermediate, and product streams. In the case of the leaching reactor, samples were taken at several specified times during the 2-hr reaction period. The samples were submitted to the FEMP analytical laboratory for analyses such as pH, uranium content, and weight percent solids. The sample points for each run are identified in Sect. 7.

In addition to the acquisition of analytical data, measurements were made of process parameters. These parameters consisted primarily of the weights and volumes of feed and product streams (such as feed soil, leaching chemicals, trommel oversize material, centrifuge wet cake, leaching reactor slurry, spent leaching solutions, etc.).

The analytical and process data were used to calculate material balances and uranium leaching efficiencies. Variances (equal to the standard deviation squared) were calculated using the analytical results from replicate samples. These variances were used to compare measured uranium concentrations in the treated soils with target uranium levels. The results from these data analysis activities are discussed in Sect. 8.

6. DATA ANALYSIS PROCEDURES

6.1 MATERIAL BALANCE AND REACTOR KINETICS CALCULATIONS

Analytical and process data were used to calculate material balances for solids and uranium. To check for consistency and to better characterize potential losses, three different material balances were made for each of Tests 0 through 19. Two were intermediate material balances, the first taken between the feed point and the centrate and the wet cake from the first centrifuge operation and the second between the feed point and the leaching reactor. The third was an overall material balance taken around the entire test unit. The inlet stream for the balances was the total amount of soil that was emptied from the feed drum. The outlet streams for each of the three material balances are listed in Table 2. Rather than including the chemicals in the inlet stream, the total weight of chemicals used in the test was subtracted from the total weight of solids calculated in the outlet streams. Since percent solids in the various streams was determined by evaporation of a sample to dryness, both soil and soluble chemicals were included in the calculated weight of solid product.

In addition to the material balances, the analytical data were used to examine the kinetics of the leaching reaction by determining the fraction of uranium leached from the soil as a function of time in the reactor. Again, this was done for Tests 0 through 19. The fraction of uranium leached at each sampling time was determined by dividing the measured uranium concentration in the reactor liquid by the uranium concentration in the reactor liquid that would be attained if the total uranium in the soil were leached into the liquid, that is, 100% decontamination of the soil. The reactor liquid was the filtrate obtained by collecting and filtering a sample of the reactor slurry. The uranium concentration in the liquid that would result at 100% decontamination was calculated by dividing the measured uranium concentration in the reactor slurry (which was determined on a weight fraction basis) by the weight fraction of liquid in the reactor slurry.

Table 2. Outlet streams for material balance calculations

Centrifuge balance	Reactor balance	Overall balance
Feed soil samples	Feed soil samples	Feed soil samples
Trommel oversize ^a	Trommel oversize ^a	Trommel oversize ^a
Trommel heel ^a	Trommel heel ^a	Trommel heel ^a
Centrate from centrifuge operation after trommel ^b	Attrition scrubber samples	Attrition scrubber samples
Wet cake from centrifuge operation after trommel	Reactor slurry	Reactor samples
		Vibrating screen oversize ^a
		Centrifuge purge ^a
		Centrates from final three centrifuge operations
		Solids samples from first two centrifuge operations after reactor
		Centrifuge heel ^{a,c}
		Treated soil

^aSee Sect. 7 for description of modifications made with each test.

^bIncludes the centrifuge heel from the centrifuge operation.

^cFrom last three centrifuge operations.

The material balances and reactor kinetics calculations were programmed into ORACLE. ORACLE is the database program used to compile the results from the FERMCO analytical laboratory. In some tests, corrections were made to the material balance results by hand calculations. This was necessary when the operating procedure for a test was modified such that the equations did not strictly apply. In Test 16, for example, the oversized material from the vibrating screen could not be mixed with the centrifuge solids (because of the physical characteristics of the solids as a result of polymer injection during centrifuging) before addition to the attrition scrubber. Consequently, the oversized material was weighed and analyzed separately.

6.2 STATISTICAL ANALYSIS PROCEDURES

The mean, or arithmetic average, and the standard deviation are customary statistical parameters calculated for sets of data. An informative statistic, but one that is not used in statistical

comparisons, is the coefficient of variation. This parameter is defined as the ratio of the standard deviation to the mean of a set of replicate data. Since this ratio is a dimensionless number, it allows one to judge the relative precision of test methods regardless of the difference in units. The coefficient of variation is included in the calculation of descriptive statistics for various sets of data.

For the comparison of uranium decontamination levels with the preliminary technology screening level, the Student's t-test was used. The t-test was also used to determine if factors such as attrition scrubbing, type of leachant, or reactor temperature had any significant effect on decontamination level. This was done by comparing the results from the replicate tests with the result from each test in which a factor of interest was changed. For these comparisons, the mean and the standard error of the mean (SEM — equal to the standard deviation divided by the square root of the number of replicates) of the results from the replicate tests were determined for each soil. The SEM was then used to calculate confidence limits about the test mean in order to make the desired comparison. The confidence limits are determined as $\pm t_{\alpha/2} s/\sqrt{n}$, where $s/\sqrt{n}$ is the SEM, n is the sample size, $(1-\alpha)$ is the confidence level, and $t_{\alpha/2}$ is the value of the t distribution at $n-1$ degrees of freedom leaving an area of $\alpha/2$ to the right.⁹

The t-test comparisons were made using SigmaStat™, a statistical software package. The procedure used in SigmaStat™ was the paired t-test. For such a comparison of many observations (the replicate tests) with a single value, the paired t-test procedure is equivalent to the t-test described above. If statistical comparisons showed that a particular factor had no significant effect, the results from the test or tests involving changes in that factor were pooled with the results from the replicate tests. Such a pooling of results when a factor has been shown to have no effect is an acceptable statistical technique.¹⁰ The consequence of this pooling is to increase the sensitivity of the statistical comparison by reducing the confidence interval about the mean of the replicates. In this and in the other SigmaStat™ procedures described below, the 95% confidence level was used.

In the Phase II Fernald test unit study, not all tests were replicated due to time and cost considerations. Consequently, in analyzing the effects of factors such as temperature and attrition scrubbing, the results of the replicate tests were compared with the result from a single test, as described above. If a significant difference was detected and the power of the t-test was high, the conclusion was that there was a high probability that the result from the single test was truly

different from the mean result of the replicate tests. However, since the single test was not replicated, it could not be concluded that the result from the single test belonged to a population that was significantly different from the result of the replicate tests; that is, it could not be concluded that the factor being studied actually had an effect. If supported by the results of other studies, though, one might reasonably infer that the factor being investigated in the single test was the cause of the deviation from the replicate tests. This is the approach taken in this report in examining the effects of factors such as temperature and attrition scrubbing.

In the t-test, α is the probability of rejecting the null hypothesis (H_0) (i.e., no difference exists) when it is true. Obviously, it is desirable that α be small. Another statistical parameter is β , the probability of rejecting the alternative hypothesis (H_A) (i.e., a difference does exist) when it is true. SigmaStat™ calculates the quantity $(1 - \beta)$, which is known as the power of the test. The power is the probability of rejecting H_0 when it is false. If H_0 is rejected in a t-test at a particular level of significance of $(1 - \alpha)$, it is important to examine the power of the test. If H_0 is to be rejected, it is desirable that the power of the test be high. That is, one would like to have a high probability of concluding that a difference exists when it actually does.

Since pre-blended soils were used for feed, drums prepared from each blend would be expected to be fairly homogeneous. To test this assumption, a statistical comparison was made between the analytical data on the feed drums for each type of soil. This comparison was also made using SigmaStat™. The comparison method involved a one-way analysis of variance (ANOVA). This is a parametric test that assumes that all the samples were drawn from normally distributed populations with the same standard deviations (variances). The null hypothesis is that there is no difference among the populations from which the samples were drawn.

If the one-way ANOVA detected a significant difference between populations (drums), the Student-Newman-Keuls (SNK) test was used in SigmaStat™ to determine which drums were different. The SNK test is an all pairwise comparison of every combination of group pairs. It is said to generally be the preferred test for all pairwise comparisons.

The statistical test used for the soil feed drums was a group comparison test. This test compares random samples from two or more different groups for differences in the mean values that cannot be attributed to random sampling variation. Statistical tests were also done to compare the percent

recoveries calculated for each leaching test by the three different material balances described previously. Uranium decontamination levels calculated for each leaching test by two different methods were compared as well. These comparisons of recoveries and decontamination levels were done by repeated measures procedures. These procedures take into account variation among individuals, allowing attention on the effect of the treatments rather than the differences between individuals. A paired t-test is used to compare the effect of a single treatment on the same individuals. A one-way repeated-measures ANOVA is used to compare the effects of a single series of treatments or conditions. The repeated-measures procedures in SigmaStat™ were used for the statistical comparisons.

7. EXPERIMENTAL SUMMARY

This section applies to Tests 0 through 19. The final four tests are discussed in Sect. 9.

7.1 OPERATIONS SUMMARY

Table 3 shows the order in which the Phase II Tests 0 through 19 were run, the dates the tests were run, and the identification number of the drum used in each test. The standard operating procedure for the Phase II tests was described previously. However, as mentioned, modifications to this procedure (other than those made to study the effects of process variables) were made on several occasions, as recorded in the operations logbook. These modifications are summarized as follows.

Test 16 In this test and in all subsequent tests (after 1/5/94), a trommel heel product was collected. This heel was the material remaining in the bottom of the trommel product drum after completion of the trommel and the first vibrating screen operations. The heel contained large size material (some even > 4.74 mm) that was not suspended by the mixer in the trommel product drum. In previous tests, this material was pumped through the vibrating screen. This was done by using a water jet to mobilize the material while operating the transfer pump. Because of the downstream processing problems, the decision was made to collect the trommel heel as a by-product. Also, in this test and in subsequent tests up to Test 15, the 2- to 4.75-mm material from the first vibrating screen operation was combined with the trommel oversize (> 4.75 mm).

Collecting the trommel heel and the 2- to 4.75-mm material from the vibrating screen as by-products (which represented an average of 4% of the feed soil) removed the large size material that was causing downstream processing problems. By collecting these streams as by-products, it was possible to eliminate the vibrating screen operation after the leaching reactor from this test and from all subsequent tests.

Test 17 Prior to this test (before 1/10/94), the centrifuge heel that was produced by the last three centrifuge operations was collected but was not analyzed. In this test and in all subsequent tests, this centrifuge heel was weighed, sampled, and analyzed for solids and uranium contents. This procedure was initiated when problems with the solids material balance were identified. In Phase II, the centrifuge was usually shut down after each operation. This generated a greater quantity of heel than typically produced in Phase I tests. In Phase I, the procedure was to keep the centrifuge running during a test until all centrifuge processing steps had been completed.

Table 3. Test summary

Test no.	Date of test	Feed drum no.
4	11/23/93–12/6/93	B1
5	12/6/93–12/8/93	B2
6	12/9/93–12/14/93	B3
16	12/16/93–1/5/94	B4
17	1/10/94–1/12/94	B8
18	1/31/94–2/4/94	A1
1	2/7/94–2/10/94	A2
2	2/14/94–2/17/94	A4
3	2/15/94–2/16/94	A3
15	2/22/94–2/25/94	A5
13	2/25/94–3/1/94	A6
14	3/2/94–3/3/94	A7
0	3/7/94–3/10/94	A8
7	3/11/94–3/15/94	A10
8	3/16/94–3/17/94	B9
19	3/28/94–3/30/94	B7

Test 18 In this test and in all subsequent tests (after 2/4/94), a centrifuge purge was taken. This consisted of the initial 60 lb of wet cake produced during the first centrifuge operation after the leaching reactor. The purge, which was taken as a by-product, was weighed and sampled for uranium and solids analyses. The objective was to minimize contamination of the treated soil with feed soil. Such cross-contamination was a possible consequence of using the same piece of equipment to process both materials, as discussed previously.

Test 15 In this test and in all subsequent tests (after 2/25/94), the 2- to 4.75-mm material from the first vibrating screen operation was added to the trommel heel rather than to the trommel screen oversize. Since the trommel heel should be <4.75 mm, the two materials should have similar physical characteristics. This change was of little consequence because of the small amount of the 2- to 4.75-mm material produced by the vibrating screen (< 0.5% of the feed soil).

The process flow sheets for all the Phase II tests are included in Appendix A. These flow sheets, which are presented in the order that the tests were run, contain the process modifications discussed

above. Also shown on the flow sheets are the sample points for each test. The process sample points are described in Table A-1. Samples were taken at these specified locations during each test. Sample points 12 through 18 were for rinsate samples taken while cleaning equipment after each test. Sample points 19 through 28 were for any samples that, although not specified in the sampling plan, could be included in any test. Sample point 29 was for a duplicate sample to be analyzed onsite, and sample points 101 through 118 were for duplicates for off-site analyses.

7.2 PROCESS DATA

Appendix B summarizes the Phase II process data. The data sheets for each run tabulate the weights and volumes of feed and product streams, as well as intermediate streams and samples.

7.3 ANALYTICAL DATA

The analytical results for the Phase II tests are presented in Appendix C. As mentioned previously, the process flow sheets in Appendix A indicate the locations of the sample points.

8. RESULTS OF DATA ANALYSIS AND DISCUSSION

This section applies to Tests 0 through 19. Section 9 discusses the final four tests.

8.1 EXPERIMENTAL VARIANCES

Table 4 shows results from the statistical analyses of the results for uranium concentration in the feed soils. Figures 3 and 4 show the individual results of the feed soil uranium analyses for each of the storage pad soil and the incinerator area soil tests, respectively. Included in the figures are results from analyses done in December 1993 after the soils had been blended. Results identified as replicates refer to multiple samples that were taken of the feed soils during the pilot plant tests, each sample being analyzed only once. The results identified as repeat analyses refer to single samples that were analyzed more than once.

The SNK test was run on the feed soil data to determine if there were significant differences between the drums of soil used in the Phase II tests. As discussed previously, each of the feed soils was blended in two batches. All the tests with the incinerator soil, except for Test 7, were run with soil blended in the same batch. For these tests, as might be expected, the SNK test showed no significant differences in uranium content between the drums of incinerator soil. For the storage pad soil, the SNK test did detect significant differences between drums. Differences would not be surprising since four tests used soil blended in one batch, and three tests used soil blended in another batch. An unexpected finding was that the SNK test detected differences not only between drums from different batches, but also between drums from the same batch. Because of these differences, uranium material balances for the storage pad soil tests were calculated using the individual feed soil data rather than the average uranium concentration for all the feed drums. This was also done for

Table 4. Statistical parameters for feed soils

Statistical parameter	Uranium in feed soil, ppm (S-1)	
	Storage pad soil ^a	Incinerator soil ^b
Average	1722	717
Standard deviation	147	55
Coefficient of variation, %	8.5	7.7
Standard error of mean	56	20
95% confidence limits	±136	±46

^aIncludes all tests with storage pad soil.

^bIncludes all tests with incinerator soil, except Test 7.

the incinerator soil tests, even though the SNK test indicated no significant differences in uranium content between the feed drums prepared from the same batch. Based on the magnitude of the standard deviation for the uranium content of the incinerator soil feed drums, the individual feed drum data appeared to be more appropriate for the material balances. Decontamination efficiency was also calculated using the individual feed drum data.

Table 5 shows the statistical parameters determined from analysis of the treated soil data from the replicate tests (Table 1) for each soil. Also included are parameters for a set of seven of the incinerator soil tests. The rationale for pooling the results of these seven incinerator soil tests is discussed later. The parameters in Table 5 were used for the comparison of decontamination levels between tests and with the preliminary technology screening level of 52 mg U/kg of soil.

8.2 MATERIAL BALANCES

The results of the material balances for solids and uranium are summarized in Table 6 for the storage pad soil tests and in Table 7 for the incinerator soil tests. As discussed above, uranium material balances were calculated using the analytical data for the feed drum used in each test. The

Fig. 3. Storage pad soils — analysis of feed soils

Fig. 4. Incinerator soils — analysis of feed soils

Table 5. Statistical parameters for replicate tests

Statistical parameter	Uranium in treated soil, ppm (S-10)		
	Storage pad	Incinerator	
	Tests 4,5,6, & 19	Tests 2, 3, & 15	Tests 0, 1, 2, 3, 13, 14, & 15
Average	134	138	129
Standard deviation	33	27	26
Coefficient of variation, %	25	20	20
Standard error of mean	17	16	10
95% confidence limits	±54	±69	±24

detailed material balance results are shown in Appendix D. These detailed balances list the amounts of solids and uranium in each stream.

The overall material balance results for solids from Tables 6 and 7 are portrayed in Figs. 5 and 6, respectively. In these figures, the solids are separated into three categories: product solids (treated soil), by-product solids, and solids loss. The by-product solids category represents all solids that were accounted for other than the product solids. This includes trommel oversize, trommel heel, vibrating screen oversize, centrifuge purge, concentrates from last three centrifuge operations, centrifuge heel, and the samples (see Table 2, column 3). Figs. 7 and 8 show comparable information for uranium for the storage pad soil and the incinerator area soil, respectively.

8.2.1 Storage Pad Soil

As seen in Table 6 and Fig. 5, the overall material balances showed relatively low solids recoveries for the storage pad soil tests. For Tests 4, 5, 6, and 16, weight percent solids was not determined for the centrifuge heel, which contributed to the low recoveries. The recovery for Test 8

Table 6. Solids and uranium material balances for storage pad soil tests

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Soil in (lb ^a)	394	299	299	322	366	308	309
% Soil recovery ^b							
Centrifuge balance	83	84	92	91	82	87	86
Reactor balance	68	74	78	77	56	88	71
Overall balance	70	89	77	72	71	85	94
Uranium in ^c (lb)	0.584	0.574	0.542	0.551	0.673	0.506	0.510
% Uranium recovered							
Centrifuge balance ^c	55.2	61.8		83.8	89.9	88.7	85
Reactor balance ^c	102.6	94.3	80.1	77.2	74.9	86.8	77.9
Overall balance ^c	97.8	89.6	73.1	86.9	81.6	81.1	98.5

^a All weights are on a dry basis.

^b See Table 2 for outlet streams used for each balance.

^c Based on U concentration in feed drum for each test.

Table 7. Solids and uranium material balances for incinerator soil tests

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Soil in (lb ^a)	307	283	283	281	276	275	285	293	298
% Soil Recovery ^b									
Centrifuge balance	87	92	90	95	86	96	90	84	86
Reactor balance	66	77	76	81	68	81	86	67	69
Overall balance	80	103	89	89	72	90	93	92	86
Uranium in ^c (lb)	0.186	0.207	0.196	0.203	0.309	0.218	0.215	0.204	0.222
% Uranium Recovered									
Centrifuge balance ^c	106.9	95.9	90.1	101.1	100.2	93.5	88.6	89.9	85
Reactor balance ^c	108.4	83.2	97	82.2	86.6	68.7	78.9	90.9	89.2
Overall balance ^c	107.9	93.7	94.8	90.4	97.3	84.1	87.8	98.8	83.7

^aAll weights are on a dry basis.

^bSee Table 2 for outlet streams used in each material balance method.

^cBased on uranium concentration in feed drum for each test.

• Solids Recovered In Byproduct Streams

Fig. 5. Solids balance for storage pad soils

* Solids Recovered in Byproduct Streams

Fig. 6. Solids balance for incinerator soils

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Fig. 7. Uranium balance for storage pad soils

Fig. 8. Uranium balance for incinerator soils

was low, as was that for Test 7 with the incinerator soil. Citric acid was the leachant in both of these tests. A possible explanation for the low recoveries with citric acid could be the dissolution of calcite and dolomite minerals. In secondary waste treatment studies, significant amounts of calcium and magnesium citrate were found to precipitate over time from citric acid solutions produced by leaching.¹¹ Precipitation likely occurred in the Fernald test unit samples that were submitted for weight percent solids analysis. It is conceivable that the aliquots taken from the samples to be analyzed for weight percent solids were not representative due to the difficulty of resuspending the precipitate. This would result in a low value from the analysis of weight percent solids (determined by evaporation to dryness) in the centrate sample and, consequently, a low solids recovery in the material balance. An undetermined amount of solids was lost in Test 16 as a result of operational problems. The solids recovery was acceptable in Test 19. The reason for the low solids recovery in Test 17, which should have been comparable with that in Test 19, is not known.

For Tests 4, 5, 6, and 16, overall uranium recoveries, as presented in Table 6 and Fig. 7, also were reduced as a result of not measuring the uranium content of the centrifuge heel. However, as seen from the detailed balances in Appendix D for the other tests, the uranium recoveries were reduced by only a few percent. In Test 6 and especially in Test 17, the analytical results for uranium in the centrate (Sample Point 11A) are lower than those for uranium in the reactor liquid. As may be seen from Fig. 1, both samples should have approximately the same uranium concentration. Since most of the uranium is recovered in this centrate stream, substitution of the uranium concentration in the reactor liquid for that in the centrate significantly improves the uranium material balance. The uranium recovery for Test 19 was acceptable.

For the three different material balances, the uranium and solids recoveries for the centrifuge material balance should be the highest and the overall material balance recoveries the lowest. This is due primarily to an expected increase in rinsing losses as the soil was processed through the

Fernald test unit. An analysis of the solids recovery results in Table 6 by the one-way repeated-measures ANOVA and the SNK tests showed that the centrifuge material balance recoveries were significantly greater than those of the reactor vessel material balance. No significant differences were detected between the overall and the centrifuge material balances or between the overall and the reactor vessel material balances. For the uranium recovery results in Table 6, the statistical tests did not detect any significant differences between any of the three material balances. One might conclude, then, that the statistical tests do not show the expected trends. However, the calculated recoveries are confounded as a result of not having measured the material in the centrifuge heel in several tests. Also, during Tests 4 and 5, problems were experienced in establishing the procedure for generating the samples from the centrifuge centrate and the reactor slurry. This likely affected the calculated recoveries for the intermediate material balances for these two tests. Because of these complications, no conclusions are made about the comparisons of the uranium and the solids recoveries between the different material balances for the storage pad soil tests.

8.2.2 Incinerator Soil

Table 7 and Fig. 6 show that in most cases the overall material balances for the incinerator soil tests gave good solids recoveries. A possible cause of the low recovery for Test 7 with citric acid was discussed above. The reason for the low solids recovery in Test 0 is not known.

For most of the incinerator soil tests, the overall uranium recoveries were satisfactory, as seen in Table 7 and in Fig. 8. The reason for the low recovery in Test 18 is unknown.

As was done for the storage pad soil tests, the solids and uranium recovery results in Table 7 were analyzed by the one-way repeated-measures ANOVA and the SNK statistical tests. For the

solids, both the overall and the centrifuge material balance recoveries were significantly greater than those of the reactor vessel material balance. There was no significant difference between the recoveries of the overall and the centrifuge material balances. No significant differences were detected between the uranium recoveries for any of the three material balances.

8.2.3 Slurry Measurement Problems

Whereas it was inconclusive for the storage pad soil, the statistical analyses of the incinerator soil tests did not show the expected variation of recoveries with the different material balances (see the explanation in Sect. 8.2.1). A possible reason for this could be problems with obtaining accurate measurements of solids and uranium in slurries. For the intermediate material balances, samples of the centrate from the first centrifuge operation and of the reactor slurry were required. Except for Tests 14 and 16, this centrate contained the nominal $<20\text{-}\mu\text{m}$ fraction of the feed soil. The reactor contained the feed soil, less any losses that occurred and samples that were taken up to that point. Thus, any problems with slurry measurements would be expected to be more likely for the reactor than for the centrate due to the higher solids content.

Inaccurate measurements could result from (1) nonrepresentative samples that are taken from the process for submission to the laboratory, (2) nonrepresentative aliquots that are taken from the laboratory samples for analysis, and (3) inaccuracies in the analytical methods that are utilized.

To examine possible problems with slurry measurements, the results for the reactor slurry samples taken at the beginning and at the end of the 2-hr reaction period in Test 0 were compared (three replicate slurry samples were taken at each of the two times). Although uranium is being transferred from the solid to the liquid phase during the reaction period, the total uranium content, as well as the total solids content, of the slurry samples does not change with time. A t-test

comparison showed no significant difference between the uranium contents of the slurry samples taken at the two different times. However, the solids content, as well as the density, of the slurry at the beginning of the reaction period was significantly lower than that at the end. In the other tests, the uranium content of the reactor slurry samples also appears to be the same at the two different sampling times. However, differences in solids content are again seen, especially in the tests with incinerator area soil.

The results of these comparisons indicate problems with slurry measurements. Also, the problems do not appear to be due to taking nonrepresentative samples from the reactor. If this were the case, differences in both uranium and solids contents would likely have been observed. Because of the intense mixing in the reactor, obtaining representative slurry samples should not be difficult. A possible problem is taking representative aliquots of the samples in the laboratory for solids and density analyses.

The slurry samples from the beginning of the reaction period were taken before the addition of chemicals to the reactor. Thus, differences in settling behavior, due to the effect of chemicals, could have contributed to the differences seen in the solids content of the slurry samples.

In addition to material balance calculations, the reactor slurry data for uranium and solids contents were used in the analysis of the reactor kinetics. If either the low uranium or solids recoveries calculated by the reactor material balance were due to problems with slurry measurements, the kinetics analysis would be affected. This is discussed later.

8.3 REACTOR KINETICS

The reactor kinetics data are presented in Figs. 9–12. In Figs. 9 and 10, the concentration of uranium in the reactor solution (i.e., the filtrate from the reactor slurry) is plotted as a function of

Fig. 9. Storage pad soils — uranium concentration in reactor solution vs time

Fig. 10. Incinerator soils — uranium concentration in reactor solution vs time

■ Avg Tests 2, 3 & 15 * Test 13 ○ Test 14 △ Test 18

Fig. 10. (continued)

■ Average Tests 6 & 19 ○ Test 8 * Test 16 △ Test 17

Fig. 11. Storage pad soils — percent uranium decontamination in reactor vs time

Fig. 12. Incinerator soils — percent uranium decontamination in reactor vs time

■ Avg Tests 2, 3 & 15 * Test 13 * Test 14 △ Test 18

Fig. 12. (continued)

time. The percent decontamination (i.e., percent uranium leached from the soil) vs time is shown in Figs. 11 and 12. For each soil, the results from the replicate runs are compared with the results from each of the other tests.

8.3.1 Storage Pad Soil

In Figs. 9 and 11, a composite curve is shown for replicate Tests 6 and 19. The data from Tests 4 and 5, the other two of the four replicate tests for this soil, are not included. During these first two tests of Phase II, problems were experienced in establishing the procedure for filtering the reactor slurry. The anomalous data for Tests 4 and 5 likely resulted from these problems. Comparison of the curve of the replicate tests with those of the other tests does not indicate any effect of attrition scrubbing, type of leachant, or reaction temperature. For all the storage pad soil tests, the kinetic data show that the leaching reaction is essentially complete within 30 to 60 min.

8.3.2 Incinerator Soil

In Figs. 10 and 12, a composite curve is shown for replicate Tests 2, 3, and 15. Comparison with the curves of the other tests does not indicate any effect of attrition scrubbing or type of leachant on leaching rate. As seen in Fig. 12, the percent decontamination curve for Test 7 did lie below the curve for the replicate tests. Because of the uncertainties in the measurements of uranium concentration in the reactor slurry, the difference between the curves was not great enough to indicate an effect. A confounding factor, though, is the high concentration of uranium in the feed soil in Test 7 (1120 ppm as compared with an average of 717 ppm for the other incinerator tests). As discussed earlier, the Test 7 feed soil was prepared in a different batch from the other incinerator feed soils.

Test 18 indicates that a higher reactor temperature increases leaching rate (Figs. 10 and 12). At the 40°C operating temperature, both the concentration and the percent decontamination curves have greater initial slopes and significantly higher final values than do the curves for the other tests.

The percent decontamination curve for Test 13 is seen to lie noticeably above that of the replicate tests. However, the Test 13 curve is suspect because of uncertainty about the analytical results for uranium concentration in the reactor slurry (which is used to calculate percent decontamination, as described previously). One of the analytical results was obviously in error (a factor of 10 too low), and the other was significantly lower than those for the other tests.

As with the storage pad soil, the kinetic data show that the leaching reaction is essentially complete within 30 to 60 min.

