DRAFT
FINAL SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
NU-WEST INDUSTRIES, INC. and
NU-WEST MINING, INC.

August 16, 2006

Prepared by:

GLOBAL ENVIRONMENTAL TECHNOLOGIES L.L.C.

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Scott B. Sprague
Environmental Remediation Manager

August 17, 2006

Doug Tanner
Idaho Department of Environmental Quality
444 Hospital Way, Number 300
Pocatello, ID 83201

Re: Central Farmers Fertilizer Facility Site Investigation
Final Site Investigation Report

Dear Doug:

Enclosed please find three copies of the Final Site Investigation Report for the Georgetown Canyon plant site. There were no changes to the Appendices so this document was not published again. Please use the appendices that were submitted with the final draft report on January 27, 2006. Please distribute copies of this report to those in your organization who will be reviewing the report.

The human health and ecological risk assessment has been completed for the site. This document will be submitted under separate cover

If you have any questions regarding this submittal, please contact me at 208-547-3935, extension 13 or on my cell phone (303) 883-1184.

Sincerely,
Nu-West Industries, Inc.

Scott B. Sprague, P.E.
Environmental Remediation Manager

SBS:sbs

Enclosure

cc: JB Brown – GET w/o attachment
Matt Smith – w/o attachment
Anna Watson
Zach Miller

GLOBAL ENVIRONMENTAL TECHNOLOGIES L.L.C.

August 16, 2006

Nu-West
3010 Conda Road
Soda Springs, Idaho 83276
Attn: Mr. Scott B. Sprague, P.E.

RE: TRANSMITTAL: DRAFT FINAL SITE INVESTIGATION REPORT – CENTRAL FARMERS FERTILIZER FACILITY IN GEORGETOWN CANYON, IDAHO for NU-WEST INDUSTRIES, INC. and NU-WEST MINING, INC.

Dear Scott:

Please find transmitted the Draft Final Site Investigation Report (SI report) for the Central Farmers Fertilizer Facility in Georgetown Canyon, Idaho. This document addresses the comments provided by the IDEQ in their correspondence dated March 21, 2006. This revised report includes changes transmitted to you in April 2006 and also includes the total metals and TCLP analytical results from the clarifier sediment investigations performed in May 2006.

We sincerely appreciate the opportunity to work with you on this project. If you have any questions regarding this transmittal, please contact us.

Very truly yours,
Global Environmental Technologies, LLC

John S. Brown, P.G.
Principal/Owner

Enclosures – 8 hard report copies, 8 disk copies

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APPENDIX C	ACZ LABS ANALYTICAL PROJECTS FOR THE CENTRAL FARMERS FERTILIZER FACILITY SI (ON DISK ONLY)

DRAWINGS

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DRAWING 2	GEOLOGIC MAP – CENTRAL FARMERS FERTILIZER PLANT, GEORGETOWN CANYON, IDAHO

1.0 INTRODUCTION

1.1 Background

The former Central Farmers facility is located seven miles to the east of Georgetown, Idaho, as shown on Figure 1-1. The former facility is within Georgetown Canyon, in the general areas of the NW ¼ Sec. 25 and the SW ¼ Sec. 24, T. 10 S., R. 44 E, in Bear Lake County.

Nu-West Industries, Inc. and Nu-West Mining Inc. (Nu-West) acquired ownership of the Central Farmers Fertilizer Facility in Georgetown Canyon, Idaho as a result of bringing the Beker Industries assets out of bankruptcy. On September 19, 2001, the Idaho Department of Environmental Quality (IDEQ) conducted a site visit to the Georgetown Canyon property. Based on the findings of the September 19, 2001 site visit and other information provided to the agency, the IDEQ expressed concern that there may have been a potential for a release from the former site to the environment. Potential contamination at the former Central Farmers Fertilizer Facility was alleged in a preliminary assessment completed by the IDEQ on September 19, 2001. During 2002, Nu-West and IDEQ negotiated a Consent Judgment pursuant to Idaho Code § 39-101 *et seq*., [Idaho Environmental Protection and Health Act (EPHA)], and Idaho Code § 39-4401 *et seq.,* [Idaho Hazardous Waste Management Act (HWMA)] enforceable under Idaho Code §§ 39-108 and 39-109, and the HWMA, Idaho Code §§ 39-4413 and 39-4414. Judge Harding of the Bear Lake County Court signed the Consent Judgment on May 28, 2003.

A site investigation (SI) work plan was submitted to the Agency on September 19, 2003. The SI work plan presented the approach that would be used to address concerns raised by the IDEQ in the Consent Judgment and outline the process to identify or fill gaps in existing data. The SI work plan described the specific site investigation activities based upon initial site reconnaissance, the facility history, historic maps, and processing steps.

A sampling and analysis plan (SAP) was submitted in early April 2004 and conditionally

approved by the IDEQ in their correspondence of April 15, 2004. The objective of the SAP was to present the detailed methodology of investigatory activities to be performed as part of the Central Farmers Fertilizer Facility SI in Georgetown Canyon.

During March 2005, Nu-West submitted a draft site investigation report that summarized the data and the findings of the 2004 investigations. Following their review of the report, the IDEQ provided comments in correspondence dated April 8, 2005. In this correspondence, IDEQ requested follow up investigation and site characterization during the 2005 field season to fill data gaps and address concerns raised in the meeting held in March 2005. One of the concerns raised by the IDEQ was that Nu-West should explore alternatives to evaluating the integrity of the 60-inch CMP and observed flows and losses within the 60-inch CMP that conveys the creek beneath the entire length of the site. Among the alternatives discussed with the IDEQ was the possible performance of a camera survey for the total length of the culvert. Although a number of sewer contractors were contacted in 2005 for the performance of the survey, Nu-West was unable to identify a contractor with suitable equipment that would allow video documentation of the conditions within the culvert. Therefore, Nu-West has elected to continue to measure flows above and below the culvert, and include additional flow monitoring points to assess the inflows between inlet and outlet points of the culvert and complete a water balance around the culvert.

This report documents the site investigation findings for the 2004 and 2005 field seasons and the TCLP sampling results from the May 2006 sampling event that were requested by IDEQ in March 2006., This report also addresses comments provided in the April 2005 and March 2006IDEQ correspondence and is considered the final site investigation report. This final report will be used to develop possible corrective actions at the site through the development of the Remedial Action Plan (RAP).

1.2 Purpose

The purpose of this draft final SI report is to present data obtained during the 2004 and

2005 field site investigations to characterize impacts to the ground water, surface water, Georgetown Creek sediments and clarifier sediments, surface and subsurface soils from site operations and remaining sources. The SI was completed to characterize the nature and extent of environmental risks posed by the presence of historic releases from the site and the facilities remaining on site, including the furnace building areas, covered phossy water pond, underground phosphorous storage tanks and piping, clarifier, and ore storage areas.

1.3 Objectives of the Site Investigation

The SI was designed to gather sufficient information to support an informed risk management decision regarding which remedy appears to be the most appropriate for the Central Farmers Georgetown Canyon site. The overall objectives of this investigation included:

- Collection of data to characterize soil, surface water and ground water site conditions at the former fertilizer facility;
- Evaluation of the nature and extent of surface water and ground water impacts at the Georgetown site, and;
- Evaluation of the nature and extent of sediment and site soil impacts from historic operations.

1.4 Site Investigation DRAFT Report Organization

This site investigation draft report includes the following elements:

- **Introduction:** Describes the physical setting of the site, the site history, and the background information on the site.
- **Study Area Investigations:** This chapter describes the types of investigations performed.
- **Physical Characteristics**: This chapter includes a description of site features, geologic interpretations, surface water hydrology, site source features, and soils characteristics.

- **Nature and Extent of Contamination**: This chapter presents results of ground water, surface water, soils, and ore source and uses the data to evaluate the nature and extent of site impacts.

- **Contaminant Fate and Transport**: This section presents interpretation of potential pathways, the persistence of contaminants and potential transport mechanisms.

- **Summary and Conclusions**: Presents the findings and associated conclusions regarding the nature and extent of contamination and the fate and transport of these chemicals into the environment.

1.5 Background

1.5.1 Site History

Phosphate deposits in Georgetown Canyon were initially located between April 1906 and October 1907 (USGS, 2000). Claims were patented between 1912 and 1916. Mining and production of ore began on sixteen claims between 1909 and 1928. Central Farmers conducted underground and open pit mining between 1955 and 1963. The ore from this mine was processed at the production facility that is the subject of this investigation.

The patented phosphate mining claims were sold to Central Farmers Fertilizer Company in 1955. Shortly afterwards, The Central Farmers Fertilizer Company rerouted Georgetown Creek through a 60-inch pipeline and constructed a processing plant within the canyon in the NW ¼ Sec. 25 and the SW ¼ Sec. 24, T. 10 S., R. 44 E, in Bear Lake County. Construction started on a phosphate processing plant with an electric furnace and kiln in the Canyon in 1957. The fertilizer plant facility consisted of a beneficiation plant, a 35,000 kW electric arc furnace, phosphoric acid plant, and fertilizer processing plant. The plant was completed in May 1959.

Central Farmers Fertilizer Company continued phosphate mining in Georgetown Canyon during the operation of the fertilizer plant facility. A conveyor belt was used to move ore from the open pit to the processing plant. Open pit mining was initiated in June 1958 to the

east of the plant facility. A railroad spur was constructed from the main line near Georgetown to the processing facility in 1957.

By late 1959, underground mining had ceased. A new open pit was opened in 1960. Open pit mining continued until 1963. The open pit was extended to approximately 10,000 feet long, 250 feet wide, and 100 feet deep (Hansen, 1964). In 1964, production stopped from the mine. In July, 1964, the El Paso Natural Gas Products Company bought the Georgetown Canyon phosphate properties from the Central Farmers Fertilizer Company (Hansen, 1965) and in October, closed the plant facility and moved parts of the plant to Conda where the company was building a new phosphate processing plant (USGS, 2000). The Georgetown Canyon Mine has not produced phosphate ore since 1964.

In May of 1972, Agricultural Products Corporation (APC), a wholly owned subsidiary of Beker Industries Corporation purchased the mine properties from El Paso. In 1972, APC was dissolved and all of their property holdings, including the Georgetown Canyon mine were assigned to Beker Industries. In January of 1979, Beker Industries Corporation sold the Georgetown Canyon mine to Western Co-Operative Fertilizer, Ltd., USA and formed the Conda Partnership. In 1987, the Beker Corporation filed for a Chapter 11 bankruptcy. Nu-West Industries, Inc. replaced the Beker Corporation in the Conda Partnership. In 1992, Nu-West bought out the Western Co-Operative Fertilizer, Ltd., and formed a wholly owned subsidiary named Nu-West to replace the co-op in Conda Partnership. In 1995, the Conda Partnership was dissolved and all of the mine properties were assigned to Nu-West.
In October of 1995, Agrium, Inc., a Canadian firm based in Calgary, Alberta, acquired Nu-West Industries, Inc.

1.5.2 Process History and General Works Description

This section discusses the process operation of the Georgetown fertilizer plant through the brief period of operation between 1957 and 1964. Much of this information was provided from a June 16, 1963 report “Idaho Phosphate Works of Central Farmers Fertilizer Company” (Cox, 1963). Figure 1-2 shows the flow of materials used in the process (Cox,

1963). The plant works consisted of five operational units, (shown on Figure 1-2) including:

- Ore Reclaiming;
- Phosphorus Furnace Operations (including phosphate burden preparation, proportioning, products and by-product materials);
- Ore Beneficiation and Rock Drying, Calcining and Milling - handling any phosphate rock not going to the furnace, therefore for sale or use in Concentrated/Triple Superphosphate;
- Phosphoric Acid Plant, and;
- Triple/Concentrated Superphosphate production, including storage and shipping.

Figure 1-3 is an aerial photo of the site taken in 1965. This photograph shows much of the building features and site operational layout.

1.5.3 Stock Piling and Ore Reclaiming

The phosphate ore was stockpiled on site into four phosphorous grades, including:

1. 31-32% P_20_5
2. 25-26% P_20_5
3. 23-25% P_20_5
4. 18-20% P_205

Non-phosphatic components in the ore varied during processing, such as the lime to phosphate (CaO/P_20_5) ratios, the iron content, and the clay (alumina). The mineralogical compositions of the beds differed, which became a significant problem in operations. Ore grading was also a problem for operations, aggravated by the various grade accumulations and random blending of various ore grades from the early days of operation (1959 to 1961).

1.5.4 Phosphorus Furnace Operations – Nodulizing and Phosphatic Burden Preparation

The full furnace load (46,000 kW load) produced about 4 tons per hour of elemental phosphorus during the short operational span of the facility. The furnace was the primary operating unit of this portion of the plant. Problems in furnace operations included - uniformity of the phosphatic burden, disposal of the produced slag, and phosphorus filtration (Cox, 1963).

1.5.5 Phosphoric Acid Unit

The phosphoric acid unit had the capacity to convert 3.2 tons of phosphorus per hour into phosphoric acid. The phosphoric acid was produced at strengths varying from 94 to 96 percent H_3PO_4 equivalent. At concentrations above 88 percent H_3PO_4 equivalent, the product contained varying percentages of “polyphosphoric acids” (Cox, 1963). The Georgetown unit followed a special design to produce a superphosphoric acid of 104 percent phosphoric acid equivalent. The conversion unit consisted of two combustion units. One unit was used for clean phosphorus and one was used for phosphorus containing sludge. The phosphorus was burned and acid was hydrated in the two combustion chambers. The gases from both were carried into another hydrator to complete the hydration of the phosphorus. The gas stream from the last hydrator then passed to a two-stage Peabody scrubber. As originally constructed, the performance of this unit was not satisfactory. Efficiencies of the phosphoric acid unit were later improved to about 98 percent.

1.5.6 Beneficiation Unit for Phosphate Ores

The ores from Meade Peak strata differed in phosphorous content. Ore beneficiation was accomplished by washing and the removal of non-phosphatic or low phosphatic content material. The ore was not milled until after the washing, dewatering and filtering operations. A problem that the facility faced was that much of the phosphatic nodule material was in the material washed from the ore and the P_2O_5 loss was excessively high.

1.5.7 Phosphate Rock -Drying and Calcining and Milling

A Dorr-Oliver three-zone Fluo-Solids unit dried and calcined the phosphatic ores (Cox, 1963). The capacity was 24 tons per hour of calcined rock, plus 12 tons per hour additional dried rock. The high organic "A" bed ore was raised in P_20_5 content by up to 4 percent. The 250 horsepower ball mill had a milling capacity to grind 15 to 22 tons per hour, dependent upon fineness desired and speeds of reaction.

1.5.8 Triple Superphosphate Production, Storage and Shipping

Central Farmers Fertilizer Company concentrated superphosphate, their principal product, from the plant works using a conventional cone mixer, modified Broadfield den, and a Sackett-type granulating unit (Cox, 1963). Production capacities were in excess of 130 tons per hour. Products ranged from 46 to 54 percent available P_2O_5. The original process was based on the use of "super-phosphoric acid", 104 percent H_3PO_4 equivalent. Difficulties were experienced in uniformity of acid and control of the reaction. Triple superphosphate storage capacity at the site was 40,000 tons. Shipping of the products made at the facility was both in bulk and in bags via railroad.

1.6 Regulatory Background

The following section presents a number of regulatory-related reports that document environmentally-related site issues following the closing of the Central Farmers plant site. During August 1979, USEPA Region 10 identified "electric furnace slag tailing, heater (sic) dust with elemental phosphorous, and other wastes disposed of on the site". Wastes marked on the form included: paint or pigment, oily waste, solvents, acids, fly ash, and lab wastes. None of these wastes were located during the demolition that took place in 2001 or during site visits since 2000. Additionally, these wastes were not mentioned in any subsequent agency inspections.

During 1985, a memorandum was generated from the Idaho Hazardous Materials Bureau to Region 10, USEPA. In this memo, the following statements were presented:

- Elemental phosphorous may be present in small quantities, although no data exists to support this assumption;

- The site owner was dismantling the site in September 1984 for the purpose of salvage, and dismantling had been performed over the past three years. The transformers were also removed from the substation area during that time;

- No further action was contemplated by the state, based on the assessment and on the fact that quantities of the elemental phosphorous were assumed to be small, and that phosphates in the tails pose little or no potential for adverse environmental impact, and;

- Most of the mill tailing was reported to have been recycled into fertilizer by Soda Springs Phosphate in Soda Springs.

In an EPA document dated February 6, 1985, for potential hazardous waste site disposition at the Central Farmers site, EPA recommended further investigation because the area is noted for high radioactivity in phosphate mine tailing. EPA also recommended investigation of the transformer sites for PCB spills.

On April 29, 1988, Ecology and Environment, an EPA contractor, conducted a site assessment of the Georgetown facility. Based on the available information, E&E concluded in a report to USEPA Region 10 that no HRS (hazard ranking score = 0.0) was possible since the waste quantity at the site was estimated to be zero. Additionally, Ecology and Environment stated that reevaluation of the site under HRS II would not result in a score above zero. The report was based on past information contained in the file, and not based on independent verification. The report concluded by recommending no further actions for the site.

During August 1996, two USTs were removed from the site, and during 1997, approximately 1,340 yards of petroleum-contaminated soils were removed from the tank excavation. During the summer of 2001, Nu-West commenced and completed demolition of the remaining fertilizer plant buildings, tanks, and structures as part of complete site closure. The former facility property, including Georgetown Canyon Mine remains under the ownership of Nu-West.

1.7 Status of Remaining Site Features

Remaining site buildings, calcine bins and other remaining structures were removed in 2001. Much of the material was scrapped and recycled. Some of the remaining construction and demolition waste was impounded and covered on site below the calcine bins. A number of concrete foundations remain on site, including those of the TSP storage building, maintenance shop, calcine bins, beneficiation building, phos tanks and kiln scrubber.

1.7.1 60-Inch CMP Culvert

The 60-inch corrugated metal pipe culvert (60-inch CMP) shown on Figure 1-3 conveys Georgetown Creek beneath the site. The 60-inch CMP was constructed approximately 50 years ago, and is about 2,200 feet in length. A spring that issues from a drainage west of the site enters a drain that is believed to discharge into the CMP. The overflow from Phosphoria Gulch was noted to discharge from the sediment settling pond directly into the CMP and Georgetown Creek during runoff. Site surface water may enter the CMP at other locations. These flows add to the flow in Georgetown Creek, however, water flow measurements in 2004 and 2005 indicate that creek water may leak out of the 60-inch CMP.

1.7.2 Slurry Pit Area

The covered slurry pit shown on Figure 1-3 includes a covered phos impoundment that may be divided into two cells. The estimated area is approximately 38,650 square feet. Thickness of the slurry pit cover was not determined, although the soils are indicated to contain elevated levels of phosphorous based on the analytical results from the surface soils investigations. White phosphorus was intercepted at shallow depth during drilling near the north end of the facility. The cover contains sparse grasses, sweet clover, alfalfa, lupine and other native plants, willows, a number of aspen trees, and stockpiled armoring

rock material. The cover shows signs of animal burrowing activity. The covered impoundment feature is raised several feet above surrounding grade near the south end of the impoundment, with slight slope to the north and the east on the cover surface. Surface water is present immediately to the east of the facility throughout much of the year. During the runoff period in 2005, leakage was noted from the west side of the impoundment that resulted in localized discoloration of the soil. Leakage from the impoundment suggests that the cover is of lower permeability than the bottom of the slurry pit.

1.7.3 Furnace

The furnace building (shown on Figure 1-3) was removed in 2001. The remaining furnace feature is a circular reinforced conical flat-topped steel structure with blind flanged pipes on top of the structure. The furnace was filled approximately 80percent with silica sand and all openings were welded shut during the demolition activities that occurred in 2001. The steel structure is exposed at an elevation of approximately 6921 feet, approximately 6 to 9 feet above the surrounding ground surface elevations. The soils surrounding the furnace slope away and indicate settlement and voids in a few locations adjacent to the structure. The furnace structure is known to contain flammable white phosphorus.

1.7.4 Ore Storage Area

The ore storage area is contained within Phosphoria Gulch on the steep north side of the drainage, as shown on Figure 1-3. Lesser amounts of ore are identified on the south side of the gulch. The ore is of low grade (small phosphorus content), is dispersive and was noted to erode during spring runoff. The top elevation of the stockpile is about 7095 feet, with the bottom elevation at about 6960 feet. The bottom of Phosphoria Gulch contains from 6 inches to several feet of ore. White phosphorus was identified to be mixed in with the ore at the base of the stockpile in one test pit. An estimated volume of about 75,000 yards of ore material remains on the north side of the drainage, based on the survey conducted in 2005.

1.7.5 Clarifier

The clarifier structure is a round concrete water-filled structure, approximately 210 feet in diameter, and up to about 9 feet in water depth in the spring. The bottom of the clarifier pond contains about 0.8 to 1 foot of extremely fine sediment. Probing of the clarifier bottom sediment in May 2006 revealed that the bottom surface is smooth, regular and hard in all probed locations, indicating that the base of the clarifier structure is constructed of poured and shaped concrete. The basin is partially filled with sediment and contains wetland plants, including an abundance of cattails. No piping has been identified to be associated entering or exiting the structure. Water was not observed to either enter or exit the structure during 2004, 2005 or 2006 during runoff. Based on staff gage observation in 2005 and 2006, water levels in the clarifier appear to change in response to precipitation and evapotransporation.

2.0 STUDY AREA INVESTIGATION

2.1 Introduction

The investigations described in this chapter were performed during 2004 and 2005 as part of the SI of the former Central Farmers Fertilizer Facility site in Georgetown Canyon. The purpose of this investigation was to collect data needed to characterize the phosphate ore source in Phosphoria Gulch, characterize the surface and vadose zone soils, characterize surface and ground water pathways to support a Risk-Based Corrective Action (RBCA) assessment and to provide requisite data for input into the Remedial Action Plan (RAP). Data resulting from tasks described in this chapter are used to refine the conceptual model of site hydrogeology and potential pathways, and to evaluate potential impacts from site releases.

2.2 Topographic Mapping and Surveying

Prior to the SI, limited detailed surface information for the site was available beyond the Harrington Peak Quadrangle and engineering drawings of the site layout provided by Nu-West. An initial survey was performed in 2002 by Harper-Leavitt Engineers of Blackfoot, Idaho. This survey included a site boundary identification survey map based on requirements set forth in the Consent Judgment. Control provided by Harper-Leavitt allowed for construction of a site map delineating site roads, Georgetown Creek, former building foundations, structures, construction and demolition landfill units, water tanks, former ponds and storage areas, and activities performed during the SI. The ground survey was performed to establish both control of scale and to tie in surface feature locations and elevations with localized coordinates and U.S. Geological Survey (USGS) elevations. Surveying was also required for subsurface investigations performed during the SI.

During July 2005, Harper-Leavitt performed additional surveys of the phosphate ore pile to provide data for the assessment of the remaining ore quantities in Phosphoria Gulch. Harper-Leavitt also surveyed selected surface water features and areas surrounding the

covered slurry pit in preparation for possible site remedial actions.

To achieve the requirements for mapping and surveying, the following tasks were completed:

- Establishment of control at the site in 2002;
- Performance of a site survey to locate site features, fence line and property boundaries, and site locations for drilling and sampling tasks. This task was completed in early 2002 for use in the SI work plan.
- Survey of locations and elevations of soil borings (ground surface) in June 2004;
- Survey of the locations, measuring point elevations, and ground surface of the two existing 10-inch wells and eight newly installed 4-inch monitor wells;
- Survey of the ore storage area perimeter and surface features;
- Survey control of on-site springs, drains, and estimated covered slurry pit perimeter;
- Construction of the site survey map (DRAWING 1) with a scale of 400 feet per inch and a 20-foot contour interval that included the off-site area adjacent to and south of the property.

Surveying also included identification of the site boundary specified in the Consent Judgment. Specifically a metes and bounds property description of the site was based on the following physical boundaries:

- North Boundary**:** Approximately fifty yards north of gate to mine access road;
- South Boundary: Approximately fifty yards south of the clarifier unit;
- East Boundary: East edge of mine access road above the water tank, east end of Phosphoria Gulch used for ore storage, and;
- West Boundary: West edge of Nu-West-owned Forest Service road above the loading facility.

All survey work was performed under the direction of a licensed surveyor of the State of Idaho,

A copy of the site survey topographic map is provided on Figure 2-1, and shown on DRAWING 1. The map was utilized for detailed analysis of site surface geology and subsurface features, and details locations and dimensions of the former site features, facilities and ore storage areas. After drilling and well construction activities were completed, all new wells were surveyed for both location and elevation. Horizontal control was ±0.1 feet and vertical control was ± 0.01 feet for the monitoring wells.

2.3 Hydrogeologic Investigation

2.3.1 Preliminary Geological Reconnaissance

A preliminary geological reconnaissance was performed prior to initiation of field activities outlined in the SAP. The objective of the geological reconnaissance was to refine the preliminary site model of regional and site hydrogeology, and of potential migration pathways. Specific issues addressed in the reconnaissance included:

- An evaluation of hydrogeologic factors controlling the off-site exposure pathways for ground water and surficial soils;
- Conceptualization of a preliminary model of site-specific hydrogeology which controls the potential release and migration via exposure pathways, and;
- An evaluation of potential human and environmental receptors.

Geological and site reconnaissance included the following tasks:

- Obtaining available site maps of facilities in order to estimate locations of previously existing facilities;
- Interviews of available individuals with working experience at the site and site obtain information on work practices, site features, and information on water resources and occurrences;
- Construction of base maps of the site and immediately adjacent areas that included the topographic and site features, geologic features, and site boundaries.

- Review of site history, processes, facility construction, waste characteristics, and waste management practices (if possible).

- Compilation, review, and evaluation of existing geological information. Sources included USGS publications and other water resource bulletin publications including thesis documents in the vicinity of the site. Data compiled included structural geology, geohydrology, surface water hydrology, and other pertinent details that may relate to conditions at the Central Farmers Fertilizer Facility.

- Compilation and review historic and any available aerial photographs of the Central Farmers Fertilizer Facility and vicinity.

- Performance of a field reconnaissance of site geology and hydrology survey, including mapping of surficial features and potential expressions of geologic structure, examination of off-site expression of geological characteristics that relate to site stratigraphy, structure, and occurrence of surface and ground water.

The geological and site reconnaissance tasks resulted in establishing site control and establishment of former facility site locations, and geologic features shown on Figure 2-2. Completion of the geologic site map shown on DRAWING 2 resulted in a more comprehensive understanding of site and regional factors that affect the site hydrogeology.

2.4 Source Investigation

2.4.1 Phosphate Ore Evaluation

Investigations of solid source materials performed for SI included survey of the ore to estimate volumes and performing grab samples of the remaining phosphate ore material in Phosphoria Gulch for the purpose of evaluating both radiological and chemical characteristics. The remaining phosphate ore had been identified as a material of concern in previous regulatory audits of the site. Three grab samples were collected in 2004 and analyzed chemical and radiologic parameters. These samples were obtained from the upper twelve inches of the ore. Locations of the ore samples are shown on Figure 2-3 (GTORE-1 through GTORE-3).

During 2005, a grab sample of the ore (CVM-1) was obtained to analyze the ore for

geotechnical properties. During the excavation of the ore with a backhoe, white phosphorus was encountered at a depth of approximately three to four feet. The test pit was immediately backfilled.

2.4.2 Sediment Evaluation

Sediment sampling included collection of samples from three composited-sampling locations from sediments within the creek and a representative composite sample obtained from the shallow sediments in the clarifier. Locations of the sediment samples are shown on Figure 2-3 (GTSED-1 through GTSED-4 and GTSED-7). GTSED-7 is a composite sample obtained from the clarifier for TCLP metals analysis. Key issues addressed by the sediment investigation included addressing to what extent creek sediments had been impacted by historic plant activities.

Analyses of sediment samples included analysis of metals at all locations, and semi volatile organic compounds (SVOCs) at the GTSED-2 location on one round in May 2004. These particular analyses were performed to determine the potential for release of organic compounds from these sources to the ground and surface water because of reported organic spills at the site.

2.4.3 Soil Investigations

The purpose of surface soil characterization was to evaluate the chemical background character of the site soils, to identify areas of soil contamination from the historic Central Farmers Fertilizer Facility and to develop project remediation goals based on risk and background. Potentially impacted soil areas included:

- In the areas around the site represented by soils eroded from underlying formations for background assessment;
- Within central areas of the former plant site;
- In the areas of the removed fuel oil tank and the master substation where historic spills

have been reported, and;

- In the areas of the ore storage area.

Key issues addressed by the soil investigation included:

- What is the nature and extent of impacted surface soils?
- What are the chemical properties of the background versus surface soils and phosphate ore in the ore stockpile?

The scope of work included:

- Location of sampling points, as shown on Figure 2-3.
- Collection of four composited background soil samples (GTSO-1 through GTSO-4) from areas containing soils similar to those at the site, and not likely to be influenced by exposures from the former Central Farmers Fertilizer Facility. Soil characterization included evaluation of background soil samples derived from bedrock formations exposed on both sides of the canyon.
- Collection of surface soil samples (GTSO-5 through GTSO-8) from beneath the cover surface at the site, and from the 1-foot depth in auger borings.
- Transporting samples to an analytical laboratory under full chain of custody and control;
- Analyzing samples as specified in Table 2-1, and;
- Collection of QA/QC samples.

The chemical characterization data collected during the soil investigation was used to develop a conceptual understanding of the background and for use in the statistical screening of impacted soils and general chemical characteristics. Data quality objectives for the soil investigation included the identification and the distribution of impacted soils. Soil samples were analyzed for total metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc, and other parameters listed in Table 2-1.

Organic compounds were analyzed from selected surface soil sites. Organic compound analytes are shown in Table 2-1. These selected sample sites include designations GTSO-5 through GTSO-8, as shown on Figure 2-3. These soil sampling locations included sites where cleaning or degreasing operations may have been expected or transformer spills could have occurred, and include the shop and vehicle maintenance areas and at the master substation location.

2.4.4 Vadose Zone Characterization

The vadose zone was drilled and sampled to evaluate the chemical and physical characteristics of the soils and to evaluate the potential for the soils or identified sources to impact ground water quality. The primary purpose of the vadose zone investigation was to obtain data from directly beneath the reclamation soil cover at the site near former fertilizer plant facilities. Shallow soil samples (one foot depth) obtained from this study for chemical analysis were also used in the evaluation of surface soil impacts.

The objective of the vadose zone soil characterization investigation was to evaluate the chemical character of the site soils, to identify the presence of phosphorous or other materials in the buried phos bunkers, to identify areas of elevated soil concentrations from the historic Central Farmers Fertilizer Facility operations and to develop project remediation goals. This investigation utilized hollow stem auger drilling methods with driven samples through discreet zones. Areas evaluated during the vadose zone investigation included:

- Borings GTB-01 through GTB-03 investigated the soils in areas surrounding the phossy water pond slurry pit;
- Borings GTB-04 and GTB-05 investigated soils in the areas around the furnace building, slag pit and the phos storage area;
- Boring GTB-06 investigated the soils in the master substation area;
- Borings GTB-07, GTB-08, GTB-17, and GTB-20 through GTB-24 investigated the soils in areas of the removed fuel oil tank and near the maintenance shop

- Borings GTB-10 through GTB-13 investigated the soils in areas of the acid plant, TSP plant, and TSP shipping building;

- Borings GTB-09 and GTB-14 investigated the soils in areas near the beneficiation building and stockpiled area, and;

- Boring GTB-16 investigated the soils downgradient of the site in sediment runoff pond area.

No drilling was performed through the cover of the phossy water pond or into or beneath the pond for health and safety reasons. Borings performed as part of the vadose zone investigation are shown on Figure 2-4.

Vadose zone characterization assessed the potential for the vadose zone soil to affect the quality of ground water. This characterization was accomplished by the following tasks:

- The thickness of fill, underlying unsaturated native and non-native soils were estimated from data obtained from auger borings and monitor well borings where possible. Auger refusal at shallow depth was a problem at some locations.

- Soil samples were collected at close intervals during drilling for detailed geologic logging. Representative undisturbed and disturbed soil and non-native materials samples were collected at each source boring location. Selected soil samples were retained for chemical analysis and analyzed for metals and general indicator parameters, shown in Table 2-2.

- Representative relatively undisturbed and disturbed soil and non-native materials samples were collected to evaluate physical characteristics.

- Infiltration rates were estimated from the results of physical parameter testing in a geotechnical lab.

Data obtained as part of the vadose zone characterization included physical properties such as thickness of source or soil, character, moisture content, bulk density, permeability, grain size distribution, Atterberg limits, and capillary moisture.

2.5 Monitor Well Installation

Eight (8) monitor wells were installed during 2004 as part of the SI. The primary purpose of

well installation, testing and sampling was to obtain data that could be used to evaluate the nature and extent (horizontal and vertical) of ground water impacts in the shallow alluvial and deeper bedrock aquifer systems. The well locations shown on Figure 2-5 were selected to: 1) identify and evaluate potential sources of ground water impacts; 2) measure ground water elevations and estimate the direction and magnitude of hydraulic gradients; 3) characterize the upgradient background water quality (GT-1); and 4) evaluate the potential for off-site migration of contaminated ground water. In addition, the wells were used to evaluate aquifer hydraulic characteristics including potentiometric levels, hydraulic gradients, and transmissivity. Total depths and screened intervals of wells were designed to evaluate vertical hydraulic gradients and differences in water quality. The eight monitor wells include seven shallow wells (22 to 68 feet) and one deep well to a depth of 160 feet in bedrock.

To achieve the objectives of monitor well installation, the scope of work included:

- Obtaining the drilling permits;
- Drilling, installing, and surveying seven shallow monitoring wells;
- Drilling, installing, and surveying one deeper bedrock monitoring well, and;
- Developing all wells until the discharge water was relatively free of turbidity, sand, and drilling fluids.

Data obtained from the monitoring wells was used to:

- Evaluate ambient ground water quality within potential ground water migration pathways;
- Evaluate the presence of shallow ground water impacts beneath the site in the migration pathways identified;
- Evaluate potential deeper ground water migration pathways and whether those deeper zones have been impacted by the operations of the Central Farmers Georgetown facility;
- Evaluate principal water bearing zones, migration pathways, direction and rate of

potential chemical migration based on water level observations and well testing;

- Produce an analytical database for screening risk and comparison with Idaho Ground Water Quality Standards, and;
- Provide data and observations to support development of the remedial action plan.

The lithologic data obtained during drilling was used to evaluate the hydrogeology underlying the area and ascertain the extent of impact to the shallow water-bearing zones. The types of data obtained from the monitoring well installations included geologic characterization, ground water contaminant concentrations with time over a two-year period, general ground water quality parameters, piezometric head, and hydraulic conductivity.

The shallow monitoring wells were located to characterize the upgradient “background” quality of ground water moving onto the site, and to investigate the potential migration off the Central Farmers site via the ground water pathway. To characterize potential impacts in the uppermost ground water aquifer zone, shallow monitoring well GT-1 was drilled along the upgradient perimeter of the site. Four wells were located within the central areas of the former facility, GT-2 near the slurry pit, GT-3 near the furnace and phos storage areas, GT-4 near the phos ore beneficiation building, and GT-5 in the vicinity of the former TSP and acid plants. One well, GT-6, was placed near the clarifier at the most downgradient location on the site. One additional shallow well, GT-8, was drilled next to deep well GT-7 to estimate vertical gradients on the site.

One deeper bedrock monitor well was constructed at the site during the SI, as shown on Figure 2-5. Information obtained during the geological investigation (Ralston, 1979) indicated that the Phosphoria Formation acted as a vertical barrier to flow (aquitard). Therefore, it was assumed that the gradient in the deeper bedrock aquifer may flow to the north in response to stratigraphic relationship and regional structure at the Central Farmers site. The deep well location allowed evaluation of ambient water quality and assessment of deeper bedrock ground water gradients when used in combination with the existing on-site deep well. Piezometric data from the deeper monitor wells allowed for evaluation of

horizontal gradients within the bedrock aquifer and vertical gradients between the alluvial and bedrock aquifer.

The monitoring wells were developed using airlift, bailing and pumping techniques after grouting and well construction was completed. The pH, specific conductivity, and temperature of the produced water were monitored during well development using portable pH and specific conductivity meters.

Data quality objectives for the SI monitor well installation program were achieved. Monitor well data were used to characterize ground water occurrence and flow directions as discussed in Chapter 3 and ground water quality as presented in Chapter 4. Monitor well drilling installation methods and data including geologic logs and water level elevations are provided in Appendix A to this report.

2.6 Aquifer Testing Program

Aquifer characterization included interpretation of lithologic, hydrogeologic, and aquifer test data from monitor wells installed in 2004 at the Central Farmers Fertilizer Facility project area. The overall purpose of aquifer characterization was to evaluate the physical controls on ground water flow and potential migration of impacts from the site and to provide data to support the RAP. Data obtained from the aquifer testing program was used to estimate and characterize the relative permeabilities of the aquifers. Aquifer tests consisted slug tests and specific capacity tests in completed monitoring wells. Reduction and analysis of the slug test and specific capacity test data was performed to estimate aquifer hydraulic properties.

The scope of work for the completion of the aquifer characterization at the Central Farmers site included:

- Drilling, geologically logging, completing and developing wells;
- Measuring water level elevations in open borings, new and existing wells on an

approximate monthly basis between June 2004 and November 2004;

- Measuring water level elevations monitoring wells on an approximate monthly basis in 2005 through October 2005;
- Conducting slug tests in each new well;
- Conducting short-term (minimum 100-minute tests) specific capacity tests in the new wells, and;
- Reducing and analyzing data to estimate hydraulic properties.

Aquifer test data obtained from the tests achieved the data quality objectives outlined for these tasks. The hydraulic conductivity, transmissivity and specific capacity data obtained from this task were used to characterize ground water flow that is discussed in Chapter 3.

Detailed descriptions of the various aquifer test methods and results are presented in Appendix A to this report. Appendix A also contains descriptions of the analytical methods used and identifies limits to the interpretations based on data quality, aquifer characteristics, and assumptions.

2.7 Water Quality Investigations

2.7.1 Ground Water Quality Studies

The data obtained from the ground water sampling program at the Central Farmers project area SI were used to achieve the following objectives:

- To evaluate ambient water quality, including potential impacts from the industrial sources, other sources and the general geochemical regime;
- To evaluate and characterize the occurrence of a release of from the former defined sites at the Central Farmers Fertilizer Facility;
- To detect impacts at downgradient well sites;
- To evaluate water quality trends, based on data obtained over time;

- To evaluate seasonal variations in ground water piezometric levels and water quality characteristics over a 15 month period;
- To develop a project-specific database to support risk characterization for the RAP;
- To determine appropriate parameters to monitor during the implementation of the RAP;
- To develop preliminary information to support the development of the RAP.

Nine sample rounds were completed between July 2004 and October 2005 and analyzed for general indicators, total metals, anions, and cations. Samples for PCBs and total petroleum hydrocarbons analysis were typically collected from wells GT-4 and GT-5 except when water levels were too low to collect samples. The existing deep well was also sampled twice, once in July 2004 and once in May 2005. The ground water analyte list is shown in Table 2-4.

The scope of work for ground water sampling included:

- Collecting nine rounds of ground water samples from the new shallow and deep monitoring wells at the site, and from the preexisting deep well during the first and sixth sampling rounds;
- Collecting duplicate and blank samples for quality assurance and quality control;
- Transporting samples to an analytical laboratory under full chain of custody and control;
- Analyzing water samples as specified in Table 2-4;
- Performing depth to water measurements in monitor wells, and;
- Verifying and reducing sampling data, including preparing potentiometric surface maps.

Information obtained from the ground water sample analyses is required to evaluate the ambient water quality and geochemical regime. These data are also used to evaluate sources and the nature and extent of ground water impacts at the site, to characterize risk and to support the RAP.

Information obtained from the ground water sampling results included:

- Ground water contaminant concentrations and distribution;
- General water quality parameters including dissolved solids, anions, cations, pH, specific conductivity, and temperature; and,
- Ground water elevations.

Data quality objectives for the SI monitor ground water sampling program were achieved. Potentiometric gradients during sampling events are shown in Chapter 3. Results of the ground water chemical analyses are presented in Chapter 4. Ground water sample collection methods are presented in Appendix A. Appendix B contains analytical database for all analyzed parameters obtained from the nine sampling rounds. The raw analytical data is shown in Appendix C (on disk).

2.7.2 Surface Water Sampling and Measurements

Surface water samples were collected on an approximate monthly basis during the field seasons in 2004 and 2005 and analyzed for general indicators, total metals, anions, and cations. The surface water analyte list for the Central Farmers Plant project is shown in Table 2-3, and sampled locations are shown on Figure 2-5. The data obtained from the surface water sampling program at the Central Farmers Plant Project Area SI were used to achieve the following objectives:

- Evaluate ambient water quality in Georgetown Creek and contributing ephemeral streams and the general geochemical character;
- Evaluate the occurrence of a release of hazardous substances from the former defined industrial sites and impacts from runoff from the ore storage areas at the Central Farmers Fertilizer Facility;
- Evaluate the occurrence and magnitude of releases from the site to Georgetown Canyon Creek;
- Characterize the nature of any such releases on-site, if identified;

- Evaluate water quality trends;
- Evaluate seasonal variations in surface water flow characteristics and evaluate losses from and gains to the creek through the 60” CMP culvert beneath the site;
- Develop a project-specific database in support risk characterization, and;
- Develop preliminary information in support of the RAP.

The specific scope of work included:

- Collecting surface water samples from three locations in Georgetown Creek, above and below the settling ponds in Phosphoria Gulch, and from the clarifier;
- Collecting surface water samples from four surface water locations across the surface of the site on one round;
- Collecting duplicate and blank samples for quality assurance and quality control;
- Transporting samples to an analytical laboratory under full chain of custody and control and analyzing for parameters shown in Table 2-3;
- Performing flow measurements in Georgetown Creek, and;
- Verifying and reducing surface water sampling and flow measurement data.

Discussions of flow characteristics are contained in Chapter 3. Discussion of the surface water quality sampling results is presented in Chapter 4. Ground water sampling methods and data are described and provided in Appendix A. A complete listing of analytical results is presented in the surface water database presented in Appendix B. The raw analytical data is contained in Appendix C (on disk).

3.0 SITE PHYSICAL CHARACTERISTICS

3.1 Surface Features and Physiographic Description

The site of the former Central Farmers Fertilizer Facility, as defined by the Consent Judgment, occupies approximately 87 acres on patented ground at a location approximately seven miles to the northeast of the City of Georgetown, Idaho as shown on Figure 3-1. The site is constructed on both native fill materials and slag produced from the plant process. Caribou/Targhee National Forest land surrounds the site.

The fertilizer site examined during this SI is located in Georgetown Canyon on the upper (allochthanous) Meade Thrust plate. The site lies between the Aspen Range to the north and northwest of the site, and the Pruess Range containing the highest peak, Meade Peak directly to the east of the site. Topographic relief in the area is denoted by the contrasting elevations between the mountain ranges with highest elevation of 9,957 feet (Meade Peak) and the site canyon areas with elevations of about 6,860 feet above mean sea level (amsl).