8.3.3 Effect of Slurry Measurement Problems

If the low recoveries from the reactor material balance were due to slurry measurement problems, a likely consequence of the problems would be that the measured uranium and solids concentrations in the reactor slurry were too low. However, the comparisons of the measurements on reactor slurry samples taken at different times in Test 0 indicated that there were no significant problems with uranium determination but that solids content and density results were low. The effect on the kinetics analysis would be to increase the calculated value of percent decontamination somewhat (see Sect. 6 for a description of this calculation).

The uranium concentration in the liquid portion of the reactor slurry was another parameter used in the calculation of the percent decontamination in the reactor. This was determined by filtering a reactor slurry sample and submitting the filtrate for analysis. Comparison of the measured uranium concentrations in these filtrate samples with those in samples of the centrate (produced by

centrifuging the reactor slurry) indicates problems with the filtration procedure.

The uranium concentration of the centrate should be less than that of the filtrate from the reactor slurry because of dilution during the centrifuge operation. At the end of the transfer of the reactor slurry to the centrifuge feed tank, the reactor was rinsed with water. Also, at the end of the centrifuge operation, the feed tank was rinsed. The water from both rinses was added to the centrate that was collected. Considering the volume of the rinse water and the fact that a portion of the centrate, before dilution by the feed tank rinse water, is collected with the centrifuge wet cake, the uranium concentration in the centrate should be about 90% or less of that in the reactor slurry filtrate. However, the test results do not exhibit such differences. In several cases, the centrate uranium concentration was actually higher than that of the reactor slurry filtrate.

A possible explanation for this anomalous behavior is that during the filtration of the reactor slurry samples, some of the uranium in solution is adsorbed by the filter paper. The measured concentration of uranium in the filtrate would then be lower than the actual concentration in the reactor solution. The obvious effect on the kinetics analysis would be to calculate low values for percent decontamination. This adsorption effect was also apparent in bench-scale studies.¹²

When the results of using centrifugation and filtration for separating leaching solution from solids were compared in these studies, the solutions generated by filtration contained less uranium. Again, an explanation is the adsorption of the soluble uranium species on the filter paper.

The percent decontamination values from the kinetic analysis were compared with those calculated from the measurements of uranium in the treated soil. This is discussed later.

8.4 SOIL DECONTAMINATION

Tables 8 and 9 list the soil decontamination results for the storage pad soil tests and the incinerator soil tests, respectively. Percent decontamination is calculated using the uranium concentration in each feed drum and the uranium concentration in the treated soil. Figures 13 and 14 show the treated soil uranium concentrations corresponding to Tables 8 and 9, respectively. In these figures, all the analytical results for each test are presented. As discussed previously for the feed soils, included are results for replicate samples and repeat analyses. The data in Tables 8 and 9 for the feed and the treated soils are averages of these replicate and repeat analyses.

8.4.1 Storage Pad Soil

As indicated by Table 8 and Fig. 13, except for Test 19, there appeared to be no significant differences between the treated soil uranium concentrations in the tests that were run with the storage pad soil. As a first approximation, all the treated soil uranium concentrations, except for Test 19, lay within two standard deviations from the average. While Test 19, which was a replicate of Tests 4, 5, and 6, appeared to be an outlier, statistical tests by the Dixon and the Grubbs methods¹³ could not reject the Test 19 result at a 95% confidence level. Using the paired t-test described previously, no significant differences were found between the results of the replicate tests and the results of each of the other three tests. This was the case even when Test 19 was excluded from the comparison (making the detection of a difference more likely). This agrees with the kinetic data presented above, which showed no effects of attrition scrubbing (Test 16), type of leachant (Test 8), or reaction temperature (Test 17). This is also consistent with the results of the ORNL bench-scale studies. Finally, the storage pad treated soils had significantly higher concentrations of uranium than

Table 8. Soil decontamination results for storage pad soil tests

Test	U in feed (ppm)	U in product (ppm)	Decontamination ^a (%)
Test 4	1484	108	92.7
Test 5	1920	116	94
Test 6	1810	129	92.8
Test 8	1710	125	92.7
Test 16	1840	125	93.2
Test 17	1640	130	92.1
Test 19	1650	182	89
Average	1722	131 ^b	92.4
Standard deviation	147	24	1.6
Coefficient of variation, %	8.5	18	1.7

^a% decontamination = $100(1 - (U \text{ in product}) / (U \text{ in feed}))$.

^bAverage of carbonate tests = 132 ppm.

Table 9. Soil decontamination results for incinerator soil tests

Test	U in feed (ppm)	U in product (ppm)	Decontamination ^a (%)
Test 0	606	120	80.2
Test 1	730	110	84.9
Test 2	690	130	81.2
Test 3	723	116	84
Test 7	1120	290	74
Test 13	791	159	79.9
Test 14	756	99	86.9
Test 15	697	168	75.9
Test 18	743	85	88.6
Average	761	142 ^b	81.7
Standard deviation	144	62	4.9
Coefficient of variation, %	19	43	5.9

^aPercent decontamination = $100[1 - (\text{U in product})/(\text{U in feed})]$.

^bAverage of carbonate tests = 123 ppm.

Fig. 13. Storage pad soil tests — uranium concentration in treated soil

Fig. 14. Incinerator soil tests — uranium concentration in treated soil

the preliminary decontamination target of 52 ppm uranium, based on a the t-test comparison of the target level with the replicate test results (including Test 19) at a 95% confidence level. The power of the t-test was 0.88, indicating a high probability that the difference was true.

Statistical analysis showed no significant relationship between percent decontamination and the uranium feed concentration for the storage pad soil. The average percent decontamination was 92%. Based on a paired t-test comparison, the percent decontamination values in Table 8 were significantly higher than those determined in the kinetic analysis [calculated as measured uranium concentration in the filtrate phase divided by the uranium concentration in the filtrate assuming 100% decontamination (Sect. 6)]. This is consistent with the speculation that low decontamination values in the kinetics analysis may have resulted from uranium adsorption on filtration paper.

8.4.2 Incinerator Soil

For the incinerator soil, Table 9 and Fig. 14 indicate that the type of leaching agent had a significant effect on the treated soil uranium concentration. Except for Test 7, in which citric acid was the leachant, all the treated soil uranium concentrations lay within two standard deviations from the average. The average for the carbonate tests was 123 ppm, as compared with an average of 142 ppm for all tests. Again using the paired t-test to compare with the results of the replicate tests (Tests 2, 3, and 15), the treated soil uranium concentration from the citric acid test was significantly higher than those from the carbonate tests. However, as discussed above, a confounding factor is the high concentration of uranium in the feed soil in Test 7. Because of this, no conclusion is made about the effect of type of leaching agent on uranium decontamination.

The t-test did not detect any significant effect of attrition scrubbing (Tests 0, 1, 13, & 14) or reactor temperature (Test 18). As discussed previously, soil samples were taken in Test 0 at attrition scrubbing times of 0, 15, 30, 45, and 60 min. Bench-scale tests with these samples confirmed the absence of a beneficial effect of attrition scrubbing on treated soil uranium concentration.¹⁴ Consequently, pooling the results of Tests 0, 1, 2, 3, 13, 14, and 15 is valid since attrition scrubbing had no effect. A subsequent paired t-test using the pooled results did show that increased reactor temperature significantly lowered the treated soil uranium concentration. The power of the t-test

was 0.96, indicating a high probability that the difference was true. The effect of reactor temperature is consistent with results of ORNL bench-scale leaching studies. As discussed above, the kinetic data also indicated a significant effect of temperature on leaching.

As was found for the storage pad soil, the t-test at a 95% confidence level showed that the treated incinerator soils from the replicate tests had significantly higher concentrations of uranium than the preliminary decontamination target of 52 ppm. The power of the t-test was essentially equal to 1, indicating a very high probability that the difference was true.

Statistical analysis showed no significant relationship between percent decontamination and the uranium feed concentration. The average percent decontamination was 83%. Based on a paired t-test comparison, the percent decontamination values in Table 9 were significantly higher than those calculated in the kinetic analysis. Again, this is consistent with the idea that low decontamination values in the kinetics analysis resulted from slurry filtration problems, namely, uranium adsorption on the paper filter.

9. RESULTS OF TESTS CARRIED OUT AT "OPTIMUM" CONDITIONS

9.1 BASIS FOR EXPERIMENTAL CONDITIONS

As discussed in the Phase II test plan, the final tests of Phase II were to be carried out at "optimum" conditions. These conditions were to be based on the results of the Phase II tests listed in Table 1, as well as previous and concurrent bench-scale tests at ORNL. Also, the feed soils were to be incinerator and storage pad soils, each of which had been prepared by blending in a concrete mixer, as described in Sect. 3.3, and a soil that contained grass and roots. In collecting the soils that were ultimately blended, the procedure involved removing several inches of the topsoil layer before collecting the actual soil samples. In collecting the latter soil from the Plant 1 Pad area, the topsoil layer, which contained grass and roots, was included as part of the soil sample.

Based on the results presented in Sect. 8 and on ORNL bench-scale results, the conditions for the final Phase II soil leaching tests were chosen as described in the following:

- *Attrition scrubbing was eliminated as a process step.* Fernald test unit and bench-scale tests showed no beneficial effect of attrition scrubbing on uranium removal efficiency. In fact, the ORNL bench-scale tests on the samples produced in the Fernald test unit attrition scrubber showed a detrimental effect on efficiency. A possible cause of this was the increase in surface area due to the generation of small soil particles. The additional surface area could provide more adsorption sites for solubilized uranium species, thereby decreasing the experimental leaching efficiency (which was determined by analysis of the solubilized uranium in the leaching solution).
- *By eliminating attrition scrubbing, the centrifuge was used to process only treated soil.* As discussed in Sect. 8, the centrifuge was used to process both feed soils and treated soils in the previous tests. Consequently, contamination of the treated soil by residual feed soil in the centrifuge was a potential problem. This was not the case in the final tests.
- *In each test, the soil underwent three 1-hr leaching reactions followed by two rinsing steps.* The soil slurry was centrifuged after each leaching reaction, and fresh lixiviant was added when another leaching reaction followed. When a rinsing step followed, the centrifuged solids were repulped with process water with no addition of chemicals. In bench-scale tests at ORNL, soil samples were subjected to five successive leaching steps, with fresh lixiviant used in each step. The results indicated that a certain amount of uranium was leached from the soil in each leaching step, the amount leached decreasing with each step.
- *Potassium permanganate was used as an oxidant in the leaching reaction.* ORNL bench-scale tests showed this to be beneficial in leaching uranium from incinerator area soil.
- *The leaching reactor was to be operated at 40°C.* From the results discussed in Sect. 8 and from ORNL bench-scale tests, increased temperature has a beneficial effect on leaching rate and uranium leaching efficiency for incinerator area soil.

9.2 EXPERIMENTAL SUMMARY

Table 10 shows the order in which the final Phase II tests were run, the dates the tests were run, the type of soil feed, and the number of the drum used in each test.

Table 10. Summary of final phase II tests

Test no.	Date of test	Soil	Feed drum number
20	9/28/94–10/3/94	Incinerator area	No.27 W050-766 P011-A360
25	10/3/94–10/5/94	Storage pad (grass and roots)	No. 1 W062-176 P011-0389
21	10/11/94–10/13/94	Storage pad	No. 22 W050-176 P011-A360
22	10/18/94–10/20/94	Incinerator area	No. 19 W050-766 P011-A360

At the start of the tests, the steam to Plant 8 had been shut off for repairs. Consequently, the first three tests were run with the reactor at ambient temperature. In Test 22, the fourth and final test, the reactor was heated with steam for the first leaching reaction, with the next two leaching reactions carried out at ambient temperature.

In the four tests, KMnO_4 was added only to the first leaching reaction. In Test 20, the first test that was run, the reactor slurry was observed to be purple at the end of the first reaction step. In the previous Phase II tests, the reactor slurry changed from purple to brown within about 5 min after addition of KMnO_4 , indicating that the KMnO_4 had been consumed in oxidizing reactions (the feed soils may have contained more organic material than those for the final tests). Since excess KMnO_4 was present during the entire time of the first reaction period of Test 20, the decision was made to use KMnO_4 in only the first reaction step of each of the final four tests. As just three final tests had been originally planned, the quantity of KMnO_4 on hand was not sufficient for the 12 reaction steps of the four tests that were actually run. In retrospect, a better approach would have been to use KMnO_4 in the first two reaction steps of each of the final four tests. In later discussions with an

USID consultant,¹⁵ the oxidation of uranium (IV) to uranium (VI) was identified as a relatively slow reaction. With KMnO_4 present in the second leaching step, the additional reaction time may have been beneficial.

In Tests 20, 21, and 25, two 55-gal drums of slurry were collected from the reactor at the end of the first reaction period. Plans are to use these samples in future filtration tests.

In Test 25, the oversized material discharged from the trommel had a considerable amount of clay mixed with the rocks. The oversized material was recycled through the trommel after the feed soil had been processed.

Also in Test 25, problems were encountered with blinding of both screens in the vibrating screen deck. Blinding of the 10 mesh screen was caused primarily by grass. This material (approximately 500 g) was collected and sampled separately, rather than combined with the trommel heel as was the usual procedure.

9.3 DISCUSSION OF RESULTS

The process data for the final four Phase II soil leaching tests are summarized in Appendix B. The analytical results for these tests are presented in Appendix C. This information was used to determine material balances for soil and uranium and decontamination efficiencies. The results are discussed in the following.

9.3.1 Material Balances

The material balance results for solids and uranium are summarized in Table 11. The detailed material balance results are presented in Appendix D. For the tests in which two 55-gallon drums of slurry were collected from the reactor, the quantity of solids removed was calculated based on the solids content of the slurry as determined from the net amount of soil fed to the reactor. The analytical results for slurry density and solids content of the slurry were not used since, as discussed in Section 8.2.3, problems with measurement of these parameters were evident.

Table 11. Solids and uranium material balances for final Phase II tests

	Quantity of soil or uranium (lb)			
	Test 20	Test 21	Test 22	Test 25
Feed soil	340.4	293.2	332	282.5
Product soil	205.2	165.6	255.8	144.2
Soil in other streams	138.1	123.4	62.8	124.5
Percent soil recovery	100.9	98.6	96	95.1
Uranium in feed	0.1900	0.1507	0.1855	0.2495
Uranium in product	0.0179	0.0083	0.0171	0.0164
Uranium in other streams	0.1671	0.1250	0.1445	0.4205
Percent uranium recovery	97.4	88.5	87.1	175

The material balances for soil for these four runs were very good, the average soil recovery being 97.7%. The fraction of the feed soil recovered in the product soil in Tests 20, 21, and 25 was relatively low because of the 55-gal drum samples of reactor slurry that were taken. The product soil accounted for an average of 56% of the soil that was recovered, as compared with 77% for Test 22.

The uranium recoveries for Tests 20, 21, and 22 were acceptable. In Test 25, however, the uranium recovery was almost 200%. This is considerably greater than would be expected due to experimental variances. The high recovery could be caused by errors in the data. If this were the case, the measured uranium concentrations in the feed soil and in the centrate would be the prime suspects (since these represent the major inlet and outlet uranium streams). However, the variance of the uranium concentrations of the three samples of the feed soil that were taken was acceptable (the coefficient of variation being equal to 9%). Also, the uranium concentrations of the centrates agreed well with those of the filtrates from the reactor slurry samples (recall that the centrates were produced from centrifuging the reactor slurries). Thus, the high uranium recovery in Test 25 does not appear to be attributed to errors in the data.

The uranium concentration of the grass collected on the 10 mesh screen in Test 25 was 21,900 ppm. If about 10 lb of this grass had passed through the vibrating screens along with the soil, the high uranium recovery in this test could be explained. This assumes that the samples of the feed soil that were taken did not contain a representative amount of grass. This could have resulted if the grass and soil in the feed drum were not mixed together well.

9.3.2 Soil Decontamination

The soil decontamination results for the final four Phase II tests are shown in Table 12. Except for Test 25, the uranium concentrations of the product soil were significantly less (by the paired t-test) than the averages of the corresponding replicate tests in Sect. 8 (i.e., Tests 20 and 22 compared with the incinerator soil tests and Tests 21 and 25 with the storage pad soil tests). It would appear that use of the "optimum" operating conditions resulted in a less contaminated soil product. However, the feed uranium concentrations in Table 12 were significantly lower than those of the replicate tests. Thus, if percent decontamination was unrelated to feed concentration, the observed lower uranium levels in the treated soil would be expected. Tests with feed soils similar to those used in the replicate tests would be desirable to confirm the effect of the "optimum" operating conditions. The results of Test 25 are believed to be confounded by the presence of highly contaminated grass in the feed soil.

Since the tests in Table 12 were not replicated, the results cannot be statistically compared with the target cleanup level of 52 ppm uranium. If, however, Tests 20 and 22 can be considered to be replicates (the use of steam in the reactor in Test 22 being the main difference between the two tests), a uranium level less than 52 ppm in the treated soil was apparently not achieved for the incinerator soil.

Table 12. Soil decontamination results for final Phase II tests

Test	U in feed (ppm)	U in product (ppm)	Decontamination ^a (%)
Test 20	558 ^b	87	84
Test 21	514	50	90
Test 22	558 ^b	67	88
Test 25	883	114	87

^a% decontamination = $100(1 - (\text{U in product})/(\text{U in feed}))$.

^bAverage of Tests 20 and 22.

To determine if additional leaching steps increased decontamination efficiency, samples of the centrifuge solids were taken after each leaching step, as well as after each rinsing step. Table 13 shows the uranium contents of the solids in these samples. Since the samples consisted of both soil and residual leaching solution, the analytical results were corrected by subtracting the uranium contained in the solution. Thus, the data in Table 13 represent the actual uranium concentrations of the solids.

In general, the decreases in uranium concentration shown in Table 13 indicate that the overall leaching efficiency is increasing with each leaching step. However, a significant decrease in the uranium content of the solids also occurs with the first rinsing step. Since dilution with rinse water dropped the carbonate concentration by more than a factor of 10 and residence time in the rinsing tank was relatively short, little, if any, additional reaction would be expected during rinsing. A possible cause of the observed behavior is the desorption of soluble uranium species from the soil particles. That is, the uranium concentrations in Table 13 include not only unreacted uranium, but also reacted uranium adsorbed on the soil particles in equilibrium with that in the leaching solution. In this case, the equilibrium relationship between the dissolved and adsorbed uranium species would have to be known in order to determine the effect of each leaching step on leaching efficiency. Alternatively, a portion of the solids from each leaching step could have been rinsed to remove adsorbed uranium species before sampling for uranium analysis. Before inclusion in the design of a commercial soil leaching process, experiments should be done to determine if there is a real effect of successive leaching steps on leaching efficiency. If no effect exists, the process would obviously be simplified by specification of only one leaching step.

Table 13. Uranium concentration in soil from leaching and rinsing steps

Process step	Uranium concentration in solids (ppm dry)			
	Test 20	Test 21	Test 22	Test 25
1st leaching	no sample	98	122	331
2nd leaching	137	69	111	143
3rd leaching	119	74	75	148
1st rinse	89	55	69	114
2nd rinse	87	50	67	114

9.3.3 Decontamination of Trommel Oversize

In the Phase II tests discussed in Sect. 8, the trommel oversized material, which consisted of clay and small rocks, typically contained significant amounts of uranium. The uranium likely was associated with the clay. To determine if this oversized material could be decontaminated, plans were to study the recycle of the material through the trommel during the final four Phase II tests. Of these tests, only Test 25 produced trommel oversize material with an appreciable clay fraction. After the feed soil had been processed through the trommel in this test, the oversize material was recycled. The resultant uranium content was 77 ppm, indicating removal of the clay did accomplish decontamination. Unfortunately, this cannot be confirmed because the oversize material was not sampled before being recycled. If desired, a short test could be run on the trommel using as feed the oversize material that was archived from previous runs.

10. CONCLUSIONS

The conclusions from the USID Phase II Fernald test unit studies are as follow:

- No significant effects of attrition scrubbing were observed.
- Increased reaction temperature significantly increased uranium decontamination for the incinerator area soil. No effect was observed for the storage pad soil.
- The rates of uranium leaching with carbonate and with citric acid are reasonably fast; within 30–60 min, the uranium removal is 90% or more of that reached at the end of the 120-min reaction period.
- Citric acid was apparently not as effective as sodium carbonate/sodium bicarbonate for leaching the incinerator area soil. However, the comparison was confounded by a significantly higher uranium concentration in the feed soil that was used in the citric acid test. Thus, no conclusion is made concerning the effect of leaching agent in the incinerator soil tests. For the storage pad soil, there was no significant difference between the two leaching agents.
- The preliminary decontamination target level of 52 ppm uranium was not achieved with either the incinerator area or the storage pad soil.
- In the replicated tests in the experimental design, the average uranium levels in the treated soil that were achieved with carbonate as leachant were 132 and 123 ppm for the storage pad soil and the incinerator area soil, respectively.
- In the final tests run under "optimum" operating conditions, uranium levels less than 100 ppm were attained. However, because of the lower uranium concentrations in the feed soils, no conclusion can be drawn about an effect of operating conditions.
- The average percent uranium decontamination was 92% for the storage pad soil and 83% for the incinerator area soil.

11. RECOMMENDATIONS

Based on the results from the USID Phase II Fernald test unit studies, recommendations for the development, design, and operation of a soil leaching process for uranium decontamination are as follow:

- Perform bench-scale studies to establish whether or not successive leaching steps improve overall leaching efficiency.
- Exclude attrition scrubbing from the soil leaching process, as this unit operation has no beneficial effect on leaching efficiency.
- Specify a residence time of at least 1 hr in the design of a soil leaching process.
- Operate the leaching reactor(s) at 40°C.

Although the preliminary decontamination target level of 52 ppm uranium was not achieved in the pilot plant tests, a significant portion of uranium was removed from the soils. The uranium remaining in the soil likely exists in a more refractory form. Because of the lower uranium concentrations and the apparent decreased mobility of the uranium, the soil leaching process may well produce a treated soil capable of meeting levels developed from risk-based analyses.

12. REFERENCES

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APPENDIX A

PROCESS FLOW SHEETS

APPENDIX A

PROCESS FLOW SHEETS

The process flow sheets for all of the Phase II tests are included in Appendix A. These flow sheets, which are presented in the order that the tests were run, illustrate the process configuration of each test. Also shown on the flow sheets are the sample points for each test. The process sample points are described in Table A-1. Samples were taken at these specified locations during each test. Sample points 12 through 18 were for rinsate samples taken when cleaning equipment after each test. Sample points 19 through 28 were for any samples that, although not specified in the sampling plan, could be included in any test. Sample point 29 was for a duplicate sample to be analyzed onsite, and sample points 101 through 118 were for duplicates for off-site analyses.

Table A-1. Description of process sample points for phase II tests

Sample point no.	Description	Comments
1	Feed soil	^a
31	Feed soil	Sample to CRU5
51	Feed soil	Sample to ORNL
2	Trommel screen oversize	
32	Trommel screen oversize	Sample to CRU5
81	Trommel screen heel	
3	Not used	
4	Not used	
5	Centrifuge centrate	From centrifuge operation after trommel
6	Centrifuge wet cake	From centrifuge operation after trommel
7	Attrition scrubber effluent	Samples to ORNL in Test 0
8	<u>Reactor</u>	
8YL	Filtrate	Filtrate at time zero
8YS	Slurry	Slurry at time zero
85	Filtrate	Filtrate at time 5 min
815	Filtrate	Filtrate at time 15 min
830	Filtrate	Filtrate at time 30 min
860L	Filtrate	Filtrate at time 60 min
860S	Slurry	Slurry at time 60 min
82L	Filtrate	Filtrate at time 120 min
82S	Slurry	Slurry at time 120 min
818L	Filtrate	Filtrate at time 180 min
818S	Slurry	Slurry at time 180 min
9	Vibrating screen oversize	From vibrating screen operation after reaction
39	Vibrating screen oversize	From vibrating screen operation after reaction
60	Centrifuge wet cake	Sample to CRU5 From centrifuge operation after first of three reactions (final four tests only)
70	Centrifuge wet cake	From centrifuge operation after second of three reactions (final four tests only)
80	Centrifuge Wet Cake	From centrifuge operation after final reaction and before rinse cycles
90	Centrifuge wet cake	From centrifuge operation in first rinse cycle
10	Centrifuge Wet Cake	From centrifuge operation in second rinse cycle
40	Centrifuge wet cake	Treated soil product From centrifuge operation in second rinse cycle Treated soil product
50	Centrifuge wet cake	Sample to CRU5 From centrifuge operation in second rinse cycle Treated soil product. Sample to ORNL
11A	Centrifuge centrate	From first centrifuge operation after reaction
11B	Centrifuge centrate	From second centrifuge operation after reaction
11C	Centrifuge centrate	From third centrifuge operation after reaction
11D	Centrifuge centrate	From fourth centrifuge operation after reaction
11E	Centrifuge centrate	From fifth centrifuge operation after reaction
82	Centrifuge heel	Composite from centrifuge operations during reaction and rinsing operations

^aUnless otherwise noted, sample was sent to the FERMCO analytical laboratory for analysis.

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 1

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 5

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 6

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 13

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 14

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 17

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 19

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 22

PHASE 2 SOIL WASHING SAMPLE POINTS - TEST 25

APPENDIX B

PROCESS FLOW SHEETS

APPENDIX B

PROCESS DATA

Appendix B summarizes the process data taken during the Phase II tests. Data sheets for each test are presented that tabulate the weights and volumes of feed and product streams, as well as intermediate streams and samples. The data sheets are arranged in the order in which the tests were run.