The Pruess Range is considered part of the Middle Rocky mountain physiographic province. The ranges surrounding the site are northerly trending and are comprised of folded and tilted fault block features similar to the Basin and Range Province. The general topographic features differ from the Basin and Range in that the valleys tend to be narrower, and contain greater vegetation due to greater amounts of available moisture (Cressman, 1964). Much of the surficial erosion features in the area are related to resistant geologic structure, faults, and erosion of these features. Resistant limestones tend to define ridges, such as the Brazer Limestone that defines Snowdrift Mountain and Dry Ridge to the east and west of the site, respectively, whereas heavily fractured formations or shale features tend to form valleys and drainages. Georgetown Canyon has been eroded partly into softer lower Triassic rocks and the softer non-resistant Wells Formation in the center of the Georgetown Syncline. In contrast, the uppermost beds of the Brazer Limestone, the Rex Chert and the contact between the upper and Lower Dinwoody can be traced along strike for miles to the west of Snowdrift Ridge in Georgetown Canyon (Cressman, 1964).

Georgetown Creek (shown on older maps as Twin Creek) which flows through Georgetown Canyon flows directly across the site from north to south as shown on Figure 3-1. The creek enters the 60-inch corrugated metal pipe (60-inchCMP) just to the north of the fenced off portion of the site at an elevation of 6918 feet amsl. Georgetown Creek is contained within the pipe beneath the site for about 2,283 feet, exiting the CMP at an elevation of 6873 feet amsl, at a location approximately 615 feet to the south of the main gate entrance to the site. The creek was sampled at three locations during the SI.

The site area receives much of the moisture from snowmelt and runoff directly onto the site. Nearby Slug Creek snow station indicates an average peak snow water equivalent of about 18 inches that occurs within the first week of April (NRCS, 2005). However, during 2004 and 2005, the peak snow water equivalent was approximately 13 inches, about 70 percent of normal.

A small (about 1 cfs or less) annual flow discharges from Phosphoria Gulch and is diverted a sediment pond (GTSW-6) located south of the fenced area. During 2005, the overflow from the sediment control pond emptied into Georgetown Creek, adding measurable volume and some fine sediment. The flow from the sediment control pond stopped when the flow down Phosphoria Gulch slowed in early summer. The flow in Phosphoria Gulch was sampled when available during the SI although no flow measurements could be reasonably made as the result of the shallow depth of the flow. During late summer and fall, the flow in Phosphoria Gulch disappeared within the drainage above the ore piles. This site was routinely sampled during the SI.

The draw immediately west of the north end of the fenced area contains ephemeral springs that issue after runoff, at an elevation of about 400 feet above the site. These springs issue from a suspected fault zone intersecting at high angle to the axial trace of the Georgetown Syncline. This spring area was likely developed during site operations for exploitation of available water for former site operations. Some of this water now flows to the canyon floor during runoff and is collected in a drain that empties into the 60-inch CMP beneath

Georgetown Canyon Road.

Immediately east of the furnace and below the water tank, a spring issues along the contact between the lower Dinwoody Formation and the Phosphoria Formation. This contact is indicated to be a fault contact within the site area. These springs enter the fenced portion of the site to the north and east of the furnace building footprint. These springs create marsh-like conditions within the former facility area that appear to affect site water levels. Water issuing from these seep areas flowed across the lower elevations of the site throughout the 2004 and 2005SI field seasons, causing the site ground surface (and much of the investigated areas) to remain under saturated conditions during much of the year. During 2005, the surface water flowing across the site was noted to flow south off of the site near the gate entrance and discharge into a drain which may discharge to the creek. This on-site surface water was sampled during the SI in July 2005.

Surface elevations at the Central Farmers Fertilizer Facility site range from approximately 7,180 feet amsl on the eastern side of the site near the mine road, 7060 feet amsl along the Forest Service road on the west side of the site area. The north end of the site near well GT-1 is about 6,960 feet amsl and the road elevation is approximately 6858 feet amsl at the surveyed southern boundary, as defined by the Consent Judgment. The surface expression of the site is steep on the east and west sides, with occasional outcrop exposures that crop out through surficial soils where road cuts are present. Resistant members of the Rex Chert and Wells formations also form occasional outcrops through the soil mantle.

3.2 Demographics

According to the census of 2000, there are 538 people, 182 households, and 147 families residing in Georgetown, approximately 7 miles to the southwest of the site. The population density is 802.6/mi^2. There are 200 housing units. The racial makeup of the city is 97.77 percent White, 0.19 percent African American, 1.12 percent Native American, 0.00 percent Asian, 0.19 percent Pacific Islander, 0.37 percent from other races, and 0.37 percent from

two or more races. About 1.67 percent of the population is Hispanic.

There are 182 households out of which 45.6 percent have children under the age of 18 living with them, 75.3 percent are married couples living together, 4.9 percent have a female householder with no husband present, and 19.2 percent are non-families. Approximately 17.0 percent of all households are made up of individuals and 8.2 percent have someone living alone who is 65 years of age or older. The average household size is 2.96 and the average family size is 3.35 (U.S. Census Bureau, 2000)

In the city the population is spread out with 34.6 percent under the age of 18, 7.8 percent from 18 to 24, 24.9 percent from 25 to 44, 19.7 percent from 45 to 64, and 13.0 percent who are 65 years of age or older. The median age is 32 years. For every 100 females there are 91.5 males. For every 100 females age 18 and over, there are 101.1 males (U.S. Census Bureau, 2000).

The median income for a household in the city is $33,500, and the median income for a family is $37,813. Males have a median income of $30,938 versus $13,750 for females. The per capita income for the city is $12,673. Approximately 11.9 percent of the population and 11.3 percent of families are below the poverty line. Out of the total population, 18.8 percent of those under the age of 18 and 0.0 percent of those 65 and older are living below the poverty line. (U.S. Census Bureau, 2000).

Land in the Georgetown area is zoned for agricultural and residential uses. The most prominent crops grown in the area are wheat, barley, and alfalfa.

3.3 Wildlife

Selected terrestrial wildlife species in the area of the Central Farmers site are shown in Table 3-1 (Dames & Moore, 1995). Large and small game animals are present within and surrounding the project area. The Idaho Fish and Game Department has divided areas of habitat in southeast Idaho into big game management units. The site area lies within

management unit #76. Major big game species in the vicinity of the site include elk, mule deer, moose, black bear, and mountain lion. Elk occur in unit #76, but are widely distributed over their summer range, which is mainly confined to the conifer-aspen vegetative type. The preferred critical elk wintering areas are generally in the sagebrush-grass vegetative cover type. Elk migration routes in the southeastern Idaho area are often complex. Calving occurs on winter, spring and summer ranges. Favored calving areas appear to be in the sagebrush-grass vegetation type adjacent to conifer-aspen areas.

Mule deer are the most important big game species in Idaho in terms of hunter participation and total animals harvested. The critical winter range of these animals is located in the sagebrush-grass vegetative type upwards into the mountain brush type. Mule deer tend to use the same wintering areas year after year. If migration routes are well developed these areas tend to be used even if partially blocked.

Moose are also indigenous to the site area. Black bear are also noted in the study area, although the population is at a low density. The mountain lion is also present in the area, but its status and numbers are unknown.

Sage grouse and sharp tailed grouse exist in the sagebrush-grass vegetative type, usually near stream bottoms and meadows. Other small game species include: two species of forest grouse (blue and ruffed); two species of partridge (the chukar and the Hungarian); the pheasant; the snowshoe hare; the white tailed jackrabbit; cottontail and pygmy rabbits; and the morning dove.

A number of mammalian non-game species are noted in the southeastern Idaho area. Although less is known about this group of animals in terms of their life habits, they are one of the more important vertebrate species present because they constitute the food base for a number of wildlife species higher in the food chain. This group includes mice, voles, ground squirrels, and beaver. Beaver have been recognized at a number of locations in Georgetown Canyon. Other well known species within the area are the muskrat and otter.

There are a number of raptors known to inhabit the area. The better known species are the peregrine falcon and prairie falcon, osprey, various hawks, owls, golden eagles and bald eagles. Golden eagles and bald eagles are known to winters along the Bear River.

3.3.1 Fish Species

No species of fish were noted in Georgetown Creek at the site, although rainbow trout are identified in beaver ponds below Church Hollow, about 3 miles downstream to the south of the site. No studies of species are known to have been completed in Georgetown Creek, although rainbow, cutthroat, whitefish, sucker, dace, shiner and sculpin are noted to exist in the Bear River.

3.4 Vegetation

North- and east-facing hillsides in Georgetown Canyon are generally forested with aspen, Douglas fir, and lodgepole pine. Alpine fir and Engelmann spruce grow in some of the moist mountain valleys and on some of the higher slopes. Limber pine is found on the highest divides. South- and west-facing slopes are not generally heavily forested, but are covered with mixed grass and sagebrush or with mountain-lilac, serviceberry, chokecherry, and other mountain brush. Mountain mahogany grows on some relatively dry slopes along lower Georgetown Canyon and near the west front slopes of the Aspen Range. Sagebrush is found at all elevations (Cressman, 1964).

3.5 Regional Features

Regional physiographic features in the vicinity of the site in Georgetown Canyon are shown on Figure 3-2. The Peale Mountains described by Cressman (USGS, 1964) include the Aspen and Pruess Ranges and consist of northward-trending ridges that are separated by narrow valleys and canyons and are cut by several steep, narrow transverse canyons, including the canyon of Deer Creek, Wells Canyon, and lower Georgetown Canyon. The highest point in the area is Meade Peak of the Pruess Range at an elevation of 9,960 feet.

The lowest point is 6,200 feet near the mouth of Georgetown Canyon. In general, the elevation of the major divides in the Peale Mountains decreases from east to west. The crest of Snowdrift Mountain is greater than 9,000 feet and Dry Ridge ranges between 8,500 and 9,000 feet. Most crests in the Aspen Range are between 8,000 and 8,500 feet above sea level. Local relief is as much as 3,300 feet near Meade Peak and between 2,000 to 3,000 feet throughout much of the Preuss Range. Slopes are steep throughout most of the area. Divides are sharp in the Preuss Range but they are somewhat more rounded in the Aspen Range (Cressman, 1964). General Features of the site are shown on the aerial photograph on Figure 3-2A.

3.6 Regional Geology

A discussion of the regional geology was extracted from Borden, 1986. The Idaho—Wyoming—Utah overthrust belt is an arcuate salient composed of six to eight major allochthons, as shown on Figure 3-3. The belt extends from the Snake River Plain to near Salt Lake City and is part of the Cordilleran Foreland thrust belt that extends from Alaska to Mexico.

The thrusting occurred in a thick wedge of sedimentary rock, which is approximately 12,000 feet thick in the east and thickens to 60,000 feet on the western margin of the overthrust belt (Blackstone, 1977). The lowest regional level of detachment is in the Cambrian and the Precambrian basement, which is not deformed. Thrusting has tended to double the section and has thus caused a total shortening of about 50 percent in the width of the overthrust belt (Royse et al., 1975).

From west to east, the major thrust faults are the Paris, Meade, Crawford, Absaroka, Darby and the Prospect (Figure 3-3). Thrusting began in the Latest Jurassic when movement began on the Paris Thrust. Movement on the Meade and Crawford Thrusts, which was contemporaneous, began in the middle to late Cretaceous (Wiltschko and Dorr, 1983). The total displacement on the Meade was approximately 24 miles with a west to east transport direction (Royse et al., 1975). The sites of active deformation moved successively eastward

over the next 100 million years until thrusting ceased In the Early Eocene (Wiltschko and Dorr, 1983). Since the Eocene much of the overthrust belt has experienced extensional tectonic overprinting. Many of the larger valleys such as Grand Valley, Bear Lake Valley and Star Valley are the topographic expressions of half—graben structures (Royse et al., 1975).

The majority of rocks exposed on the Meade Plate are Paleozoic in age. The plate does not contain surface exposures of rocks older than the Mississippian Lodgepole Limestone. Below the thrust, exposures of the Absaroka Plate consist predominantly of Mesozoic age rocks and the Jurassic Twin Creek Limestone tends to be in footwall contact with the thrust. The Twin Creek is exposed below the thrust fault exposure below Church Hollow.

3.6.1 Regional Geologic Structure

Cross section of the geologic structure of the area is illustrated on Figure 3-4. The most prominent structural feature of the field area is the Meade Overthrust. South of Georgetown Canyon the thrust is a single fault. Near the project area, several thrust surfaces and horses are associated with a duplex structure along the Meade (Borden, 1986). The name Meade Thrust Fault was applied by Cressman (1964) to fault exposures in this area which had previously been named the Bannock Overthrust by Richards and Mansfield (1912). It generally places older Mississippian limestone on top of the upper Twin Creek Limestone or the Preuss Sandstone of Jurassic age.

The upper Meade Plate, on which the site is located, is dominated by a series of north-trending folds, which dominate the structure in the project area. The largest horses of the underlying duplex contain strata folded into a large—scale overturned syncline (Borden, 1986). South of Georgetown Canyon the Meade places the Mississippian Lodgepole Limestone atop the Jurassic Giraffe Creek Member of the Twin Creek Limestone. This represents a stratigraphic displacement of greater than 35,000 feet. The thrust does not change its stratigraphic position significantly in this area. The attitude of the Meade, as determined by a three-point solution is approximately N45^{0}W, dipping 23 degrees to the

northeast. Structural dips measured on beds directly above and below the thrust vary between 20 degrees and 45 degrees. The axial surfaces of most of the folds dip to the west. The exception is the Snowdrift anticline, in which the axial plane is nearly vertical. The east limbs of several anticlines are overturned and cut by thrusts that occur within or between the incompetent lower member of the Dinwoody formation, the Meade Peak member of the Phosphoria Formation, and the upper member of the Wells Formation.

Structure in the vicinity of the investigation area is dominated by north-northeasterly trending Georgetown Syncline fold feature, schematically illustrated on Figure 3-4A relative to the site. The Meade plate contains a series of north-trending, low plunging, asymmetrical and overturned folds, which are thought to be box folds. The fold axial surfaces dip to the west and strike approximately N10°E. The wavelength of these folds is about 8,000 feet (Borden, 1986). Except for the Summit View Anticline that was named by Cressman (1964), all of these folds were first named by Mansfield (1927). The folds in the vicinity of the project area are discussed in sequence from east to west.

3.6.1.1 Snowdrift Mountain Anticline

The axial trace of the Snowdrift Mountain Anticline (illustrated on Figure 3-4) is exposed to the east of the project area. The anticline is exposed in profile on the steep southern slope of Snowdrift Mountain (Sections 18 and 19, Township11South, Range 45 East). In this area, the western limb dips gently to the west and the eastern limb is nearly vertical.

The anticline is cored by the Madison Group, which is terminated downward by the Meade Thrust. The thrust fault and the beds below it are not folded by the anticline (Cressman, 1964).

In the vicinity of Meade Peak (Sec. 1, Township11South, Range 44 East) a profile of the Snowdrift Mountain Anticline is again exposed. The fold is more symmetrical here and both limbs dip steeply. The anticline here closely resembles the chevron core of a box fold (Cressman, 1964).

3.6.1.2 Georgetown Syncline

The Georgetown syncline is the dominant structure in the project area, illustrated on the cross section on Figure 3-4, and shown approximately on Figure 3-4A. The fold is large and complex, and the west limb of the anticline is overturned. In the vicinity of the project area, the syncline is plunging to the north at about 25 degrees (Borden, 1986). The fold is approximately three miles across and extends in some form from the south end of the thrust sheet to 30 or 40 miles beyond the north end of the area. It plunges gently but irregularly northward. The Georgetown Syncline is broad and overturned to the east and has a minor fold developed on the normal limb.

The Lower Triassic rocks in the center of the syncline have been compressed into a number of small discontinuous folds that die out laterally just north of the project area, and therefore probably vertically before reaching the Phosphoria formation (Cressman, 1964).

Within the project area, the surface trace of the Phosphoria formation swings around the plunging nose of the Georgetown Syncline, and bends very sharply and is offset by several transverse faults. The Meade Peak member is noticeably thinned east of the site for at least 1,000 yards along strike on the east side of the fold and for about 1,000 feet on the west side. The sharp bend and the transverse fault in the Phosphoria and the thinning of the Meade Peak member may be related in some way to the northeast-striking longitudinal fault within the Wells formation on the east limb of the syncline. Details of the structure of the Georgetown syncline within the site are obscured by poor exposures in the project area and complicated by faulting.

3.6.1.3 Dry Valley Anticline

The trace of the axial plane of the Dry Valley anticline is located west of the project area as shown on Figure 3-4, and extends from near the south end of Dry Ridge, where it is truncated by a fault, north-northeastward along the west side of Dry Ridge to Dry Valley. It

is tightly folded, nearly isoclinal, and generally overturned slightly to the east. The segment just east of Summit View is overturned to the west. A thrust zone cuts the east limb of the anticline. The largest thrust has a stratigraphic displacement of about 1,600 feet, and the other thrusts in the zone appear to be relatively small and discontinuous. Thrusts cut out part of the Brazer limestone, thin the Wells formation, thin or cut out the Meade Peak member of the Phosphoria formation, and thin the Rex Chert member of the Phosphoria and the lower member of the Dinwoody. The thrusts die out northward before reaching the edge of the area. Southward they cross Georgetown Canyon at its bend, continue southeastward, and terminate against tear faults in South Canyon. The dips of most of the thrusts are not known, but they generally seem to be approximately parallel to the bedding and therefore probably dip 60 or 70 degrees to the west.

3.7 Site Geology

Site geology was verified in the field during the site investigation. The site geologic map is presented on DRAWING 2. Figure 3-4 shows a cross-section through the site area with the location of the Central Farmers Fertilizer Facility shown. The site is located on the east limb of the Georgetown Syncline. The site overlies four geologic units (Recent and Quaternary alluvium and fill (estimated from the SI to be about 45 to 62 feet), Wells Formation (estimated at 1,300 to 2,000 feet thick), Phosphoria Formation (300 to 450 feet), and the lower Dinwoody Formation (lowest part of section). The Meade Overthrust is estimated to exist at depths of 4,500 to 5,800 feet beneath the site (Cressman, 1964). The strike varies across the site in relation to the folding of the synclinal structure. A minor anticline structure is inferred based on strikes and dips on the northern portion of the site. Dominant joint patterns in the rocks on the bottom sides of the valley on the site are N 25° E to N 35° E, dipping 85 degrees to the northwest or southwest. A second pattern was noted to strike N 40° W and dip vertically. Several north-trending normal or strike-slip-type faults are indicated to cross Phosphoria Gulch on the east side of the site. The Wells was noted to be heavily fractured at the mouth of Phosphoria Gulch, with dominant joint sets striking approximately N 40° W and dipping steeply to the southwest.

3.8 Regional Hydrology

The Great Basin-Columbia River drainage divide crosses the area from southeast to northwest. Crow and Slug Creeks drain into the Columbia by way of the Blackfoot and Snake Rivers. Georgetown, Preuss, and Montpelier Creeks drain into the Bear River, which empties into the Great Salt Lake, located in the Great Basin.

3.8.1 Hydrostratigraphy

Hydrostratigraphic units in the immediate vicinity of the Central Farmers Facility project area are presented below from oldest to youngest. Except for the Gannett group, the Paleozoic and Mesozoic formations are not very porous (Cressman, 1964). Even sandstone of the Wells formation that is porous in weathered outcrops is tightly cemented at depth (Zeni, 1953). This, together with the occurrence of springs, suggests that the Dinwoody formation, where highly fractured, is the most likely bedrock formation to carry ground water. Based on the observed northerly plunging structure in the project area, and the assumed very low permeability of the Meade Peak member of the Phosphoria Formation underlying the Dinwoody, it was assumed before the SI that bedrock water levels followed structural trends. This gradient was evidenced based on the results of deep water levels measured during the SI, showing that the bedrock aquifer gradient is also in a northerly direction.

3.8.1.1 Wells Formation and Grandeur Tongue of the Park City Formation

The upper member of the Wells Formation is exposed in the southern portion of the site as shown on DRAWING 2. The Wells exposure extends as far north as Dud Hollow and Phosphoria Gulch, where it contacts the Phosphoria Formation. Ralston (1979) indicates that the siliceous limestone of the Wells upper member is of moderate permeability.

Richards and Mansfield (1912) originally placed the Permian dolomite immediately below the Phosphoria Formation in the Wells. Cheney and others (McKelvey, 1959) classified it as the Grandeur Tongue of the Park City Formation. It consists of approximately 75 feet of

light gray dolomite and limestone (Conner, 1980; Cressman, 1964). The upper half contains lenses and nodules of black chert.

The Pennsylvanian and Permian-age Wells Formation disconformably overlies the Aspen Range Formation (Borden, 1986). The type-section was named by Richards and Mansfield (1912) at Wells Canyon, approximately five miles to the northeast of the site. Cressman (1964) estimated the thickness of the Wells in this area to be between 1,300 to 1,500 feet, although the formation is indicated to be up to 2,000 feet north and west of the site (Borden, 1986). The Wells Formation is exposed on both canyon sides, immediately south of Phosphoria Gulch and to the south of the site. The Wells Formation was also intercepted in well boring GT-4. The base of the upper member of the Wells is made up of white, fine-grained quartzite. The contact between the upper and lower members of the Wells is gradational through a zone of interbedded sandstone and limestone.

The upper member of the Wells is divided into three sections, each constituting about one-third of the member (Cressman, 1964). The lowest third member consists of very fine-grained quartz sandstone (Cressman, 1964), and is of moderate to high permeability (Ralston, 1979). It does not commonly crop out but generally forms talus in which the fragments are blocky and brown or reddish-brown. The weathered fragments are light in weight, porous, and non-calcareous. Several beds of light-gray finely crystalline to dense limestone, similar in appearance to much of the limestone in the lower member of the Wells, occur in the middle of the unit on the west side of Snowdrift Mountain and on the east side of Harrington Peak.

The middle third of the upper member is mostly light gray or light-brownish-gray finely crystalline to dense dolomite and very fine-grained dolomitic and calcareous sandstone (Cressman, 1964). The member is of high permeability (Ralston, 1979). The dolomite beds form prominent dip slopes on the west side of Georgetown Canyon and are well exposed in gullies (Cressman, 1964). Some dolomite beds contain lenses and nodules of black chert and closely resemble the Grandeur tongue of the Park City formation.

The uppermost third of the upper member is of moderate permeability (Ralston, 1979) and consists mostly of non-resistant grayish-brown and reddish-brown calcareous sandstone. This member is the unit exposed within the southern portion of the site. The sandstone is typically very fine-grained to fine-grained and contains well-rounded and frosted grains of medium sand scattered throughout. The rock is rather poorly-sorted compared with other sandstone in the Wells Formation (Cressman, 1964). Much of the sandstone has been brecciated and rehealed and is commonly porous and vuggy in surface exposures. Many of the breccia fragments are laminated, and it is apparent in many exposures that the breccia is not sedimentary but has resulted from fracturing of the rock, slight rotation of the fragments, and recementation. An interval about 100 feet thick at the top of the member contains red sandstone and limestone. These red beds generally form a brush- or tree-covered swale. The uppermost part is exposed in bulldozed roads on the east side of the site in Georgetown Canyon. The top of the member is marked by a gray and brown, poorly sorted, fine-grained, calcareous, quartz sandstone. The contact with the overlying Grandeur Tongue is conformable and indistinct (Borden, 1986).

3.8.1.2 Phosphoria Formation

The Phosphoria Formation outcrops in Phosphoria Gulch, crosses Georgetown Canyon beneath a portion of the site of the former facility where it is covered by alluvium and fill materials, as shown on DRAWING 2. The Phosphoria is partially covered on the west side of the canyon beneath Dud Hollow.

The Permian-age Phosphoria Formation was named from the type section in Phosphoria Gulch, which is located and exposed within the project area on the east side of the canyon. Formation thickness in the project area ranges between 306 and 453 feet (Conner, 1980; Cressman, 1964). The Phosphoria rarely crops out, although exposures are viewed above the calcine bin area above the former site in Phosphoria Gulch. The formation contains three distinct lithologic units (McKelvey and others, 1956). The lower unit, called the Meade Peak Phosphatic Shale Member, consists of dark, carbonaceous mudstone and phosphorite. According to Ralston (1979), this member is of low to very low permeability,

and can act as a perching layer for ground water, as is the case noted at the site. The middle (Rex Chert Member) contains massively bedded chert with minor amounts of argillaceous and carbonaceous matter. The Rex grades upward into the Cherty Shale Member (Borden, 1986). The upper contact of the Phosphoria is sharp and conformable (Cressman, 1964) with the lower member of the Mesozoic-age Dinwoody Formation. According to Ralston (1979), this unit is permeable when fractured. The Rex outcrops on the east side of Georgetown Canyon in the vicinity of the former oil tanks and substation area. The Rex is not indicated to outcrop on the west side of the canyon as the result of younger cover materials.

3.8.13 Dinwoody Formation

Mansfield (1927) called the sequence between the Phosphoria Formation and the Thaynes Formation in southeastern Idaho the Woodside Shale (Borden, 1986). This interval was later redefined as the Triassic Dinwoody Formation (Kummel, 1954). Cressman (1964) estimated the total thickness of the Dinwoody to vary between 1,400 and 1,800 feet in the area of the site.

A swale is commonly developed on the uppermost part of the cherty shale member of the Phosphoria formation and on the basal shale of the Dinwoody. The contact between the two formations is generally covered in the project area. Where the contact is exposed, it is sharp and conformable and is marked by a thin nodular phosphorite bed at the very top of the Phosphoria. The lower member of the Dinwoody Formation underlies the northern portion of the former facility, as shown on DRAWING 2. The formation is covered but was identified in the drilling of well GT-7 beneath alluvium and fill at the site, and outcrops in well-defined exposures on the west side of the canyon just north and above the foundation of the former TSP fertilizer storage building. Exposures of the lower member of the Dinwoody formation extend beyond the northern border of the site on both sides of Georgetown Canyon. The Lower Dinwoody was identified to be the main water-bearing bedrock formation beneath the site, based on the drilling and testing of well GT-7. Ralston (1979) indicates that the hydrogeologic characteristics of the Dinwoody suggest moderate

permeabilities for the limestones and shales identified in this unit.

The lower member of the Dinwoody formation which outcrops at the site consists mostly of thin-bedded to fissile light-grayish-brown to olive-brown shale and calcareous siltstone that grades upward into thick-bedded calcareous siltstone and silty limestone. Although there is some clay shale in the base of the member, most of the material described as shale in the measured section is thin-bedded olive-gray, olive-brown, and dusky-yellow calcareous siltstone. The limestone interbedded with the shale is gray and finely crystalline and is generally in beds of one to six inches thick. Some limestone beds contain many vague impressions of pelecypod valves, and much of the limestone weathers a distinctive grayish brown. The medium- and thick-bedded silty limestone in the upper 130 to 200 feet of the lower member is thicker bedded and more resistant than the underlying shale and its position along nearly the entire length of the east limb of the Georgetown syncline is marked by low ridges and aligned knobs. The silty limestone contains equal amounts of silt and calcite and could as validly be termed “calcareous siltstone.” It is typically dark brown and shiny black on weathered surfaces, and it breaks into blocky fragments. Throughout the area the black-weathering silty limestone zone is capped by a gray limestone bed, about 15 feet thick that in many places forms conspicuous dip slopes.

The lower member averages about 700 feet thick or greater in the Georgetown syncline. It is incompetent and poorly exposed, and thickness may range from 500 to 900 feet within a mile or so along strike without any other surface evidence of faulting. Thicknesses as much as 1,000 feet have been described in the Dry Valley quadrangle (Cressman and Gulbrandsen, 1955) and as much as 1,400 feet in the Johnson Creek quadrangle (Gulbrandsen and others, 1956).

Considering the generally small flow of the springs rising from the Dinwoody formation, the amount of water obtainable is probably small (Cressman, 1964). Considerable quantities may be obtained from alluvium in the canyon floors, but the withdrawal of water would likely result in diminished flow in the surface streams in the lower parts of the canyons.

According to Ralston (1979) the upper member of the Dinwoody Formation has similar hydrogeologic characteristics to the lower member. The upper member of the Dinwoody formation is about 900 feet thick in the Georgetown Canyon area (Cressman, 1964), and is exposed just to the north of site property. It contains the same rock types as the lower member, including gray limestone, grayish-brown and olive-brown shale, and brown- and black-weathering calcareous siltstone. The shale is much less abundant and the gray limestone is thicker bedded and much more conspicuous. The limestone beds crop out in ledges and ribs, and the member commonly underlies rounded knobs and hills of intermediate height. The upper member of the Dinwoody outcrops to the north of the site

3.9 Hydrogeologic Characteristics of Site Aquifers

Much of the shallow alluvium found in at the site in Georgetown Canyon consists of silt, silty clay, naturally occurring organic detritus such as wood branches and roots, and silty sand and gravel deposited along the stream course in Georgetown Canyon. Alluvium also contains recent hillwash (Cressman, 1964). In the site area, up to 20 feet of construction fill and slag fill from the former operations were deposited directly over the canyon-fill alluvium.

Ground water at the Central Farmers Fertilizer Facility site is found within the alluvial sequences. Ground water also exists within the underlying Dinwoody Formation, and likely within the Phosphoria Formation above the Meade Peak member. The shallow monitor wells were completed at various depths within the alluvium, although all were completed to about twelve feet below the original static level. The alluvium is considered to be the principal aquifer shallow aquifer at the Central Farmers Fertilizer Facility site.

The hydrogeologic properties of the alluvium were characterized using the geologic, hydraulic head, hydraulic gradient, hydraulic conductivity, and hydraulic response data obtained as a result of the installation, observation and testing of the monitor wells. Completion depths and screened intervals of the Central Farmers Fertilizer Facility site monitor wells and drilled depths are summarized in Table 3-2.

Seven of the SI wells were designated "shallow" wells with total depths ranging between 21 and 68 feet. One well, GT-7, is a deep bedrock well, completed on-site to a total depth of 160 feet at the base of the Dinwoody Formation. The deep well was completed with 20 feet of well screen. The shallow wells were completed with 10 feet of well screen set in alluvium. However, well GT-5 was completed with 20 feet of screen to facilitate the request of IDEQ that the screened interval starts in the vadose zone for purpose of sampling organics.

Two preexisting wells (GT-Shallow and GT-Deep shown on Figure 2-6) are present on the Central Farmers Fertilizer Facility site. These wells were installed prior to the SI, most probably during the time of plant operation. The wells are located within the project area north of the former facility, approximately 510 feet to the north of the fence line and directly west of the location where Georgetown Creek flows into the CMP culvert. The south well (GT-Shallow) is 123.5 feet in depth, and has a shallow static water level, measured at about 15.5 feet below top of casing. Water levels in this well may reflect the shallow water levels in the alluvium at the site, although it may mix water between the alluvium and the bedrock aquifer, based on the total depth of the well and the small observed variability in water levels over time. The existing deeper well (GT-Deep) is located several feet north of the shallow well and is 222.2 feet in depth, with a static water level that ranges between about 50 and 65 feet below the top of casing. Construction details of these wells are unknown. However, based on the difference in water levels between the two wells, it is likely that the deeper well is sealed through the alluvial aquifer sequence and reflects a deeper bedrock water level, similar to the water levels observed in deep monitor well GT-7.

3.9.1 Bedrock Aquifer (Dinwoody Formation)

The bedrock aquifer found in the lower member of the Dinwoody Formation is comprised of thin-bedded to fissile light-grayish-brown to olive-brown shale and calcareous siltstone and limestone. Limestone interbedded with the shale is gray and finely crystalline and is generally in beds of one to six inches in thickness. The rocks yield variable amounts of ground water. Well GT-7 was screened from 140 to 160 feet in the Dinwoody Formation

(total depth of GT-7) and was found to consist of fractured dark brown to olive brown coarse crystalline limestone and interbedded calcareous shale over calcareous siltstone with a specific capacity test hydraulic conductivity estimated to be 22.45 ft/day.

3.9.2 The Alluvial Aquifer

The alluvium comprises the principal aquifer beneath the Central Farmers Fertilizer Facility site. All of the Central Farmers Fertilizer Facility site wells, with the exception of well GT-7, are screened exclusively within alluvium. Wells GT-4 and GT-6 are screened directly above bedrock as the result of a shallow alluvial depth and a greater depth to ground water. The alluvial sequence at the Central Farmers Fertilizer Facility site is variable, although all shallow wells within the fenced plant area demonstrate relatively small hydraulic conductivity. Alluvium identified in well boring GT-1 upgradient of the site consists of coarser sub-angular sandy and silty gravels. On the site, the upper alluvial sequence tends to consist of fine to coarse silty gravels, clayey gravels, and silts and silty clays. The alluvial sequence indicates the presence of coarser sediments in well boring GT-6. Geologic logs of these wells are contained in Appendix A.

Because the primary permeability of the alluvium on the site is relatively small, most ground water is believed to be transmitted in discontinuous stream gravel lenses of fluvial and colluvial materials, and within the coarser native fill materials identified above the contact with bedrock, as observed in the drilling of deep well GT-7. The presence of coarse sand and gravel materials, such as those noted in GT-1 can also greatly increase the ability of alluvium to transmit water. Variations in the ability of the alluvium to transmit water are the result of the inconsistency and heterogeneity of the alluvial aquifer sediments.

The hydraulic conductivities listed in Table 3-3 were estimated from specific capacity tests conducted in the Central Farmers Fertilizer Facility site wells. Field and office methods used to conduct and analyze the tests are presented with the field data and discussed in Appendix A. Hydraulic conductivities estimated from the specific capacity pumping tests conducted in the shallow alluvial wells ranged from 0.47 feet per day (ft/day) in GT-5 to

greater than 190 ft/day in monitor well GT-1. Deep well GT-7 has an estimated hydraulic conductivity of about 100 ft/day. Generalizations about hydraulic conductivities observed within the alluvial aquifer at the Central Farmers Fertilizer Facility site include the following:

- The bedrock aquifer is substantially more transmissive than the shallow alluvial aquifer directly beneath the site.
- The hydraulic conductivity of the upgradient well GT-1 is within the range of the bedrock aquifer hydraulic conductivity, but up to three orders of magnitude greater than the hydraulic conductivity of the other shallow site wells.
- Hydraulic conductivities of the alluvium within the former plant area vary by an order of magnitude.
- The larger hydraulic conductivities within the fenced site area are found along the east side of the site near bedrock contacts.
- Well GT-6 sited at the most downgradient location was tested for short a duration in 2005 and indicated alluvium of larger hydraulic conductivity than shallow wells within the fenced site area.
- A continuous horizontal layer of significantly smaller hydraulic conductivity that could greatly limit or prevent vertical movement of ground water was not identified.
- A continuous horizontal layer of significantly larger hydraulic conductivity along which horizontal ground water flow could be localized was not identified.

3.9.3 Direction and Rate of Alluvial Ground Water Flow

Alluvial ground water flows in response to hydraulic gradients from areas of higher hydraulic head to areas of lower hydraulic head at rates that are proportional to hydraulic conductivity and hydraulic gradient and inversely proportional to effective porosity of the aquifer. Alluvial ground water on the site is indicated to flow from the shallow to the deep aquifer in response to vertical hydraulic gradients and horizontally across the shallow alluvial aquifer in response to horizontal gradients. Alluvial ground water generally flows southward from the topographically higher areas of Georgetown Canyon. In the fenced area of the former facility, the direction of ground water flow at times is directed towards the east from the alluvium into bedrock. Alluvial ground water flow directions appear to

convergence of flow paths on zones of increased transmissivity such as those associated with larger occurrences of higher permeability gravels, fault zones in the Phosphoria and Wells bedrock contact, or fractured zones within the Dinwoody or Wells formations.

Horizontal hydraulic gradients and ground water flow directions within the alluvium are indicated by water level elevations measured during the SI. Water levels measured between July 2004 and October 2005 in the alluvial aquifer are contoured on Figures 3-5 through 3-15. These figures demonstrate the seasonal variability component of flow directions. Based on water level observations during 2004 and 2005, it appears that ground water levels are primarily impacted by snowmelt and runoff peak events.

The predominant flow direction between upgradient well GT-1 and the fence line surrounding the former facility is to the south-southwest, following the slope gradient of the canyon, estimated to be approximately 0.03 feet per foot throughout the year. The alluvial ground water gradient is to the south of the fence line and beneath the former plant site and then flows towards the east-southeast during the late summer and fall seasons as indicated by water levels measured in wells GT-3, GT-4 and GT-5. The strong easterly flow component to ground water flow is likely the result of the loss to bedrock on the east side of the canyon. North-south trending faults identified near the east side of the site, dipping bedrock, and a possible normal fault in Phosphoria Gulch are expected to facilitate flow to the bedrock through localized fractures. North-south trending fractures associated with the faults that cut Phosphoria Gulch may increase local hydraulic conductivities and locally enhance the easterly component of ground water flow.

During the spring, a greater amount of the ground water flows down the canyon within the alluvium than later in the season. Ground water loss also occurs from the alluvium to the bedrock beneath the site, based on an average differential vertical hydraulic gradients noted in paired wells GT-7 and GT-8. The average horizontal hydraulic gradient is estimated to be approximately 0.015 feet per foot (ft/ft) on average. The gradient is less steep in the early summer as the alluvial aquifer fills from runoff recharge. Some site recharge may result from infiltration of surface water running directly onto the site. As the

inflow to the aquifer decreases in summer, the alluvial aquifer tends to drain down to the east and south changing the gradient of the bedrock aquifer.

To the south of the southern facility fence line, the alluvium rests directly on the upper Wells Formation. Ground water is estimated to be present in the alluvium at an elevation that is 15 to 25 feet beneath the creek elevation at the creek discharge from the 60-inch CMP near surface water sampling site GTSW-2. The gradient between the south fence line and GT-6 (a distance of 1730 feet) is estimated to be about 0.05 ft/ft. Little change is noted in gradient throughout the year. During the months of peak runoff, the contours on the potentiometric maps indicate that more ground water flow is discharged down-canyon within the alluvial aquifer. As the water levels drop on the site following the peak runoff, the gradients become increasingly more to the east beneath the site and appear to decrease the amount of flow within the alluvium south of the site. This may account for the drastic change in the ground water level in well GT-6 following runoff in 2004 and 2005.

As previously mentioned, ground water level contours directly beneath the former Central Farmers site appear to be affected significantly by seasonal changes, with the site gradient changing significantly in the months following spring runoff in 2004 and 2005. Hydrographs for each well are contained in Appendix A. Ground water levels fall greater than ten feet over the period of the summer months, leaving some wells dry in later summer and fall months. A steep ground water gradient develops directly beneath the covered phos pond during this period. The flatter gradients beneath the east side of the former facility may result from larger hydraulic conductivities and transmissivities within coarser materials that have been noted in this area.

Water level elevations measured during the SI in the deep existing well and monitor well GT-7 are contoured on Figures 3-16 through 3-24. Based on two data points, these contours indicated a pattern of bedrock ground water flow direction to the north through October 2004, or opposite to the direction observed in the shallow wells. However, between November 2004 and throughout much of 2005, bedrock water levels indicate that flow could be in a southerly or other direction. Figure 3-25 plots water levels in the deep

wells over time and demonstrates water levels differences between the wells. No clear pattern is noted, although the gradient appears to flatten and reverse in the fall and winter months. Water levels elevations in all wells are plotted in Appendix A.

3.9.4 Vertical Hydraulic Gradients

Water level elevations are plotted versus time on Figures 3-26 and 3-27 for grouped shallow and deep wells. These plots indicate the magnitude and direction of vertical hydraulic gradients on the northern portion of the site in addition to seasonal fluctuations over the 15-month period. Water levels appear to peak in the shallow well prior to the peak in the deep well.

Water levels measured in shallow well GT-8 and nearby deep well GT-7 during the SI are plotted versus time on Figure 3-26. This plot indicates the presence of a significant consistent downward vertical gradient of about 0.14 to 0.17 feet per foot between these two wells, with an increasing vertical gradient throughout the season. To the north of this site, existing paired wells GT-Shallow and GT-Deep are located near the point where Georgetown Creek enters the CMP. The vertical water level difference between these two wells also indicates a vertically downward gradient, as shown on Figure 3-27. The fact that the existing shallow well changes very little over the period evaluated indicates that the well may be screened across the alluvium, or the ground water level is affected by the Georgetown Creek elevation. The downward gradient in these two wells is estimated at about 0.43 to 0.5 ft/ft, greater than the vertical gradient noted near the covered slurry pit.

3.9.5 Estimated Ground Water Velocities

As noted earlier, horizontal hydraulic gradients within the shallow alluvial aquifer vary from 0.03 feet per foot in the upgradient part of the site, about 0.015 ft/ft on the site, and to 0.05 feet per foot to the south of Phosphoria Gulch. Effective porosities were conservatively estimated to be 45 percent. Using an effective porosity of 45 percent and range of hydraulic conductivities of 0.5 to 191 ft/day, ground water particle velocities of 0.02 to 13 ft/day is

within the estimated range that can be expected for the site.

3.10 Surface Water Hydrology

The Georgetown Creek drainage flows into the Bear River Basin of southeastern Idaho. The Bear River originates in the Uinta Mountains of Utah, flows north across southwest Wyoming, north into Idaho and then turns back to the south around the Bear River Range west of Soda Springs, continuing its flow southward to the Great Salt Lake in Utah. The Bear River is a gaining stream for most of its length through Idaho, with exceptions noted between Alexander and Grace (Dion, 1974).

Surface water in the project area includes small creeks flowing through the canyons originating from higher elevations. Regionally, Crow Creek to the east of the site and the lower parts of Twin and Preuss Creeks are perennial. Georgetown Creek in the project site area is also perennial. Runoff in the spring months may also include ephemeral streams that flow in response to snowmelt events, such as small side-canyon tributaries into Georgetown Creek.

Stream flow characteristics in the Georgetown Creek study area were investigated during the SI in 2004 and 2005. Flows measured in the creek are presented on Figure in 3-28. Peak runoff occurs as the result of snowmelt. The closest station where snow levels are measured is at Slug Creek. Figure 3-28 shows the snow-water equivalent for the snow pack at Slug Creek station during the 2004 and 2005 seasons and compares these values with the average curve. Snow packs during 2004 and 2005 were approximately 74 percent of average. However, runoff in 2005 was greater than 2004 because the snow moisture peaked approximately one month later in 2005. According to the Slug Creek chart, the largest snow water equivalent values typically occur during the first week in April, with greatest melting of the snow pack occurring during the months of April and May. Peak flows in Georgetown Canyon Creek coincide with the near completion of snow melt period. Peak flows in the creek are observed during the last week in May. The high water mark typically occurs over a several week period during May and June.

In 2004 peak flow in Georgetown Creek was approximately 6.7 cubic feet per second (cfs) measured on May 26, 2004 at GTSW-1 (located upgradient of the inlet into the 60-inch CMP). By the end of June 2004, flow at GTSW-1 dropped below 4 cfs, and flow at GTSW-1 was about 1 cfs by the end of September. The hydrographs suggest a loss of about 1 cfs from the 60-inch CMP between GTSW-1 and GTSW-2 during the 2004 high water runoff period, but neither a gaining or losing trend is suggested throughout the remainder of the year between sites. During 2005, the significantly larger peak flow of 25.7 cfs occurred at GTSW-2 on June 1st. This measured flow was larger than the flow measured at upgradient GTSW-1 at that time, indicating that the site was contributing approximately 3 cfs from site run-on and side drainage contributions. This contributing flow of 3 cfs results from the sediment pond overflow into Georgetown Creek, the inflow into the 60-inch CMP from the Syncline Spring drain, and from surface water flowing across the site and entering the 60-inch CMP. By July 21, 2005 flow measurements at GTSW-1 and GTSW-2 indicated that the 60-inch CMP was losing approximately 3.8 cfs beneath the site. As flows diminished, the sites showed similar characteristics to 2004 flows.