Test No. 0

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	380		392
31 (to CRU5)			2198
51 (to ORNL)			2358
TROMMEL OVERSIZE -2	13.3		
CENTRIFUGE CENTRATE -5		330	368
CENTRIFUGE WET CAKE -6	317		4516
ATTRITION SCRUBBER EFFLUENT -7			13644
REACTOR - 8		400	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	409		380
RINSE CYCLE SOLIDS - 90	274.5		350
RINSE CYCLE SOLIDS - 10	272		
RINSE CYCLE CENTRATE Tank A - 11A		410	
RINSE CYCLE CENTRATE Tank B - 11B		310	
RINSE CYCLE CENTRATE Tank C - 11C		415	
TROMMEL SCREEN HEEL - 81	11		
CENTRIFUGE HEEL - 82	99.5		
CENTRIFUGE PURGE SOLIDS -	50		

Test No. 0

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	384
20	Centrate for Argonne (S-11B)	
21	Centrate for Argonne (S-11C)	
22		
23		
24		
25		
26		
27		
28		
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	2690	1152		1032	980	2072

Test No. 1

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	351		306
31 (to CRU5)			2112
51 (to ORNL)			2244
TROMMEL OVERSIZE -2	4.1		
CENTRIFUGE CENTRATE -5		340	358
CENTRIFUGE WET CAKE -6	314.5		416
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		400	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	365.5		350
RINSE CYCLE SOLIDS - 90	355		312
RINSE CYCLE SOLIDS - 10	377		
RINSE CYCLE CENTRATE Tank A - 11A		425	
RINSE CYCLE CENTRATE Tank B - 11B		360	
RINSE CYCLE CENTRATE Tank C - 11C		350	
TROMMEL SCREEN HEEL - 81	11.9		
CENTRIFUGE HEEL - 82	47		
CENTRIFUGE PURGE SOLIDS -	58		

Test No. 1

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge Solids	
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Trommel Oversize Replicate	302
108	Reactor Slurry (8ZS)	

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1780	628	632	524	604	470

Test No. 2

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	352		276
31 (to CRU5)			2148
51 (to ORNL)			2220
TROMMEL OVERSIZE -2	4		
CENTRIFUGE CENTRATE -5		325	358
CENTRIFUGE WET CAKE -6	302.5		2694
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		380	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	330.5		
RINSE CYCLE SOLIDS - 90	311.5		396
RINSE CYCLE SOLIDS - 10	328		396
RINSE CYCLE CENTRATE Tank A - 11A		370	
RINSE CYCLE CENTRATE Tank B - 11B		325	
RINSE CYCLE CENTRATE Tank C - 11C		375	
TROMMEL SCREEN HEEL - 81	9.3		
CENTRIFUGE HEEL - 82	114.5		
CENTRIFUGE PURGE SOLIDS -	59.5		

Test No. 2

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	364
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Trommel Heel Replicate	384
110	Treated Soil Replicate (S-10)	482

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	948	534	608	558	627	780

Test No. 3

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	346.5		296
31 (to CRU5)			2232
51 (to ORNL)			2316
TROMMEL OVERSIZE -2	3.4		
CENTRIFUGE CENTRATE -5		350	344
CENTRIFUGE WET CAKE -6	327		3074
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		380	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	308		346
RINSE CYCLE SOLIDS - 90	303		388
RINSE CYCLE SOLIDS - 10	318.3		
RINSE CYCLE CENTRATE Tank A - 11A		375	
RINSE CYCLE CENTRATE Tank B - 11B		360	
RINSE CYCLE CENTRATE Tank C - 11C		325	
TROMMEL SCREEN HEEL - 81	11.5		
CENTRIFUGE HEEL - 82	33.5		
CENTRIFUGE PURGE SOLIDS -	97		

Test No. 3

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	388
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Centrate Replicate (S-5)	

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1202	716	672	656	586	970

Test No. 4

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	460		302
31 (to CRU5)			2210
51 (to ORNL)			2248
TROMMEL OVERSIZE -2	13.6		
CENTRIFUGE CENTRATE -5		375	5000
CENTRIFUGE WET CAKE -6	372.5		436
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		420	
VIBRATING SCREEN OVERSIZE - 9	5		
RINSE CYCLE SOLIDS - 80			688
RINSE CYCLE SOLIDS - 90			688
RINSE CYCLE SOLIDS - 10	370		
RINSE CYCLE CENTRATE Tank A - 11A		410	
RINSE CYCLE CENTRATE Tank B - 11B		330	
RINSE CYCLE CENTRATE Tank C - 11C		325	
TROMMEL SCREEN HEEL - 81			
CENTRIFUGE HEEL - 82			
CENTRIFUGE PURGE SOLIDS -			

Test No. 4

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19		
20		
21		
22	Centrifuge Centrate (S-11D)	
23		
24		
25		
26		
27		
28		
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	252	234		364	822	1000

Test No. 5

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	351		304
31 (to CRU5)			2470
51 (to ORNL)			2510
TROMMEL OVERSIZE -2	16.5		
CENTRIFUGE CENTRATE -5		340	368
CENTRIFUGE WET CAKE -6	291.5		420
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		385	
VIBRATING SCREEN OVERSIZE - 9	2.5		
RINSE CYCLE SOLIDS - 80			
RINSE CYCLE SOLIDS - 90			
RINSE CYCLE SOLIDS - 10	330.6		
RINSE CYCLE CENTRATE Tank A - 11A		400	
RINSE CYCLE CENTRATE Tank B - 11B		350	
RINSE CYCLE CENTRATE Tank C - 11C		350	
TROMMEL SCREEN HEEL - 81			
CENTRIFUGE HEEL - 82			
CENTRIFUGE PURGE SOLIDS -			

Test No. 5

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Wet Cake (S-80)	362
20	Centrifuge Wet Cake (S-90)	410
21		
22		
23		
24		
25		
26		
27		
28		
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	766	398	780	662	648	1830

Test No. 6

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	349.5		274
31 (to CRU5)			2354
51 (to ORNL)			2388
TROMMEL OVERSIZE -2	13.2		
CENTRIFUGE CENTRATE -5		370	382
CENTRIFUGE WET CAKE -6	330.5		424
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		415	
VIBRATING SCREEN OVERSIZE - 9	4.5		
RINSE CYCLE SOLIDS - 80			
RINSE CYCLE SOLIDS - 90			
RINSE CYCLE SOLIDS - 10	335		
RINSE CYCLE CENTRATE Tank A - 11A		400	
RINSE CYCLE CENTRATE Tank B - 11B		350	
RINSE CYCLE CENTRATE Tank C - 11C		375	
TROMMEL SCREEN HEEL - 81			
CENTRIFUGE HEEL - 82			
CENTRIFUGE PURGE SOLIDS -			

Test No. 6

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19		
20		
21		
22		
23		
24		
25		
26		
27	Treated Soil (8-10) from 5 gal. bucket (3-29-94)	
28	Free Water from Sample No. 27	
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1166	780	766	702	746	1918

Test No. 7

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	336		312
31 (to CRU5)			2202
51 (to ORNL)			2366
TROMMEL OVERSIZE -2	4.5		
CENTRIFUGE CENTRATE -5		340	370
CENTRIFUGE WET CAKE -6	317		8140
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		375	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	304		402
RINSE CYCLE SOLIDS - 90	278		366
RINSE CYCLE SOLIDS - 10	265		
RINSE CYCLE CENTRATE Tank A - 11A		425	
RINSE CYCLE CENTRATE Tank B - 11B		310	
RINSE CYCLE CENTRATE Tank C - 11C		370	
TROMMEL SCREEN HEEL - 81	13		
CENTRIFUGE HEEL - 82	96		
CENTRIFUGE PURGE SOLIDS -	58.5		

Test No. 7

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	414
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Centrate Replicate (S-11C)	
110	Treated Soil Replicate (S-10)	588

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1036	642	612	616	650	998

Test No. 8

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	377		292
31 (to CRU5)			2218
51 (to ORNL)			2324
TROMMEL OVERSIZE -2	29		
CENTRIFUGE CENTRATE -5		335	368
CENTRIFUGE WET CAKE -6	312		3156
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		380	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	312		356
RINSE CYCLE SOLIDS - 90	291		
RINSE CYCLE SOLIDS - 10	269		
RINSE CYCLE CENTRATE Tank A - 11A		425	
RINSE CYCLE CENTRATE Tank B - 11B		340	
RINSE CYCLE CENTRATE Tank C - 11C		370	
TROMMEL SCREEN HEEL - 81	25		
CENTRIFUGE HEEL - 82	108		
CENTRIFUGE PURGE SOLIDS -	56.5		

Test No. 8

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	354
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Centrate Replicate (S-11C)	
110	Treated Soil Replicate (S-10)	466

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	968	640	686	616	618	1052

Test No. 13

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	343		262
31 (to CRU5)			1974
51 (to ORNL)			2018
TROMMEL OVERSIZE -2	3.8		
CENTRIFUGE CENTRATE -5		340	
CENTRIFUGE WET CAKE -6	313		3405
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		385	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	355		526
RINSE CYCLE SOLIDS - 90	334.5		454
RINSE CYCLE SOLIDS - 10	342		
RINSE CYCLE CENTRATE Tank A - 11A		365	
RINSE CYCLE CENTRATE Tank B - 11B		325	
RINSE CYCLE CENTRATE Tank C - 11C		360	
TROMMEL SCREEN HEEL - 81	14		
CENTRIFUGE HEEL - 82	43.5		
CENTRIFUGE PURGE SOLIDS -	60		

Test No. 13

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	586
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Centrate Replicate (S-11A)	
111	Centrifuge Centrate Replicate (S-11A)	

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1074	706	870	692	650	1048

Test No. 14

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	350		306
31 (to CRU5)			2236
51 (to ORNL)			2412
TROMMEL OVERSIZE -2	5.5		
CENTRIFUGE CENTRATE -5		250	
CENTRIFUGE WET CAKE -6	413		6973
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		375	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	322.5		410
RINSE CYCLE SOLIDS - 90	315		406
RINSE CYCLE SOLIDS - 10	329		
RINSE CYCLE CENTRATE Tank A - 11A		400	
RINSE CYCLE CENTRATE Tank B - 11B		375	
RINSE CYCLE CENTRATE Tank C - 11C		325	
TROMMEL SCREEN HEEL - 81	8		
CENTRIFUGE HEEL - 82	74		
CENTRIFUGE PURGE SOLIDS -	59.5		

Test No. 14

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	428
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Treated Soil Replicate (S-10)	
110	Treated Soil Replicate (S-10)	

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1060	638	628	606	694	902

Test No. 15

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	361.5		270
31 (to CRU5)			2260
51 (to ORNL)			2370
TROMMEL OVERSIZE -2	2.8		
CENTRIFUGE CENTRATE -5		335	370
CENTRIFUGE WET CAKE -6	316.5		4476
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		375	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	361.5		354
RINSE CYCLE SOLIDS - 90	352		354
RINSE CYCLE SOLIDS - 10	355		
RINSE CYCLE CENTRATE Tank A - 11A		375	
RINSE CYCLE CENTRATE Tank B - 11B		330	
RINSE CYCLE CENTRATE Tank C - 11C		330	
TROMMEL SCREEN HEEL - 81	10.5		
CENTRIFUGE HEEL - 82	80		
CENTRIFUGE PURGE SOLIDS -	59.5		

Test No. 15

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	336
20	Solids from Trench	
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Wet Cake Replicate (S-6)	374

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	952	664	652	692	558	932

Test No. 16

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	429.5		276
31 (to CRU5)			2246
51 (to ORNL)			2382
TROMMEL OVERSIZE -2	19		
CENTRIFUGE CENTRATE -5		350	364
CENTRIFUGE WET CAKE -6	535.5		19068
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		385	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80			
RINSE CYCLE SOLIDS - 90			
RINSE CYCLE SOLIDS - 10	419.5		
RINSE CYCLE CENTRATE Tank A - 11A		400	
RINSE CYCLE CENTRATE Tank B - 11B		350	
RINSE CYCLE CENTRATE Tank C - 11C		425	
TROMMEL SCREEN HEEL - 81			
CENTRIFUGE HEEL - 82			
CENTRIFUGE PURGE SOLIDS -			

Test No. 16

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge heel + Vibrating Screen Oversize	348
20	Centrifuge Solids (S-80)	280
21	11A Filtrate	
22		
23		
24		
25		
26		
27		
28		
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1212	526	540	516	476	1774

Test No. 17

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	361		880
31 (to CRU5)			2378
51 (to ORNL)			2450
TROMMEL OVERSIZE -2	13.5		
CENTRIFUGE CENTRATE -5		378	440
CENTRIFUGE WET CAKE -6	280		4767
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		400	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80			
RINSE CYCLE SOLIDS - 90			
RINSE CYCLE SOLIDS - 10	411.5		
RINSE CYCLE CENTRATE Tank A - 11A		420	
RINSE CYCLE CENTRATE Tank B - 11B		375	
RINSE CYCLE CENTRATE Tank C - 11C		350	
TROMMEL SCREEN HEEL - 81	33.5		
CENTRIFUGE HEEL - 82	32		
CENTRIFUGE PURGE SOLIDS -			

Test No. 17

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Feed Soil Replicate	302
20	Feed Soil Replicate	296
21	Trommel Screen Heel	450
22	Reactor Slurry at time=0 (S8YS)	
23	Centrifuge Solids (S-80)	222
24	Centrifuge Solids (S-90)	306
25	Treated Soil Replicate (S-10)	306
26	Treated Soil Replicate (S-10)	304
27	Centrate S-11A Replicate	
28		
29		

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	1126	528	566	1092	792	1036

Test No. 18

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	370		272
31 (to CRU5)			2116
51 (to ORNL)			2186
TROMMEL OVERSIZE -2	5.5		
CENTRIFUGE CENTRATE -5		350	440
CENTRIFUGE WET CAKE -6	315		6099
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		375	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	330		
RINSE CYCLE SOLIDS - 90	340.5		350
RINSE CYCLE SOLIDS - 10	358.5		368
RINSE CYCLE CENTRATE Tank A - 11A		380	
RINSE CYCLE CENTRATE Tank B - 11B		375	
RINSE CYCLE CENTRATE Tank C - 11C		375	
TROMMEL SCREEN HEEL - 81	18		
CENTRIFUGE HEEL - 82	48		
CENTRIFUGE PURGE SOLIDS -	60		

Test No. 18

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Treated Soil Replicate (S-10)	314
20	Treated Soil Replicate (S-10)	342
21	Centrifuge Purge (after rinsing)	233
22	Centrate from rinsing Centrifuge Purge	
23		
24		
25		
26		
27		
28		
29	Feed Soil Replicate	258
108	Reactor Slurry at 120 minutes (8ZS)	
110	Treated Soil Replicate (S-10)	312
111	Centrifuge Centrate Replicate (S-11A)	

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	912	506	604	532	516	1056

Test No. 19

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number	Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (gms)
FEED SOIL - 1	356		306
31 (to CRU5)			2296
51 (to ORNL)			2644
TROMMEL OVERSIZE -2	12.8		
CENTRIFUGE CENTRATE -5		360	
CENTRIFUGE WET CAKE -6	304		3829
ATTRITION SCRUBBER EFFLUENT -7			
REACTOR - 8		410	
VIBRATING SCREEN OVERSIZE - 9			
RINSE CYCLE SOLIDS - 80	305.5		406
RINSE CYCLE SOLIDS - 90	317.5		388
RINSE CYCLE SOLIDS - 10	333		
RINSE CYCLE CENTRATE Tank A - 11A		425	
RINSE CYCLE CENTRATE Tank B - 11B		340	
RINSE CYCLE CENTRATE Tank C - 11C		350	
TROMMEL SCREEN HEEL - 81	19.5		
CENTRIFUGE HEEL - 82	74.5		
CENTRIFUGE PURGE SOLIDS -	59		

Test No. 19

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Sample Number	Description	Sample Weight (gms)
19	Centrifuge Purge	
20		
21		
22		
23		
24		
25		
26		
27		
28		
29	Centrifuge Centrate Replicate (S-11C)	
110	Treated Soil Replicate (S-10)	560

Field Wt of Reactor Samples (gms)	Reaction Time = 0	5 minutes	15 minutes	30 minutes	60 minutes	120 minutes
Test 0						
Tests 1-19	924	600	600	600	600	1000

Test No. 20

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number		Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (lbs)
Feed Soil - 1		377		2.3
31 (to CRU5)				5.6
51 (to ORNL)				5.4
Trommel Oversize -2		11.5		2.9
Reaction 1 - 8			350	2 - 55 gal. drums
Reaction 2 - 8			250	
Reaction 3 - 8			250	
Leached Solids 1 - 60		342.5		
Leached Solids 2 - 70		331.5		
Leached Solids 3 - 80		326.5		
Rinse Cycle Solids 1 - 90		320		
Rinse Cycle Solids 2 - 10		330.5		
Centrifuge Centrate - 11A			325	
Centrifuge Centrate - 11B			275	
Centrifuge Centrate - 11C			325	
Centrifuge Centrate - 11D			240	
Centrifuge Centrate - 11E			270	
Trommel Screen Heel - 81		15.5		
Centrifuge Heel - 82		24		
Chemicals	Reaction 1	67.5		
	Reaction 2	48		
	Reaction 3	48		

Test No. 21

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number		Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (lbs)
Feed Soil - 1		328		1.7
31 (to CRU5)				3.9
51 (to ORNL)				7.1
Trommel Oversize -2				1.9
Reaction 1 - 8			350	2 - 55 gal. drums
Reaction 2 - 8			250	
Reaction 3 - 8			250	
Leached Solids 1 - 60		280.5		
Leached Solids 2 - 70		284		
Leached Solids 3 - 80		284		
Rinse Cycle Solids 1 - 90		269.5		
Rinse Cycle Solids 2 - 10		289.5		
Centrifuge Centrate - 11A			320	
Centrifuge Centrate - 11B			310	
Centrifuge Centrate - 11C			325	
Centrifuge Centrate - 11D				
Centrifuge Centrate - 11E			290	
Trommel Screen Heel - 81		25.5		
Centrifuge Heel - 82		28.5		
Chemicals	Reaction 1	67.5		
	Reaction 2	48		
	Reaction 3	48		

Test No. 22

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number		Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (lbs)
Feed Soil - 1		372		≈2
31 (to CRU5)				≈11
51 (to ORNL)				
Trommel Oversize -2		9.5		≈3
Reaction 1 - 8			350	
Reaction 2 - 8			350	
Reaction 3 - 8			350	
Leached Solids 1 - 60		442		
Leached Solids 2 - 70		411		
Leached Solids 3 - 80		399		
Rinse Cycle Solids 1 - 90		391		
Rinse Cycle Solids 2 - 10		433.5		
Centrifuge Centrate - 11A			405	
Centrifuge Centrate - 11B			405	
Centrifuge Centrate - 11C			375	
Centrifuge Centrate - 11D			370	
Centrifuge Centrate - 11E			370	
Trommel Screen Heel - 81		24		
Centrifuge Heel - 82		40		
Chemicals	Reaction 1	67.5		
	Reaction 2	62		
	Reaction 3	62		

Test No. 25

PHASE II SOIL WASHING PILOT PLANT / PROCESS DATA

Stream and Sample Point Number		Weight of Process Stream (lbs)	Volume of Process Stream (gallons)	Weight of Sample (lbs)
Feed Soil - 1		327		≈2
31 (to CRU5)				≈11
51 (to ORNL)				
Trommel Oversize -2		15.5		≈3
Reaction 1 - 8			350	2 - 55 gal. drums
Reaction 2 - 8			250	
Reaction 3 - 8			250	
Leached Solids 1 - 60		286.5		
Leached Solids 2 - 70		269.5		
Leached Solids 3 - 80		270.5		
Rinse Cycle Solids 1 - 90		269.5		
Rinse Cycle Solids 2 - 10		267.5		
Centrifuge Centrate - 11A			325	
Centrifuge Centrate - 11B			275	
Centrifuge Centrate - 11C			350	
Centrifuge Centrate - 11D			275	
Centrifuge Centrate - 11E			300	
Trommel Screen Heel - 81		24.5		
Centrifuge Heel - 82		20 to 30		
Chemicals	Reaction 1	67.5		
	Reaction 2	48		
	Reaction 3	48		

APPENDIX C

ANALYTICAL RESULTS

APPENDIX C

ANALYTICAL RESULTS

All of the analytical results from the Phase II tests are included in Appendix C. For each result, the test number and the sample number are shown as part of the User Sample Identification Number. For example, T4S830 refers to the reactor filtrate sample taken at a reaction time of 30 min in Test 4 (refer to Appendix A for a description of the sample points).

FEB- 3-95 FRI 15:50

FERMCO ANALYTICAL

FAX NO. 5137386667

P.02

DATE 02-FEB-95
TIME 11:52:33

SUMMARY REPORT

PAGE 1

RELEASE NUMBER : 1000001428

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE 11

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200025748	93-614-1000T4S	SP-1		SOLIDS	85.6	wt %		23-NOV-93	09-DEC-93	B
INORGANICS-EPH	200025748	93-614-1000T4S	SP-1		URANIUM	1520	ppm		23-NOV-93	17-DEC-93	B
INORGANICS-EPH	200025748	93-614-1000T4S	SP-1		URANIUM	1470	ppm d		23-NOV-93	01-MAR-94	B
INORGANICS-EPH	200025757	93-614-1003-T4	SP-2		SOLIDS	91.4	wt %		23-NOV-93	10-FEB-94	B
INORGANICS-EPH	200025757	93-614-1003-T4	SP-2		URANIUM	1500	ppm		23-NOV-93	15-DEC-93	B
INORGANICS-EPH	200025758	93-614-T4S12	SP-12		PH	8.41	pH Un		23-NOV-93	07-DEC-93	B
INORGANICS-EPH	200025758	93-614-T4S12	SP-12		URANIUM	1.6	mg/L		23-NOV-93	07-DEC-93	B
INORGANICS-EPH	200025759	93-614-1006-T4	SP-6		SOLIDS	64.7	wt %		24-NOV-93	10-FEB-94	B
INORGANICS-EPH	200025759	93-614-1006-T4	SP-6		URANIUM	780	ppm		24-NOV-93	15-DEC-93	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponents: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

FEB- 3-95 FRI 15:50

FERMCO ANALYTICAL

FAX NO. 5137386667

P.03

DATE 02-FEB-95
TIME 11:52:33

SUMMARY REPORT

PAGE 2

RELEASE NUMBER : 1000001448

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			ANTIMONY	60.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			ARSENIC	10.0	ug/L	U	02-DEC-93	05-JAN-94	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			BERYLLIUM	5.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			CADMIUM	5.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			CHROMIUM	10.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			COPPER	25.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			LEAD	6.0	ug/L	U	02-DEC-93	28-DEC-93	
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			NICKEL	40.0	ug/L	U	02-DEC-93	07-DEC-93	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			SELENIUM	5.0	ug/L	U	02-DEC-93	05-JAN-94	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			THALLIUM	10.0	ug/L	U	02-DEC-93	06-JAN-94	B
INORGANICS-AA/I	200026017	93-614-1025-T4	SP-18			ZINC	437.0	ug/L		02-DEC-93	07-DEC-93	B
INORGANICS-EPM	200026239	93-614-1011-T4	SP-RB			URANIUM	0.2	mg/L		01-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026240	93-614-1012-T4	SP-FB			URANIUM	0.1	mg/L	U	01-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026241	93-614-1023-T4	SP-13			URANIUM	1.0	mg/L		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026244	93-614-1025-T4	SP-18			PH	7.73	pH Un		02-DEC-93	07-DEC-93	B
INORGANICS-EPM	200026244	93-614-1025-T4	SP-18			URANIUM	2.3	mg/L		02-DEC-93	07-DEC-93	B
INORGANICS-EPM	200026245	93-614-1021-T4	SP-17			URANIUM	0.2	mg/L		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026246	93-614-1022-T4	SP-15			URANIUM	0.5	mg/L		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026247	93-614-1024-T4	SP-14			URANIUM	1.0	mg/L		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026248	93-614-1009-T4	SP-9			SOLIDS	82.7	wt %		01-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026248	93-614-1009-T4	SP-9			URANIUM	210	ppm		01-DEC-93	14-DEC-93	B
INORGANICS-EPM	200026249	93-614-1014-T4	SP-10-1			SOLIDS	52.6	wt %		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026249	93-614-1014-T4	SP-10-1			URANIUM	190	ppm		02-DEC-93	14-DEC-93	B
INORGANICS-EPM	200026250	93-614-1015-T4	SP-10-2			SOLIDS	57.2	wt %		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026250	93-614-1015-T4	SP-10-2			URANIUM	100	ppm		02-DEC-93	14-DEC-93	B
INORGANICS-EPM	200026251	93-614-1017-T4	SP-10-3			SOLIDS	54.8	wt %		02-DEC-93	09-DEC-93	B
INORGANICS-EPM	200026251	93-614-1017-T4	SP-10-3			URANIUM	59	ppm		02-DEC-93	16-DEC-93	B
INORGANICS-EPM	200026251	93-614-1017-T4	SP-10-3			URANIUM	120	ppm d		02-DEC-93	07-MAR-94	B

Your Selection Criteria Was:

Release Numbers : X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X93-614X

From Received Date: X

Display Text? N

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TIME 11:52:33

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RELEASE NUMBER : 1000001486

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200026895	93-614-1038-T5	S-8ZL		PH	9.46	pH Un		07-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026895	93-614-1038-T5	S-8ZL		URANIUM	74.8	mg/L		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026898	93-614-1039-T5	S-9		SOLIDS	77.3	wt %		07-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026898	93-614-1039-T5	S-9		URANIUM	160	ppm d		07-DEC-93	14-DEC-93	B
INORGANICS-EPH	200026899	93-614-1041-T5	S-19		SOLIDS	56.5	wt %		07-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026899	93-614-1041-T5	S-19		URANIUM	230	ppm d		07-DEC-93	14-DEC-93	B
INORGANICS-EPH	200026900	93-614-1045-T5	S-20		SOLIDS	58.0	wt %		08-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026900	93-614-1045-T5	S-20		URANIUM	120	ppm d		08-DEC-93	14-DEC-93	B
INORGANICS-EPH	200026901	93-614-1042-T5	S-11A		PH	9.36	pH Un		07-DEC-93	15-DEC-93	B
INORGANICS-EPH	200026901	93-614-1042-T5	S-11A		URANIUM	116	ppm		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026902	93-614-T5S11A	S-11A		SOLIDS	9530	mg/L		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026904	93-614-1043-T4	S-22		URANIUM	118	ppm		08-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026904	93-614-1043-T4	S-22		URANIUM	111	mg/L		08-DEC-93	03-FEB-94	B
INORGANICS-EPH	200026937	93-614-1038-T5	S-8YS		SOLIDS	5.7	wt %		07-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026937	93-614-1038-T5	S-8YS		URANIUM	146	ppm		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026938	93-614-1038-T5	S-8YS		DENSITY	1.04	g/ml		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026939	93-614-1038-T5	S-8YL		PH	7.40	pH Un		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026939	93-614-1038-T5	S-8YL		URANIUM	45.1	mg/L		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026940	93-614-1038-T5	S-8S		PH	9.42	pH Un		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026940	93-614-1038-T5	S-8S		URANIUM	74.7	mg/L		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026941	93-614-1038-T5	S-815		PH	9.43	pH Un		07-DEC-93	15-DEC-93	B
INORGANICS-EPH	200026941	93-614-1038-T5	S-815		URANIUM	62.4	mg/L		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026942	93-614-1038-T5	S-830		PH	9.46	pH Un		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026942	93-614-1038-T5	S-830		URANIUM	30	mg/L		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026943	93-614-1038-T5	S-860		PH	9.44	pH Un		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026943	93-614-1038-T5	S-860		URANIUM	63.4	mg/L		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026944	93-614-1038-T5	S-8ZS		URANIUM	150	ppm		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026945	93-614-1038-T5	S-8ZS		DENSITY	1.06	g/ml		07-DEC-93	17-DEC-93	B
INORGANICS-EPH	200026946	93-614-1038-T5	S-8ZS		SOLIDS	61895	mg/L		07-DEC-93	16-DEC-93	B
INORGANICS-EPH	200026950	93-614-1044-T5	18		PH	9.47	pH Un		08-DEC-93	13-DEC-93	B
INORGANICS-EPH	200026950	93-614-1044-T5	18		URANIUM	17.5	mg/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		ANTIMONY	60.0	ug/L	U	08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		ARSENIC	100.0	ug/L	U	08-DEC-93	14-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		BERYLLIUM	16.1	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		CADMIUM	11.5	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		CHROMIUM	259.5	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		COPPER	1121	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		LEAD	407.2	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		NICKEL	462.4	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		SELENIUM	100	ug/L	U	08-DEC-93	03-JAN-94	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		SILVER	10.0	ug/L	U	08-DEC-93	10-DEC-93	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		THALLIUM	100	ug/L	U	08-DEC-93	11-JAN-94	B
INORGANICS-AA/I	200026951	93-614-1044-T5	18		ZINC	1851	ug/L		08-DEC-93	10-DEC-93	B
INORGANICS-EPH	200027666	93-614-1064-T6	S18		PH	9.55	pH Un		09-DEC-93	13-DEC-93	
INORGANICS-EPH	200027666	93-614-1064-T6	S18		URANIUM	13.0	mg/L		09-DEC-93	10-DEC-93	
INORGANICS-AA/I	200027667	93-614-1064-T6	S18		ANTIMONY	60.0	ug/L	U	09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667	93-614-1064-T6	S18		ARSENIC	100	ug/L	U	09-DEC-93	14-DEC-93	