3.11 Physical Characteristics of Soils

Physical soil characteristics were assessed through a soil boring investigation that allowed for the collection of relatively undisturbed soil samples. A discussion of soil samples collected for chemical analysis from the vadose zone is presented in Chapter 4. The boring program performed as part of the vadose zone investigation is presented in Appendix A.

The soils beneath the site range from poorly sorted non-plastic silty and sandy gravel derived from weathered limestone bedrock to low to medium plasticity silts and silty clays derived from the shales of the Dinwoody and Phosphoria formations. A summary of geotechnical testing results from soils obtained during the SI is shown in Table 3-4. In general, testing results indicate that the sediments are of low permeability. Testing results of the underlying soils from borings indicate that silty gravel and clayey gravels are the predominant soil types identified in the vadose zone, with lesser amounts of silty clay layers

and sandy gravels. In general, results indicate that the soils are mostly non-plastic with moisture contents ranging between approximately 6.4 to 27.3 percent. Unsaturated hydraulic conductivity ranges were measured between 9.4×10^{-8} for a silty clay material from 17 feet in boring GTB-3 (near the covered slurry pit) to 1.1×10^{-6} cm/s from 27 feet in boring GTB-7 (near boiler and shop building) for a silty gravel material. Calculated falling head saturated hydraulic conductivities range from 1.7×10^{-6} cm/s for silty and gravelly clays to 3.1×10^{-3} cm/sec for a sandy gravel. Soils have a range of specific gravities between 2.73 to 2.83 and bulk densities (dry) ranging from 96.3 pcf for silty clays to 124.7 pcf for sandy gravels.

3.12 Physical Characteristics of Borrow Materials

In 2005, an investigation was performed to collect three disturbed bulk soil samples (CVM-1, CVM-2 and CVM-3) from possible borrow sources for the development of the RAP. Physical soil characteristics were assessed through a test pit investigation that allowed for the collection of bulk soil samples for geotechnical soils testing. These samples were collected for the assessment of possible cover materials for the site, as requested by IDEQ in their April 8, 2005 correspondence. Soils were collected from the phosphate ore storage pile, from the colluvial material in Dud Hollow, and from a site in Georgetown. A summary of geotechnical testing results from soils obtained in 2005 is shown in Table 3-4. In general, testing results indicate that the bulk soils have remolded permeabilities that are within the range of site native soils. Calculated falling head saturated hydraulic conductivities range from 2.7×10^{-6} cm/s to 3.7×10^{-5} cm/sec.

4.0 NATURE AND EXTENT OF CONTAMINATION

4.1 Introduction

The objectives of this chapter are to present the analytical results of the SI. The SI sampling program was initiated in April 2004 and the program continued through October 2005. SI sampling programs included: 1) collection of nine rounds of ground water and thirteen rounds of surface water samples; 2) collection of one round of ore samples from Phosphoria Gulch sources; 3) collection of one round of surface soil samples from on-site and background locations and one round of sediment sampling; and 4) collection of soil samples from borings as part of the vadose zone investigation.

ACZ Analytical Laboratories of Steamboat Springs, Colorado, analyzed soil and water samples. Quality assurance (QA) plans were presented in the April 2004 SAP. A summary of data collected during the SI is provided in the database in Appendix B. Appendix C contains all analytical data reports from the lab, including the data qualifiers provided by the lab. The laboratory analytical data reports are on the disk enclosed with this report, Appendix C.

4.2 Background Soil Concentrations

4.2.1 Introduction

Soil samples (GTSO-1 through GTSO-4) were collected in the vicinity of the site as representative background soil samples (see Figure 2-3, Chapter 2.0). The background samples were collected from forested areas on the east and west sides of the site that appeared undisturbed by former site operations. Shallow (less than one foot from the ground surface) samples were collected at each background location to characterize constituent concentration differences with surface soils at the 1-foot depth on the site. Soil sample collection methods are described in Appendix A. Analytical results for soil samples are provided in Appendix B to this report.

The background soil samples were analyzed for the parameters listed in Table 2-1, including pH, total metals, and phosphorous.

A statistical summary of background concentrations for selected parameters is presented in Table 4-1. This table also compares these data to metals concentrations reported for soils in the Western United States. The 95-percent upper threshold limit (UTL) was calculated using the method described by the EPA (1989). A sample size of four was used to calculate the UTL for parameters that were analyzed in background samples. Background locations GTSO-1 and GTSO-2 were collected from the soil horizon overlying the Dinwoody Formation. Background sample GTSO-3 was obtained from the soil above the Wells Formation and GTSO-4 was obtained on the west side of the canyon from a soil overlying the Phosphoria Formation.

4.3 Phosphate Ore

Samples collected in the surface soil investigation for chemical characterization included three samples (GTORE-1 through GTORE-3) obtained from the phosphate “phos” ore in Phosphoria Gulch that were analyzed for parameters shown in Table 2-1, including metals and radionuclides. Phosphate ore sampled locations are shown on Figure 2-3.

The range of metals, non-metals, and radionuclides that were detected in the phos ore are listed approximately in decreasing order of concentration in Table 4-2. Results of all analyses are contained in Appendix B. Laboratory analysis of the ore indicated a pH of 8 units. Metals detected at the greatest concentration in the ore included on average calcium (21 percent), chromium (1,090 mg/kg), copper (120 mg/kg), cadmium (87 mg/kg), iron (13,367 mg/kg), nickel (207 mg/kg), manganese (167 mg/kg), molybdenum (33 mg/kg), phosphorous (7.5 percent), radium 226 (28.5 pCi/g), radium-228 (10.1 pCi/g) total uranium (74 mg/kg), vanadium (1,060 mg/kg) and zinc (1177 mg/kg).

4.4 Surface Soils

4.4.1 Inorganic Impacts to Surface Soils

Surface soils include soils that were obtained from the upper 12-inch soil layer, but taken from beneath the soil cover placed by Nu-West in 2001. Surface soil samples were also obtained from the one to three-foot depth in the vadose zone boring investigation. Locations of the samples are shown on Figure 2-3 and 2-4. Samples were analyzed for parameters shown in Table 2-1. Details of the SI field work are presented in Appendix A. Table 4-3 presents a statistical summary of surface soil and vadose zone investigation soil samples and compares these concentrations with EPA Region 9 Preliminary Remediation Goals (PRGs) for residential and industrial soils. Radionuclides in the ore are compared with EPA Superfund Preliminary Remediation Goals for Radionuclides.

Soils at the site were identified to have been impacted predominantly by both the presence and processing of the ore on the site, and therefore, surface soil concentrations are evaluated with the ore in Table 4-4. Table 4-4 ranks parameters that exceed the 95 percent UTL of background for metals and compares the maximum concentration of surface soils and ore materials with the PRGs set by EPA Region 9 EPA in October 2004. The SI identified 15 metals and phosphorous that exceeded the background in four or more sampled locations, with the three ore samples exceeding the background soil 95 percent UTL for most parameters. Metals found in the ore and surface soil samples that exceeded the background soil 95 percent UTL included arsenic, antimony, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, silver, selenium, sodium, thallium, vanadium, and zinc. It is assumed that the radionuclides in the ore exceed background.

Distribution of selected surface soil parameters exceeding the 95 percent UTL (background) are presented on Figures 4-1 through 4-8A. These figures indicate that in most cases, the largest concentrations tend to be found in Phosphoria Gulch from the ore, while other localized elevated surface soil concentrations are identified near the center of the former plant site area. The distribution of soil lead concentrations differs from the

concentration distribution noted for most parameters. The minimum contours used in plotting concentrations are based on the calculated upper 95 percent UTL for each parameter.

Figure 4-8A shows the distribution of arsenic at the site. Data indicate that the larger concentrations of arsenic are identified in the clarifier and within the ore, although arsenic concentrations in background soils were found to be elevated above the residential soil PRGs.

Although Table 4-4 indicates that soils metals concentrations exceed background at a seventeen locations, residential soil PRGs are exceeded for six constituents in the phos ore, including arsenic, cadmium, chromium, thallium, uranium, and vanadium. The surface soil metals concentrations exceed the industrial soil PRGs for arsenic, chromium, and vanadium.

4.4.2 Organic Impacts to Surface Soils

Surface soils were sampled for organics at selected locations, and analyzed for parameters shown in Table 2-1. Surface soil data indicate that the organic parameters analyzed for were non-detected in the majority of surface soils sampled as part of the SI. Detected soil organic concentrations are shown in Table 4-5 and are compared with PRGs. Only Aroclor 1260 (PCB) exceeds the residential PRG for soil, but did not exceed the industrial PRG at any locations. Aroclor 1260 was detected at highest concentration at GTB-8 (1-3 ft) near the former shop building. Organics were only sampled and detected in the former shop (GTSO-5, GTSO-6, GTSO-7, GTB-7, GTB-8, and GTB-17) and transformer area (GTSO-8).

4.5 Sediments

Locations of the sediment samples obtained during the SI are shown on Figure 2-3. Sediment samples were analyzed for parameters listed in Table 2-1, and results are

summarized in Tables 4-6 and 4-6A. The sediment concentrations from each location are plotted on Figures 4-1 through 4-8A to compare sediment concentrations with surface soil concentrations.

Sediment samples were collected from three locations on Georgetown Creek. The first location GTSED-1 was collected upstream of the location where the creek enters the CMP and flows below the former plant area. GTSED-2 was collected in the creek immediately downstream of the plant site where the flows enter the stream channel downstream of the plant site. A third sample, GTSED-3 was collected from the creek below the clarifier unit. Only slight increases in metals concentrations are noted in the sediments between upgradient and downgradient sediment sampling locations in Georgetown Creek, including chromium, vanadium, and zinc. In some cases, no increases are noted. Selenium concentrations in the sediments are essentially unchanged across the site.

Two sediment samples, GTSED-4 and GTSED-7 were composite samples obtained from within the clarifier. Analyzed metals in Table 4-6 show the largest concentrations identified were from the fine sediment (GTSED-7) obtained from the bottom of the clarifier. Table 4-6A presents the results of the TCLP analysis of GTSED-7. The concentrations of the TCLP analysis are smaller than the regulatory limits for hazardous waste.

Organics were sampled at the GTSED-2 location and nearly all results were less than detection. Only one hit of 2-Butanone was noted as estimated at 100ug/kg (method detection limit) and the reason for this hit is not known.

4.6 Vadose Zone

Investigations of the vadose zone were performed to evaluate chemical and physical characteristics of the site soils and the potential for the solid sources to generate leachate and impact ground water quality through meteoric infiltration. Seventeen soil borings were drilled and sampled to assess soil characteristics, chemical distribution of metals and

phosphorous in the soils existing above ground water, the occurrence and persistence of PCBs in soils, and the extent of hydrocarbon contamination in the vicinity of the former shop area. Boring locations are presented on Figure 2-4 (Chapter 2.0). Details of the vadose zone investigation are contained in Appendix A. The chemical results of the vadose zone investigation are summarized in Table 4-7.

In general, the vadose zone soils are similar in chemical distribution to the surface soils, with some maximum metals concentrations in the vadose zone exceeding surface soil concentrations. This is not unexpected because much of the fill placed prior to the building of the plant is presumed to be derived from adjacent native materials of the Phosphoria Formation that are naturally elevated in these constituents.

One soil sample obtained between 3 and 5 feet from boring GTB-10 yielded a mercury concentration of 29.2 mg/kg, two orders of magnitude above concentrations noted in the ore and surface soils. With the exception of TPH (C10-C28), organics were identified as less than detection in the borehole samples obtained from the vadose zone in 2004. PCB (Aroclor 1260) was less than detection within the substation area and below the 3-foot depth near the former shop (GTB-8).

One boring, GTB-2 could not be drilled as the result of spontaneous fire that occurred after encountering elemental phosphorous at the depth of about one foot. Nearby monitor well GT-7 encountered elemental phosphorous within the first several feet while driving casing. No elemental phosphorous was noted below the 5-foot depth in monitor well GT-7.

4.6.1 Organic Impacts to Soils Near Removed USTs

In 2004, TPH was identified in boring GTB-7 at elevated concentrations of 217 mg/kg to 647 mg/kg between the depths of 14 and 24 feet. This boring was drilled and sampled adjacent to backfill that was placed in an UST excavation. Information provided by Nu-West indicated that the tanks were removed intact in 1997, but that leaks in the distribution piping or overfills created a release to the soil. More than 1,300 yards of soil was reportedly

removed from the site during 1998 and land farmed at Nu-West's Conda facility under the purview of IDEQ.

Based on the depth of the soils impacted by hydrocarbons in GTB-7, it is likely that the release reached ground water. TPH was identified at 13 mg/kg the surface in boring GTB-17, located approximately 45 feet from GTB-7, but was less than detection at depth. Additional soil borings drilled during the 2005 investigation near the former UST site included analysis of semi-volatile and volatile organic compounds. Vadose zone organic soil results are presented in Table 4-8. State of Idaho Tier 0 soil concentrations were compared with analyzed values, each of which were derived for each compound by selecting the lowest risk-based soil level for residential exposure scenarios including soils leaching to ground water. Comparison of soil detections with State of Idaho Tier 0 Soil Cleanup Levels indicate that the soils surrounding the former UST do not exceed cleanup level concentrations. Distribution of the organics in the soils indicate that organics are present in the soils at depths below the 10 foot depth extending into soils to the north of the shop concrete pad. Analytical results indicate that the spread of the leaking products did not extend into soils beneath the shop pad. It is likely that surface water ponding and infiltrating directly above the former UST site has resulted in a mounding effect that spread organics into the aquifer in all directions, including towards well GT-2 that is upgradient of the former UST.

4.7 Surface Water Quality

4.7.1 Surface Water Sites

Surface water sampling was performed to evaluate the ambient surface water quality and geochemical regime and to evaluate sources and the nature and extent of surface water impacts at the site. The surface water analyte list for the Central Farmers Fertilizer Facility is shown in Table 2-3 and sample locations are shown on Figure 2-5.

With the exception of sites GTSW-8 through GTSW-11, surface water samples were

collected approximately monthly during the 2004 and 2005 field seasons and analyzed for general indicators, orthophosphate, total metals, anions, and cations. Sites GTSW-8 through GTSW-11 were sampled on a one-time basis in 2005 to address the chemical nature of surface water flowing across the site. Samples collected from GTSW-2 in April, May, and November 2004 included an analysis for organic parameters.

4.7.1.1 Background Surface Water Quality

Surface water quality and type can be characterized using the trilinear diagram classification method developed by Piper (1944). The Piper diagram consists of two ternary fields (triangles) for plotting percentages of cations (left triangle) and anions (right triangle), and a central diamond-shaped composite field for plotting the relative contribution of the major ion pairs. Major ion data for the surface water sampling rounds are plotted on Figures 4-9 through 4-12. Ionic compositions of Georgetown Creek, GTSW-1 through GTSW-3, are shown on Figure 4-9. Based on the Piper plot, water in GTSW-1 can be classified as a calcium bicarbonate water type. Monitor well GT-1 also plots within this range.

4.7.1.2 On-site and Downgradient Surface Water

There are small difference in the major ion composition between upgradient GTSW-1 and downgradient GTSW-3 in Georgetown Creek, as shown on Figure 4-9. The plots shown on Figure 4-10 illustrate that surface water quality obtained from sites GTSW-4, and GTSW-5 in Phosphoria Gulch, are similar to background. Site GTSW-6 (sediment control pond) shows slightly more variability in the cation field. GTSW-7 (clarifier) shown on Figure 4-11 indicates increased compositions of sodium, chloride, and sulfate. Figure 4-12 shows that the surface waters that flow across the surface of the site change only slightly in cation composition.

Table 4-9 presents the range of concentrations observed at the surface water sample

locations. Water quality in the creek is excellent, with TDS concentrations ranging from about 120 to 310 mg/l. Reported chloride concentrations are about 1 to 6 mg/l. Sulfate concentrations range from about 2 mg/l to 26 mg/l. Nitrate concentrations ranged from 0.02 mg/l to 0.25 mg/l in 2004, but spiked in downstream locations in 2005 to 8.2 mg/l .

Concentrations of metals are elevated in the clarifier (GTSW-7), including aluminum (13.4 mg/l), antimony (0.0067 mg/l), arsenic (0.022 mg/l), cadmium (0.029 mg/l), chromium (0.4 mg/l), manganese (0.457 mg/l), molybdenum (0.54 mg/l), nickel (0.14 mg/l), and vanadium (0.548 mg/l).

Figures 4-13 through 4-19 present arsenic, antimony, cadmium, iron, orthophosphate, nitrate plus nitrite and selenium concentrations versus time for all sampled surface water sites. These plots indicate that during periods of runoff, concentration of antimony, cadmium, iron and selenium are increased in the Phosphoria drainage below the ore storage pile. Concentrations of mercury are also increased below the ore in the sediment control pond during runoff. Following peak runoff in July 2005, an unexplained nitrate spike is noted in Georgetown Creek at GTSW-2, GTSW-3 and GTSW-4. Other notable trends include seasonal concentration fluctuations of arsenic, antimony and orthophosphate in the clarifier.

4.8 Ground Water

The purpose of the ground water quality sampling investigation was to characterize ground water and to evaluate the magnitude and extent of impacts to ground water from former site operations. Nine rounds of water quality samples were collected in 2004 and 2005. Samples were analyzed for parameters shown in Table 2-4. Table 4-10 includes the range of results from ground water sampling rounds in 2004 and 2005.

4.8.1 Water Quality and Type

Background ground water quality and type was characterized using the Piper trilinear

diagram classification. Major ion data for all sample rounds are plotted on Figures 4-20 through 4-27. Upgradient well GT-1 best represents background ground water quality for the site. This sample point is located to the north of the site as shown on Figure 2-6. Piper plots of well GT-1 background ion compositions are shown on Figure 4-20. Based on the plots, ground water in well GT-1 is a calcium bicarbonate type, nearly identical to Georgetown Creek. By comparison with background, major ion concentrations in wells GT-3 and downgradient well GT-6 are similar to the upgradient well GT-1, as identified by the plots. Deep well GT-7 is similar to GT-1 with slight increases in sodium and potassium composition. Well GT-2 indicates an increase in bicarbonate, sodium, and potassium composition when compared with background. Well GT-4 water quality indicates changing bicarbonate, sodium, and potassium composition with time. When compared with other wells, well GT-5 demonstrates the greatest variability in ionic compositions over time as the result of the changing gradients at this location. Well GT-5 shows seasonally changing magnesium and chloride compositions. Shallow well GT-8 located to the north of the covered slurry pit indicates the largest bicarbonate compositions.

Reported TDS concentrations are about 230 to 240 mg/l in background well GT-1. The pH values measured at the background location is neutral to slightly alkaline and ranged from 7.0 to 8.1, becoming more alkaline throughout the season. Reported chloride concentrations are low, ranging up to 20 mg/l in GT-4. Sulfate concentrations range from 3 mg/l in GT-8 to 186 mg/l in well GT-4. Nitrate concentrations range from less than 0.02 mg/l in GT-1 to 69.5 mg/l in well GT-5.

4.8.2 Turbidity

Although turbidity and total suspended solids (TSS) are generally not considered indicators of ground water contamination. Excessive turbidity and TSS in an unfiltered sample can bias analytical results and cause reported total metals concentrations to be significantly greater than, and not representative of, the true concentrations in ground water.

Turbidity is a measure of the solids and suspended organic material in a sample and is

reported in nephelometric turbidity units (NTUs). Turbidity values were not collected in the field, however turbidity was visibly greater than 100 NTU. High turbidity was the result predominantly of two factors, including very low hydraulic conductivity in the wells, and the falling water levels that were occurring between the time of well completion and development. The falling water levels were significant in well GT-6 and did not allow for complete development of the well in 2004. Well GT-6 was developed and tested in 2005 when the water levels recovered. The combined low hydraulic conductivity and falling water levels for all shallow wells resulted in conditions that were not conducive to the low-flow sampling techniques that were requested by IDEQ for inclusion into the SAP. Therefore, following the first round in July 2004, samples were collected after each well was bailed to dryness prior to sampling, or three complete casing volumes were removed using a bailer and routinely monitored for field parameters prior to obtaining samples. These field parameters measured for each sampling event are presented in Appendix A.

During 2004 and 2005, both filtered and unfiltered samples were collected for comparison of results. Total suspended solids (TSS) results are shown on Figure 4-28. Results indicate that monitor well GT-6 had the highest turbidity in 2004 with TSS greater than 4000 mg/l, resulting in large total concentrations of aluminum, beryllium, iron, manganese, and nickel. Development in May 2005 resulted in a notable drop in TSS. However, TSS in well GT-6 increased throughout 2005 as the screen section dewatered in response to seasonal water level changes. Overall TSS trends indicate that turbidity is decreasing with time, although TSS continues to remain elevated in a number of wells.

Plots of total and dissolved metals versus TSS over time for monitor wells GT-5 and GT-6 are presented on Figures 4-28A through 4-28V. These wells were selected because these are located downgradient of former site features and both wells showed the highest TSS concentrations in 2004. These results show that many of the metals are not in the dissolved phase and that excessive TSS concentrations result in increased concentrations of aluminum, beryllium, cadmium, chromium, iron, lead, molybdenum, manganese, and vanadium. Dissolved samples were less than detection in many cases for these metals. Other metals that are increased in unfiltered samples include barium, copper, and zinc. In

contrast to these results, the figures indicate that arsenic and selenium concentrations are predominantly present in the dissolved phase.

4.8.3 Selected Ground Water Constituents

Figures 4-29 through 4-41 present contoured concentrations of selected inorganic constituents for July 2004 and July 2005. These figures are described in the following sections. Sample collection procedures are described in Appendix A; analytical data are provided in the database in Appendix B; and, the raw laboratory is presented in Appendix C (on disk). Analytical results are summarized and interpreted in this section.

4.8.3.1 Total Dissolved Solids (TDS)

Reported TDS concentrations for four rounds of samples collected from wells ranged from slightly less than 230 mg/l in well GT-1 to about 870 mg/l in well GT-2. Reported TDS concentrations for July 2004 and July 2005 are shown on Figures 4-29 and 4-35. These figures illustrates that concentrations of TDS are elevated in shallow wells GT-2, GT-4 , and GT-5 within the central area of the former plant area between the covered slurry pit, the acid plant and the beneficiation building. Figure 4-42 presents TDS concentrations versus time during the 2004 and 2005 SI. Well GT-2 generally had the largest concentrations, when ground water was available, while the upgradient well (GT-1) and the most downgradient well (GT-6) generally indicated the smallest concentrations over time.

4.8.3.2 Nitrate + Nitrite

Reported nitrate + nitrite (NO_3 + NO_2 as N) concentrations in the monitor wells are summarized in Table 4-10. Nitrate plus nitrite distributions are shown on Figures 4-30 and 4-36. Nitrate + nitrite concentrations in ground water range from 0.02 mg/l in background (GT-1) to 81.5 mg/l in well GT-5 near the former acid plant. Nitrate + nitrite indicates a small ground water trend on site that extends between wells GT-3 and GT-5. Nitrate also extends off towards well GT-6 at small concentration. The primary drinking water standard

of for nitrate is 10 mg/l. Figure 4-43 illustrates that nitrate + nitrite concentrations increased in well GT-5 during low water level periods, and reached the highest concentration during the last sampling event in October 2005. Well GT-3 also indicated a smaller increase in nitrate + nitrite during the same time period, and exceeded 10 mg/l on one occasion. The remaining site wells showed little changes throughout the season.

4.8.3.3 Orthophosphate

Reported orthophosphate concentrations in monitor wells are summarized in Table 4-10. Reported orthophosphate concentrations for four rounds of samples collected from the wells ranged from slightly less than about 0.01 mg/l in well GT-1 to about 98 mg/l in well GT-5. Reported orthophosphate concentrations for July 2004 and July 2005 are shown on Figures 4-31 and 4-37. These figures illustrates that concentrations of orthophosphate are elevated in shallow wells GT-2, GT-3 and GT-5, an area that underlies the area of the TSP building and the acid plant. Figure 4-44 presents orthophosphate concentrations versus time during the 2004 and 2005 SI. Orthophosphate concentrations, where detected, were slightly greater in 2005. Well GT-2 showed an increase in 2005 and a concentration spike in August 2005. Well GT-3 suggests an overall increasing trend for the 15-month period. Well GT-5 had the largest orthophosphate concentrations and an increase in concentration as water levels dropped in the shallow aquifer. The remainder of the wells have very small orthophosphate concentrations and showed little change in orthophosphate concentration versus time.

4.8.3.4 Arsenic

Arsenic is indicated to be present in the dissolved phase in ground water. Reported ranges of arsenic concentrations in monitor wells are summarized in Table 4-10. Concentrations in ground water range from less than detection to 0.124 mg/l in well GT-5, exceeding the Idaho Ground Water quality Standard for arsenic (0.05 mg/l). None of the samples collected from the other wells exceeded 0.05 mg/l. Arsenic concentrations are largest between the areas monitored by GT-5 and GT-2, as shown on Figures 4-32 and 4-38.

Concentrations fall to less than 0.005 mg/l at off-site locations. Figure 4-45 indicates that dissolved arsenic concentrations in the ground water demonstrated slightly larger over concentrations in 2005, and that well GT-5 concentrations increased as water levels fell in the shallow aquifer and the gradient shifted to a more easterly flow direction.

4.8.3.5 Iron

Iron is identified in dissolved phase in the ground water. Reported total and dissolved iron concentrations in monitor wells are summarized in Table 4-10. Concentrations of dissolved iron in ground water ranged from less than 0.01 mg/l in well GT-1 to 11.6 mg/l in well GT-4.

A comparison of the sample rounds shown on Figure 4-46 indicates that dissolved iron concentrations fluctuated between rounds in well GT-4, sometimes by a factor of two or more. Figures 4-33 and 4-39 suggest a ground water trend for dissolved iron that extends downgradient from well GT-2 towards well GT-4. Iron concentrations showed a spike in July 2005 and well GT-4 shows a sharply increasing trend in 2005. Well GT-8 shows an overall increasing concentration trend with time over the 15-month period.

4.8.3.6 Manganese

Reported manganese concentrations in monitor wells are summarized in Table 4-10. Dissolved manganese concentrations were less than the secondary constituent standards in upgradient well GT-1, downgradient well GT-6, and deep well GT-7. The secondary constituent standard for manganese (0.05 mg/l) was exceeded in wells GT-2, GT-3, GT-4, GT-5, and GT-8. Figures 4-34 and 4-40 suggests a ground water trend for dissolved manganese that extends between well GT-8, beneath the covered phos pond and southeast towards well GT-4. A comparison of the sample rounds shown on Figure 4-47 indicates a fair amount of variability in manganese concentrations between rounds. During the 15-month period, manganese concentrations suggest a decreasing trend in well GT-3, and an increasing trend in well GT-8. Wells GT-2, GT-4 and GT-5 concentration patterns with time suggest seasonal trends.

4.8.3.7 Antimony and Selenium

Antimony is identified in well GT-5 ground water in concentrations approaching the drinking water standard of 0.006 mg/l. Figure 4-48 shows that antimony is seasonal in GT-5 and highest concentrations occurred during the high ground water period at runoff in 2005. Antimony is generally less than detection in other wells at the site.

Figure 4-41 presents the July 2005 selenium distribution across the site. Selenium concentrations in upgradient well GT-1 exceed the ground water protection standard and the drinking water standard of 0.05 mg/l. Selenium is distributed down-canyon and appears to decrease in concentration in a southerly direction across the site. Selenium does not appear to follow the gradient to the southeast. Figure 4-49 presents the changes in selenium concentrations in ground water with time for the 15-month period. In general, selenium concentrations at the site peak during periods of runoff and high water levels in the wells and decrease throughout the season. Concentrations in 2005 were slightly greater than in 2004.

4.8.3.8 Organic Compounds in Ground Water

As noted earlier in Chapter 4, organic compounds including petroleum hydrocarbons related diesel or fuel oil were detected in the soils near the shop in borings GTB-7, GTB-8, GTB-23 and GTB-24. In order to evaluate the nature and extent of organic compounds in the ground water, an investigation was conducted which included the routine collection of samples from wells GT-4 and GT-5 for analysis of volatile and semivolatile compounds, and total petroleum hydrocarbons (TPH). During 2005, organics were also collected from wells GT-2, GT-3, and downgradient well GT-6. Organic compounds detected in the ground water and the range of detected concentrations is listed in Table 4-11. Organics are identified in wells GT-2, GT-3, GT-4 and GT-5 at levels below regulatory limits. TPH concentrations plots for the 15-month period for these wells are shown on Figure 4-50. TPH concentrations are typically larger in well GT-4, with smaller concentrations present in 2005. TPH concentrations at GT-4 indicate slight increases during periods of lowered

water levels.

A total of 11 VOCs and SVOCs were detected in the ground water, as shown in Table 4-11. No compounds were identified to exceed ground water standards or target levels. All were in the sub-milligram per liter range, except TPH. Most of the identified compounds are petroleum hydrocarbons related to the hydrocarbon release near the former UST area. Most of the organic compounds identified in the ground water were noted in some of the surface soil locations and soil borings.

5.0 FATE AND TRANSPORT

5.1 Introduction

Data presented in Chapter 4 indicate that the former site operations resulted in some impacts to the ground water, vadose zone, clarifier sediment and surface soils. Surface water impacts are identified in the water contained by the clarifier, in the drainage in Phosphoria Gulch, and in Georgetown Creek at sites GTSW-2 and GTSW-3. Physical characteristics of the site, chemical characteristics of the remaining ore on site, and the nature and the extent of ground water impacts are evaluated in this chapter to provide an overview of the fate and transport of organic, metal and non-metal constituents. The most significant pathway for migration of chemicals off the site, as identified during the 2004 and 2005 SI is ground water. Other less important pathways include off-site migration of surface water and surface seepage through site soil profile. Precipitation and snowmelt and water flowing on the site surface result in the generation and movement of leachate through the vadose zone. Ultimately, this leachate may discharge to the ground water.

5.2 Environmental Pathways

5.2.1 Surface Water

The hydrogeology of the study area, including ground water flow direction is discussed in Section 3.9. Overall ground water flow within the shallow alluvial aquifer on the site is to the east-southeast and is discharged into fractured bedrock, with a smaller amount discharged down-canyon to the south in the alluvium as evidenced in well GT-6. The ground water elevation is essentially equal to the elevation of Georgetown Creek where the creek enters the 60-inch CMP culvert. The ground water elevations are projected to be near the level of the 60-inch CMP near wells GT-8 and GT-5 during periods of high ground water levels in 2005, although the exact depth of the culvert is not known at these locations. Ground water elevations during the remainder of the year are projected to be lower than the level of the CMP elevation beneath the site and lower than the elevation where the creek exits the CMP, based on an inferred potentiometric gradient. Based on 2005 data, it is not

determined whether site ground water is affecting creek water quality or creek water quality is being affected by surface runoff only. The water contained by the clarifier indicates increased concentrations of metals and non-metals. The clarifier was not noted to release water from containment during the SI and therefore does not contribute to exposures beyond the confines of the structure. The water levels indicated seasonal patterns during 2005 based on measurements from a newly installed staff gage. Changes in levels in the clarifier appear to result from evaporation, transpiration, and possibly a lesser amount of infiltration into the underlying alluvium.

5.2.2 Vadose Zone

Site precipitation and ponded surface water has the potential to leach metals and other constituents from the vadose zone and transport these constituents to the ground water. The effects of evaporation and transpiration reduce the potential for vadose zone transport. Leachate that reaches and mixes with ground water may increase concentrations of metals in the ground water and contribute to the observed impacts to ground water. Within the vadose zone, metals can be dissolved in meteoric water to form a leachate, adsorbed by soil particles, or migrate through site soils and underlying alluvium to the ground water. Properties of the underlying native soils can affect the rate of migration of dissolved metals in the vadose zone and these properties include:

- Physical characteristics such as thickness, gradation, unsaturated hydraulic conductivity, porosity, moisture content, and moisture distribution;
- Organic content of the vadose zone;
- Cation exchange capacity;
- Microbial activity, and;
- pH and overall chemical characteristics.

Climate and vegetation can also affect the rate of migration through evapotranspiration, precipitation, and/or plant uptake. One of the more important properties of metal solubility

in the native soils is pH. The solubility of most metals increases with decreasing soil pH. The pH of the site soils was noted to neutral to alkaline, a factor that tends to prevent metals solubility.

5.2.3 Ground Water Pathway

The ability of contaminants to migrate through an aquifer system, or to be removed from an aquifer, depends predominantly on ground water flow, physical and chemical properties of the aquifer, and chemical and physical characteristics of the individual contaminants themselves. Hydrodynamic processes that are the primary mechanisms and affect the transport or removal of contaminants from ground water include advection, dispersion, and preferential flow. The chemical composition of the mix of the natural waters and infiltrating contaminants is dependant on the rate of seepage, proximity to the source, variations in hydrogeologic characteristics of the aquifer, and the direction and rate of ground water flow.

5.3 Persistence of Contaminants

The chemical, physical, and biological processes resulting in the persistence and/or the degradation of selected compounds are presented in this section. The inorganic and organic constituents discussed in this section include those representing the most persistent constituents identified in the SI. In addition, selected metals detected less frequently or at smaller concentrations in the environmental media are also discussed.

5.3.1 Inorganic Constituents

Inorganic constituents can be non-reactive and move through the environmental pathways virtually unaffected by biotic (metabolism, such as microorganisms) and abiotic (adsorption, ion exchange, precipitation, hydrolysis, reduction/oxidation) processes. The opposite is also true. Reactive constituents can be affected by biotic and abiotic processes during transport. The fate of specific compounds ultimately depends on the reactivity or nonreactivity of the chemical with the media during transport.

5.3.1.1 Metals

According to Allen et al. (1993), several processes interact to control the reactivity, and therefore the rate of transport of metals in ground water. Metal ions can be strongly adsorbed to mineral surfaces in a porous medium such as clay, or to rock surfaces exposed by fractures. On the other hand, this would inhibit their transport through the aquifer when complexed with other ions, some metals can be transported at average velocities that are orders of magnitude faster than when not complexed because of changes in the attenuation properties for the complexed metal. Changes in speciation and reactivity can result from encountering different chemistries within the aquifer. The mobility of the different oxidation states of metals such as arsenic, , iron, manganese, molybdenum, uranium, and vanadium may also differ by an order of magnitude (Allen et al., 1993).

Arsenic

Arsenic is detected at about 21 mg/kg in the phosphate ore. Arsenic was measured at 4 to 8 mg/kg in background soils and of similar concentration in the on-site surface soils. Arsenic is generally less than detection in monitor well GT-1 background ground water and up to 0.131 mg/l in downgradient well GT-5.

In an aqueous solution the stable forms of arsenic are arsenate or arsenite oxyanions (Hem, 1978), with the dominant form being dependant on the pH of the water. Inorganic factors that maintain low concentrations of arsenic in water include adsorption by hydrous iron oxide, co precipitation or combination with sulfide.

Chromium

Chromium is detected in the phosphate ore at 1,020 to 1,160 mg/kg. However, chromium concentrations in the ground water are less than detection in the dissolved phase, with larger concentrations noted in the exceedingly turbid samples from GT-5 and GT-6.

Turbidity was noted to have a substantial impact on total and dissolved chromium results. Chromium can exist in several oxidation states including the trivalent (Cr^{+3}) and hexavalent (Cr^{+6}) states. Very little chromium can be dissolved in ground water under natural conditions unless the pH of the solution is less than about 5 (National Academy of Sciences, 1977). Under strongly oxidizing conditions, chromium may be converted to the hexavalent state and occur as chromate anion. Hexavalent chromium can also be rapidly reduced to trivalent chromium in an iron rich solution, or may be reduced by and adsorbed on mineral surfaces such as biotite and magnetite (Allen et al., 1993).

Manganese

Manganese is detected in the phosphate ore at 95 to 175 mg/kg, up to 0.46 mg/l in the clarifier waters, and up to 1.76 mg/l (dissolved) in the ground water in well GT-2. Manganese appears to emanate from the area of the covered phos slurry pit.

Manganese is an essential element in plant metabolism. The tendency for soluble manganese to adsorb to soils and sediments depends largely on the cation exchange capacity and the organic composition of the soil (USHHS, 1990). At small concentrations, manganese may become fixed by clays; whereas, at larger concentrations manganese may be desorbed by ion exchange with other ions in solution (USHHS, 1990).

The transport and partitioning of manganese in water is controlled by the solubility of the specific chemical form of manganese that is present (USHHS, 1990). The solubility and speciation of manganese oxides in solution is largely a function of pH and reduction/oxidation (redox) potential. Manganese may undergo oxidation at a high pH or redox potential, and can also be subject to microbial activity. The divalent form of manganese is usually predominant in waters with a pH between 4 and 7. The principal anion associated with manganese is carbonate, although in waters with large bicarbonate concentrations, manganese bicarbonate complexes can be formed.

Selenium

Selenium is detected in the phosphate ore and in the creek sediments at less than 40 mg/kg, at 0.05 mg/l in the sediment settling pond at the bottom of Phosphoria Gulch, and at concentrations exceeding drinking water standards (0.05 mg/l) at upgradient well GT-1. Selenium concentrations have been reduced in the downgradient wells as a result of chemical reduction in the aquifer.

Selenium in ground water, behaves in a similar manner to sulfur, and is usually mobile under oxidizing conditions. At the site, selenium moves in solution at larger concentrations during periods of high surface water flow and elevated water levels. In solution, selenium may exist in four oxidation states (Allen et al, 1993). Selenium adsorption is highly dependant on the oxidation state. Changes in oxidation states have significant influences on the solubility and reactivity with mineral surfaces, and may strongly affect the mobility of the selenium species present. Above a pH of 6.6, the stable form is selenate (Se^{+6}). Prediction of selenium sorption or other fates may be complicated by variable aquifer conditions present, including variable pH, sulfate concentrations, and the presence of other complexing ions (Allen et al., 1993).

Vanadium

Vanadium is detected in the ore up to 1,240 mg/kg, in clarifier sediments 608 mg/kg, in the surface soils and vadose zone up to 554 mg/kg. Vanadium is detected in the clarifier waters at concentrations up to 0.548 mg/l. Dissolved vanadium concentrations are less than detection in background ground water in GT-1 and range up to 0.271 mg/l in well GT-5. Vanadium exposed to water under oxidizing conditions is typically converted from the less soluble trivalent state to the more soluble pentavalent state. Transport of vanadium in water and soil is influenced by redox potential, pH, and the presence of particulate (USHHS, 1990). Vanadium species have a tendency to bind strongly to mineral or biogenic surfaces by adsorption or complexing, hence it can be transported either in solution or in suspension. Adsorption may be the most significant attenuating factor at the site.

5.3.1.2 Non-Metals

Fluoride

Fluoride was not analyzed in the ore or surface soils. Fluoride was identified to fluctuate seasonally in the surface water in the clarifier (GTSW-7) at concentrations up to 13.6 mg/l. Fluoride is less than 0.3 mg/l in Georgetown Creek and less than 1.3 mg/l in the ground water, as identified in well GT-4. Fluoride has the lowest molecular weight of the halogen group and is also the most electronegative. Fluoride has nearly the same charge and radius as the hydroxide ion and these two ions can substitute for each other. Larger concentrations of fluoride in waters generally tend to be found where calcium concentrations are small (Hem, 1978). Fluoride can also substitute for hydroxide in waters that have a high pH.

Phosphorus and Orthophosphate

Phosphorous ranged up to 8.6 percent in the ore, and up to 26.1 percent in the background surface soils. Orthophosphate ranges from 0.02 mg/l in the background ground water (GT-1) to 98 mg/l in well GT-5. Orthophosphate ranges up to 5.5 mg/l in the clarifier, and small amounts are identified from surface waters running across the site. Downstream surface water concentrations indicate concentrations up to 0.44 mg/l.

Orthophosphate is a mobile form of phosphorus in ground water. Phosphorous is essential to all forms of terrestrial life. Phosphorus is widely distributed over the surface of the earth in biologically available forms cycling within plants, animals, soil, and water. Phosphorus is immobile in soils and does not leach. Consequently, contamination of ground water is rarely a problem (University of Idaho, 1992). Phosphorus in fertilizers and manures will not leach through soils to pollute ground water because it is held tightly to soil particles. However, soil particles that are transported offsite by erosion have the potential to pollute surface waters. Surface water pollution is controllable by reducing soil erosion (University of Idaho, 1992).

Nitrate + Nitrite

Nitrate + nitrite was not detected at significant quantities at surface water sites in 2004. During 2005, nitrate was detected at GTSW-2 and GTSW-3 in Georgetown Creek. Nitrate + nitrite were detected at notable concentrations up to 81.5 mg/l in well GT-5. Nitrate (NO_3) is a major stable nutrient in vegetation and essential to all life. Nitrate is significantly influenced by biological activity, and can readily be taken up by plant activity. Some mediating organisms can reduce nitrate, producing nitrogen gas and ammonia (Hem, 1978). In the absence of plant growth, nitrate behaves as a mobile anion, similar to chloride (Drever, 1988). Nitrate concentrations can be rapidly reduced in surface waters through assimilation by aquatic plants (National Academy of Sciences, 1977). Attenuating factors for nitrates do not appear significant at the site, and concentrations may be reduced primarily through dilution in the aquifer.

5.3.2 Organic Constituents

Eleven different organic compounds and TPH were detected in the ground water. A number of organic compounds listed in Table 4-11 are constituents and degradation products of diesel fuel oil. Remaining compounds consist of solvent products, and potential degradation products of the diesel fuel oil.

TPH and Polychlorinated biphenyls (PCBs) in the form of Aroclor 1260 were also identified in the surface soils near the former shop area.

5.3.2.1 Aroclor 1260

Aroclor was not identified in the ground or surface water. However, Aroclor 1260 was detected at one vadose zone location (B-8, 1-3 feet). Aroclors are industrial mixtures of PCBs, differing in level of chlorine substitution. Aroclor 1260 contains 60 percent chlorine by weight (Davis, 2003). PCB manufacture began about 1930. Because of their heat stability, low reactivity and lubricating properties, PCBs had a variety of industrial uses (electrical transformers and capacitors, hydraulic fluid, paints, inks, adhesives, paper

products, etc.). PCBs were banned in the U.S. in 1977, because of their bioaccumulation, persistence in the environment, and toxicity (Davis, 2003).

The mobility of Aroclor 1260 is dependant on a number of factors, including variability in the physical and chemical properties of different PCB constituents. PCBs enter water bodies from surface runoff. PCBs strongly sorb to soils, limiting mobility. Biodegradation (bacterial) results in selective de-chlorination. Volatility and mobility in the atmosphere increases with decreasing chlorination (Davis, 2003).

5.3.2.2 TPH

Total petroleum hydrocarbons (TPH) is a term used to describe a large group of chemical compounds that were derived from crude oil. The TPH in this study consists of hydrocarbons ranging from C10-C28. Volatilization and biodegradation are the two major processes that determine the fate of TPH components in soil. While volatilization is expected to be the dominant fate process for these fuels from soil surfaces, biodegradation will become increasingly dominant as the soil depth increases. When the products of TPH enter the soil or ground water, they are subjected to various weathering processes that alter their chemical and physical nature. Biodegradation of petroleum pollutants by microorganisms is a major process mediating the fate of TPH in the environment, including in ground water. Hydrocarbons on the surface of soil and other surfaces are more likely to evaporate then biodegrade. Hydrocarbons deep in the soil are likely to biodegrade to a larger extent than evaporate since these compounds are not exposed to the open environment (Sameer, 2004). Some TPH constituents reach ground water, as is the case with TPH reporting in ground water in the site wells (GT-2, GT-3, GT-4 and GT-5) at low concentrations.