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X93-614X

From Received Date: X

Display Text? H

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SUMMARY REPORT

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RELEASE NUMBER : 1000001486

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE 11

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		BERYLLIUM	5.0	ug/L	U	09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		CADMIUM	5.0	ug/L	U	09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		CHROMIUM	40.1	ug/L		09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		COPPER	239.4	ug/L		09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		LEAD	74.0	ug/L		09-DEC-93	15-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		NICKEL	102.7	ug/L		09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		SELENIUM	100	ug/L	U	09-DEC-93	03-JAN-94	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		SILVER	10.0	ug/L	U	09-DEC-93	13-DEC-93	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		THALLIUM	10.0	ug/L	U	09-DEC-93	07-JAN-94	
INORGANICS-AA/I	200027667		93-614-1064-T6	S18		ZINC	372.7	ug/L		09-DEC-93	13-DEC-93	
INORGANICS-EPM	200027813		93-614-1046-T5	S-11B		PH	9.37	pH Un		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027813		93-614-1046-T5	S-11B		URANIUM	18	ppm		08-DEC-93	17-DEC-93	B
INORGANICS-EPM	200027814		93-614-1048-T5	S-11C		PH	9.66	pH Un		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027814		93-614-1048-T5	S-11C		URANIUM	3	ppm		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027815		93-614-1046-T5	S-11B		SOLIDS	5815	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027818		93-614-1048-T5	S-11C		SOLIDS	1630	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027831		93-614-1049-T5	S-17		URANIUM	0.2	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027834		93-614-1057-T5	S-13		URANIUM	0.6	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027835		93-614-1050-T5	S-15		URANIUM	0.4	mg/L		08-DEC-93	17-DEC-93	B
INORGANICS-EPM	200027836		93-614-1051-T5	S-14		URANIUM	0.7	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027837		93-614-1052-T5	S-16		URANIUM	1.3	mg/L		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027840		93-614-1063-T6	S-12		URANIUM	4.2	mg/L		09-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027844		93-614-1047-T5	S-10		SOLIDS	56.2	wt %		08-DEC-93	13-DEC-93	B
INORGANICS-EPM	200027846		93-614-1047-T5	S-10		URANIUM	130	ppm d		08-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027846		93-614-1047-T5	S-10		URANIUM	101	ppm d		08-DEC-93	03-FEB-94	B
INORGANICS-EPM	200027845		93-614-1035-T5	S-RB		URANIUM	12.2	mg/L		09-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027846		93-614-1036-T5	S-FB		URANIUM	0.1	mg/L	U	09-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027847		93-614-1058-T6	S-1		SOLIDS	85.6	wt %		09-DEC-93	13-DEC-93	B
INORGANICS-EPM	200027847		93-614-1058-T6	S-1		URANIUM	1830	ppm d		09-DEC-93	16-DEC-93	B
INORGANICS-EPM	200027848		93-614-1061-T6	S-2		URANIUM	1470	ppm d		09-DEC-93	16-DEC-93	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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SUMMARY REPORT

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RELEASE NUMBER : 1000001649

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200032397	94-614-1100-T1	17			URANIUM	0.5	mg/L		05-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032398	94-614-1101-T1	13			URANIUM	0.6	mg/L		06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032399	94-614-1103-T1	15			URANIUM	0.2	mg/L		06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032400	94-614-1105-T1	14			URANIUM	0.1	mg/L		06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032401	94-614-1109-T1	16			URANIUM	0.1	mg/L	U	06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032402	94-614-1110-T1	21			URANIUM	210	mg/L		06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032402	94-614-1110-T1	21			URANIUM	107	mg/L		06-JAN-94	08-FEB-94	B
INORGANICS-EPM	200032403	94-614-1102-T1	11B			PH	9.45	pH Un		06-JAN-94	10-JAN-94	B
INORGANICS-EPM	200032403	94-614-1102-T1	11B			URANIUM	18	ppm		06-JAN-94	12-JAN-94	B
INORGANICS-EPM	200032404	94-614-1104-T1	11C			PH	9.67	pH Un		06-JAN-94	10-JAN-94	B
INORGANICS-EPM	200032404	94-614-1104-T1	11C			URANIUM	6	ppm		06-JAN-94	12-JAN-94	B
INORGANICS-EPM	200032405	94-614-1102-T1	11B			SOLIDS	219	mg/L		06-JAN-94	14-JAN-94	B
INORGANICS-EPM	200032406	94-614-1104-T1	11C			SOLIDS	158	mg/L		06-JAN-94	14-JAN-94	B
INORGANICS-EPM	200032409	94-614-1106-T1	10			SOLIDS	49.9	wt %		06-JAN-94	11-JAN-94	B
INORGANICS-EPM	200032409	94-614-1106-T1	10			URANIUM	65	ppm		06-JAN-94	12-JAN-94	B
INORGANICS-EPM	200032409	94-614-1106-T1	10			URANIUM	119	ppm d		06-JAN-94	25-FEB-94	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? H

Submission ID: X

Project Name: 50.05.0819X-614X

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DATE 02-FEB-95

SUMMARY REPORT

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TIME 11:52:33

RELEASE NUMBER : 1000001665

PROJECT NAME : 50.05.08 93-614 CAUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200032785	94-614-1119-T1	18			PH	9.60	pH Un		10-JAN-94	12-JAN-94	
INORGANICS-EPM	200032785	94-614-1119-T1	18			URANIUM	32.1	mg/L		10-JAN-94	12-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			ANTIMONY	60.0	ug/L	U	10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			ARSENIC	12.49	ug/L		10-JAN-94	25-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			BERYLLIUM	5.0	ug/L	U	10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			CADMIUM	5.0	ug/L	U	10-JAN-94	14-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			CHROMIUM	47.2	ug/L		10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			COPPER	429.5	ug/L		10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			LEAD	112.0	ug/L		10-JAN-94	24-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			NICKEL	107.7	ug/L		10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			SELENIUM	50.0	ug/L	U	10-JAN-94	25-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			SILVER	10.0	ug/L	U	10-JAN-94	13-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			THALLIUM	10.0	ug/L	U	10-JAN-94	28-JAN-94	
INORGANICS-AA/I	200032786	94-614-1119-T1	18			ZINC	354.4	ug/L		10-JAN-94	13-JAN-94	
INORGANICS-EPM	200032787	94-614-1111-T1	1			SOLIDS	85.4	wt %		10-JAN-94	11-JAN-94	
INORGANICS-EPM	200032787	94-614-1111-T1	1			URANIUM	1670	ppm		10-JAN-94	12-JAN-94	
INORGANICS-EPM	200032787	94-614-1111-T1	1			URANIUM	1588	ppm d		10-JAN-94	03-MAR-94	8
INORGANICS-EPM	200032788	94-614-1117-T1	19			SOLIDS	85.3	wt %		10-JAN-94	11-JAN-94	
INORGANICS-EPM	200032788	94-614-1117-T1	19			URANIUM	1620	ppm		10-JAN-94	12-JAN-94	
INORGANICS-EPM	200032789	94-614-1118-T1	20			SOLIDS	85.4	wt %		10-JAN-94	11-JAN-94	
INORGANICS-EPM	200032789	94-614-1118-T1	20			URANIUM	1620	ppm		10-JAN-94	12-JAN-94	
INORGANICS-EPM	200032790	94-614-1114-T1	2			URANIUM	950	ppm		10-JAN-94	12-JAN-94	
INORGANICS-EPM	200032791	94-614-1115-T1	12			URANIUM	1.6	mg/L		10-JAN-94	12-JAN-94	

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X9X-614X

From Received Date: X

Display Text? N

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RELEASE NUMBER : 1000001683

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE 11

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200033130	94-614-1020-T1	21			SOLIDS	85.8	wt %		10-JAN-94	20-JAN-94	
INORGANICS-EPM	200033130	94-614-1020-T1	21			URANIUM	370	ppm		10-JAN-94	21-JAN-94	
INORGANICS-EPM	200033131	94-614-1021-T1	5			PH	7.86	pH Un		11-JAN-93	14-JAN-94	
INORGANICS-EPM	200033131	94-614-1021-T1	5			SOLIDS	1.6	wt %		11-JAN-93	25-JAN-94	
INORGANICS-EPM	200033131	94-614-1021-T1	5			URANIUM	65	ppm		11-JAN-93	16-JAN-94	
INORGANICS-EPM	200033132	94-614-1021-T1				DENSITY	0.97	g/ml		11-JAN-94	26-JAN-94	
INORGANICS-EPM	200033135	94-614-1022-T1	6			SOLIDS	60.2	wt %		11-JAN-94	20-JAN-94	
INORGANICS-EPM	200033135	94-614-1022-T1	6			URANIUM	740	ppm		11-JAN-94	21-JAN-94	
INORGANICS-EPM	200033136	94-614-1023-T1				SOLIDS	5.6	wt %		11-JAN-94	25-JAN-94	
INORGANICS-EPM	200033136	94-614-1023-T1				URANIUM	114	ppm		11-JAN-94	16-JAN-94	
INORGANICS-EPM	200033137	94-614-1023-T1	8YL			DENSITY	1.02	g/ml		11-JAN-94	26-JAN-94	
INORGANICS-EPM	200033138	94-614-1023-T1	8YL			PH	7.68	pH Un		11-JAN-94	14-JAN-94	
INORGANICS-EPM	200033138	94-614-1023-T1	8YL			URANIUM	34.1	ng/L		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033139	94-614-1023-T1	8S			PH	9.36	pH Un		11-JAN-94	14-JAN-94	
INORGANICS-EPM	200033139	94-614-1023-T1	8S			URANIUM	94.0	ng/L		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033140	94-614-1023-T1	815			PH	9.36	pH Un		11-JAN-94	14-JAN-94	
INORGANICS-EPM	200033140	94-614-1023-T1	815			URANIUM	98.8	ng/L		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033141	94-614-1023-T1	830			PH	9.37	pH Un		11-JAN-94	16-JAN-94	
INORGANICS-EPM	200033141	94-614-1023-T1	830			URANIUM	100	ng/L		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033143	94-614-1023-T1	860			PH	9.37	pH Un		11-JAN-94	14-JAN-94	
INORGANICS-EPM	200033143	94-614-1023-T1	860			URANIUM	100	ng/L		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033144	94-614-1023-T1	8ZS			SOLIDS	6.7	wt %		11-JAN-94	25-JAN-94	
INORGANICS-EPM	200033144	94-614-1023-T1	8ZS			URANIUM	112	ppm		11-JAN-94	16-JAN-94	
INORGANICS-EPM	200033145	94-614-1023-T1	8ZS			DENSITY	1.06	g/ml		11-JAN-94	26-JAN-94	
INORGANICS-EPM	200033147	94-614-1023-T1	8ZL			PH	9.37	pH Un		11-JAN-94	14-JAN-94	
INORGANICS-EPM	200033147	94-614-1023-T1	8ZL			URANIUM	100	ng		11-JAN-94	13-JAN-94	
INORGANICS-EPM	200033148	94-614-1024-T1	22			SOLIDS	5.4	wt %		11-JAN-94	25-JAN-94	
INORGANICS-EPM	200033148	94-614-1024-T1	22			URANIUM	106	ppm		11-JAN-94	16-JAN-94	

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X92-614X

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RELEASE NUMBER : 1000001687

PROJECT NAME : 50.05.08 93-614 CAUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-AA/I	200033308	94-614-1142-T1	18			ANTIMONY	60.0	ug/L	U	12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			ARSENIC	10.0	ug/L	U	12-JAN-94	19-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			BERYLLIUM	5.0	ug/L	U	12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			CADMIUM	5.0	ug/L	U	12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			CHROMIUM	35.9	ug/L		12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			COPPER	280.3	ug/L		12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			LEAD	66.28	ug/L		12-JAN-94	01-FEB-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			NICKEL	84.7	ug/L		12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			SELENIUM	50.0	ug/L	U	12-JAN-94	25-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			SILVER	10.0	ug/L	U	12-JAN-94	14-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			THALLIUM	50	ug/L	U	12-JAN-94	30-JAN-94	
INORGANICS-AA/I	200033308	94-614-1142-T1	18			ZINC	274.7	ug/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033309	94-614-1142-T1	18			PH	9.56	pH Un		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033309	94-614-1142-T1	18			URANIUM	25.4	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033310	94-614-1136-T1	11C			PH	9.90	pH Un		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033310	94-614-1136-T1	11C			SOLIDS	0.1	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033310	94-614-1136-T1	11C			URANIUM	1.6	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033311	94-614-1137-T1	13			URANIUM	1.4	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033312	94-614-1127-T1	11A			PH	9.39	pH Un		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033312	94-614-1127-T1	11A			SOLIDS	1.6	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033312	94-614-1127-T1	11A			URANIUM	85	ppm		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033313	94-614-1129-T1	F8			URANIUM	0.1	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033314	94-614-1143-T1	27			PH	9.38	pH Un		13-JAN-94	14-JAN-94	
INORGANICS-EPH	200033314	94-614-1143-T1	27			SOLIDS	1.6	wt %		13-JAN-94	20-JAN-94	
INORGANICS-EPH	200033314	94-614-1143-T1	27			URANIUM	85.3	mg/L		13-JAN-94	14-JAN-94	
INORGANICS-EPH	200033315	94-614-1138-T1	14			URANIUM	0.2	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033316	94-614-1139-T1	15			URANIUM	0.3	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033317	94-614-1141-T1	17			URANIUM	0.3	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033318	94-614-1140-T1	16			URANIUM	0.2	mg/L		13-JAN-94	14-JAN-94	
INORGANICS-EPH	200033319	94-614-1128-T1	11B			PH	9.67	pH Un		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033319	94-614-1128-T1	11B			SOLIDS	0.3	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033319	94-614-1128-T1	11B			URANIUM	10	ppm		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033320	94-614-1130-T1	R8			URANIUM	0.2	mg/L		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033323	94-614-1125-T1	23			SOLIDS	60.7	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033324	94-614-1131-T1	10			SOLIDS	47.8	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033324	94-614-1131-T1	10			URANIUM	65	ppm		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033324	94-614-1131-T1	10			URANIUM		ppm d		12-JAN-94		B
INORGANICS-EPH	200033325	94-614-1126-T1	24			SOLIDS	53.7	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033326	94-614-1132-T1	25			SOLIDS	47.8	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033326	94-614-1132-T1	25			URANIUM	62	ppm		12-JAN-94	14-JAN-94	
INORGANICS-EPH	200033327	94-614-1133-T1	26			SOLIDS	48.0	wt %		12-JAN-94	20-JAN-94	
INORGANICS-EPH	200033327	94-614-1133-T1	26			URANIUM	59	ppm		12-JAN-94	14-JAN-94	

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X92-614X

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RELEASE NUMBER : 1000001834

PROJECT NAME : 50.05.08 93-614 CRU5 I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200037644	94-614-1159-T1	5			DENSITY	1.01	g/ml		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037645	94-614-1159-T1	5			PH	7.04	pH Un		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037645	94-614-1159-T1	5			SOLIDS	0.9	wt %		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037645	94-614-1159-T1	5			URANIUM	20.0	ppm		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037646	94-614-1161-T1	8YS			DENSITY	1.01	g/ml		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037647	94-614-1161-T1	8ZS			DENSITY	1.07	g/ml		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037648	94-614-1161-T1	8YS			SOLIDS	3.8	wt %		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037648	94-614-1161-T1	8YS			URANIUM	32.1	mg/L		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037650	94-614-1161-T1	8YL			PH	6.61	pH Un		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037650	94-614-1161-T1	8YL			URANIUM	2.6	mg/L		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037651	94-614-1161-T1	8ZS			SOLIDS	8.4	wt %		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037651	94-614-1161-T1	8ZS			URANIUM	55.81	mg/L		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037652	94-614-1161-T1	8ZL			PH	9.30	pH Un		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037652	94-614-1161-T1	8ZL			SOLIDS	1.9	wt %		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037652	94-614-1161-T1	8ZL			URANIUM	45.2	mg/L		03-FEB-94	11-FEB-94	
INORGANICS-EPH	200037653	94-614-1161-T1	85			PH	9.26	pH Un		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037653	94-614-1161-T1	85			URANIUM	41.0	mg/L		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037654	94-614-1161-T1	81S			PH	9.26	pH Un		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037654	94-614-1161-T1	81S			URANIUM	44.8	mg/L		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037655	94-614-1161-T1	830			PH	9.25	pH Un		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037655	94-614-1161-T1	830			URANIUM	45.8	mg/L		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037656	94-614-1161-T1	860			PH	9.24	pH Un		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037656	94-614-1161-T1	860			URANIUM	46.8	mg/L		03-FEB-94	10-FEB-94	
INORGANICS-EPH	200037657	94-614-1164-T1	11A			PH	9.32	pH Un		04-FEB-94	11-FEB-94	
INORGANICS-EPH	200037657	94-614-1164-T1	11A			SOLIDS	1.9	wt %		04-FEB-94	16-FEB-94	
INORGANICS-EPH	200037657	94-614-1164-T1	11A			URANIUM	44.0	mg/L		04-FEB-94	11-FEB-94	
INORGANICS-EPH	200037672	94-614-1161-T1	6			SOLIDS	64.3	wt %		03-FEB-94	16-FEB-94	
INORGANICS-EPH	200037672	94-614-1161-T1	6			URANIUM	350	ppm		03-FEB-94	12-FEB-94	
INORGANICS-EPH	200037697	94-614-1163-T1	80			SOLIDS	61.5	wt %		04-FEB-94	16-FEB-94	
INORGANICS-EPH	200037697	94-614-1163-T1	80			URANIUM	75	ppm		04-FEB-94	11-FEB-94	

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000001875

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200038677	94-614-1199-T1	11A			PH	9.38	pH Un		10-FEB-94	12-FEB-94	
INORGANICS-EPH	200038677	94-614-1199-T1	11A			SOLIDS	2.0	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038677	94-614-1199-T1	11A			URANIUM	36	ppm		10-FEB-94	12-FEB-94	
WATER TREATMENT	200038678	94-614-1200-T1	11B			PH	9.57	pH Un		10-FEB-94	12-FEB-94	B
INORGANICS-EPH	200038678	94-614-1200-T1	11B			SOLIDS	0.3	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038678	94-614-1200-T1	11B			URANIUM	4	ppm		10-FEB-94	12-FEB-94	
INORGANICS-EPH	200038679	94-614-1201-T1	16			URANIUM	1	ppm	U	10-FEB-94	12-FEB-94	
INORGANICS-EPH	200038680	94-614-1204-T1	11C			PH	9.51	pH Un		10-FEB-94	12-FEB-94	
INORGANICS-EPH	200038680	94-614-1204-T1	11C			SOLIDS	0.2	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038680	94-614-1204-T1	11C			URANIUM	2	ppm		10-FEB-94	12-FEB-94	
WATER TREATMENT	200038681	94-614-1192-T1	5			PH	7.22	pH Un		09-FEB-94	12-FEB-94	B
INORGANICS-EPH	200038681	94-614-1192-T1	5			SOLIDS	1.3	wt %		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038681	94-614-1192-T1	5			URANIUM	19	ppm		09-FEB-94	12-FEB-94	
INORGANICS-EPH	200038682	94-614-1192-T1	5			DENSITY	1.00	g/ml		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038683	94-614-1194-T1	8YS			SOLIDS	5.4	wt %		09-FEB-94	17-FEB-94	
INORGANICS-EPH	200038683	94-614-1194-T1	8YS			URANIUM	42	ppm		09-FEB-94	14-FEB-94	
INORGANICS-EPH	200038684	94-614-1194-T1	8YS			DENSITY	1.02	g/ml		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038685	94-614-1199-T1	8YL			PH	6.63	pH Un		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038685	94-614-1199-T1	8YL			URANIUM	2	ppm		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038686	94-614-1194-T1	8S			PH	9.40	pH Un		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038686	94-614-1194-T1	8S			URANIUM	27	ppm		09-FEB-94	14-FEB-94	
INORGANICS-EPH	200038687	94-614-1194-T1	815			PH	9.39	pH Un		09-FEB-94	12-FEB-94	
INORGANICS-EPH	200038687	94-614-1194-T1	815			URANIUM	30	ppm		09-FEB-94	14-FEB-94	
INORGANICS-EPH	200038688	94-614-1194-T1	830			PH	9.38	pH Un		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038688	94-614-1194-T1	830			URANIUM	31	ppm		09-FEB-94	14-FEB-94	
INORGANICS-EPH	200038689	94-614-1194-T1	860			PH	9.36	pH Un		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038689	94-614-1194-T1	860			URANIUM	28	ppm		09-FEB-94	14-FEB-94	
INORGANICS-EPH	200038689	94-614-1194-T1	860			URANIUM		mg/L		09-FEB-94		B
INORGANICS-EPH	200038690	94-614-1199-T1	82S			DENSITY	1.06	g/ml		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038691	94-614-1194-T1	82S			SOLIDS	7.8	wt %		10-FEB-94	17-FEB-94	
INORGANICS-EPH	200038691	94-614-1194-T1	82S			URANIUM	49	ppm		10-FEB-94	14-FEB-94	
INORGANICS-EPH	200038692	94-614-1195-T1	82L			PH	9.36	pH Un		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038692	94-614-1195-T1	82L			SOLIDS	1.9	wt %		09-FEB-94	17-FEB-94	
INORGANICS-EPH	200038692	94-614-1195-T1	82L			URANIUM	42	ppm		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038692	94-614-1195-T1	82L			URANIUM		mg/L		09-FEB-94		B
INORGANICS-EPH	200038693	94-614-1210-T1	13			URANIUM	1	ppm	U	10-FEB-94	14-FEB-94	
INORGANICS-EPH	200038694	94-614-1209-T1	14			URANIUM	1	ppm	U	10-FEB-94	14-FEB-94	
INORGANICS-EPH	200038695	94-614-1211-T1	17			URANIUM	1	ppm	U	10-FEB-94	14-FEB-94	
INORGANICS-EPH	200038707	94-614-1203-T1	18			PH	9.56	pH Un		10-FEB-94	12-FEB-94	
INORGANICS-EPH	200038707	94-614-1203-T1	18			URANIUM	10	ppm		10-FEB-94	12-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			ARSENIC	27.2	ug/L		10-FEB-94	14-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			BERYLLIUM	5.0	ug/L	U	10-FEB-94	14-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			CADMIUM	5.0	ug/L	U	10-FEB-94	14-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			CHROMIUM	35.8	ug/L		10-FEB-94	14-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			COPPER	136.0	ug/L		10-FEB-94	14-FEB-94	
INORGANICS-AA/I	200038708	94-614-1203-T1	18			LEAD	86.4	ug/L		10-FEB-94	10-MAR-94	B
INORGANICS-AA/I	200038708	94-614-1203-T1	18			NICKEL	58.1	ug/L		10-FEB-94	14-FEB-94	

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X92-614X

From Received Date: X

Display Text? N

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RELEASE NUMBER : 1000001875

PROJECT NAME : 50.05.08 93-616 CRUS 1/D TREAT-PHASE 11

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-AA/I	200038708		94-614-1203-T1	18		SELENIUM	5	ug/L	U	10-FEB-94	17-FEB-94	
INORGANICS-AA/I	200038708		94-614-1203-T1	18		SILVER	11.8	ug/L		10-FEB-94	16-FEB-94	
INORGANICS-AA/I	200038708		94-614-1203-T1	18		THALLIUM	10.0	ug/L	U	10-FEB-94	25-FEB-94	B
INORGANICS-AA/I	200038708		94-614-1203-T1	18		ZINC	209.7	ug/L		10-FEB-94	14-FEB-94	
INORGANICS-EPH	200038709		94-614-1196-T1	19		SOLIDS	59.5	wt %		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038709		94-614-1196-T1	19		URANIUM	230	ppm d		09-FEB-94	18-MAR-94	
INORGANICS-EPH	200038710		94-614-1197-T1	80		SOLIDS	58.0	wt %		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038710		94-614-1197-T1	80		URANIUM	140	ppm d		09-FEB-94	08-MAR-94	
INORGANICS-EPH	200038711		94-614-1198-T1	90		SOLIDS	55.7	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038711		94-614-1198-T1	90		URANIUM	150	ppm d		10-FEB-94	08-MAR-94	
INORGANICS-EPH	200038712		94-614-1202-T1	10		SOLIDS	54.6	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038712		94-614-1202-T1	10		URANIUM	110	ppm d		10-FEB-94	08-MAR-94	
INORGANICS-EPH	200038713		94-614-1206-T1	82		SOLIDS	51.5	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038713		94-614-1206-T1	82		URANIUM	170	ppm d		10-FEB-94	17-FEB-94	
INORGANICS-EPH	200038714		94-614-1193-T1	6		SOLIDS	64.9	wt %		09-FEB-94	16-FEB-94	
INORGANICS-EPH	200038714		94-614-1193-T1	6		URANIUM	640	ppm d		09-FEB-94	08-MAR-94	
INORGANICS-EPH	200038715		94-614-1208-T1	21		SOLIDS	47.8	wt %		10-FEB-94	16-FEB-94	
INORGANICS-EPH	200038715		94-614-1208-T1	21		URANIUM	130	ppm d		10-FEB-94	12-FEB-94	
ITAS-STL	200038716		94-614-1195-T1	108		TOTAL SUS. SOLI	1.0	mg/L		09-FEB-94	14-MAR-94	B
ITAS-STL	200038716		94-614-1195-T1	108		URANIUM	24200	ug/L		09-FEB-94	21-MAR-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X9X-614X

From Received Date: X

Display Text? N

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RELEASE NUMBER : 1000001940

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200039907	94-614-1246-T3	19		SOLIDS	56.5	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039907	94-614-1246-T3	19		URANIUM	250	ppm d		16-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039908	94-614-1249-T3	80		SOLIDS	55.9	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039908	94-614-1249-T3	80		URANIUM	134	ppm d		16-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039909	94-614-1247-T3	90		SOLIDS	54.2	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039909	94-614-1247-T3	90		URANIUM	150	ppm d		16-FEB-94	25-FEB-94	B
INORGANICS-EPM	200039910	94-614-1254-T3	10		SOLIDS	50.2	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039910	94-614-1254-T3	10		URANIUM	138	ppm d		16-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039910	94-614-1254-T3	10		URANIUM	94	ppm d		16-FEB-94	13-APR-94	B
INORGANICS-EPM	200039911	94-614-1257-T3	82		SOLIDS	45.6	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039911	94-614-1257-T3	82		URANIUM	250	ppm d		16-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039912	94-614-1264-T2	10		SOLIDS	48.5	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039912	94-614-1264-T2	10		URANIUM	130	ppm d		17-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039913	94-614-1268-T2	82		SOLIDS	40.5	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039913	94-614-1268-T2	82		URANIUM	234	ppm d		17-FEB-94	08-MAR-94	B
INORGANICS-EPM	200039914	94-614-1272-T9	1		SOLIDS	99.7	wt %		15-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039914	94-614-1272-T9	1		URANIUM	86	ppm d		15-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039915	94-614-1273-T9	2		SOLIDS	99.6	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039915	94-614-1273-T9	2		URANIUM	43	ppm d		16-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039916	94-614-1274-T9	3		SOLIDS	99.6	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039916	94-614-1274-T9	3		URANIUM	9.6	ppm d		16-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039917	94-614-1275-T9	4		SOLIDS	55.1	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039917	94-614-1275-T9	4		URANIUM	110	ppm d		16-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039918	94-614-1276-T9	5		SOLIDS	55.1	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039918	94-614-1276-T9	5		URANIUM	130	ppm d		16-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039919	94-614-1277-T9	6		SOLIDS	52.7	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039919	94-614-1277-T9	6		URANIUM	127	ppm d		16-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039920	94-614-1278-T9	7		SOLIDS	55.4	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039920	94-614-1278-T9	7		URANIUM	161	ppm d		16-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039921	94-614-1279-T9	8		SOLIDS	53.4	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039921	94-614-1279-T9	8		URANIUM	172	ppm d		16-FEB-94	27-FEB-94	B
INORGANICS-EPM	200039922	94-614-1280-T9	9		SOLIDS	99.9	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039922	94-614-1280-T9	9		URANIUM	162	ppm d		17-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039923	94-614-1281-T9	10		SOLIDS	100	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039923	94-614-1281-T9	10		URANIUM	140	ppm d		17-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039924	94-614-1282-T9	11		SOLIDS	100	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039924	94-614-1282-T9	11		URANIUM	133	ppm d		17-FEB-94	25-FEB-94	B
INORGANICS-EPM	200039925	94-614-1283-T9	12		SOLIDS	53.4	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039925	94-614-1283-T9	12		URANIUM	140	ppm d		17-FEB-94	26-FEB-94	B
INORGANICS-EPM	200039926	94-614-1250-T3	11A		SOLIDS	1.7	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039926	94-614-1250-T3	11A		URANIUM	37.5	ppm		16-FEB-94	02-MAR-94	B
INORGANICS-EPM	200039927	94-614-1248-T3	11B		SOLIDS	0.3	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039927	94-614-1248-T3	11B		URANIUM	4	ppm		16-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039928	94-614-1252-T3	8B		URANIUM	0.1	mg/L	U	16-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039929	94-614-1253-T3	FB		URANIUM	0.1	mg/L	U	16-FEB-94	01-MAR-94	B
INORGANICS-EPM	200039931	94-614-1258-T3	11C		SOLIDS	0.2	wt %		16-FEB-94	22-FEB-94	B
INORGANICS-EPM	200039931	94-614-1258-T3	11C		URANIUM	1	ppm		16-FEB-94	01-MAR-94	B