5.3.3 Radionuclides

Radium

Radium (radium-226 and radium-228) was detected at 30.6 and 24.8 Pico curies per gram (pCi/g) in the phos ore. Radium samples were not obtained from ground water or from surface water media. The isotopes of radium result from the decay series of thorium and uranium 235 and 238. Radium can complex with other compounds, which can alter its stability, solubility, and bioavailability. In soils, the higher adsorption rate of radium is directly correlated with higher alkalinities which facilitate binding to soil particles. Increased concentrations of calcium in soil retards radium mobility by forming insoluble complexes that may be the controlling attenuating factor at the site. The fate of radium depends on its chemical form, but it is generally not a mobile constituent in the environment (SAIC, 1993).

Uranium

Uranium was detected up to 81.8 mg/kg in the phos ore. Uranium was not evaluated in other media. Three naturally occurring isotopes of uranium exist, with greater than 99 percent by weight attributable to uranium-238. The mobility of uranium in the soil and in ground water is greatly influenced by its ionic state and complexes it may form with other compounds. The higher the valence state, the easier it is to form soluble complexes. Uranium generally becomes more soluble and mobile in water under conditions with pH less than 6 and waters high in organic content (SAIC, 1993).

5.4 Transport Mechanisms

The transport and fate of chemicals in the vadose zone or ground water is dependant on the interaction between the chemical and the subsurface environment.

5.4.1. Water Movement in the Vadose Zone

Within the fenced area of the former plant site, much of the vadose zone is infiltrated by seepage from nearby seeps and surface streams that flow onto and pond on the site. Throughout much of the spring and summer after runoff, a substantial amount of surface water flows in a southerly direction across the site and to the south of the gate where it infiltrates. Much of the area to the north of the shop building in the vicinity of the former USTs and east of the covered slurry pit and west of the furnace was perpetually wet or had some standing water during the 2004 and 2005 SI. The occurrence of surface water at the site may affect the potentiometric site gradient through rapid infiltration directly to the shallow alluvial aquifer.

Where a continual source of surface seepage is not occurring, such as during the fall season, transport in the vadose zone is dominated by the physical ability for the soil, source, or bedrock to hold and transport fluids (Knox et al., 1993). Pressure heads for moisture in the vadose zone are negative and equal in magnitude to the height of the moisture above the water table. Water in the vadose zone is held in place by the effects of surface tension.

Percent saturation is the volume fraction of the total pore volume that is occupied by a fluid. The minimum saturation of a soil is known as the irreducible saturation (for water) or residual saturation (for water and other fluids). Percent saturation in the vadose zone is plotted versus height above the water table (negative pressure) to obtain a soil moisture characteristic curve. If the effects of evapotranspiration are ignored under steady state conditions, then percent saturation in soils near the ground surface and to some depth will remain near residual saturation. As depth increases percent saturation will increase to a depth at the top of the capillary fringe where percent saturation is nearly 100 percent. When enough water is present in the vadose zone to exceed residual saturation, movement of the soil water (flux) can occur that is governed by or is proportional to such physical properties and forces as suction gradient (moisture dependent), pore channel geometry, and the relationship between saturated and unsaturated hydraulic conductivity.

Natural properties of the native soil that can reduce concentrations and slow down the rate of migration of metals through the vadose zone to the ground water include: 1) thickness of

native soils, 2) clay content, 3) cation exchange capacity, and 4) pH.

5.4.2 Transport in the Ground Water

The general processes affecting the subsurface transport of chemicals in the aquifer, or the removal of chemicals from the aquifer, depends on the flow of the ground water, chemical and physical properties of the aquifer and the chemicals themselves. Hydrodynamic mechanisms that affect the migration of persistent chemicals include advection, dispersion and preferential flow. No one process is totally responsible for explaining the observed distribution and transport of chemicals across site locations; however, advection and preferential flow appear to be important factors.

5.4.2.1 Advection

Advection is the bulk flow of ground water carrying a dissolved chemical through the aquifer. In general, ground water flows from areas of relatively higher hydraulic head (expressed as ground water elevation) to areas of relatively lower hydraulic head. In a uniform portion of a porous medium, the Darcy equation is used to estimate flow velocity as a function of the hydraulic gradient and effective porosity as described in Chapter 3 of this report. These estimated water velocities (calculated in Chapter 3) are used to estimate the rate of transport by advection in the aquifer.

Hydraulic gradients at the site vary from the influences in recharge and changes in hydraulic conductivity. Hydraulic conductivities and effective porosities vary from place to place within the aquifer as the result of variations in the physical characteristics of the alluvium.

5.4.2.2 Effects of Hydraulic Gradient

During high water periods in spring and early summer, some of the water flowing in the alluvial aquifer beneath the site follows the alluvium down the canyon. As shown on Figures 3-5 through 3-15 in Chapter 3, the hydraulic gradient observed in the shallow wells is to the east in the central portion of the site during later summer and fall periods at about 0.015 ft/ft Some water continues to flow within the alluvium down-canyon, but less than at times of high water flow. This easterly site gradient may be affected by losses from the alluvial aquifer to the fractured Wells Formation. This loss occurs where the alluvial aquifer overlies Wells Formation rather than Phosphoria or lower Dinwoody formations. There are no noted occurrences of formations with low permeability between the top of the Wells and the underlying Madison group and the Meade Thrust Fault. The Wells Formation is recognized to be heavily brecciated and fractured within the upper member. The occurrence of fractured Wells bedrock was noted both in the literature and during hydrogeologic investigations at the site. Based on the site hydrogeologic evidence, it is presumed that the bedrock gradient is downward within the Wells because the formation is of moderate permeability with zones of high porosity (Ralston, 1979). Ground water leaving the site to the east eventually commingles with regional ground waters at significant depth and follows a regional ground water level trend to the north or northeast in line with the attitude and structure of the Meade Thrust.

Another fate for site ground water is loss to the Dinwoody Aquifer. Water level elevations measured in on-site deep and shallow paired wells GT-7 and GT-8, respectively, indicate the presence of a significant downward vertical gradient. This demonstrates the potential for some loss from the shallow to the deep bedrock aquifer. However, one significant observation is that chemical impacts from the site to the deep aquifer were not identified during the SI. Therefore, the hydraulic gradient contributing flow to the bedrock of the Wells Formation on the east-southeast side of the site are assumed to be more important than either the effects on ground water flow in the alluvium down canyon, or vertical losses on-site.

5.4.2.3 Effects of Hydraulic Conductivity

Ground water flow within the alluvium occurs at rates that are proportional to the hydraulic gradient and the hydraulic conductivity. Variations in the hydraulic conductivity within the alluvium have significant impacts on the rate of advective transport of chemicals. Estimated hydraulic conductivities ranged from about 0.5 to 190 ft/day in the alluvium. Variation in the hydraulic conductivity of the aquifer indicates that the alluvium at the site is both heterogeneous and anisotropic with respect to hydraulic conductivity. The hydraulic conductivity has a direct influence on the average ground water velocity in an aquifer and transport of chemicals in the subsurface. Concentration Figures 4-29 through 4-41 indicate that the bulk of solute transport for some of these constituents is to the east- southeast on site for constituents like iron, manganese and TDS that appear to emanate from the area of the covered slurry pit, whereas concentration distribution of arsenic and orthophosphate is not normal to the observed hydraulic gradient. This deviation from the expected direction of transport may be due, in part, to the observed decrease in permeability in the vicinity of well GT-5.

5.4.2.4 Preferential Flow

Preferential flow within the alluvium may be a factor controlling the transport of the constituents in ground water across the site. Once the ground water flows from alluvium to bedrock, preferential flow may be along opened fractures noted in a northwesterly trending direction. Heavily fractured zones may locally enhance flow or enhance preferential flow.

5.4.2.5 Retardation Factors

Retardation of chemical migration in the aquifer can be attributed to a number of mechanisms present in the properties of the subsurface environment. These may be classified as abiotic and biotic.

Abiotic mechanisms that may have effects on the persistent chemicals at the site include:

- Adsorption (effected by organic content, clay content, mineral surface area);
- Ion exchange (cation exchange capacity, ionic strength);

- Hydrolysis (pH, competing reactions);
- Precipitation/dissolution (reactions creating or dissolving solids, the pH and presence of other metals in solution), and;
- Redox reactions (reactions involving electron transfer, including elements in more than one oxidation state, Eh and pH in water).

All of these processes can be important mechanisms for retarding the transport of chemicals in the ground water. Redox reactions may be responsible for the removal of small quantities of other metals by precipitation. Metals, such as selenium, may be precipitated and removed from the ground water system.

Biotic mechanisms which may have effects on organic compounds or nitrogen compounds include metabolism or co-metabolism, which are a function of microorganisms and nutrients present, pH, redox, and trace elements.

Adsorption may be an important retardation factor at the site. Clays in the alluvium may be the best naturally existing aquifer material for adsorption. These clays may affect adsorption of trace metals.

5.5 Summary

In summary, the most significant pathway of migration from the site is through the ground water, with a lesser component through surface water. This conclusion is based on observed concentrations in the ore, surface soils, sediments, vadose zone, surface water, and ground water. The vadose zone may contribute to a small percentage of the total observed ground water concentrations as the result of saturated conditions throughout a portion of the year. Transport in the aquifer for many of the metals or other constituents are through the advective process.

6.0 SUMMARY AND CONCLUSIONS

6.1 SI Summary

A summary of the principal findings and conclusions of the SI are presented in this chapter. Investigations included:

- Site survey for ground surface mapping control;
- Characterization of the site geology and hydrogeology;
- Drilling and sampling of twenty two soil borings to characterize the vadose zone;
- Physical testing in the laboratory of selected soil samples from the surface soil and soil boring program;
- Collection of background soils, on-site surface soils, ore and sediment samples from Georgetown Creek and clarifier to characterize the distribution of organic and inorganic constituents;
- Drilling and completion of seven shallow alluvial wells and one deep bedrock monitor well;
- Water level measurement in new and existing wells and measurement of pH, conductivity, and temperature following completion and development;
- Aquifer testing using the monitor wells to characterize aquifer conditions in the alluvial and bedrock aquifers;
- Surface water quality sampling and collection of flow measurements in Georgetown Creek at three locations;
- Surface water quality sampling from two locations in Phosphoria Gulch, the sediment control pond, the clarifier and four locations of surface water running across the site, and;
- Collection of ground water samples from the monitor wells and one preexisting deep well on two rounds to characterize ground water quality.

Findings and conclusions related to the hydrogeology of the study area, sources of observed impacts, nature and extent of observed impacts and pathways of migration are summarized in this chapter.

6.1.1 Geology

The site of the former Central Farmers Fertilizer Facility occupies approximately 87 acres on patented ground at a location approximately seven miles to the northeast of the City of Georgetown, Idaho. The site lies between the Aspen Range to the north and northwest of the site, and the Pruess Range containing the highest peak, Meade Peak, directly to the east of the site. The site is surrounded by Caribou-Targhee National Forest land.

The site is located in Georgetown Canyon on the upper plate of the Meade Thrust. The majority of rocks exposed on the Meade Plate are Paleozoic in age. The ranges surrounding the site are northerly trending and are comprised of folded and tilted fault block features. The structure in the vicinity of the investigation area is dominated by north-northeasterly trending Georgetown Syncline. The fold is large and complex, and the west limb of the anticline is overturned. In the vicinity of the project area, the syncline is plunging gently but irregularly to the north at about 25 degrees. The fold is approximately three miles across and extends to 30 or 40 miles beyond the north end of the area. The Georgetown Syncline is broad and overturned to the east and has a minor fold developed on the normal limb. The site is located on the east limb of the syncline.

The site overlies Recent and Quaternary alluvium and construction fill. Unconsolidated sediments are estimated to be about 45 to 62 feet in thickness. Bedrock formations exposed at the site include from south to north the Wells Formation, Phosphoria Formation, and the lower Dinwoody Formation. The strike varies across the site in relation to the folding of the synclinal structure. Dominant rock joint patterns on the site are N 25° E to N 35° E, dipping 85 degrees to the northwest or southwest. A second pattern strikes N 40° W and dip vertically. Several north-trending normal or strike-slip-type faults are indicated to cross Phosphoria Gulch on the east side of the site in the vicinity of the ore pile. The Wells Formation is heavily fractured at the mouth of Phosphoria Gulch, with dominant joint sets striking approximately N 40° W and dipping steeply to the southwest.

6.1.2 Hydrogeology

Much of the shallow alluvium found at the site consists of silt, silty clay, naturally occurring organic detritus such as wood branches and roots, and silty sand and gravel deposited along the stream course in Georgetown Canyon. Ground water at the Central Farmers Fertilizer Facility site is first encountered within the alluvial sequences. Ground water also exists within the underlying Dinwoody Formation, and likely within the Phosphoria Formation above the Meade Peak member. A vertically downward gradient is noted between the alluvial and bedrock aquifers.

On the site, the upper alluvial sequence consists of fine to coarse silty gravels, clayey gravels, and silts and silty clays. Most ground water is believed to be transmitted in discontinuous stream gravel lenses of fluvial and colluvial materials, and within the coarser native fill materials at the bottom of the alluvium above the contact with bedrock.

The alluvial sequence in the plant area demonstrates minimal hydraulic conductivity, although alluvium penetrated upgradient and downgradient of the fenced site area indicated substantially greater hydraulic conductivity. Hydraulic conductivities estimates in the shallow alluvial wells ranged from 0.47 feet per day (ft/day) in GT-5 to greater than 190 ft/day in upgradient monitor well GT-1. Results of testing indicate that the bedrock aquifer is substantially more transmissive than the shallow alluvial aquifer directly beneath the site. Deep well GT-7 has an estimated hydraulic conductivity of about 100 ft/day. Hydraulic conductivities of the alluvium within the former plant area vary by an order of magnitude, but generally a decrease in conductivity is observed from north to south. The larger hydraulic conductivities are found along the east side of the site.

Ground water generally flows southward from the topographically higher areas of the canyon. In the vicinity of the former facility, the direction of ground water flow is directed towards the east from the alluvium into bedrock. The average horizontal hydraulic gradient is estimated to be approximately 0.015 feet per foot (ft/ft) on average. Ground water

particle velocities were estimated from the site data and range from 0.02 to 13 ft/day.

To the south of the southern fence line of the facility the alluvium rests directly on the upper Wells Formation. Ground water is estimated to be present in the alluvium at an elevation that is 15 to 25 feet beneath the creek elevation at the location of the creek discharge from the 60-inch CMP.

Water level elevations measured in the bedrock wells indicated a pattern of ground water flow direction that was in a northerly, up-canyon flow direction in 2004. This trend appears to have reversed in late 2004 through some of 2005, but the gradient in this direction is very small.

6.1.3 Surface Water Hydrology

Stream flow characteristics of Georgetown Creek in the study area indicate the peak runoff usually occurs as the result of snowmelt. During the SI, measured peak flows were approximately 6.7 cubic feet per second (cfs) in late May 2004, and about 25.7 cfs in early June 2005. Measurements made during the SI suggest that, following peak runoff, up to 4 cfs of creek water is lost from the culvert beneath the site, substantially more than the 2004 estimate. Phosphoria Gulch and other surface waters added about 3 cfs during high water in 2005.

Surface water flows in Phosphoria Gulch are small and are collected in the sediment control pond. The sediment control pond overflowed from the site into Georgetown Creek during runoff in 2005. Runoff onto the site near the slurry pit and the furnace flows across the site in spring and summer, keeping much of the site soils in a saturated condition throughout the summer months. This condition has developed a zone of perched ground water in the vicinity of the furnace and covered slurry pit area.

6.1.4 Nature and Extent of Contamination

The nature and extent of contamination was investigated through the IDEQ approved SI sampling programs. These sampling programs were initiated in April 2004 and continued through October 2005.

6.1.4.1 Phosphate Ore

Samples collected from the phosphate ore in Phosphoria Gulch included elevated levels of phosphorous, chromium, iron, copper, cadmium, nickel, manganese, vanadium and zinc, that exceed statistical comparison with background. The ore also contains elevated levels of radium 226, radium-228 and total uranium. Metals concentrations exceed background concentrations and residential soil PRGs for arsenic, cadmium, chromium, thallium, uranium, and vanadium.

6.1.4.2 Surface and Background Soils

Statistical comparisons of site soil samples to background samples obtained just beyond disturbed areas indicate that the concentrations of some metals and nonmetals exceeded background at one or more locations. Metals found in the ore and surface soil samples that exceeded the background soil 95 percent UTL included arsenic, antimony, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, silver, selenium, sodium, thallium, vanadium, and zinc. Distribution of selected surface soil parameters exceeding the 95 percent UTL (background) shows that the largest concentrations tend to be found in Phosphoria Gulch near the ore, while other localized elevated surface soil concentrations are identified near the center of the former plant site area.

Some organics were detected in soils near the shop area. Aroclor 1260, a PCB, was identified in the shop area but not near the former substation. Aroclor 1260 concentrations exceed the residential PRG, but do not exceed the industrial PRG for this constituent. The surface soil metals concentrations exceed the industrial soil PRGs for arsenic, chromium,

and vanadium.

6.1.4.3 Sediments

In general, the largest concentrations identified from the sediments were obtained from the fine sediment in the bottom of the clarifier. Most of these concentrations are comparable with the ore concentrations. Slight increases in metals concentrations are noted in the sediments between upgradient and downgradient sediment sampling locations in Georgetown Creek, including chromium, vanadium, and zinc. Selenium concentrations in the sediments are essentially unchanged across the site within the creek. Most metals show no increase at downstream locations in Georgetown Creek. The TCLP results of the clarifier sediments indicate that the clarifier sediments are not considered hazardous waste.

6.1.4.4 Vadose Zone

Twenty-two soil borings were drilled and sampled to assess soil characteristics, chemical distribution of metals, organics and phosphorous in the vadose zone soils. In general, the vadose zone soils are similar in chemical distribution to the surface soils, with some metals concentrations in the vadose zone exceeding the maximum surface soil metals concentrations. This is not unexpected because much of the fill placed prior to the building of the plant is presumed to be derived from adjacent native materials of the Phosphoria Formation that are naturally elevated in these constituents.

A number of borings were drilled in 2004 and 2005 near the former UST at the north end of the former shop building location. Although a number of these borings indicate elevated levels of TPH below the 10-foot depth, none of the samples indicated concentration exceedences of regulated volatile or semivolatile constituents.

Boring GTB-2 could not be drilled as the result of spontaneous fire that occurred after encountering elemental phosphorous at the depth of about one foot. Nearby well GT-7 also encountered elemental phosphorous within the first several feet while driving casing. No

elemental phosphorous was noted below the 5-foot depth in well GT-7.

6.1.4.5 Surface Water Quality

Based on the Piper plots, surface water can be classified as a calcium bicarbonate water type. There is essentially no difference in the major ion composition between upgradient and downgradient locations on Georgetown Creek. Water quality in Georgetown Creek is of excellent quality, with TDS concentrations ranging from about 120 to 310 mg/l. Concentrations of metals are generally very low or less than the detection limits at the surface water locations. During 2005, substantial increases in nitrate concentrations were identified downstream from the site in Georgetown Creek.

The clarifier contains the largest surface water concentrations for many of the constituents analyzed in the SI. Concentrations of metals are elevated in the clarifier when compared with other surface water sites. Elevated surface water concentrations in the clarifier are directly related to contact with sediment materials in the clarifier. No water is identified to enter or leave the clarifier structure and water level changes appear to be affected by meteoric events and evaporation.

The ephemeral flow in Phosphoria Gulch indicated that during peak runoff in 2005, levels of arsenic, antimony, cadmium, iron and selenium increased in surface water at surface water site GTSW-5 below the ore pile. This water periodically flows from Phosphoria Gulch through the overflow in the sediment control pond into Georgetown Creek.

6.1.4.6 Ground Water

Ground water quality was characterized using data from nine sample rounds. Background water quality and type is classified as a calcium-bicarbonate type, similar to the surface water. The wells vary slightly in composition across the site, increasing slightly in sodium, bicarbonate, magnesium, sulfate and chloride.

Ground water samples contain elevated levels of TSS. The elevated turbidities in unfiltered samples are the result of low hydraulic conductivity in the wells and falling water levels that result in screen dewatering later in the summer and fall seasons. Due to elevated sample turbidity, both filtered and unfiltered samples were collected for comparison of metals concentrations. Elevated turbidity is associated with increased concentrations of aluminum, beryllium, cadmium, chromium, iron, lead, molybdenum, manganese, and vanadium. Dissolved samples were less than detection in many cases for these metals.

TDS concentrations range from 213 mg/l in well GT-1 to about 870 mg/l in well GT-2. TDS concentrations are elevated in shallow wells GT-2 (870 mg/l), GT-4 (830 mg/l), and GT-5 (810 mg/l). This is the area between the covered slurry pit, the acid plant and the beneficiation building.

Nitrate + nitrite concentrations in ground water range from 0.02 mg/l in background (GT-1) to 81.5 mg/l in well GT-5 near the former acid plant. Nitrate + nitrite had a small ground water trend on site that extends between wells GT-3 and GT-5. Nitrate + nitrite concentrations reached the highest concentrations during low water periods. Well GT-3 also indicated a smaller increase in nitrate + nitrite through May 2005.

Othophosphate concentrations ranged from slightly less than about 0.01 mg/l in well GT-1 to about 98 mg/l in well GT-5. Orthophosphate concentrations are elevated in an area that underlies the area of the TSP building and the acid plant. Orthophosphate concentrations also demonstrated an increasing trend in low water periods in GT-5, demonstrating a similar trend to nitrate.

Dissolved arsenic concentrations in ground water range from less than detection in upgradient well GT-1 to 0.124 mg/l in well GT-5. Arsenic concentrations are largest in the central areas monitored by GT-5 and GT-2, although well GT-2 demonstrates slight increases during high water season. Concentrations drop to less than 0.005 mg/l at downgradient well GT-6. Well GT-5 demonstrates an increasing arsenic trend as water levels drop in the well.