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000001940

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200039932		94-614-1259-T3	16		URANIUM	1	ppm	U	17-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039933		94-614-1260-T3	17		URANIUM	1	ppm	U	17-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039934		94-614-1261-T3	13		URANIUM	1	ppm	U	17-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039935		94-614-1262-T3	14		URANIUM	1	ppm	U	17-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039936		94-614-1263-T2	13		URANIUM	1	ppm	U	16-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039937		94-614-1264-T2	10		URANIUM	74	ppm		17-FEB-94	28-FEB-94	B
INORGANICS-EPH	200039949		94-614-1269-T2	11C		PH	8.10	pH Un		17-FEB-94	01-MAR-94	B
INORGANICS-EPH	200039949		94-614-1269-T2	11C		SOLIDS	0.1	wt %		17-FEB-94	22-FEB-94	B
INORGANICS-EPH	200039949		94-614-1269-T2	11C		URANIUM	1	ppm		17-FEB-94	01-MAR-94	B
INORGANICS-EPH	200039950		94-614-1270-T2	14		URANIUM	1	ppm	U	17-FEB-94	25-FEB-94	B
INORGANICS-EPH	200039951		94-614-1271-T2	17		URANIUM	1	ppm	U	17-FEB-94	03-MAR-94	B
INORGANICS-EPH	200039952		94-614-1251-T3	18		PH	7.45	pH Un		16-FEB-94	27-FEB-94	B
INORGANICS-EPH	200039952		94-614-1251-T3	18		URANIUM	3	ppm		16-FEB-94	23-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		ANTIMONY	60.0	ug/L	U	16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		ARSENIC	10.0	ug/L	U	16-FEB-94	01-MAR-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		BERYLLIUM	5.0	ug/L	U	16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		CADMIUM	5.0	ug/L	U	16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		CHROMIUM	14.6	ug/L		16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		COPPER	75.6	ug/L		16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		LEAD	54.0	ug/L		16-FEB-94	09-MAR-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		NICKEL	40.0	ug/L	U	16-FEB-94	25-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		SELENIUM	50.0	ug/L	U	16-FEB-94	03-MAR-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		SILVER	11.5	ug/L		16-FEB-94	24-FEB-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		THALLIUM	40.0	ug/L	U	16-FEB-94	12-MAR-94	B
INORGANICS-AA/I	200040001		94-614-1251-T3	18		ZINC	20.0	ug/L	U	16-FEB-94	24-FEB-94	B
ITAS-STL	200042033		94-614-1267-T2	110		TOTAL SUS. SOLI	47.88	mg/L		17-FEB-94		B
ITAS-STL	200042033		94-614-1267-T2	110		URANIUM	17.7	ug/g		17-FEB-94	23-MAR-94	B
MASS SPECTROSCO	200076060		94-614-1272 T9	1		URANIUM 234	4.0E+01	pCi/g		15-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076060		94-614-1272 T9	1		URANIUM 235	1.3E+00	pCi/g		15-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076060		94-614-1272 T9	1		URANIUM 236	1.2E-01	pCi/g		15-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076060		94-614-1272 T9	1		URANIUM 238	2.9E+01	pCi/g		15-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076061		94-614-1273 T9	2		URANIUM 234	1.2E+01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076061		94-614-1273 T9	2		URANIUM 235	6.6E-01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076061		94-614-1273 T9	2		URANIUM 236	2.8E-02	pCi/g	U	16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076061		94-614-1273 T9	2		URANIUM 238	1.4E+01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076062		94-614-1274 T9	3		URANIUM 234		pCi/g		16-FEB-94		B
MASS SPECTROSCO	200076062		94-614-1274 T9	3		URANIUM 235		pCi/g		16-FEB-94		B
MASS SPECTROSCO	200076062		94-614-1274 T9	3		URANIUM 236		pCi/g		16-FEB-94		B
MASS SPECTROSCO	200076062		94-614-1274 T9	3		URANIUM 238		pCi/g		16-FEB-94		B
MASS SPECTROSCO	200076063		94-614-1275 T9	4		URANIUM 234	3.5E+01	pCi/g		16-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076063		94-614-1275 T9	4		URANIUM 235	1.5E+00	pCi/g		16-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076063		94-614-1275 T9	4		URANIUM 236	6.2E-01	pCi/g		16-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076063		94-614-1275 T9	4		URANIUM 238	3.7E+01	pCi/g		16-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076064		94-614-1276 T9	5		URANIUM 234	3.6E+01	pCi/g		16-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076064		94-614-1276 T9	5		URANIUM 235	1.8E+00	pCi/g		16-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076064		94-614-1276 T9	5		URANIUM 236	5.6E-01	pCi/g		16-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076064		94-614-1276 T9	5		URANIUM 238	4.3E+01	pCi/g		16-FEB-94	04-AUG-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.0893-614X

From Received Date: X

Display Text? N

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RELEASE NUMBER : 1000001940

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LG	DATE SAMPLED	DATE TASK PERFORMED	ASL
MASS SPECTROSCO	200076065	94-614-1277	T9 6		URANIUM 234	4.4E+01	pCi/g		16-FEB-94	08-AUG-94	B
MASS SPECTROSCO	200076065	94-614-1277	T9 6		URANIUM 235	1.8E+00	pCi/g		16-FEB-94	08-AUG-94	B
MASS SPECTROSCO	200076065	94-614-1277	T9 6		URANIUM 236	6.7E-01	pCi/g		16-FEB-94	08-AUG-94	B
MASS SPECTROSCO	200076065	94-614-1277	T9 6		URANIUM 238	4.2E+01	pCi/g		16-FEB-94	08-AUG-94	B
MASS SPECTROSCO	200076066	94-614-1278	T9 7		URANIUM 234	4.2E+01	pCi/g		16-FEB-94	26-OCT-94	B
MASS SPECTROSCO	200076066	94-614-1278	T9 7		URANIUM 235	2.2E+00	pCi/g		16-FEB-94	26-OCT-94	B
MASS SPECTROSCO	200076066	94-614-1278	T9 7		URANIUM 236	6.9E-01	pCi/g		16-FEB-94	26-OCT-94	B
MASS SPECTROSCO	200076066	94-614-1278	T9 7		URANIUM 238	5.4E+01	pCi/g		16-FEB-94	26-OCT-94	B
MASS SPECTROSCO	200076067	94-614-1279	T9 8		URANIUM 234	5.6E+01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076067	94-614-1279	T9 8		URANIUM 235	2.6E+00	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076067	94-614-1279	T9 8		URANIUM 236	5.7E-01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076067	94-614-1279	T9 8		URANIUM 238	5.7E+01	pCi/g		16-FEB-94	07-AUG-94	B
MASS SPECTROSCO	200076068	94-614-1280	T9 9		URANIUM 234	5.6E+01	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076068	94-614-1280	T9 9		URANIUM 235	2.5E+00	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076068	94-614-1280	T9 9		URANIUM 236	5.5E-01	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076068	94-614-1280	T9 9		URANIUM 238	5.4E+01	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076069	94-614-1281	T9 10		URANIUM 234	8.7E+00	pCi/g	U	17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076069	94-614-1281	T9 10		URANIUM 235	2.1E+00	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076069	94-614-1281	T9 10		URANIUM 236	9.1E-02	pCi/g	U	17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076069	94-614-1281	T9 10		URANIUM 238	4.7E+01	pCi/g		17-FEB-94	05-AUG-94	B
MASS SPECTROSCO	200076070	94-614-1282	T9 11		URANIUM 234	9.0E+01	pCi/g		17-FEB-94	19-OCT-94	B
MASS SPECTROSCO	200076070	94-614-1282	T9 11		URANIUM 235	1.9E+00	pCi/g		17-FEB-94	19-OCT-94	B
MASS SPECTROSCO	200076070	94-614-1282	T9 11		URANIUM 236	1.1E+00	pCi/g		17-FEB-94	19-OCT-94	B
MASS SPECTROSCO	200076070	94-614-1282	T9 11		URANIUM 238	4.4E+01	pCi/g		17-FEB-94	19-OCT-94	B
MASS SPECTROSCO	200076071	200076071	12		URANIUM 234	6.2E+01	pCi/g		17-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076071	200076071	12		URANIUM 235	2.2E+00	pCi/g		17-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076071	200076071	12		URANIUM 236	5.9E-01	pCi/g		17-FEB-94	04-AUG-94	B
MASS SPECTROSCO	200076071	200076071	12		URANIUM 238	4.7E+01	pCi/g		17-FEB-94	04-AUG-94	B

Your Selection Criteria Was:

Release Numbers: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X-614X

From Received Date: X

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RELEASE NUMBER : 1000002055

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200042890	94-614-1331-T1	5			PH	7.30	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042890	94-614-1331-T1	5			SOLIDS	1.5	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042890	94-614-1331-T1	5			URANIUM	24	ppm		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042891	94-614-1331-T1	5			DENSITY	1.00	g/ml		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042892	94-614-1332-T1	8YS			SOLIDS	5.8	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042892	94-614-1332-T1	8YS			URANIUM	39	ppm		28-FEB-94	18-MAR-94	B
INORGANICS-EPH	200042893	94-614-1332-T1	8YL			PH	8.35	pH Un		28-FEB-94	12-MAR-94	B
INORGANICS-EPH	200042893	94-614-1332-T1	8YL			URANIUM	19	ppm		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042894	94-614-1333-T1	13			URANIUM	0.4	ppm		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042895	94-614-1349-T1	FB			URANIUM	0.1	mg/L	U	01-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042896	94-614-1336-T1	11A			PH	9.19	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042896	94-614-1336-T1	11A			SOLIDS	1.8	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042896	94-614-1336-T1	11A			URANIUM	37	ppm		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042897	94-614-1340-T1	11B			PH	9.25	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042897	94-614-1340-T1	11B			SOLIDS	0.3	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042897	94-614-1340-T1	11B			URANIUM	4	ppm		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042898	94-614-1332-T1	82L			PH	9.20	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042898	94-614-1332-T1	82L			SOLIDS	1.6	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042898	94-614-1332-T1	82L			URANIUM	34	ppm		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042899	94-614-1341-T1	11L			PH	8.67	pH Un		01-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042899	94-614-1341-T1	11L			SOLIDS	0.2	wt %		01-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042899	94-614-1341-T1	11L			URANIUM	2	ppm		01-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042900	94-614-1372-T1	11A			PH	9.24	pH Un		03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042900	94-614-1372-T1	11A			SOLIDS	1.8	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042900	94-614-1372-T1	11A			URANIUM	38	ppm		03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042901	94-614-1375-T1	11B			PH	9.18	pH Un		03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042901	94-614-1375-T1	11B			SOLIDS	0.3	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042901	94-614-1375-T1	11B			URANIUM	4	ppm		03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042902	94-614-1378-T1	11C			PH	9.05	pH Un		03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042902	94-614-1378-T1	11C			SOLIDS	0.1	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042902	94-614-1378-T1	11C			URANIUM	1	ppm	U	03-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042903	94-614-1332-T1	8YS			DENSITY	1.03	g/ml		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042904	94-614-1332-T1	82S			DENSITY	1.04	g/ml		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042905	94-614-1363-T1	8YS			DENSITY	1.02	g/ml		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042906	94-614-1369-T1	82S			DENSITY	1.06	g/ml		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042907	94-614-1332-T1	82S			SOLIDS	7.6	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042907	94-614-1332-T1	82S			URANIUM	5	ppm		28-FEB-94	17-MAR-94	B
INORGANICS-EPH	200042909	94-614-1369-T1	82S			SOLIDS	7.8	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042909	94-614-1369-T1	82S			URANIUM	47	ppm		02-MAR-94	22-MAR-94	B
INORGANICS-EPH	200042910	94-614-1361-T1	5			SOLIDS	0.6	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042910	94-614-1361-T1	5			URANIUM	2	ppm		02-MAR-94	26-MAR-94	B
INORGANICS-EPH	200042911	94-614-1363-T1	8YS			SOLIDS	5.5	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042911	94-614-1363-T1	8YS			URANIUM	46	ppm		02-MAR-94	07-APR-94	B
INORGANICS-EPH	200042912	94-614-1332-T1	85			PH	9.31	pH Un		28-FEB-94	14-MAR-94	B
INORGANICS-EPH	200042912	94-614-1332-T1	85			URANIUM	27.7	ppm		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042913	94-614-1332-T1	81S			PH	9.30	pH Un		28-FEB-94	14-MAR-94	B
INORGANICS-EPH	200042913	94-614-1332-T1	81S			URANIUM	28.9	ppm		28-FEB-94	13-MAR-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.0829X-614X

From Received Date: X

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RELEASE NUMBER : 1000002055

PROJECT NAME : 50.05.08 93-614 CRU5 I/O TREAT-PHASE II

LAR	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200042914	94-614-1332-T1	830			PH	9.30	pH Un		28-FEB-94	14-MAR-94	B
INORGANICS-EPH	200042914	94-614-1332-T1	830			URANIUM	28.9	ppm		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042915	94-614-1332-T1	860			PH	9.28	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042915	94-614-1332-T1	860			URANIUM	32	ppm		28-FEB-94	13-MAR-94	B
INORGANICS-EPH	200042916	94-614-1364-T1	8YL			PH	7.59	pH Un		02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042916	94-614-1364-T1	8YL			URANIUM	19	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042917	94-614-1365-T1	85			PH	9.36	pH Un		02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042917	94-614-1365-T1	85			URANIUM	32	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042918	94-614-1366-T1	815			PH	9.36	pH Un		02-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042918	94-614-1366-T1	815			URANIUM	32	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042919	94-614-1367-T1	830			PH	9.35	pH Un		02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042919	94-614-1367-T1	830			URANIUM	35	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042920	94-614-1368-T1	860			PH	9.34	pH Un		02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042920	94-614-1368-T1	860			URANIUM	36	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042921	94-614-1370-T1	8ZL			PH	9.32	pH Un		02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042921	94-614-1370-T1	8ZL			URANIUM	37	ppm		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042922	94-614-1343-T1	14			URANIUM	1	ppm	U	01-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042923	94-614-1347-T1	17			URANIUM	1	ppm	U	01-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042924	94-614-1348-T1	16			URANIUM	1	ppm	U	01-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042925	94-614-1356-T1	12			URANIUM	1	ppm	U	02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042926	94-614-1357-T1	13			URANIUM	1	ppm	U	02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042927	94-614-1362-T1	15			URANIUM	1	ppm	U	02-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042928	94-614-1376-T1	16			URANIUM	1	ppm	U	03-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042929	94-614-1382-T1	14			URANIUM	1	ppm	U	03-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042930	94-614-1383-T1	17			URANIUM	1	ppm	U	03-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042931	94-614-1350-T1	RB			URANIUM	0.1	mg/L	U	01-MAR-94	14-MAR-94	B
INORGANICS-EPH	200042932	94-614-1384-T1	FB			URANIUM	0.1	mg/L	U	03-MAR-94	15-MAR-94	B
INORGANICS-EPH	200042933	94-614-1385-T1	RB			URANIUM	0.1	mg/L	U	03-MAR-94	15-MAR-94	B
INORGANICS-EPH	200042937	94-614-1330-T1	6			SOLIDS	64.6	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042937	94-614-1330-T1	6			URANIUM	590	ppm d		28-FEB-94	15-MAR-94	B
INORGANICS-EPH	200042938	94-614-1335-T1	19			SOLIDS	54.5	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042938	94-614-1335-T1	19			URANIUM	250	ppm d		28-FEB-94	15-MAR-94	B
INORGANICS-EPH	200042939	94-614-1337-T1	29			PH	9.18	pH Un		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042939	94-614-1337-T1	29			SOLIDS	1.8	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042939	94-614-1337-T1	29			URANIUM	37	ppm		28-FEB-94	16-MAR-94	B
INORGANICS-EPH	200042940	94-614-1339-T1	90			SOLIDS	54.6	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042940	94-614-1339-T1	90			URANIUM	180	ppm d		28-FEB-94	15-MAR-94	B
INORGANICS-EPH	200042941	94-614-1334-T1	80			SOLIDS	54.7	wt %		28-FEB-94	09-MAR-94	B
INORGANICS-EPH	200042941	94-614-1334-T1	80			URANIUM	230	ppm d		28-FEB-94	15-MAR-94	B
INORGANICS-EPH	200042942	94-614-1344-T1	10			SOLIDS	52.0	wt %		01-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042942	94-614-1344-T1	10			URANIUM	169	ppm d		01-MAR-94	16-MAR-94	B
INORGANICS-EPH	200042942	94-614-1344-T1	10			URANIUM	151	ppm d		01-MAR-94	26-MAY-94	B
INORGANICS-EPH	200042943	94-614-1351-T1	1			SOLIDS	81.4	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042943	94-614-1351-T1	1			URANIUM	840	ppm d		02-MAR-94	13-MAR-94	B
INORGANICS-EPH	200042944	94-614-1352-T1	2			SOLIDS	88.0	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPH	200042944	94-614-1352-T1	2			URANIUM	150	ppm d		02-MAR-94	18-MAR-94	B
INORGANICS-EPH	200042945	94-614-1355-T1	81			SOLIDS	78.3	wt %		02-MAR-94	09-MAR-94	B

Your Selection Criteria Was:

Release Numbers %

Components: X-LR

Submission ID: %

Project Name: 50.05.0829X-614X

From Received Date: %

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RELEASE NUMBER : 1000002055

PROJECT NAME : 50.05.08 93-614 CRU5 I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200042945	94-614-1355-T1	81			URANIUM	740	ppm d		02-MAR-94	16-MAR-94	B
INORGANICS-EPM	200042946	94-614-1358-T1	82			SOLIDS	41.7	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042946	94-614-1358-T1	82			URANIUM	190	ppm d		02-MAR-94	16-MAR-94	B
INORGANICS-EPM	200042947	94-614-1360-T1	6			SOLIDS	54.1	wt %		02-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042947	94-614-1360-T1	6			URANIUM	780	ppm d		02-MAR-94	15-MAR-94	B
INORGANICS-EPM	200042948	94-614-1371-T1	80			SOLIDS	59.6	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042948	94-614-1371-T1	80			URANIUM	393	ppm d		03-MAR-94	16-MAR-94	B
INORGANICS-EPM	200042949	94-614-1373-T1	19			SOLIDS	59.8	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042949	94-614-1373-T1	19			URANIUM	230	ppm d		03-MAR-94	26-MAR-94	B
INORGANICS-EPM	200042950	94-614-1374-T1	90			SOLIDS	56.4	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042950	94-614-1374-T1	90			URANIUM	140	ppm d		03-MAR-94	16-MAR-94	B
INORGANICS-EPM	200042951	94-614-1379-T1	10			SOLIDS	50.8	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042951	94-614-1379-T1	10			URANIUM	100	ppm d		03-MAR-94	16-MAR-94	B
INORGANICS-EPM	200042952	94-614-1386-T1	29			SOLIDS	49.8	wt %		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042952	94-614-1386-T1	29			URANIUM	97	ppm d		03-MAR-94	16-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			ANTIMONY	60.0	ug/L	U	01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			ARSENIC	11.6	ug/L		01-MAR-94	16-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			BERYLLIUM	5.0	ug/L	U	01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			CADMIUM	5.0	ug/L	U	01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			CHROMIUM	29.0	ug/L		01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			COPPER	96.8	ug/L		01-MAR-94	10-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			LEAD	89.7	ug/L		01-MAR-94	12-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			NICKEL	40.4	ug/L		01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			SELENIUM	5.0	ug/L	U	01-MAR-94	29-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			SILVER	14.6	ug/L		01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			THALLIUM	100	ug/L	U	01-MAR-94	19-APR-94	B
INORGANICS-AA/I	200042953	94-614-1342-T1	18			ZINC	156.2	ug/L		01-MAR-94	15-MAR-94	B
INORGANICS-EPM	200042954	94-614-1342-T1	18			PH	9.36	pH Un		01-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042954	94-614-1342-T1	18			URANIUM	13	ppm		01-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			ANTIMONY	60.0	ug/L	U	03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			ARSENIC	10.0	ug/L	U	03-MAR-94	16-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			BERYLLIUM	5.0	ug/L	U	03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			CADMIUM	5.0	ug/L	U	03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			CHROMIUM	38.2	ug/L		03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			COPPER	139.2	ug/L		03-MAR-94	10-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			LEAD		ug/L		03-MAR-94		B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			LEAD	72.4	ug/L		03-MAR-94	12-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			NICKEL	41.9	ug/L		03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			SELENIUM	5.0	ug/L	U	03-MAR-94	29-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			SILVER	20.0	ug/L		03-MAR-94	09-MAR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			THALLIUM	100.0	ug/L	U	03-MAR-94	20-APR-94	B
INORGANICS-AA/I	200042955	94-614-1377-T1	18			ZINC	156.9	ug/L		03-MAR-94	15-MAR-94	B
INORGANICS-EPM	200042957	94-614-1377-T1	18			PH	9.43	pH Un		03-MAR-94	09-MAR-94	B
INORGANICS-EPM	200042957	94-614-1377-T1	18			URANIUM	15	ppm		03-MAR-94	08-MAR-94	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? X

Submission ID: X

Project Name: 50.05.08392-614X

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RELEASE NUMBER : 1000002116
PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200044720	94-614-1390-TO 2			SOLIDS	94.3	wt %		07-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044720	94-614-1390-TO 2			URANIUM	32	ppm d		07-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044720	94-614-1390-TO 2			URANIUM	31	ppm d		07-MAR-94	18-APR-94	B
INORGANICS-EPH	200044721	94-614-1388-T1 82			SOLIDS	44.9	wt %		07-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044721	94-614-1388-T1 82			URANIUM	169	ppm d		07-MAR-94	12-APR-94	B
INORGANICS-EPH	200044722	94-614-1389-TO 1			SOLIDS	80.7	wt %		07-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044722	94-614-1389-TO 1			URANIUM	525	ppm d		07-MAR-94	13-APR-94	B
INORGANICS-EPH	200044722	94-614-1389-TO 1			URANIUM	679	ppm d		07-MAR-94	15-APR-94	B
INORGANICS-EPH	200044723	94-614-1396-TO 81			SOLIDS	76.7	wt %		07-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044723	94-614-1396-TO 81			URANIUM	1140	ppm d		07-MAR-94	12-APR-94	B
INORGANICS-EPH	200044724	94-614-1397-TO 6			SOLIDS	65.1	wt %		07-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044724	94-614-1397-TO 6			URANIUM	535	ppm d		07-MAR-94	12-APR-94	B
INORGANICS-EPH	200044725	94-614-1344-TO 80			SOLIDS	45.2	wt %		09-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044725	94-614-1344-TO 80			URANIUM	120	ppm d		09-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044726	94-614-1346-TO 19			SOLIDS	48.3	wt %		09-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044726	94-614-1346-TO 19			URANIUM	215	ppm d		09-MAR-94	12-APR-94	B
INORGANICS-EPH	200044727	94-614-1393-TO 12			URANIUM	1	ppm	U	07-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044728	94-614-1340-TO 5			PH	7.31	pH Un		08-MAR-94	22-MAR-94	B
INORGANICS-EPH	200044728	94-614-1340-TO 5			SOLIDS	1.1	wt %		08-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044728	94-614-1340-TO 5			URANIUM	26	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044729	94-614-1340-TO 5			DENSITY	1.02	g/ml		08-MAR-94	05-APR-94	B
INORGANICS-EPH	200044730	94-614-1341-TO 8AYL			PH	7.45	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044730	94-614-1341-TO 8AYL			URANIUM	2.5	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044731	94-614-1342-TO 8B			URANIUM	0.1	mg/L	U	08-MAR-94	25-MAR-94	B
INORGANICS-EPH	200044732	94-614-1395-TO 13			URANIUM	0.2	ppm		07-MAR-94	25-MAR-94	B
INORGANICS-EPH	200044733	94-614-1399-TO 15			URANIUM	0.3	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044734	94-614-1341-TO 8AYS			SOLIDS	4.1	wt %		08-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044734	94-614-1341-TO 8AYS			URANIUM	50	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044735	94-614-1341-TO 8BYS			SOLIDS	3.1	wt %		08-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044735	94-614-1341-TO 8BYS			URANIUM	50	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044736	94-614-1341-TO 8CYS			SOLIDS	1.2	wt %		08-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044736	94-614-1341-TO 8CYS			URANIUM	65	ppm		08-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044737	94-614-1345-TO 11A			PH	9.26	pH Un		09-MAR-94	22-MAR-94	B
INORGANICS-EPH	200044737	94-614-1345-TO 11A			SOLIDS	1.9	wt %		09-MAR-94	16-MAR-94	B
INORGANICS-EPH	200044737	94-614-1345-TO 11A			URANIUM	36	ppm		09-MAR-94	24-MAR-94	B
INORGANICS-EPH	200044738	94-614-1341-TO 8AYS			DENSITY	1.02	g/ml		08-MAR-94	05-APR-94	B
INORGANICS-EPH	200044739	94-614-1341-TO 8BYS			DENSITY	1.03	g/ml		08-MAR-94	05-APR-94	B
INORGANICS-EPH	200044740	94-614-1341-TO 8CYS			DENSITY	1.03	g/ml		08-MAR-94	05-APR-94	B
INORGANICS-EPH	200044741	94-614-1341-TO 8BYL			PH	7.07	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044741	94-614-1341-TO 8BYL			URANIUM	3	ppm		08-MAR-94	25-MAR-94	B
INORGANICS-EPH	200044742	94-614-1341-TO 8CYL			PH	7.10	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044742	94-614-1341-TO 8CYL			URANIUM	3	ppm		08-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044743	94-614-1341-TO 8E5			PH	9.29	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044743	94-614-1341-TO 8E5			URANIUM	30	ppm		08-MAR-94	25-MAR-94	B
INORGANICS-EPH	200044744	94-614-1341-TO 8F5			PH	9.28	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044744	94-614-1341-TO 8F5			URANIUM	29	ppm		08-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044745	94-614-1341-TO 8E30			PH	9.26	pH Un		08-MAR-94	17-MAR-94	B

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X93-614X

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RELEASE NUMBER : 1000002116

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LG	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200044745	94-614-1341-TO	8E30			URANIUM	34	ppm		08-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044746	94-614-1341-TO	8F30			PH	9.26	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044746	94-614-1341-TO	8F30			URANIUM	35	ppm		08-MAR-94	25-MAR-94	B
INORGANICS-EPH	200044747	94-614-1341-TO	8E60			PH	9.26	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044747	94-614-1341-TO	8E60			URANIUM	34	ppm		08-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044748	94-614-1341-TO	8F60			PH	9.25	pH Un		08-MAR-94	17-MAR-94	B
INORGANICS-EPH	200044748	94-614-1341-TO	8F60			URANIUM	36	ppm		08-MAR-94	23-MAR-94	B
INORGANICS-EPH	200044749	94-614-1342-TO	FB			URANIUM	0.1	mg/L	U	08-MAR-94	25-MAR-94	B

Your Selection Criteria Was:

Release Number: X

From Received Date: X

Component: X-LR

Display Text? N

Submission ID: X

Project Name: 50.05.08X92-614X

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RELEASE NUMBER : 1000002252

PROJECT NAME : 50.05.08 93-614 CRUS I/O TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200048499		94-614-1437	T1 15		URANIUM	1	ppm	U	29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048500		94-614-1438	T1 8Y8		SOLIDS	4.3	wt %		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048500		94-614-1438	T1 8Y8		URANIUM	102	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048501		94-614-1438	T1 8YS		DENSITY	1.04	g/ml		29-MAR-94	05-APR-94	B
INORGANICS-EPM	200048502		94-614-1438	T1 8YL		PH	7.10	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048502		94-614-1438	T1 8YL		URANIUM	30	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048503		94-614-1453	T1 FB		URANIUM	0.1	mg/L	U	30-MAR-94	04-APR-94	B
INORGANICS-EPM	200048504		94-614-1456	T1 14		URANIUM	1	ppm	U	30-MAR-94	06-APR-94	B
INORGANICS-EPM	200048505		94-614-1457	T1 16		URANIUM	1	ppm	U	30-MAR-94	06-APR-94	B
INORGANICS-EPM	200048506		94-614-1458	T1 17		URANIUM	1	ppm	U	30-MAR-94	06-APR-94	B
INORGANICS-EPM	200048507		94-614-1438	T1 8Z8		SOLIDS	7.3	wt %		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048507		94-614-1438	T1 8Z8		URANIUM	103	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048508		94-614-1438	T1 8ZL		PH	9.41	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048508		94-614-1438	T1 8ZL		SOLIDS	1.8	wt %		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048508		94-614-1438	T1 8ZL		URANIUM	87	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048509		94-614-1438	T1 8Z8		DENSITY	1.05	g/ml		29-MAR-94	05-APR-94	B
INORGANICS-EPM	200048510		94-614-1438	T1 85		PH	9.41	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048510		94-614-1438	T1 85		URANIUM	69	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048511		94-614-1438	T1 815		PH	9.41	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048511		94-614-1438	T1 815		URANIUM	76	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048512		94-614-1438	T1 830		PH	9.40	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048512		94-614-1438	T1 830		URANIUM	78	ppm		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048513		94-614-1438	T1 860		PH	9.40	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048513		94-614-1438	T1 860		URANIUM	82	ppm		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048514		94-614-1454	T1 8B		URANIUM	0.1	mg/L	U	30-MAR-94	04-APR-94	B
INORGANICS-EPM	200048515		94-614-1439	T1 11A		PH	9.40	pH Un		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048515		94-614-1439	T1 11A		SOLIDS	2.0	wt %		29-MAR-94	06-APR-94	B
INORGANICS-EPM	200048515		94-614-1439	T1 11A		URANIUM	84	ppm		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048521		94-614-1441	T1 19		SOLIDS	56.2	wt %		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048521		94-614-1441	T1 19		URANIUM	296	ppm		29-MAR-94	08-APR-94	B
INORGANICS-EPM	200048522		94-614-1442	T6 27		SOLIDS	58.1	wt %		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048522		94-614-1442	T6 27		URANIUM	129	ppm		29-MAR-94	13-APR-94	B
INORGANICS-EPM	200048522		94-614-1442	T6 27		URANIUM	525	ppm d		29-MAR-94	13-APR-94	B
INORGANICS-EPM	200048523		94-614-1444	T8 82		SOLIDS	38.8	wt %		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048523		94-614-1444	T8 82		URANIUM	277	ppm		29-MAR-94	08-APR-94	B
INORGANICS-EPM	200048524		94-614-1446	T1 90		SOLIDS	52.6	wt %		29-MAR-94	07-APR-94	B
INORGANICS-EPM	200048524		94-614-1446	T1 90		URANIUM	184	ppm d		29-MAR-94	08-APR-94	B
INORGANICS-EPM	200048525		94-614-1448	T1 10		SOLIDS	47.4	wt %		30-MAR-94	07-APR-94	B
INORGANICS-EPM	200048525		94-614-1448	T1 10		URANIUM	166	ppm d		30-MAR-94	08-APR-94	B
INORGANICS-EPM	200048525		94-614-1448	T1 10		URANIUM	198	ppm d		30-MAR-94	26-MAY-94	B
INORGANICS-EPM	200048526		94-614-1459	T1 82		SOLIDS	45.6	wt %		31-MAR-94	07-APR-94	B
INORGANICS-EPM	200048526		94-614-1459	T1 82		URANIUM	267	ppm d		31-MAR-94	08-APR-94	B

Your Selection Criteria Was:

Release Numbers: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X9X-614X

From Received Date: X

Display Text? M

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RELEASE NUMBER : 1000002342

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE II

LAB	SAMPLE IN FIELD SAMPLE IN SAMPLE POINT	SIFTY COMPONENT	RESULT	UNITS	LQ	DATE	DATE TASK
						SAMPLED	PERFORMED ASL

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RELEASE NUMBER : 1000002342

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LG	DATE SAMPLED	DATE TASK PERFORMED	ASL
ITAS-STL	200051431	94-614-1420-T8	110			SOLIDS	NR	wt %		17-MAR-94		D
ITAS-STL	200051431	94-614-1420-T8	110			URANIUM	67.8	ug/g		17-MAR-94	22-APR-94	D
ITAS-STL	200051432	94-614-1451-T1	110			SOLIDS	NR	wt %		30-MAR-94		D
ITAS-STL	200051432	94-614-1451-T1	110			URANIUM	328	ug/g		30-MAR-94	22-APR-94	D
ITAS-STL	200051433	94-614-1387-T1	110			SOLIDS	NR	wt %		03-MAR-94		D
ITAS-STL	200051433	94-614-1387-T1	110			URANIUM	110	ug/g		03-MAR-94	22-APR-94	D
ITAS-STL	200051434	94-614-1338-T1	111			TOTAL SUS. SOLI	115	mg/L		28-FEB-94	19-APR-94	C
ITAS-STL	200051434	94-614-1338-T1	111			URANIUM	37400	ug/L		28-FEB-94	21-APR-94	D

Your Selection Criteria Was:Release Numbers: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: Z

Project Name: 50.05.08X9X-614X

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SUMMARY REPORT
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RELEASE NUMBER : 1000002365

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
HANFORD	200052295	19940415-295	T 1			SHIPPED		YES/N		13-APR-94		
HANFORD	200052296	19940415-296	T 17			SHIPPED		YES/N		13-APR-94		
HANFORD	200052297	19940415-297	T 4			SHIPPED		YES/N		13-APR-94		
HANFORD	200052298	19940415-298	T 16			SHIPPED		YES/N		13-APR-94		

Your Selection Criteria Was:

Release Number: X

From Received Date: X

Component: X-LR

Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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FAX NO. 5137386667

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RELEASE NUMBER : 1000003657

PROJECT NAME : 50.05.08 93-614 CRU5 1/D TREAT-PHASE 11

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	IQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200085860	94-614-1469	A-1		ALPHA	470	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085860	94-614-1469	A-1		BETA	420	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085861	94-614-1470	A-7		ALPHA	540	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085861	94-614-1470	A-7		BETA	520	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085862	94-614-1471	A-17		ALPHA	540	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085862	94-614-1471	A-17		BETA	500	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085863	94-614-1472	B-4		ALPHA	830	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085863	94-614-1472	B-4		BETA	790	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085864	94-614-1473	B-5		ALPHA	890	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085864	94-614-1473	B-5		BETA	860	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085865	94-614-1474	B-11		ALPHA	1100	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085865	94-614-1474	B-11		BETA	840	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085866	94-614-1475	B-10		ALPHA	1100	pCi/g		16-AUG-94	17-AUG-94	B
RADIOCHEMICAL	200085866	94-614-1475	B-10		BETA	880	pCi/g		16-AUG-94	17-AUG-94	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? X

Submission ID: X

Project Name: 50.05.08X9X-614X

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FAX NO. 5137386667

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RELEASE NUMBER : 1000003894

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE 11

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200093511	94-614-1476	A-9			ALPHA	320	pCi/g		08-AUG-94	09-SEP-94	B
RADIOCHEMICAL	200093511	94-614-1476	A-9			BETA	260	pCi/g		08-AUG-94	09-SEP-94	B

Your Selection Criteria Was:

Release Number: %
From Received Date: %

Component: %-LR
Display Text? N

Submission ID: %

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000004140

PROJECT NAME : 50.05.08 93-614 CRUS I/O TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200100014	94-614-1481	T2	S51		ALPHA	360	pci/g		29-SEP-94	05-OCT-94	B
RADIOCHEMICAL	200100014	94-614-1481	T2	S51		BETA	320	pci/g		29-SEP-94	05-OCT-94	B
RADIOCHEMICAL	200100020	94-614-1506	T2	S50		ALPHA	53	pci/g		03-OCT-94	05-OCT-94	B
RADIOCHEMICAL	200100020	94-614-1506	T2	S50		BETA	130	pci/g		03-OCT-94	05-OCT-94	B
RADIOCHEMICAL	200100021	94-614-1513	T2	S51		ALPHA	450	pci/g		03-OCT-94	05-OCT-94	B
RADIOCHEMICAL	200100021	94-614-1513	T2	S51		BETA	380	pci/g		03-OCT-94	05-OCT-94	B
INORGANICS-EPM	200100216	94-614-1477	T2	S1A		MOISTURE	8.1	wt %		29-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100216	94-614-1477	T2	S1A		URANIUM	570	ppm d		29-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100233	94-614-1478	T2	S1B		MOISTURE	9.3	wt %		29-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100233	94-614-1478	T2	S1B		URANIUM	550	ppm d		29-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100234	94-614-1479	T2	S1C		MOISTURE	11.7	wt %		29-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100234	94-614-1479	T2	S1C		URANIUM	480	ppm d		29-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100235	94-614-1486	T2	S81		MOISTURE	18.9	wt %		29-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100235	94-614-1486	T2	S81		URANIUM	920	ppm d		29-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100236	94-614-1490	T2	S70		MOISTURE	32.4	wt %		30-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100236	94-614-1490	T2	S70		URANIUM	140	ppm d		30-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100237	94-614-1498	T2	S80		MOISTURE	32.6	wt %		30-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100237	94-614-1498	T2	S80		URANIUM	120	ppm d		30-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100238	94-614-1500	T2	S90		MOISTURE	35.3	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100238	94-614-1500	T2	S90		URANIUM	89	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100239	94-614-1502	T2	S10A		MOISTURE	38.9	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100239	94-614-1502	T2	S10A		URANIUM	85	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100240	94-614-1503	T2	S10B		MOISTURE	37.3	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100240	94-614-1503	T2	S10B		URANIUM	100	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100241	94-614-1504	T2	S10C		MOISTURE	37.4	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100241	94-614-1504	T2	S10C		URANIUM	74	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100242	94-614-1508	T2	S82		MOISTURE	45.1	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100242	94-614-1508	T2	S82		URANIUM	140	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100243	94-614-1509	T2	S1A		MOISTURE	14.2	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100243	94-614-1509	T2	S1A		URANIUM	910	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100244	94-614-1510	T2	S1B		MOISTURE	13.8	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100244	94-614-1510	T2	S1B		URANIUM	950	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100245	94-614-1511	T2	S1C		MOISTURE	12.7	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100245	94-614-1511	T2	S1C		URANIUM	790	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100246	94-614-1529	T2	S60		MOISTURE	40.3	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100246	94-614-1529	T2	S60		URANIUM	390	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100252	94-614-1482	T2	S2		MOISTURE	2.0	wt %		29-SEP-94	06-OCT-94	B
INORGANICS-EPM	200100252	94-614-1482	T2	S2		URANIUM	51	ppm d		29-SEP-94	13-OCT-94	B
INORGANICS-EPM	200100262	94-614-1514	T2	S2		MOISTURE	24.3	wt %		03-OCT-94	06-OCT-94	B
INORGANICS-EPM	200100262	94-614-1514	T2	S2		URANIUM	77	ppm d		03-OCT-94	13-OCT-94	B
INORGANICS-EPM	200100286	94-614-1487	T2	S8AYL		PH	7.30	ph Un		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100286	94-614-1487	T2	S8AYL		URANIUM	2.2	mg/L		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100309	94-614-1487	T2	S8BYL		PH	7.27	ph Un		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100309	94-614-1487	T2	S8BYL		URANIUM	2.3	mg/L		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100310	94-614-1487	T2	S8CYL		PH	7.26	ph Un		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100310	94-614-1487	T2	S8CYL		URANIUM	2.3	mg/L		29-SEP-94	05-OCT-94	B
INORGANICS-EPM	200100311	94-614-1487	T2	S8A6OL		PH	9.46	ph Un		29-SEP-94	08-OCT-94	B

Your Selection Criteria Was:

Release Number: X
From Received Data: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.0829X-614X

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TIME 11:52:33SUMMARY REPORT
(PRELIMINARY)

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RELEASE NUMBER : 1000004140

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200100311		94-614-1487	T2	S8A60L	SOLIDS	0.6	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100311		94-614-1487	T2	S8A60L	URANIUM	31.1	mg/L		29-SEP-94	09-OCT-94	B
INORGANICS-EPH	200100312		94-614-1487	T2	S8B60L	PH	9.45	pH Un		29-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100312		94-614-1487	T2	S8B60L	SOLIDS	1.0	wt %		29-SEP-94	10-OCT-93	B
INORGANICS-EPH	200100312		94-614-1487	T2	S8B60L	URANIUM	30.3	mg/L		29-SEP-94	09-OCT-94	B
INORGANICS-EPH	200100313		94-614-1487	T2	S8C60L	PH	9.44	pH Un		29-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100313		94-614-1487	T2	S8C60L	SOLIDS	0.6	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100313		94-614-1487	T2	S8C60L	URANIUM	31.6	mg/L		29-SEP-94	09-OCT-94	B
INORGANICS-EPH	200100314		94-614-1489	T2	S11A	PH	9.47	pH Un		29-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100314		94-614-1489	T2	S11A	SOLIDS	1.61	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100314		94-614-1489	T2	S11A	URANIUM	29.2	mg/L		29-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100315		94-614-1491	T2	S11B	PH	9.53	pH Un		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100315		94-614-1491	T2	S11B	SOLIDS	1.73	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100315		94-614-1491	T2	S11B	URANIUM	7.3	mg/L		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100316		94-614-1495	T2	S8A18L	PH	9.49	pH Un		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100316		94-614-1495	T2	S8A18L	SOLIDS	1.9	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100316		94-614-1495	T2	S8A18L	URANIUM	1.5	mg/L		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100317		94-614-1496	T2	S8B18L	PH	9.48	pH Un		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100317		94-614-1496	T2	S8B18L	SOLIDS	1.9	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100317		94-614-1496	T2	S8B18L	URANIUM	1.4	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100318		94-614-1497	T2	S8C18L	PH	9.48	pH Un		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100318		94-614-1497	T2	S8C18L	SOLIDS	1.9	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100318		94-614-1497	T2	S8C18L	URANIUM	1.5	mg/L		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100319		94-614-1501	T2	S11D	PH	9.69	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100319		94-614-1501	T2	S11D	SOLIDS	0.3	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100319		94-614-1501	T2	S11D	URANIUM	1.6	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100320		94-614-1507	T2	S11E	PH	9.76	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100320		94-614-1507	T2	S11E	SOLIDS	0.1	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100320		94-614-1507	T2	S11E	URANIUM	3.8	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100321		94-614-1520	T2	S8AYL	PH	8.02	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100321		94-614-1520	T2	S8AYL	SOLIDS	0.04	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100321		94-614-1520	T2	S8AYL	URANIUM	14.6	mg/L		03-OCT-94	09-OCT-94	B
INORGANICS-EPH	200100322		94-614-1521	T2	S8BYL	PH	7.94	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100322		94-614-1521	T2	S8BYL	SOLIDS	0.1	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100322		94-614-1521	T2	S8BYL	URANIUM	14.6	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100323		94-614-1522	T2	S8CYL	PH	7.98	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100323		94-614-1522	T2	S8CYL	SOLIDS	0.1	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100323		94-614-1522	T2	S8CYL	URANIUM	15.3	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100324		94-614-1526	T2	S8A60L	PH	9.47	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100324		94-614-1526	T2	S8A60L	SOLIDS	1.8	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100324		94-614-1526	T2	S8A60L	URANIUM	88.0	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100325		94-614-1527	T2	S8B60L	PH	9.47	pH Un		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100325		94-614-1527	T2	S8B60L	SOLIDS	2.8	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100325		94-614-1527	T2	S8B60L	URANIUM	86.9	mg/L		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100326		94-614-1528	T2	S8C60L	PH	9.44	pH Un		03-OCT-94	06-OCT-94	B
INORGANICS-EPH	200100326		94-614-1528	T2	S8C60L	SOLIDS	3.0	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100326		94-614-1528	T2	S8C60L	URANIUM	87.2	mg/L		03-OCT-94	10-OCT-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X92-614X

From Received Date: X

Display Text? N

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FAX NO. 5137386667

P. 07

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TIME 11:52:33SUMMARY REPORT
(PRELIMINARY)

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RELEASE NUMBER : 1000004140

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200100342	94-614-1487	T2	S8AYS		DENSITY	1.06	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100342	94-614-1487	T2	S8AYS		SOLIDS	8.4	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100342	94-614-1487	T2	S8AYS		URANIUM	51.5	mg/L		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100343	94-614-1487	T2	S8BY8		DENSITY	1.03	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100343	94-614-1487	T2	S8BY8		SOLIDS	8.6	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100343	94-614-1487	T2	S8BY8		URANIUM	50.0	mg/L		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100344	94-614-1487	T2	S8CYS		DENSITY	1.03	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100344	94-614-1487	T2	S8CYS		SOLIDS	6.5	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100344	94-614-1487	T2	S8CYS		URANIUM	51.3	mg/L		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100345	94-614-1487	T2	S8A60S		DENSITY	1.08	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100345	94-614-1487	T2	S8A60S		SOLIDS	8.7	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100345	94-614-1487	T2	S8A60S		URANIUM	51.6	mg/L		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100346	94-614-1487	T2	S8B60S		DENSITY	1.12	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100346	94-614-1487	T2	S8B60S		SOLIDS	8.8	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100346	94-614-1487	T2	S8B60S		URANIUM	48.1	mg/L		29-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100347	94-614-1487	T2	S8C60S		DENSITY	1.10	g/ml		29-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100347	94-614-1487	T2	S8C60S		SOLIDS	8.7	wt %		29-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100347	94-614-1487	T2	S8C60S		URANIUM	45.9	mg/L		29-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100348	94-614-1488	T2	S8AZ8		DENSITY	1.05	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100348	94-614-1488	T2	S8AZ8		SOLIDS	7.9	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100348	94-614-1488	T2	S8AZ8		URANIUM	14.7	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100349	94-614-1488	T2	S8BZ8		DENSITY	1.07	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100349	94-614-1488	T2	S8BZ8		SOLIDS	7.8	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100349	94-614-1488	T2	S8BZ8		URANIUM	15.2	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100350	94-614-1488	T2	S8CZ8		DENSITY	1.07	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100350	94-614-1488	T2	S8CZ8		SOLIDS	8.3	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100350	94-614-1488	T2	S8CZ8		URANIUM	16.9	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100351	94-614-1492	T2	S8A18S		DENSITY	1.04	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100351	94-614-1492	T2	S8A18S		SOLIDS	8.3	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100351	94-614-1492	T2	S8A18S		URANIUM	6.3	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100352	94-614-1493	T2	S8B18S		DENSITY	1.06	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100352	94-614-1493	T2	S8B18S		SOLIDS	8.1	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100352	94-614-1493	T2	S8B18S		URANIUM	11.5	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100353	94-614-1494	T2	S8C18S		DENSITY	1.06	g/ml		30-SEP-94	11-OCT-94	B
INORGANICS-EPM	200100353	94-614-1494	T2	S8C18S		SOLIDS	7.4	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPM	200100353	94-614-1494	T2	S8C18S		URANIUM	14.5	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPM	200100354	94-614-1517	T2	S8AY8		DENSITY	1.04	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPM	200100354	94-614-1517	T2	S8AY8		SOLIDS	4.9	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPM	200100354	94-614-1517	T2	S8AY8		URANIUM	120	mg/L		03-OCT-94	08-OCT-94	B
INORGANICS-EPM	200100355	94-614-1518	T2	S8BY8		DENSITY	1.03	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPM	200100355	94-614-1518	T2	S8BY8		SOLIDS	5.3	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPM	200100355	94-614-1518	T2	S8BY8		URANIUM	91.1	mg/L		03-OCT-94	08-OCT-94	B
INORGANICS-EPM	200100356	94-614-1519	T2	S8CYS		DENSITY	1.06	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPM	200100356	94-614-1519	T2	S8CYS		SOLIDS	8.3	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPM	200100356	94-614-1519	T2	S8CYS		URANIUM	120	mg/L		03-OCT-94	08-OCT-94	B
INORGANICS-EPM	200100357	94-614-1523	T2	S8A60S		DENSITY	1.06	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPM	200100357	94-614-1523	T2	S8A60S		SOLIDS	7.6	wt %		03-OCT-94	10-OCT-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X92-614X

From Received Date: X

Display Text? N

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RELEASE NUMBER : 1000004140

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200100357	94-614-1523	T2	S8A60S		URANIUM	125	mg/L		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100358	94-614-1524	T2	S8B60S		DENSITY	1.05	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPH	200100358	94-614-1524	T2	S8B60S		SOLIDS	7.6	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100358	94-614-1524	T2	S8B60S		URANIUM	122	mg/L		03-OCT-94	08-OCT-94	B
INORGANICS-EPH	200100359	94-614-1525	T2	S8C60S		DENSITY	1.02	g/ml		03-OCT-94	11-OCT-94	B
INORGANICS-EPH	200100359	94-614-1525	T2	S8C60S		SOLIDS	5.1	wt %		03-OCT-94	10-OCT-94	B
INORGANICS-EPH	200100359	94-614-1525	T2	S8C60S		URANIUM	93.1	mg/L		03-OCT-94	08-OCT-94	B
MASS SPECTROSCO	200100362	94-614-1502	T2	S10A		URANIUM 234	30.9	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100362	94-614-1502	T2	S10A		URANIUM 235	1.3	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100362	94-614-1502	T2	S10A		URANIUM 236	0.4	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100362	94-614-1502	T2	S10A		URANIUM 238	28.4	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100413	94-614-1503	T2	S10B		URANIUM 234	37.5	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100413	94-614-1503	T2	S10B		URANIUM 235	1.5	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100413	94-614-1503	T2	S10B		URANIUM 236	0.5	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100413	94-614-1503	T2	S10B		URANIUM 238	33.4	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100414	94-614-1504	T2	S10C		URANIUM 234	27.0	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100414	94-614-1504	T2	S10C		URANIUM 235	1.1	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100414	94-614-1504	T2	S10C		URANIUM 236	0.4	pCi/g		03-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200100414	94-614-1504	T2	S10C		URANIUM 238	24.7	pCi/g		03-OCT-94	17-OCT-94	B
INORGANICS-EPH	200100415	94-614-1488	T2	S8A2L		PH	9.50	pH Un		30-SEP-94	06-OCT-94	B
INORGANICS-EPH	200100415	94-614-1488	T2	S8A2L		SOLIDS	2.0	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100415	94-614-1488	T2	S8A2L		URANIUM	7.2	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100416	94-614-1488	T2	S8B2L		PH	9.50	pH Un		30-SEP-94	06-OCT-94	B
INORGANICS-EPH	200100416	94-614-1488	T2	S8B2L		SOLIDS	2.5	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100416	94-614-1488	T2	S8B2L		URANIUM	6.4	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100417	94-614-1488	T2	S8C2L		PH	9.48	pH Un		30-SEP-94	06-OCT-94	B
INORGANICS-EPH	200100417	94-614-1488	T2	S8C2L		SOLIDS	2.4	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100417	94-614-1488	T2	S8C2L		URANIUM	7.2	mg/L		30-SEP-94	08-OCT-94	B
INORGANICS-EPH	200100418	94-614-1499	T2	S11C		PH	9.46	pH Un		30-SEP-94	06-OCT-94	B
INORGANICS-EPH	200100418	94-614-1499	T2	S11C		SOLIDS	1.8	wt %		30-SEP-94	10-OCT-94	B
INORGANICS-EPH	200100418	94-614-1499	T2	S11C		URANIUM	1.7	mg/L		30-SEP-94	08-OCT-94	B

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9-614X

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RELEASE NUMBER : 1000004169

PROJECT NAME : 50.05.08 93-614 CRUS I/O TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200100890		94-614-1545-T2	S50		ALPHA	47	pCi/g		05-OCT-94	07-OCT-94	B
RADIOCHEMICAL	200100890		94-614-1545-T2	S50		BETA	360	pCi/g		05-OCT-94	07-OCT-94	B
INORGANICS-EPH	200101024		94-614-1530-T2	S81		MOISTURE	12.1	wt %		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101024		94-614-1530-T2	S81		URANIUM	154	ppm d		04-OCT-94	14-OCT-94	B
INORGANICS-EPH	200101025		94-614-1534-T2	S70		MOISTURE	39.9	wt %		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101025		94-614-1534-T2	S70		URANIUM	163	ppm d		04-OCT-94	14-OCT-94	B
INORGANICS-EPH	200101026		94-614-1537-T2	S80		MOISTURE	39.4	wt %		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101026		94-614-1537-T2	S80		URANIUM	150	ppm d		04-OCT-94	15-OCT-94	B
INORGANICS-EPH	200101027		94-614-1539-T2	S90		MOISTURE	43.5	wt %		05-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101027		94-614-1539-T2	S90		URANIUM	114	ppm d		05-OCT-94	14-OCT-94	B
INORGANICS-EPH	200101028		94-614-1541-T2	S10A		MOISTURE	46.5	wt %		05-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101028		94-614-1541-T2	S10A		URANIUM	180	ppm d		05-OCT-94	14-OCT-94	B
MASS SPECTROSCO	200101029		94-614-1541-T2	S10A		MOISTURE	45.56	wt %		05-OCT-94	17-OCT-94	B
MASS SPECTROSCO	200101029		94-614-1541-T2	S10A		URANIUM 234	6.4E+01	pCi/g		05-OCT-94	15-DEC-94	B
MASS SPECTROSCO	200101029		94-614-1541-T2	S10A		URANIUM 235	2.6E+00	pCi/g		05-OCT-94	15-DEC-94	B
MASS SPECTROSCO	200101029		94-614-1541-T2	S10A		URANIUM 236	8.5E-01	pCi/g		05-OCT-94	15-DEC-94	B
MASS SPECTROSCO	200101029		94-614-1541-T2	S10A		URANIUM 238	6.0E+01	pCi/g		05-OCT-94	15-DEC-94	B
INORGANICS-EPH	200101030		94-614-1542-T2	S10B		MOISTURE	46.1	wt %		05-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101030		94-614-1542-T2	S10B		URANIUM	114	ppm d		05-OCT-94	14-OCT-94	B
MASS SPECTROSCO	200101031		94-614-1542-T2	S10B		MOISTURE		wt %		05-OCT-94	12-OCT-94	B
MASS SPECTROSCO	200101031		94-614-1542-T2	S10B		URANIUM 234		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101031		94-614-1542-T2	S10B		URANIUM 235		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101031		94-614-1542-T2	S10B		URANIUM 236		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101031		94-614-1542-T2	S10B		URANIUM 238		pCi/g		05-OCT-94	23-NOV-94	B
INORGANICS-EPH	200101032		94-614-1543-T2	S10C		MOISTURE	45.8	wt %		05-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101032		94-614-1543-T2	S10C		URANIUM	113	ppm d		05-OCT-94	14-OCT-94	B
MASS SPECTROSCO	200101033		94-614-1543-T2	S10C		MOISTURE		wt %		05-OCT-94	12-OCT-94	B
MASS SPECTROSCO	200101033		94-614-1543-T2	S10C		URANIUM 234		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101033		94-614-1543-T2	S10C		URANIUM 235		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101033		94-614-1543-T2	S10C		URANIUM 236		pCi/g		05-OCT-94	23-NOV-94	B
MASS SPECTROSCO	200101033		94-614-1543-T2	S10C		URANIUM 238		pCi/g		05-OCT-94	23-NOV-94	B
INORGANICS-EPH	200101034		94-614-1532-T2	S19		MOISTURE	78.6	wt %		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101034		94-614-1532-T2	S19		URANIUM	21900	ppm d		04-OCT-94	15-OCT-94	B
INORGANICS-EPH	200101035		94-614-1531-T2	S11A		PH	9.48	pH Un		04-OCT-94	08-OCT-94	B
INORGANICS-EPH	200101035		94-614-1531-T2	S11A		SOLIDS	1.52	wt %		04-OCT-94	10-OCT-94	B
INORGANICS-EPH	200101035		94-614-1531-T2	S11A		URANIUM	81.0	mg/L		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101036		94-614-1533-T2	S8A2S		PH	9.52	pH Un		04-OCT-94	12-OCT-94	B
INORGANICS-EPH	200101036		94-614-1533-T2	S8A2S		SOLIDS	7.5	wt %		04-OCT-94	10-OCT-94	B
INORGANICS-EPH	200101036		94-614-1533-T2	S8A2S		URANIUM	35.1	mg/L		04-OCT-94	10-OCT-94	B
INORGANICS-EPH	200101037		94-614-1533-T2	S8B2S		PH	9.50	pH Un		04-OCT-94	12-OCT-94	B
INORGANICS-EPH	200101037		94-614-1533-T2	S8B2S		SOLIDS	7.5	wt %		04-OCT-94	10-OCT-94	B
INORGANICS-EPH	200101037		94-614-1533-T2	S8B2S		URANIUM	48.2	mg/L		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101038		94-614-1533-T2	S8C2S		PH	9.52	pH Un		04-OCT-94	12-OCT-94	B
INORGANICS-EPH	200101038		94-614-1533-T2	S8C2S		SOLIDS	7.0	wt %		04-OCT-94	10-OCT-94	B
INORGANICS-EPH	200101038		94-614-1533-T2	S8C2S		URANIUM	48.7	mg/L		04-OCT-94	11-OCT-94	B
INORGANICS-EPH	200101039		94-614-1533-T2	S8A2L		PH	9.52	pH Un		04-OCT-94	12-OCT-94	B
INORGANICS-EPH	200101039		94-614-1533-T2	S8A2L		SOLIDS	1.9	wt %		04-OCT-94	10-OCT-94	B

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text: N

Submission ID: X

Project Name: 50.05.08X93-614X

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RELEASE NUMBER : 1000004169

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LG	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200101039	94-614-1533-T2	S8A2L		URANIUM	54.8	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101040	94-614-1533-T2	S8B2L		PH	9.52	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101040	94-614-1533-T2	S8B2L		SOLIDS	1.9	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101040	94-614-1533-T2	S8B2L		URANIUM	29.6	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101041	94-614-1533-T2	S8C2L		PH	9.52	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101041	94-614-1533-T2	S8C2L		SOLIDS	2.0	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101041	94-614-1533-T2	S8C2L		URANIUM	29.2	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101042	94-614-1535-T2	S11B		PH	9.54	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101042	94-614-1535-T2	S11B		SOLIDS	2.3	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101042	94-614-1535-T2	S11B		URANIUM	26.4	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101043	94-614-1536-T2	S8A18S		PH	9.46	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101043	94-614-1536-T2	S8A18S		SOLIDS	7.1	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101043	94-614-1536-T2	S8A18S		URANIUM	22.9	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101044	94-614-1536-T2	S8B18S		PH	9.46	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101044	94-614-1536-T2	S8B18S		SOLIDS	5.2	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101044	94-614-1536-T2	S8B18S		URANIUM	25.9	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101045	94-614-1536-T2	S8C18S		PH	9.45	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101045	94-614-1536-T2	S8C18S		SOLIDS	7.9	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101045	94-614-1536-T2	S8C18S		URANIUM	20.8	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101046	94-614-1536-T2	S8A18L		PH	9.46	pH Un		04-OCT-94	08-OCT-94	8
INORGANICS-EPH	200101046	94-614-1536-T2	S8A18L		SOLIDS	2.15	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101046	94-614-1536-T2	S8A18L		URANIUM	4.9	mg/L		04-OCT-94	11-OCT-94	8
INORGANICS-EPH	200101047	94-614-1536-T2	S8B18L		PH	9.46	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101047	94-614-1536-T2	S8B18L		SOLIDS	2.1	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101047	94-614-1536-T2	S8B18L		URANIUM	3.1	mg/L		04-OCT-94	13-OCT-94	8
INORGANICS-EPH	200101048	64-614-1536-T2	S8C18L		PH	9.46	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101048	64-614-1536-T2	S8C18L		SOLIDS	2.2	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101048	64-614-1536-T2	S8C18L		URANIUM	3.0	mg/L		04-OCT-94	13-OCT-94	8
INORGANICS-EPH	200101049	94-614-1538-T2	S11C		PH	9.48	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101049	94-614-1538-T2	S11C		SOLIDS	2.0	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101049	94-614-1538-T2	S11C		URANIUM	3.4	mg/L		04-OCT-94	13-OCT-94	8
INORGANICS-EPH	200101050	94-614-1540-T2	S11D		PH	9.72	pH Un		04-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101050	94-614-1540-T2	S11D		SOLIDS	0.2	wt %		04-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101050	94-614-1540-T2	S11D		URANIUM	1.9	mg/L		04-OCT-94	13-OCT-94	8
INORGANICS-EPH	200101051	94-614-1547-T2	S29		PH	9.73	pH Un		05-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101051	94-614-1547-T2	S29		SOLIDS	0.1	wt %		05-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101051	94-614-1547-T2	S29		URANIUM	0.5	mg/L		05-OCT-94	13-OCT-94	8
INORGANICS-EPH	200101052	94-614-1548-T2	F8		URANIUM	0.2	mg/L		05-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101053	94-614-1549-T2	R8		URANIUM	0.2	mg/L		05-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101061	94-614-1550-T2	S11E		PH	9.76	pH Un		05-OCT-94	12-OCT-94	8
INORGANICS-EPH	200101061	94-614-1550-T2	S11E		SOLIDS	0.1	wt %		05-OCT-94	10-OCT-94	8
INORGANICS-EPH	200101061	94-614-1550-T2	S11E		URANIUM	0.4	mg/L		05-OCT-94	11-OCT-94	8

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X-614X

From Received Data: X

Display Text? N

FEB- 3-95 FRI 17:02

FERMCO ANALYTICAL

FAX NO. 5137386667

P.11

DATE 02-FEB-95
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(PRELIMINARY)

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RELEASE NUMBER : 1000004244

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200102576	94-614-1551-T2	S82			MOISTURE	58.0	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102576	94-614-1551-T2	S82			URANIUM	120	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102577	94-614-1552-T2	S1A			MOISTURE	8.4	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102577	94-614-1552-T2	S1A			URANIUM	525	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102578	94-614-1553-T2	S1B			MOISTURE	11.2	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102578	94-614-1553-T2	S1B			URANIUM	530	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102579	94-614-1554-T2	S1C			MOISTURE	12.2	wt %		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102579	94-614-1554-T2	S1C			URANIUM	488	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102580	94-614-1557-T2	S2			MOISTURE	6.9	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102580	94-614-1557-T2	S2			URANIUM	146	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102581	94-614-1561-T2	S81			MOISTURE	12.0	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102581	94-614-1561-T2	S81			URANIUM	122	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102582	94-614-1562-T2	S60			MOISTURE	33.6	wt %		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102582	94-614-1562-T2	S60			URANIUM	112	ppm		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102583	94-614-1563-T2	S70			MOISTURE	34.5	wt %		12-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102583	94-614-1563-T2	S70			URANIUM	71	ppm		12-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102584	94-614-1568-T2	S80			MOISTURE	35.6	wt %		13-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102584	94-614-1568-T2	S80			URANIUM	74	ppm		13-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102585	94-614-1571-T2	S90			MOISTURE	37.4	wt %		13-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102585	94-614-1571-T2	S90			URANIUM	55	ppm		13-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102586	94-614-1573-T2	S10A			MOISTURE	43.0	wt %		13-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102586	94-614-1573-T2	S10A			URANIUM	49	ppm		13-OCT-94	21-OCT-94	B
MASS SPECTROSCO	200102587	94-614-1573-T2	S10A			MOISTURE	43.3	wt %		13-OCT-94	19-OCT-94	B
MASS SPECTROSCO	200102587	94-614-1573-T2	S10A			URANIUM 234	13.9	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102587	94-614-1573-T2	S10A			URANIUM 235	0.61	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102587	94-614-1573-T2	S10A			URANIUM 236	0.21	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102587	94-614-1573-T2	S10A			URANIUM 238	16.4	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102588	94-614-1574-T2	S10B			MOISTURE	43.1	wt %		13-OCT-94	19-OCT-94	B
MASS SPECTROSCO	200102588	94-614-1574-T2	S10B			URANIUM 234	14.0	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102588	94-614-1574-T2	S10B			URANIUM 235	0.60	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102588	94-614-1574-T2	S10B			URANIUM 236	0.21	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102588	94-614-1574-T2	S10B			URANIUM 238	16.0	pCi/g		13-OCT-94	21-NOV-94	B
INORGANICS-EPM	200102589	94-614-1574-T2	S10B			MOISTURE	42.4	wt %		13-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102589	94-614-1574-T2	S10B			URANIUM	48	ppm		13-OCT-94	21-OCT-94	B
MASS SPECTROSCO	200102590	94-614-1575-T2	S10C			MOISTURE	43.4	wt %		13-OCT-94	19-OCT-94	B
MASS SPECTROSCO	200102590	94-614-1575-T2	S10C			URANIUM 234	16.5	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102590	94-614-1575-T2	S10C			URANIUM 235	0.71	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102590	94-614-1575-T2	S10C			URANIUM 236	0.24	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102590	94-614-1575-T2	S10C			URANIUM 238	16.4	pCi/g		13-OCT-94	21-NOV-94	B
INORGANICS-EPM	200102591	94-614-1575-T2	S10C			MOISTURE	43.1	wt %		13-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102591	94-614-1575-T2	S10C			URANIUM	49	ppm		13-OCT-94	21-OCT-94	B
MASS SPECTROSCO	200102592	94-614-1582-T2	S29			MOISTURE	43.2	wt %		13-OCT-94	19-OCT-94	B
MASS SPECTROSCO	200102592	94-614-1582-T2	S29			URANIUM 234	13.1	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102592	94-614-1582-T2	S29			URANIUM 235	0.56	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102592	94-614-1582-T2	S29			URANIUM 236	0.20	pCi/g		13-OCT-94	21-NOV-94	B
MASS SPECTROSCO	200102592	94-614-1582-T2	S29			URANIUM 238	15.7	pCi/g		13-OCT-94	21-NOV-94	B
INORGANICS-EPM	200102593	94-614-1582-T2	S29			MOISTURE	43.2	wt %		13-OCT-94	19-OCT-94	B

Your Selection Criteria Was:

Release Numbers: X

Component: X-LR

Submission ID: X

Project Name: 50.05.08X9X-614X

From Received Date: X

Display Text? N

FEB- 3-95 FRI 17:03

FERMCO ANALYTICAL

FAX NO. 5137386667

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DATE 02-FEB-95
TIME 11:52:33SUMMARY REPORT
(PRELIMINARY)

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RELEASE NUMBER : 1000004244

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE 11

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200102593	94-614-1582-T2	S29			URANIUM	47	ppm		13-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102594	94-614-1559-T2	S8AY8			DENSITY	1.027	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102594	94-614-1559-T2	S8AY8			SOLIDS	4.96	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102594	94-614-1559-T2	S8AY8			URANIUM	39.0	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102598	94-614-1559-T2	S8BY8			DENSITY	1.042	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102598	94-614-1559-T2	S8BY8			SOLIDS	5.49	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102598	94-614-1559-T2	S8BY8			URANIUM	37.8	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102599	94-614-1559-T2	S8CY8			DENSITY	1.043	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102599	94-614-1559-T2	S8CY8			SOLIDS	5.57	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102599	94-614-1559-T2	S8CY8			URANIUM	34.1	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102600	94-614-1559-T2	S8AYL			PH	8.12	pH Un		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102600	94-614-1559-T2	S8AYL			SOLIDS	0.05	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102600	94-614-1559-T2	S8AYL			URANIUM	10.6	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102601	94-614-1559-T2	S8BYL			PH	8.21	pH Un		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102601	94-614-1559-T2	S8BYL			SOLIDS	0.03	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102601	94-614-1559-T2	S8BYL			URANIUM	10.4	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102602	94-614-1559-T2	S8CYL			PH	8.24	pH Un		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102602	94-614-1559-T2	S8CYL			SOLIDS	0.04	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102602	94-614-1559-T2	S8CYL			URANIUM	11.1	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102603	94-614-1560-T2	S8A608			DENSITY	1.060	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102603	94-614-1560-T2	S8A608			SOLIDS	7.64	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102603	94-614-1560-T2	S8A608			URANIUM	36.0	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102604	94-614-1560-T2	S8B608			DENSITY	1.057	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102604	94-614-1560-T2	S8B608			SOLIDS	7.58	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102604	94-614-1560-T2	S8B608			URANIUM	36.9	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102605	94-614-1560-T2	S8C608			DENSITY	1.057	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102605	94-614-1560-T2	S8C608			SOLIDS	7.45	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102605	94-614-1560-T2	S8C608			URANIUM	37.2	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102606	94-614-1560-T2	S8A60L			PH	9.44	pH Un		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102606	94-614-1560-T2	S8A60L			SOLIDS	1.40	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102606	94-614-1560-T2	S8A60L			URANIUM	28.7	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102607	94-614-1560-T2	S8BYL			PH	9.45	pH Un		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102607	94-614-1560-T2	S8BYL			SOLIDS	1.39	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102607	94-614-1560-T2	S8BYL			URANIUM	28.2	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102608	94-614-1560-T2	S8CYL			PH	9.44	pH Un		11-OCT-94	21-OCT-94	B
INORGANICS-EPM	200102608	94-614-1560-T2	S8CYL			SOLIDS	1.40	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102608	94-614-1560-T2	S8CYL			URANIUM	27.1	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102609	94-614-1563-T2	S11A			DENSITY	1.012	g/ml		11-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102609	94-614-1563-T2	S11A			SOLIDS	1.35	wt %		11-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102609	94-614-1563-T2	S11A			URANIUM	27.0	mg/L		11-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102610	94-614-1564-T2	S8AZ8			DENSITY	1.050	g/ml		12-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102610	94-614-1564-T2	S8AZ8			SOLIDS	8.10	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102610	94-614-1564-T2	S8AZ8			URANIUM	8.6	mg/L		12-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102611	94-614-1564-T2	S8BZ8			DENSITY	1.049	g/ml		12-OCT-94	20-OCT-94	B
INORGANICS-EPM	200102611	94-614-1564-T2	S8BZ8			SOLIDS	8.13	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPM	200102611	94-614-1564-T2	S8BZ8			URANIUM	9.3	mg/L		12-OCT-94	19-OCT-94	B
INORGANICS-EPM	200102612	94-614-1564-T2	S8CZ8			DENSITY	1.041	g/ml		12-OCT-94	20-OCT-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.0819X-614X

From Received Date: X

Display Text? N

FEB- 3-95 FRI 17:05

FERMCO ANALYTICAL

FAX NO. 5137386667

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DATE 02-FEB-95
TIME 11:52:33SUMMARY REPORT
(PRELIMINARY)

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RELEASE NUMBER : 1000004244

PROJECT NAME : 50.05.08 93-614 CRU5 I/D TREAT-PHASE II

LAN	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200102612	94-614-1564-T2	S8C2S			SOLIDS	7.78	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102612	94-614-1564-T2	S8C2S			URANIUM	10.8	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102613	94-614-1564-T2	S8AZL			PH	9.49	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102613	94-614-1564-T2	S8AZL			SOLIDS	1.77	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102613	94-614-1564-T2	S8AZL			URANIUM	3.6	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102614	94-614-1564-T2	S8BZL			PH	9.48	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102614	94-614-1564-T2	S8BZL			SOLIDS	1.81	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102614	94-614-1564-T2	S8BZL			URANIUM	3.7	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102615	94-614-1564-T2	S8CZL			PH	9.47	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102615	94-614-1564-T2	S8CZL			SOLIDS	1.84	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102615	94-614-1564-T2	S8CZL			URANIUM	3.5	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102616	94-614-1566-T2	S11B			PH	9.49	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102616	94-614-1566-T2	S11B			SOLIDS	1.70	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102616	94-614-1566-T2	S11B			URANIUM	3.7	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102617	94-614-1567-T2	S8A1BS			DENSITY	1.037	g/ml		12-OCT-94	22-OCT-94	B
INORGANICS-EPH	200102617	94-614-1567-T2	S8A1BS			SOLIDS	6.83	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102617	94-614-1567-T2	S8A1BS			URANIUM	6.6	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102618	94-614-1567-T2	S8B1BS			DENSITY	1.046	g/ml		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102618	94-614-1567-T2	S8B1BS			SOLIDS	7.68	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102618	94-614-1567-T2	S8B1BS			URANIUM	7.2	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102619	94-614-1567-T2	S8C1BS			DENSITY	1.058	g/ml		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102619	94-614-1567-T2	S8C1BS			SOLIDS	6.75	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102619	94-614-1567-T2	S8C1BS			URANIUM	5.3	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102620	94-614-1567-T2	S8A1BL			PH	9.49	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102620	94-614-1567-T2	S8A1BL			SOLIDS	1.82	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102620	94-614-1567-T2	S8A1BL			URANIUM	0.5	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102621	94-614-1567-T2	S8A1BL			PH	9.48	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102621	94-614-1567-T2	S8A1BL			SOLIDS	1.90	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102621	94-614-1567-T2	S8A1BL			URANIUM	0.5	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102622	94-614-1567-T2	S8C1BL			PH	9.48	pH Un		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102622	94-614-1567-T2	S8C1BL			SOLIDS	1.79	wt %		12-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102622	94-614-1567-T2	S8C1BL			URANIUM	0.5	mg/L		12-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102623	94-614-1569-T2	S11C			PH	9.50	pH Un		13-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102623	94-614-1569-T2	S11C			SOLIDS	1.63	wt %		13-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102623	94-614-1569-T2	S11C			URANIUM	0.6	mg/L		13-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102624	94-614-1572-T2	S11D			PH	9.64	pH Un		13-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102624	94-614-1572-T2	S11D			SOLIDS	0.47	wt %		13-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102624	94-614-1572-T2	S11D			URANIUM	0.6	mg/L		13-OCT-94	20-OCT-94	B
INORGANICS-EPH	200102625	94-614-1581-T2	S11E			PH	9.62	pH Un		13-OCT-94	21-OCT-94	B
INORGANICS-EPH	200102625	94-614-1581-T2	S11E			SOLIDS	0.30	wt %		13-OCT-94	17-OCT-94	B
INORGANICS-EPH	200102625	94-614-1581-T2	S11E			URANIUM	0.3	mg/L		13-OCT-94	20-OCT-94	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000004299

PROJECT NAME : 50.05.08 93-614 CRUS 1/D TREAT-PHASE 17

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200103948	94-614-1556	T2	851		ALPHA	200	pCi/g		11-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103948	94-614-1556	T2	851		BETA	200	pCi/g		11-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103949	94-614-1577	T2	850		ALPHA	20	pCi/g		13-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103949	94-614-1577	T2	850		BETA	99	pCi/g		13-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103950	T20		TEST 20 CENTRA		ALPHA	11000	pCi/L		29-SEP-94	20-OCT-94	8
RADIOCHEMICAL	200103950	T20		TEST 20 CENTRA		BETA	5100	pCi/L		29-SEP-94	20-OCT-94	8
RADIOCHEMICAL	200103951	T25		TEST 25 CENTRA		ALPHA	35000	pCi/L		03-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103951	T25		TEST 25 CENTRA		BETA	16000	pCi/L		03-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103952	T21		TEST 21 CENTRA		ALPHA	10000	pCi/L		12-OCT-94	20-OCT-94	8
RADIOCHEMICAL	200103952	T21		TEST 21 CENTRA		BETA	4300	pCi/L		12-OCT-94	20-OCT-94	8

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000004309

PROJECT NAME : 50.05.08 93-614 CRUS I/O TREAT-PHASE II

LAB	SAMPLE ID	USER SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPM	200103971	94-614-1583-T2	1A		MOISTURE	9.51	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103971	94-614-1583-T2	1A		URANIUM	590	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103973	94-614-1591-T2	8AYS		DENSITY	1.35	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103973	94-614-1591-T2	8AYS		SOLIDS	0.07	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103973	94-614-1591-T2	8AYS		URANIUM	119.7	mg/L		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103977	94-614-1584-T2	1B		MOISTURE	11.64	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103977	94-614-1584-T2	1B		URANIUM	1300	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103978	94-614-1585-T2	1A		MOISTURE	11.01	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103978	94-614-1585-T2	1A		URANIUM	600	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103979	94-614-1603-T2	81		MOISTURE	22.47	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103979	94-614-1603-T2	81		URANIUM	580	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103980	94-614-1604-T2	82		MOISTURE	50.66	wt %		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103980	94-614-1604-T2	82		URANIUM	73	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103981	94-614-1605-T2	60		MOISTURE	34.78	wt %		19-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103981	94-614-1605-T2	60		URANIUM	142	ppm		19-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103982	94-614-1617-T2	70		MOISTURE	33.60	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103982	94-614-1617-T2	70		URANIUM	113	ppm		19-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103985	94-614-1592-T2	88YS		DENSITY	1.07	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103985	94-614-1592-T2	88YS		SOLIDS	1.33	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103985	94-614-1592-T2	88YS		URANIUM	16.7	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103986	94-614-1593-T2	8CY8		DENSITY	1.05	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103986	94-614-1593-T2	8CY8		SOLIDS	0.99	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103986	94-614-1593-T2	8CY8		URANIUM	17.3	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103987	94-614-1594-T2	8AYL		PH	7.92	pH Un		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103987	94-614-1594-T2	8AYL		URANIUM	2.9	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103988	94-614-1595-T2	88YL		PH	7.89	pH Un		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103988	94-614-1595-T2	88YL		URANIUM	2.6	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103989	94-614-1596-T2	8CYL		PH	8.03	pH Un		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103989	94-614-1596-T2	8CYL		URANIUM	2.3	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103990	94-614-1597-T2	8A60S		DENSITY	1.08	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103990	94-614-1597-T2	8A60S		SOLIDS	2.16	wt %		16-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103990	94-614-1597-T2	8A60S		URANIUM	41.4	mg/L		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103991	94-614-1598-T2	8B60S		DENSITY	1.10	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103991	94-614-1598-T2	8B60S		SOLIDS	4.00	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103991	94-614-1598-T2	8B60S		URANIUM	41.9	mg/L		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103992	94-614-1599-T2	8C60S		DENSITY	1.09	g/ml		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103992	94-614-1599-T2	8C60S		SOLIDS	2.10	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103992	94-614-1599-T2	8C60S		URANIUM	41.5	mg/L		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103993	94-614-1600-T2	8A60L		PH	9.45	pH Un		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103993	94-614-1600-T2	8A60L		SOLIDS	1.78	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103993	94-614-1600-T2	8A60L		URANIUM	39.3	mg/L		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103994	94-614-1601-T2	8B60L		PH	9.45	pH Un		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103994	94-614-1601-T2	8B60L		SOLIDS	1.76	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103994	94-614-1601-T2	8B60L		URANIUM	36.0	mg/L		18-OCT-94	24-OCT-94	B
INORGANICS-EPM	200103995	94-614-1602-T2	8C60L		PH	9.44	pH Un		18-OCT-94	25-OCT-94	B
INORGANICS-EPM	200103995	94-614-1602-T2	8C60L		SOLIDS	1.86	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPM	200103995	94-614-1602-T2	8C60L		URANIUM	36.2	mg/L		18-OCT-94	24-OCT-94	B

Your Selection Criteria Was:

Release Number: X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.0839X-614X

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RELEASE NUMBER : 1000004309

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LO	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200103996	94-614-1606	T2	11A		PH	9.43	pH Un		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200103996	94-614-1606	T2	11A		SOLIDS	1.62	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200103996	94-614-1606	T2	11A		URANIUM	33.3	mg/L		19-OCT-94	24-OCT-94	B
INORGANICS-EPH	200103997	94-614-1607	T2	8A2B		DENSITY	1.07	g/ml		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200103997	94-614-1607	T2	8A2B		SOLIDS	2.12	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200103997	94-614-1607	T2	8A2B		URANIUM	4.4	mg/L		19-OCT-94	24-OCT-94	B
INORGANICS-EPH	200103998	94-614-1608	T2	8B2S		DENSITY	1.07	g/ml		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200103998	94-614-1608	T2	8B2S		SOLIDS	2.10	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200103998	94-614-1608	T2	8B2S		URANIUM	12.1	mg/L		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200103999	94-614-1609	T2	8C2B		DENSITY	1.06	g/ml		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200103999	94-614-1609	T2	8C2B		SOLIDS	2.03	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200103999	94-614-1609	T2	8C2B		URANIUM	7.7	mg/L		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104000	94-614-1610	T2	8A2L		PH	9.46	pH Un		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104000	94-614-1610	T2	8A2L		SOLIDS	1.75	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200104000	94-614-1610	T2	8A2L		URANIUM	2.9	mg/L		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104001	94-614-1611	T2	8B2L		PH	9.46	pH Un		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104001	94-614-1611	T2	8B2L		SOLIDS	1.65	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200104001	94-614-1611	T2	8B2L		URANIUM	26.5	mg/L		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104002	94-614-1612	T2	8C2L		PH	9.46	pH Un		19-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104002	94-614-1612	T2	8C2L		SOLIDS	1.65	wt %		19-OCT-94	21-OCT-94	B
INORGANICS-EPH	200104002	94-614-1612	T2	8C2L		URANIUM	2.7	mg/L		19-OCT-94	25-OCT-94	B
RADIOCHEMICAL	200104004	94-614-1587-T2	51			ALPHA	360	pCi/g		18-OCT-94	24-OCT-94	B
RADIOCHEMICAL	200104004	94-614-1587-T2	51			BETA	320	pCi/g		18-OCT-94		B
INORGANICS-EPH	200104005	94-614-1588-T2	2			MOISTURE	2.27	wt %		18-OCT-94	24-OCT-94	B
INORGANICS-EPH	200104005	94-614-1588-T2	2			URANIUM	31	ppm		18-OCT-94	25-OCT-94	B
INORGANICS-EPH	200104006	94-614-1590-T2	19			MOISTURE	2.08	wt %		18-OCT-94	21-OCT-94	B
INORGANICS-EPH	200104006	94-614-1590-T2	19			URANIUM	37	ppm		18-OCT-94	25-OCT-94	B

Your Selection Criteria Was:Release Number: X
From Received Date: XComponent: X-LR
Display Text? M

Submission ID: X

Project Name: 50.05.08X-614X

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RELEASE NUMBER : 1000004349

PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-EPH	200104288	94-614-1615	T2	11B		PH	9.48	pH Un		19-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104288	94-614-1615	T2	11B		SOLIDS	1.71	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104288	94-614-1615	T2	11B		URANIUM	3.1	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104289	94-614-1616	T2	8A18S		DENSITY	1.06	g/ml		19-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104289	94-614-1616	T2	8A18S		SOLIDS	3.38	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104289	94-614-1616	T2	8A18S		URANIUM	9.7	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104290	94-614-1617	T2	8B18S		DENSITY	1.07	g/ml		19-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104290	94-614-1617	T2	8B18S		SOLIDS	4.41	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104290	94-614-1617	T2	8B18S		URANIUM	9.5	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104291	94-614-1618	T2	8C18S		DENSITY	1.08	g/ml		19-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104291	94-614-1618	T2	8C18S		SOLIDS	3.05	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104291	94-614-1618	T2	8C18S		URANIUM	11.6	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104292	94-614-1619	T2	8A18L		PH	9.46	pH Un		19-OCT-94	28-OCT-94	B
INORGANICS-EPH	200104292	94-614-1619	T2	8A18L		SOLIDS	1.77	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104292	94-614-1619	T2	8A18L		URANIUM	0.4	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104293	94-614-1620	T2	8B18L		PH	9.46	pH Un		19-OCT-94	28-OCT-94	B
INORGANICS-EPH	200104293	94-614-1620	T2	8B18L		SOLIDS	1.76	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104293	94-614-1620	T2	8B18L		URANIUM	0.4	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104294	94-614-1621	T2	8C18L		PH	9.45	pH Un		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104294	94-614-1621	T2	8C18L		SOLIDS	1.72	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104294	94-614-1621	T2	8C18L		URANIUM	0.4	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104295	94-614-1623	T2	11C		PH	9.47	pH Un		19-OCT-94	28-OCT-94	B
INORGANICS-EPH	200104295	94-614-1623	T2	11C		SOLIDS	1.74	wt %		19-OCT-94	26-OCT-94	B
INORGANICS-EPH	200104295	94-614-1623	T2	11C		URANIUM	0.4	mg/L		19-OCT-94	27-OCT-94	B
INORGANICS-EPH	200104296	94-614-1570	T2	18		PH	9.48	pH Un		13-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104296	94-614-1570	T2	18		URANIUM	10.1	mg/L		13-OCT-94	28-OCT-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		ANTIMONY	12.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		ARSENIC	2.0	mg/kg	U	13-OCT-94	03-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		BARIUM	VOID	mg/kg		13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		BERYLLIUM	1.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		CADMIUM	1.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		CHROMIUM	2.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		COPPER	5.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		LEAD	VOID	mg/kg		13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		LEAD	1.65	mg/kg		13-OCT-94	02-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		NICKEL	8.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		SELENIUM	1.0	mg/kg	U	13-OCT-94	03-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		SILVER	2.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		THALLIUM	2.0	mg/kg	U	13-OCT-94	04-NOV-94	B
INORGANICS-AA/I	200104297	94-614-1570	T2	18		ZINC	4.0	mg/kg	U	13-OCT-94	01-NOV-94	B
INORGANICS-EPH	200104298	94-614-1627	T2	18		PH	9.53	pH Un		20-OCT-94	31-OCT-94	B
INORGANICS-EPH	200104298	94-614-1627	T2	18		URANIUM	3.1	mg/L		20-OCT-94	27-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2	18		ANTIMONY	240	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2	18		ARSENIC	40.0	ug/L	U	20-OCT-94	02-NOV-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2	18		BERYLLIUM	20	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2	18		CADMIUM	20	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2	18		CHROMIUM	40.0	ug/L	U	20-OCT-94	31-OCT-94	B

Your Selection Criteria Was:

Release Numbers : X
From Received Date: XComponent: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X9X-614X

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RELEASE NUMBER : 1000004369

PROJECT NAME : 50.05.03 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LG	DATE SAMPLED	DATE TASK PERFORMED	ASL
INORGANICS-AA/I	200104299	94-614-1627	T2 18			COPPER	100	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			LEAD	12.0	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			NICKEL	160	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			SELENIUM	20.0	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			SILVER	40.0	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			THALLIUM	40.0	ug/L	U	20-OCT-94	04-NOV-94	B
INORGANICS-AA/I	200104299	94-614-1627	T2 18			ZINC	80.0	ug/L	U	20-OCT-94	31-OCT-94	B
INORGANICS-EPM	200104300	94-614-1629	T2 11D			PH	9.68	pH Un		20-OCT-94	27-OCT-94	B
INORGANICS-EPM	200104300	94-614-1629	T2 11D			SOLIDS	0.40	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104300	94-614-1629	T2 11D			URANIUM	0.4	mg/L		20-OCT-94	27-OCT-94	B
INORGANICS-EPM	200104301	94-614-1630	T2 11E			PH	9.52	pH Un		20-OCT-94	28-OCT-94	B
INORGANICS-EPM	200104301	94-614-1630	T2 11E			SOLIDS	0.18	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104301	94-614-1630	T2 11E			URANIUM	0.1	mg/L		20-OCT-94	27-OCT-94	B
INORGANICS-EPM	200104302	94-614-1625	T2 18			URANIUM	0.1	mg/L	U	20-OCT-94	25-OCT-94	B
INORGANICS-EPM	200104303	94-614-1624	T2 18			URANIUM	0.1	mg/L	U	20-OCT-94	25-OCT-94	B
INORGANICS-EPM	200104312	94-614-1622	T2 80			MOISTURE	31.28	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104312	94-614-1622	T2 80			URANIUM	75	ppm d		20-OCT-94	29-OCT-94	B
INORGANICS-EPM	200104313	94-614-1628	T2 90			MOISTURE	33.71	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104313	94-614-1628	T2 90			URANIUM	69	ppm d		20-OCT-94	28-OCT-94	B
INORGANICS-EPM	200104314	94-614-1626	T2 82			MOISTURE	56.16	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104314	94-614-1626	T2 82			URANIUM	360	ppm d		20-OCT-94	28-OCT-94	B
INORGANICS-EPM	200104315	94-614-1636	T2 82			MOISTURE	49.23	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104315	94-614-1636	T2 82			URANIUM	83	ppm d		20-OCT-94	29-OCT-94	B
INORGANICS-EPM	200104316	94-614-1632	T2 10A			MOISTURE	39.39	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104316	94-614-1632	T2 10A			URANIUM	66	ppm d		20-OCT-94	29-OCT-94	B
INORGANICS-EPM	200104317	94-614-1633	T2 10B			MOISTURE	42.10	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104317	94-614-1633	T2 10B			URANIUM	65	ppm d		20-OCT-94	29-OCT-94	B
INORGANICS-EPM	200104318	94-614-1634	T2 10C			MOISTURE	41.59	wt %		20-OCT-94	26-OCT-94	B
INORGANICS-EPM	200104318	94-614-1634	T2 10C			URANIUM	68	ppm d		20-OCT-94	29-OCT-94	B
MASS SPECTROSCO	200104319	94-614-1632	T2 10A			MOISTURE	39.64	wt %		20-OCT-94	26-OCT-94	B
MASS SPECTROSCO	200104319	94-614-1632	T2 10A			URANIUM 234	1.9E+01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104319	94-614-1632	T2 10A			URANIUM 235	9.8E-01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104319	94-614-1632	T2 10A			URANIUM 236	1.9E-01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104319	94-614-1632	T2 10A			URANIUM 238	2.2E+01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104320	94-614-1633	T2 10B			MOISTURE	42.22	wt %		20-OCT-94	26-OCT-94	B
MASS SPECTROSCO	200104320	94-614-1633	T2 10B			URANIUM 234	1.6E+01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104320	94-614-1633	T2 10B			URANIUM 235	8.6E-01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104320	94-614-1633	T2 10B			URANIUM 236	2.6E-01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104320	94-614-1633	T2 10B			URANIUM 238	2.2E+01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104321	94-614-1634	T2 10C			MOISTURE	42.15	wt %		20-OCT-94	26-OCT-94	B
MASS SPECTROSCO	200104321	94-614-1634	T2 10C			URANIUM 234	2.3E+01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104321	94-614-1634	T2 10C			URANIUM 235	1.0E+00	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104321	94-614-1634	T2 10C			URANIUM 236	1.9E-01	pCi/g		20-OCT-94	13-DEC-94	B
MASS SPECTROSCO	200104321	94-614-1634	T2 10C			URANIUM 238	2.3E+01	pCi/g		20-OCT-94	13-DEC-94	B
RADIOCHEMICAL	200104322	94-614-1635	T2 50			ALPHA	50	pCi/g		20-OCT-94	23-OCT-94	B
RADIOCHEMICAL	200104322	94-614-1635	T2 50			BETA	120	pCi/g		20-OCT-94	23-OCT-94	B

Your Selection Criteria Was:

Release Number: X

Component: X-LR

Submission ID: X

Project Name: 50.05.02X9X-614X

From Received Date: X

Display Text? N

FEB- 3-95 FRI 17:11

FERMCO ANALYTICAL

FAX NO. 5137386667

P. 19

DATE 02-FEB-95
TIME 11:52:33

SUMMARY REPORT
(PRELIMINARY)

PAGE 40

RELEASE NUMBER : 1000004656
PROJECT NAME : 50.05.08 93-614 CRUS I/D TREAT-PHASE II

LAB	SAMPLE ID	USER	SAMPLE ID	SAMPLE POINT	SUFFIX	COMPONENT	RESULT	UNITS	LQ	DATE SAMPLED	DATE TASK PERFORMED	ASL
RADIOCHEMICAL	200113920	94-614-1580-T2	T21			ALPHA	9.3	pCi/m		12-OCT-94	29-NOV-94	8
RADIOCHEMICAL	200113920	94-614-1580-T2	T21			BETA	5.7	pCi/m		12-OCT-94	29-NOV-94	8

1327 RECORDS PRINTED

END OF REPORT

Your Selection Criteria Was:

Release Number: X
From Received Date: X

Component: X-LR
Display Text? N

Submission ID: X

Project Name: 50.05.08X92-614X

APPENDIX D

DETAILED MATERIAL BALANCES

APPENDIX D

DETAILED MATERIAL BALANCES

The detailed material balance results are shown in Appendix D. These detailed balances list the amounts of solids and uranium in each stream. Tables D-1 through D-8 apply to Tests 0 through 19. Material balances for the final four Phase II tests are presented in Tables D-9 and D-10. The reactor and the centrifuge material balances for solids are shown in Table D-1 for the storage pad soil and in Table D-2 for the incinerator area soil. The overall material balances for solids are shown in Table D-3 for the storage pad soil and in Table D-4 for the incinerator area soil. The reactor and the centrifuge material balances for uranium are shown in Table D-5 for the storage pad soil and in Table D-6 for the incinerator area soil. The overall material balances for uranium are shown in Table D-7 for the storage pad soil and in Table D-8 for the incinerator area soil. The soil and uranium overall material balances for the final four tests are given in Tables D-9 and D-10, respectively.

Table D-1

CENTRIFUGE MATERIAL BALANCE FOR SOLIDS
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Feed Soil (lbs)	393.76	299.05	299.17	321.96	365.93	308.29	309.36
Solids out (lbs)							
Trommel Oversize	12.43	14.9	11.9	25.9	17.1	12.2	11.34
Trommel Heel				21.8		28.7	16.97
Centrate	62.5	45.3	46.2	42.7	2.9	48.9	36.7
Wet Cake	241	182.2	208.2	192.5	269.3	168.6	191.22
(Samples)							
Feed Soil	8.97	9.92	9.46	9.09	9.2	10.74	10.04
Total Solids Out (lbs)	324.9	252.32	275.76	291.99	298.5	269.14	266.27
Solids Loss (lbs)	68.86	46.73	23.41	29.97	67.43	39.15	43.09
% Solids Recovery	82.51%	84.37%	92.18%	90.69%	81.57%	87.30%	86.07%

REACTOR MATERIAL BALANCE FOR SOLIDS
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Feed Soil (lbs)	393.76	299.05	299.17	321.96	365.93	308.29	309.36
Solids Out (lbs)							
Trommel Oversize	12.43	14.9	11.9	25.9	17.1	12.2	11.34
Trommel Heel				21.8		28.7	16.97
Reactor Slurry	246	195.3	212.5	188	156.7	213.1	177
(Samples)							
Feed Soil	8.97	9.92	9.46	9.09	9.2	10.74	10.04
Attrition Scrubber	0.62	0.58	0.59	4.29	21.25	6.32	5.3
Total Solids Out (lbs)	268.02	220.7	234.45	249.08	204.25	271.06	220.65
Solids Loss (lbs)	125.74	78.35	64.72	72.88	161.68	37.23	88.71
% Solids Recovery	68.07%	73.80%	78.37%	77.36%	55.82%	87.92%	71.32%

Table D-2

CENTRIFUGE MATERIAL BALANCE FOR SOLIDS
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Feed Soil (lbs)	308.68	283.3	283.38	280.67	275.52	275.43	284.9	293.18	298.22
Solids out (lbs)									
Trommel Oversize	12.54	3.9	3.41	3.22	4.32	3.61	4.84	2.63	4.76
Trommel Feed	8.44	8.78	8.48	8.35	10.73	9.46	6.66	7.97	14.04
Centrate	30.8	36.8	41	37.9	14.6	42.5	12.5	33.5	26.5
Wet Cake	206.4	204	196.6	207.7	198.8	202.2	223.4	192.8	202.6
(Samples)									
Feed Soil	8.8	8.29	8.23	8.64	8.81	7.52	8.88	8.75	8.58
Total Solids Out (lbs)	266.98	281.77	255.72	265.81	237.28	265.29	256.28	245.65	256.48
Solids Loss (lbs)	39.68	21.53	27.64	14.86	38.28	10.14	28.62	47.53	41.74
% Solids Recovery	87.06%	92.40%	90.25%	94.71%	86.11%	96.32%	89.95%	83.79%	86.00%

REACTOR MATERIAL BALANCE FOR SOLIDS
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Feed Soil (lbs)	308.68	283.3	283.38	280.67	275.52	275.43	284.9	293.18	298.22
Solids out (lbs)									
Trommel Oversize	12.54	3.9	3.41	3.22	4.32	3.61	4.84	2.63	4.76
Trommel Feed	8.44	8.78	8.48	8.35	10.73	9.46	6.66	7.97	14.04
Reactor Slurry	148	197.8	192.6	202.4	151	197.5	216	169.8	169.4
(Samples)									
Feed Soil	8.8	8.29	8.23	8.64	8.81	7.52	8.88	8.75	8.58
Airflow Scrubber	26.04	0.59	3.86	4.3	11.24	5.41	8.31	6.51	8.64
Total Solids Out (lbs)	203.82	219.38	214.58	226.91	186.1	223.5	244.69	195.68	205.42
Solids Loss (lbs)	102.84	63.94	68.78	53.78	89.42	51.93	40.21	97.52	92.8
% Solids Recovery	66.46%	77.43%	75.73%	80.85%	67.55%	81.15%	85.89%	66.74%	68.88%

Table D-3
OVERALL MATERIAL BALANCE FOR SOLIDS
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Feed Soil (lbs)	393.76	299.05	299.17	321.96	365.93	308.29	309.36
Treated Soil (lbs)	202.76	185.8	187.94	126.16	209.33	196.7	157.84
By-product Solids (lbs)							
Trommel Oversize	12.43	14.9	11.9	25.9	17.1	12.2	11.34
Trommel Heel				21.8		28.7	16.97
Vibrating Screen Oversize	4.14	1.93	3.56				
Centrifuge Purge				28.4			33
Centrate No. 1	16.5	31.8	15.1	74.35	2.4	55.98	70.81
Centrate No. 2	18.3	17	1.5	5.66	0.64	9.37	28.32
Centrate No. 3	10.60	4.70	0.01	3.08	0.56	2.92	
Centrifuge Heel (Samples)				41.9		13.92	33.97
Feed Soil	8.97	9.92	9.46	9.09	9.2	10.74	10.04
Attrition Scrubber	0.62	0.58	0.59	4.29	21.25	6.32	5.3
Reactor	0.2	0.3	0.3	0.57	0.5	0.7	0.4
Centrifuge Wet Cake				0.83			0.99
Total By-product Solids	71.76	81.13	42.42	215.87	51.65	140.85	211.14
Gross Solids Out (lbs)	274.52	266.93	230.358	342.03	260.98	337.55	368.98
Chemicals (lbs)				110		77	78
Net Solids Out (lbs)	274.52	266.93	230.358	232.03	260.98	260.55	290.98
Solids Loss (lbs)	119.24	32.12	68.812	89.93	104.95	47.74	18.38
Percent Recovery	69.72	89.26	77.00	72.07	71.32	84.51	94.06

Table D-4
OVERALL MATERIAL BALANCE FOR SOLIDS
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Feed Soil (lbs)	306.68	283.3	283.38	280.67	275.52	275.43	284.9	293.18	298.22
Treated Soil (lbs)	140.82	205.1	159.08	159.79	136.48	177.84	167.13	177.15	180.68
By-product Solids (lbs)									
Trommel Oversize	12.54	3.9	3.41	3.22	4.32	3.61	4.84	2.63	4.76
Trommel Heel	8.44	8.78	8.48	8.35	10.73	9.46	6.66	7.97	14.04
Vibrating Screen Oversize									
Centrifuge Purge	24.2	32.8	33.6	54.8	35	32.7	35.6	33.5	28.7
Centrate No. 1	64.89	70.81	49.31	53.1	60.18	54.73	59.98	56.23	60.14
Centrate No. 2	7.75	9	10.83	9	5.16	8.12	9.37	8.25	
Centrate No. 3	3.46	5.83	3.12	5.41	3.08			5.50	
Centrifuge Heel	26.96	24.21	46.37	15.28	43.1	18.1	33.23	36.72	21.7
(Samples)									
Feed Soil	8.8	8.29	8.23	8.64	8.81	7.52	8.88	8.75	8.58
Altnlon Scrubber	26.04	0.59	3.86	4.3	11.24	5.41	8.31	6.51	8.64
Reactor	0.75	0.5	0.5	0.6	0.4	0.6	0.6	0.5	0.47
Centrifuge Wet Cake	0.76	0.83	0.96	0.89	0.9	1.18	1.04	0.81	0.91
Total By-product Solids	184.59	185.54	168.67	163.59	162.92	141.43	168.51	167.37	147.94
Gross Solids Out (lbs)	325.21	370.64	325.75	323.38	319.4	319.27	335.64	344.52	328.62
Chemicals (lbs)	78.5	78.5	74.5	74.5	121	72.5	70.5	73.5	73.5
Net Solids Out (lbs)	246.71	292.14	251.25	248.88	198.4	246.77	265.14	271.02	255.12
Solids Loss (lbs)	59.95	-8.84	32.11	31.79	77.12	28.68	19.76	22.16	43.1
Percent Recovery	80.45	103.12	88.87	88.87	72.01	89.59	93.06	92.44	85.55
	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18

TABLE D-5

CENTRIFUGE MATERIAL BALANCE FOR URANIUM
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Uranium in Feed (lbs)	0.584300	0.574200	0.541500	0.550600	0.673300	0.505600	0.510400
Uranium out (lbs)							
Trommel Oversize	0.01865	0.023	0.0165	0.02214	0.0159	0.0128	0.0044
Trommel Heel	0.000000	0.000000	0.000000	0.004360	0.000000	0.012400	0.002986
Centrate		0.1393		0.1748	0.1734	0.1985	0.1805
Wet Cake	0.2905	0.1731		0.2445	0.399	0.2072	0.2295
(Samples)							
Feed Soil	0.013300	0.019600	0.017100	0.015500	0.016900	0.017600	0.016600
Total Uranium Out (lbs)	0.32245	0.355	0.0336	0.4613	0.6052	0.4485	0.433986
Uranium Loss (lbs)	0.26185	0.2192	0.5079	0.0893	0.0681	0.0571	0.076414
Percent Uranium Recovery	55.19%	61.83%	6.20%	83.78%	89.89%	88.71%	85.03%

REACTOR MATERIAL BALANCE FOR URANIUM
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Uranium in Feed (lbs)	0.584300	0.574200	0.541500	0.550600	0.673300	0.505600	0.510400
Uranium out (lbs)							
Trommel Oversize	0.01865	0.023	0.0165	0.02214	0.0159	0.0128	0.0044
Trommel Heel	0.000000	0.000000	0.000000	0.004360	0.000000	0.012400	0.002986
Reactor Slurry	0.5676	0.4984	0.3995	0.3774	0.4398	0.3916	0.3676
(Samples)							
Feed Soil	0.013300	0.019600	0.017100	0.015500	0.016900	0.017600	0.016600
Attrition Scrubber	0.000485	0.000549	0.000600	0.005447	0.031900	0.004678	0.006154
Uranium Out (lbs)	0.600035	0.541549	0.4337	0.424847	0.5045	0.439078	0.39774
Uranium Loss (lbs)	-0.015735	0.032651	0.1078	0.125753	0.1688	0.066522	0.11266
Percent Uranium Recovery	102.69%	94.31%	80.09%	77.16%	74.93%	86.84%	77.93%

TABLE D-8

CENTRIFUGE MATERIAL BALANCE FOR URANIUM,
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Uranium in Feed (lbs)	0.185800	0.206800	0.195500	0.202900	0.308600	0.217900	0.215400	0.204300	0.221600
Uranium out (lbs)									
Trommel Oversize	0.0004	0.000935	0.002593	0.00008	0.001726	0.000151	0.000726	0.0005	0.001619
Trommel Heel	0.009618	0.006850	0.006028	0.006212	0.023060	0.010220	0.004925	0.005738	0.011230
Centrate	0.0729	0.0538	0.0459	0.0758	0.0875	0.068	0.0042	0.0634	0.0589
Wet Cake	0.1104	0.1306	0.116	0.1169	0.1868	0.1193	0.1743	0.1079	0.1103
(Samples)									
Feed Soil	0.005300	0.006100	0.005700	0.006200	0.010000	0.006000	0.006700	0.006100	0.006400
Total Uranium Out (lbs)	0.198618	0.198285	0.176221	0.205192	0.309086	0.203671	0.190851	0.183638	0.188449
Uranium Loss (lbs)	-0.012818	0.008515	0.019279	-0.002292	-0.000486	0.014229	0.024549	0.020662	0.033151
Percent Uranium Recovery	106.90%	95.88%	80.14%	101.13%	100.16%	93.47%	88.60%	89.89%	85.04%

REACTOR MATERIAL BALANCE FOR URANIUM
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Uranium in Feed (lbs)	0.185800	0.206800	0.195500	0.202900	0.308600	0.217900	0.215400	0.204300	0.221600
Uranium out (lbs)									
Trommel Oversize	0.0004	0.000935	0.002593	0.00008	0.001726	0.000151	0.000726	0.0005	0.001619
Trommel Heel	0.009618	0.006850	0.006028	0.006212	0.023060	0.010220	0.004925	0.005738	0.011230
Reactor Slurry	0.1722	0.1577	0.173	0.1519	0.222	0.1301	0.1511	0.1697	0.1754
(Samples)									
Feed Soil	0.005300	0.006100	0.005700	0.006200	0.010000	0.006000	0.006700	0.006100	0.006400
Attrition Scrubber	0.013930	0.000381	0.002276	0.002421	0.010570	0.003190	0.006481	0.003643	0.003023
Total Uranium Out (lbs)	0.201448	0.171866	0.189597	0.168813	0.267358	0.149661	0.169932	0.185681	0.197672
Uranium Loss (lbs)	-0.015648	0.034834	0.005903	0.036087	0.041244	0.088239	0.045468	0.018619	0.023928
Percent Uranium Recovery	108.42%	83.16%	96.98%	82.21%	86.64%	68.68%	78.89%	90.89%	89.20%

TABLE D-7
OVERALL MATERIAL BALANCE FOR URANIUM
STORAGE PAD SOIL

	Test 4	Test 5	Test 6	Test 8	Test 16	Test 17	Test 19
Uranium in Feed (lbs)	0.584300	0.574200	0.541500	0.550600	0.673300	0.505600	0.510400
Uranium in Treated Soil (lbs)	0.0218	0.0216	0.0242	0.01577	0.0262	0.0256	0.0287
By-Product Uranium (lbs)							
Trommel Oversize	0.01865	0.023	0.0165	0.02214	0.0159	0.0128	0.0044
Trommel Heel				0.004360		0.012400	0.002986
Vibrating Screen Oversize	0.001050	0.000309	0.000700				
Centrifuge Purge				0.01			0.01741
Centrate No. 1	0.444000	0.386500	0.286600	0.339900	0.383200	0.297400	0.297400
Centrate No. 2	0.057450	0.052480	0.040820	0.031150	0.052500	0.031240	0.119000
Centrate No. 3	0.013270	0.008747	0.007809	0.003082	0.021200	0.004665	0.000000
Centrifuge Heel	0.000000	0.000000	0.000000	0.030000		0.002645	0.009071
(Samples)							
Feed Soil	0.013300	0.019600	0.017100	0.015500	0.016900	0.017600	0.016600
Attrition Scrubber	0.000485	0.000549	0.000600	0.005447	0.031900	0.004678	0.006154
Reactor	0.001030	0.001655	0.001471	0.001139	0.001443	0.001278	0.000975
Centrifuge Wet Cake				0.000171			0.000232
Total Byproduct Uranium (lbs)	0.549235	0.492840	0.371600	0.462889	0.523043	0.384706	0.474228
Total Uranium out (lbs)	0.571035	0.514440	0.395800	0.478659	0.549243	0.410306	0.502928
Uranium Loss (lbs)	0.013265	0.059760	0.145700	0.071941	0.124057	0.095294	0.007472
Percent Uranium Recovery	97.73%	89.59%	73.09%	86.93%	81.57%	81.15%	98.54%

TABLE D-8
OVERALL MATERIAL BALANCE FOR URANIUM
INCINERATOR AREA SOIL

	Test 0	Test 1	Test 2	Test 3	Test 7	Test 13	Test 14	Test 15	Test 18
Uranium in Feed (lbs)	0.185800	0.206800	0.195500	0.202900	0.308600	0.217900	0.215400	0.204300	0.221600
Uranium in Treated Soil (lbs)	0.01687	0.02256	0.0207	0.0185	0.03958	0.0283	0.01671	0.02976	0.0154
By-Product Uranium (lbs)									
Trommel Oversize	0.0004	0.000935	0.002593	0.00008	0.001726	0.000151	0.000726	0.0005	0.001619
Trommel Heel	0.008618	0.006850	0.006028	0.006212	0.023060	0.010220	0.004925	0.005738	0.011230
Vibrating Screen Oversize									
Centrifuge Purge	0.0052	0.00705	0.00723	0.0137	0.0197	0.00818	0.00818	0.00569	0.0037
Centrate No. 1	0.123000	0.127400	0.114300	0.117100	0.138100	0.112500	0.126600	0.124950	0.139300
Centrate No. 2	0.015490	0.012000	0.011910	0.012000	0.033570	0.010830	0.012500	0.013750	
Centrate No. 3	0.003457	0.005831	0.003124	0.002707	0.007089	0.000000	0.000000	0.002749	
Centrifuge Heel (Samples)	0.006202	0.004115	0.010850	0.003819	0.015950	0.003400	0.005615	0.008299	0.004339
Feed Soil	0.005300	0.006100	0.005700	0.006200	0.010000	0.006000	0.006700	0.006100	0.006400
Attrition Scrubber	0.013930	0.000381	0.002276	0.002421	0.010570	0.003190	0.006481	0.003643	0.003023
Reactor	0.000870	0.000464	0.000469	0.000488	0.000676	0.000244	0.000463	0.000514	0.000384
Centrifuge Wet Cake	0.000099	0.000120	0.000138	0.000128	0.000377	0.000244	0.000283	0.000131	0.000098
Total Byproduct Uranium (lbs)	0.183566	0.171246	0.164618	0.164853	0.260818	0.154959	0.172473	0.172084	0.170093
Total Uranium out (lbs)	0.200436	0.193806	0.185318	0.183353	0.300398	0.183259	0.189183	0.201824	0.185493
Uranium Loss (lbs)	-0.014636	0.012994	0.010182	0.019547	0.008202	0.034641	0.026217	0.002476	0.036107
Percent Uranium Recovery	107.86%	93.72%	94.79%	90.37%	97.34%	84.10%	87.83%	98.79%	83.71%

Table D-9. Overall material balances for soil final four Phase II tests

	Quantity of soil (lb)			
	Test 20	Test 21	Test 22	Test 25
Feed soil	340.4	293.2	332	282.5
Treated soil	205.2	165.6	255.8	144.2
By-product solids				
Trommel oversize	14.1	1.8	12.3	14
Trommel heel	12.6	22.4	18.6	21.5
Reactor sample	86.2	73.7	0	67.3
Centrifuge heel	13.2	14.1	20.3	10.5
Other samples	12	11.4	11.6	11.2
Total by-product solids	138.1	123.4	62.8	124.5
Total solids out	343.3	289	318.6	268.7
Solids loss (gain)	(2.9)	4.2	13.4	13.8
Percent recovery	100.9	98.6	96	95.1

Table D-10. Overall material balances for uranium final four Phase II tests

	Quantity of uranium (lb)			
	Test 20	Test 21	Test 22	Test 25
Uranium in feed soil	0.1900	0.1507	0.1855	0.2495
Uranium in treated soil	0.0179	0.0083	0.0171	0.0164
By-product uranium				
Trommel oversize	0.0007	0.0003	0.0004	0.0011
Trommel heel	0.0116	0.0027	0.0108	0.0033
Reactor sample	0.0391	0.0300		0.0890
Centrates	0.1072	0.0852	0.1256	0.2952
Centrifuge heel	0.0018	0.0010	0.0017	0.0013
Other samples	0.0067	0.0058	0.0060	0.0306
Total by-product uranium	0.1671	0.1250	0.1445	0.4205
Total uranium out	0.1850	0.1333	0.1616	0.4369
Uranium loss (gain)	0.0050	0.0174	0.0239	(0.1874)
Percent recovery	97.4	88.5	87.1	175

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