Concentrations of dissolved iron in ground water ranged from less than 0.01 mg/l in well GT-1 to 11.6 mg/l in well GT-4. Dissolved iron distribution in ground water suggests a ground water trend that extends between wells GT-2 and GT-4. Iron in well GT-8 suggests an overall increasing trend with time through 2005.

Manganese concentrations were smaller than the secondary constituent standards (0.05 mg/l) in upgradient well GT-1, downgradient well GT-6, and deep well GT-7, but increased to 1.76 mg/l in well GT-2. Elevated manganese concentrations in well GT-8 suggest a manganese source upgradient of this location. A ground water trend for dissolved manganese extends between well GT-8, beneath the covered slurry pit and southeast towards well GT-4. Dissolved manganese concentrations indicate separate trends for each well, but an overall seasonality of the data are noted with increased concentrations at lower water level periods.

Dissolved selenium concentrations exceeded the ground water standards (0.05 mg/l) at the upgradient well location GT-1. Selenium concentrations decrease across the site in a southerly direction. Overall ground water selenium concentrations were larger in 2005. Selenium concentrations appear seasonal, and peak during periods of high water level elevations and periods of runoff. Antimony concentrations behave in a similar way to selenium, with largest concentrations occurring at well GT-5.

Organic constituents were detected in wells GT-2, GT-3, GT-4 and GT-5 at small concentrations. Organics were less than detection at well GT-6. TPH concentrations were larger in GT-4 than in GT-5, ranging from 2.86 mg/l to 3.5 mg/l, a slight increase noted throughout the 2004 season. TPH concentrations were smaller at all locations in 2005. A total of eleven VOCs and SVOCs were detected in the ground water in these four wells, none of which exceeded regulatory limits.

6.1.5 Fate and Transport

The most significant migration pathway identified during the SI is ground water, and to a lesser extent, surface water runoff and contributions from the vadose zone that ultimately impact ground water quality. Another less significant migration pathway includes dermal contact or ingestion of soil.

6.1.5.1 Surface Water

The clarifier is the only permanent surface water body on the site that indicates elevated concentrations of metals and non-metals. The clarifier was not observed to release water from containment during the SI. Surface water that flows across the former plant facility either reaches Georgetown Creek during peak runoff or infiltrates on-site.

Water flowing down Phosphoria Gulch contacts the phosphate ore pile and transports sediment and dissolved metals to the sediment control pond. During peak runoff, these metals enter Georgetown Creek through the overflow and are diluted with high flows in the creek such that values are near or below the detection limit at the most downstream location. Nitrate was detected in Georgetown Creek at the most downstream location in July and August 2005. It is currently not understood whether nitrate originates from site ground water, as seen in well GT-5, or is derived from another source. Nitrate in Georgetown Creek below the site may be taken up as a nutrient by aquatic plants at downstream locations within the canyon.

6.1.5.2 Vadose Zone

Infiltrated precipitation and surface water noted across much of the site that is not removed by evapotranspiration has the potential to leach metals from the vadose zone and transport these metals to the ground water. Leachate that reaches and mixes with ground water may increase concentrations of metals in the ground water and contribute to the observed impacts to ground water. One of the more important properties of metal solubility in the native soils is pH. The solubility of most metals increases with decreasing soil pH. The pH of the site soils was noted to neutral to alkaline, a factor that tends to prevent metals

solubility and limit transport.

The mobility of Aroclor 1260 is dependent on a number of factors, including variability in the physical and chemical properties of different PCB constituents. PCBs strongly sorb to soils, limiting mobility through the vadose zone.

Volatilization and biodegradation are the two major processes that control the fate of TPH, volatile and semivolatile constituents in soil. Transport of TPH in the vadose is limited, although some components of TPH reach the ground water, as evidenced by SI sampling results.

6.1.5.3 Ground Water Pathway

Hydrodynamic processes that affect the transport of dissolved chemicals in the ground water include advection, dispersion, and preferential flow. Some constituents appear to undergo less attenuation than others in the study area. Attenuating mechanisms for metals in the ground water system, including adsorption by clays may be important for a number of the metals detected in ground water.

Ground water quality patterns indicate that the bulk of solute transport of chemicals from the site is to the east-southeast in a direction that follows the observed hydraulic gradient. Faults or fractures in the Wells Formation may locally increase hydraulic conductivities and enhance preferential flow. Ground water flowing towards the east or southeast from the alluvial aquifer are lost to the Wells Formation and eventually mixed with regional ground water at significant depth.

6.2 Conclusions

The major conclusions of the SI consist of the following observations:

- Approximately 75,000 yards of low-grade phosphate ore remain in Phosphoria Gulch on a slope that is approximately 2:1 on average. The phosphate ore is elevated in

metals and radionuclides. The phosphate ore slumps from the pile in the spring and erodes into the ephemeral stream during runoff. Erosion of the phosphate ore has likely been occurring periodically since plant closure and will continue until the pile is stabilized.

- The largest metals concentrations noted in the surface soils include samples from the phosphate ore and areas associated with the processing of the phosphate ore. Where mixing of the ore and processing materials has occurred, site soils are elevated in metals and other constituents found in the ore.

- Metals concentrations in site soils associated with the former site operations are elevated when compared with background soils concentrations, and are limited to areas in close proximity to former site operations. Industrial soil PRGs are exceeded in the surface soils for arsenic, total chromium, and vanadium.

- Minor impacts from site operations are noted within the Georgetown Creek sediments.

- Aroclor 1260 is identified only in a small area near the shop near the surface and the mobility is assumed to be limited. PCB compound Aroclor 1260 exceeds residential PRG, but not the industrial PRG.

- Concentrations of metals in the vadose zone are generally similar to the surface soils with respect to maximum concentrations. This is the result of the natural occurrence of these constituents in the native materials used to construct the site fill. Surface water flowing onto the site may infiltrate on site and affect ground water concentrations. Therefore, control of surface water runoff could be a step towards mitigation of this effect.

- Elemental phosphorous is identified at shallow depth in the soil to the north of the covered slurry pit. It is not known whether the occurrence results from the material being released from slurry pit containment. Some of this area is continually saturated from site seeps. Elemental phosphorous was also identified under the lowest elevation of the phosphate ore in Phosphoria Gulch. This occurrence may have been an attempt to recycle phosphorus back into the process during plant operation.

- The former UST site was previously remediated but contains detectable levels of TPH in vadose zone soils and ground water. TPH is noted at largest concentrations in well GT-4, and conditions confirm that a historic release has occurred. Analytical results indicate, however, that soils and ground water do not exceed Idaho RBCA Tier 0 concentrations, and therefore, the former UST site can be considered closed based on these results.

- Surface water appears to be minimally impacted by runoff from the site. Nitrate occurrences in Georgetown Creek in 2005 downstream from the 60-inch CMP are not well understood.

- Water contained by the clarifier is impacted by residual sediments from the former operations.

- Data collected in 2004 and 2005, during below-average winter snow pack, indicate a loss in flow from the 60-inch CMP to the alluvium following the peak runoff period. Water also enters the 60-inch CMP culvert at several locations on the site during periods of greatest runoff. At low flow periods in the creek, the 60-inch CMP appears to neither gain nor lose water from the pipe. Since additive flows from side canyons including Syncline Spring and the sediment control pond overflow are not currently measured, losses from the pipe at peak flows or increases from site infiltration cannot be estimated.

- Alluvial aquifer ground water flow is to the east-southeast into bedrock, while a smaller amount flows in the alluvium down canyon at high water periods. Advection and preferential flow are the primary chemical transport mechanisms. The predominant site flow direction indicates that elevated levels of arsenic and nitrate are not flowing off-site and down the canyon, but rather are diverted easterly to greater depth and to a regional water level elevation in the Wells Formation or lower unit. Changes in the gradient may result in seasonal concentration changes in the ground water directly on-site. The hydraulic conductivity of the shallow alluvial sediments beneath the fenced potion of the site is relatively small. The majority of water moving in the alluvium likely occurs just above bedrock and below the screened depths of the wells.
- A vertically downward gradient is noted on site between the alluvial aquifer and the bedrock aquifer in the Dinwoody Formation. Water quality results indicate little to no impact to the bedrock aquifer from the former site operations.

- Ground water flow in the bedrock is generally toward the north, following the regional structure. At other times in late 2004 and in 2005, some data suggest that the gradient appears to change from this northerly direction. Based on the depths of the preexisting wells, however, there may be some communication between aquifers such that the preexisting shallow well is affecting changes to water levels in the adjacent deeper well, which would explain and refute that anomaly. This will be further investigated and confirmed.

- Ground water total metals concentrations are significantly affected by high sample turbidities. Dissolved phase metals are more representative of ground water quality conditions at the site.

- Selenium concentrations in ground water are largest and have exceeded drinking water standards at upgradient well GT-1. These elevated concentrations may result from shallow alluvial water discharging from another source. Alluvial materials beneath the site appear to remove selenium from ground water.

- Former site operations have impacted and continue to impact ground water quality on the site. The cover of the slurry pit is of greater permeability than soils underlying the impoundment, and seepage occurs out of the cover during runoff. Concentrations in

well GT-2 are affected by the covered slurry pit. Concentrations also increase in well GT-2 following periods of high water levels. Other sites that indicate impacts to ground water include former operations near the acid plant and TSP plant. These sites represent the most significant source impacts to the ground water at nearby well GT-5. As a result, concentrations of arsenic, antimony, iron, manganese, nitrate and orthophosphate, are elevated over background at locations downgradient from these former facilities. Arsenic and nitrate exceed ground water quality standards.

- Ground water quality distributions on the site do not appear to indicate former or current impacts from the furnace or phosphorous storage tanks. The former phosphorus storage tanks were probed during the SI and do not appear to contain elemental phosphorus.

- The alluvial aquifer down canyon from the site demonstrates little impact from site operations. Based on water levels in well GT-6, the alluvial aquifer dries up in the latter part of the season, suggesting that the ground water in the alluvium between the site and Church Hollow is also lost to the underlying moderately permeable Wells Formation.

7.0 RECOMMENDATIONS

Based on a review of data collected during the 2004 and 2005 SI, the following recommendations are provided to support potential remedial actions for the Central Farmers Fertilizer Facility and to monitor trends identified following review of the SI data.

- A Remedial Action Plan will be developed following approval of the Final Site SI Report to assess sources that impact ground and surface water media. The Final SI Report will reflect IDEQ comments to this draft final report and the results of the additional investigation requested by the IDEQ, specifically, the results of the TCLP testing of the clarifier sediment. This will complete the SI Report and the Final SI Report will be ready for approval by IDEQ.

- A risk assessment for potential receptors at the site will be completed and made part of the Remedial Action Plan.

- Ground water monitoring of the wells should continue as the result of noted exceedences of several State of Idaho ground water quality standards. Shallow wells should be monitored in late spring during high water level periods and during the fall at low water periods for metals and general chemical parameters. This sampling program should provide data that are representative of periods of elevated concentrations of constituents identified during the SI. Sampling of the wells will provide data to evaluate the effectiveness of possible site remedial actions.

- Ground water elevation measurements should be obtained from shallow and deep wells approximately monthly between April and July and during sampling events and through implementation of site remedial actions. On-going water level measurement will confirm changes in site flow direction and gradient at the time samples are obtained and be used to estimate whether the ground water levels on the site are at higher elevation than the 60-inch CMP.

- On-going monthly surface water sampling and flow measurements should made be at sites GTSW-1 through GTSW-6, since 2004 and 2005 data are based on below average winter snow packs. Flumes or weirs should be installed and measured at three locations, including: within the stream flowing onto the site east of the furnace and below the water tank; in the stream Phosphoria Gulch near the fence line and in Syncline Spring before the water enters the drain discharging to the buried culvert. Ongoing measurements will provide further understanding of the behavior of the condition of the buried culvert.

- Additional survey points may be required to address implementation of possible site remedial actions.

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TABLE 2-1
GEORGETOWN CANYON
SOIL AND SEDIMENT
PARAMETERS AND ANALYTICAL METHODS -1

Analyte	Analytical Method	Holding Time	Method Detection Limit
pH	SW-846 9045	Immediate	0.1 (units)
Phosphorous (Total)	EPA M365.4	28 Days	0.01 Percent
Metals List			
Metals Digestion	EPA M3050B		
Aluminum	EPA Method 200.7 ICP	6 Months	3 mg/kg
Arsenic	EPA Method 200.8 ICP/MS	6 Months	4 mg/kg
Antimony	EPA Method 200.8 ICP/MS	6 Months	0.02 mg/kg
Barium	EPA Method 200.7 ICP	6 Months	0.3 mg/kg
Beryllium	EPA Method 200.7 ICP	6 Months	0.2 mg/kg
Cadmium	EPA Method 200.7 ICP	6 Months	0.3 mg/kg
Calcium	EPA Method 200.7 ICP	6 Months	20 mg/kg
Chromium	EPA Method 200.7 ICP	6 Months	1 mg/kg
Copper	EPA Method 200.7 ICP	6 Months	1 mg/kg
Iron	EPA Method 200.7 ICP	6 Months	1 mg/kg
Magnesium	EPA Method 200.7 ICP	6 Months	20 mg/kg
Manganese	EPA Method 200.7 ICP	6 Months	0.5 mg/kg
Molybdenum	EPA Method 200.7 ICP	6 Months	1 mg/kg
Mercury	EPA Method 200.8 ICP/MS	28 days	0.005 mg/kg
Nickel	EPA Method 200.7 ICP	6 Months	1 mg/kg
Potassium	EPA Method 200.7 ICP	6 Months	30 mg/kg
Lead	EPA Method 200.8 ICP/MS	6 Months	4 mg/kg
Selenium	SM 3500, Se Hydride AA	6 Months	0.1mg/kg
Sodium	EPA Method 200.7 ICP	6 Months	30 mg/kg
Silver	EPA Method 200.8 ICP/MS	6 Months	0.5 mg/kg
Thallium	EPA Method 200.8 ICP/MS	6 Months	0.2 mg/kg
Vanadium	EPA Method 200.7 ICP	6 Months	0.5 mg/kg
Zinc	EPA Method 200.7 ICP	6 Months	1 mg/kg
TCLP Metals (GTSED-7 Only)	EPA Method M1311 Digestion EPA Method 6010 B ICP and EPA Method M7470 CVAA	6 Months /28 Days	Metal-Specific 0.0002 to 0.04 mg/l
Radiochemistry			
Radium - 226 (includes 3051 digestion) (Ore only)	EPA M9315	NA	1.0 pCi/g
Radium - 228 (includes 3051 digestion) (Ore only)	EPA M9320	NA	1.5 pCi/g
Uranium, Total (Ore only)	EPA M6020, ICP/MS	NA	1.0 ug
Organics -2			
Purgeables (VOA's)	EPA M8260B GC/MS	7 Days	2 mg/kg
Base/Neutral Acid Extractables (BNA's)	EPA M8270C GC/MS	7 Days	67 to 300 mg/kg
PCB	EPA M608/8082 GC/ECD	7 Days	0.02 mg/kg

- 1 – Background samples obtained from [illegible] in plant area obtained from beneath reclamation soil cover. All soils samples obtained 12-inch s[illegible] layer.
- 2 - Organics obtained from GTSO-5 through GTSO-7 from the pre-existing [illegible] beneath reclamation cover surface. PCB soil sample obtained from GTSO-8 surface sample

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TABLE 2-2
GEORGETOWN CANYON
VADOSE ZONE SOIL
PARAMETERS AND ANALYTICAL METHODS

Analyte	Analytical Method	Holding Time	Method Detection Limit
pH	SW-846 9045	Immediate	0.1 (units)
Phosphorous (Total)	EPA M365.4	28 Days	0.01 Percent
Metals List			
Metals Digestion	EPA M3050B		
Aluminum	EPA Method 200.7 ICP	6 Months	3 mg/kg
Arsenic	EPA Method 200.8 ICP/MS	6 Months	4 mg/kg
Antimony	EPA Method 200.8 ICP/MS	6 Months	0.02 mg/kg
Barium	EPA Method 200.7 ICP	6 Months	0.3 mg/kg
Beryllium	EPA Method 200.7 ICP	6 Months	0.2 mg/kg
Cadmium	EPA Method 200.7 ICP	6 Months	0.3 mg/kg
Calcium	EPA Method 200.7 ICP	6 Months	20 mg/kg
Chromium	EPA Method 200.7 ICP	6 Months	1 mg/kg
Copper	EPA Method 200.7 ICP	6 Months	1 mg/kg
Iron	EPA Method 200.7 ICP	6 Months	1 mg/kg
Magnesium	EPA Method 200.7 ICP	6 Months	20 mg/kg
Manganese	EPA Method 200.7 ICP	6 Months	0.5 mg/kg
Molybdenum	EPA Method 200.7 ICP	6 Months	1 mg/kg
Mercury	EPA Method 200.8 ICP/MS	28 days	0.005 mg/kg
Nickel	EPA Method 200.7 ICP	6 Months	1 mg/kg
Potassium	EPA Method 200.7 ICP	6 Months	30 mg/kg
Lead	EPA Method 200.8 ICP/MS	6 Months	4 mg/kg
Selenium	SM 3500, Se Hydride AA	6 Months	0.1mg/kg
Sodium	EPA Method 200.7 ICP	6 Months	30 mg/kg
Silver	EPA Method 200.8 ICP/MS	6 Months	0.5 mg/kg
Thallium	EPA Method 200.8 ICP/MS	6 Months	0.2 mg/kg
Vanadium	EPA Method 200.7 ICP	6 Months	0.5 mg/kg
Zinc	EPA Method 200.7 ICP	6 Months	1 mg/kg
Organic Parameters			
TPH (TX method C6 - C28) -1	TNRCC M1005, GC/FID	7 Days	12.0 mg/kg
PCB -2	EPA M608/8082 GC/ECD	7 Days	0.02 mg/kg

-1 Samples for TPH obtained from borings GTB-07 and GTB-08 beneath reclamation cover soil interface and below elevation of removed USTs.

-2 – Samples for PCB obtained from 3 and 6-foot depths on GTB-6. A surface soil sample obtained for PCB analysis in conjunction with surface soil sampling.

MDL, reported by ACZ Labs. Reporting limits vary with dilution.

TABLE 2-3
GEORGETOWN CANYON
SURFACE WATER
PARAMETERS AND ANALYTICAL METHODS

Analyte	Analytical Method	Holding Time	Method Detection Limit
FIELD PARAMETERS			
Specific Conductance	Field		10 uS/cm
pH	Field		0.01 units
Temperature	Field		0.1 degree C
Turbidity	Field		0.01 ntu
LABORATORY PARAMETERS			
Wet Chem			
Alkalinity	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Total Dissolved Solids	EPA M160.1 Gravimetric, 180 C	7 Days	10.0 mg/l
Total Suspended Solids	EPA M160.2 Gravimetric, 105 C	7 Days	5.0 mg/l
Specific Conductance	EPA M120.1 Wheatstone Bridge	28 Days	1.0 umhos/cm
Ion Balance	1030F & API		
PH	EPA M150.1 Meter	Immediate	0.1 (units)
Bicarbonate	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Carbonate	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Chloride	EPA M325.2 Colorimetric	28 Days	1.0 mg/l
Fluoride	EPA M340.2 Ion Specific Electrode	28 Days	0.1 mg/l
Nitrate+Nitrite	EPA M353.2 Automated Colorimetric	28 Days	0.02 mg/l
Sulfate	EPA M300.0 Ion Chromatography	28 Days	0.5 mg/l
Orthophosphate (as P)	EPA M365.1 Automated Colorimetric	28 Days	0.01 mg/l
Metals List –2			
Metals Digestion	EPA M3010		
Aluminum	EPA Method 200.7 ICP	6 Months	30 ug/l
Arsenic	EPA Method 200.8 ICP/MS	6 Months	0.5 ug/l
Antimony	EPA Method 200.8 ICP/MS	6 Months	0.2 ug/l
Barium	EPA Method 200.7 ICP	6 Months	3 ug/l
Beryllium	EPA Method 200.7 ICP	6 Months	2 ug/l
Cadmium	EPA Method 200.7 ICP	6 Months	3 ug/l
Calcium	EPA Method 200.7 ICP	6 Months	200 ug/l
Chromium	EPA Method 200.7 ICP	6 Months	10 ug/l
Copper	EPA Method 200.7 ICP	6 Months	10 ug/l
Iron	EPA Method 200.7 ICP	6 Months	10 ug/l
Magnesium	EPA Method 200.7 ICP	6 Months	200 ug/l
Manganese	EPA Method 200.7 ICP	6 Months	5 ug/l
Molybdenum	EPA Method 200.7 ICP	6 Months	10 ug/l
Mercury	EPA Method 200.8 ICP/MS	28 days	0.05 ug/l
Nickel	EPA Method 200.7 ICP	6 Months	10 ug/l
Potassium	EPA Method 200.7 ICP	6 Months	300 ug/l
Lead	EPA Method 200.8 ICP/MS	6 Months	0.1 ug/l
Selenium	SM 3114 C, AA-Hydride	6 Months	1.0 ug/l
Sodium	EPA Method 200.7 ICP	6 Months	300 ug/l

TABLE 2-3
GEORGETOWN CANYON
SURFACE WATER
PARAMETERS AND ANALYTICAL METHODS

Analyte	**Analytical Method**	**Holding Time**	**Method Detection Limit**
Silver	EPA Method 200.8 ICP/MS	6 Months	0.5 ug/l
Thallium	EPA Method 200.8 ICP/MS	6 Months	0.05 ug/l
Vanadium	EPA Method 200.7 ICP	6 Months	5.0 ug/l
Zinc	EPA Method 200.7 ICP	6 Months	10 ug/l
Organic Parameters -3			
TPH (TX method C6 - C28)	TNRCC M1005, GC/FID	7 Days	5.0 ug/l
PCB	EPA M608/8082 GC/ECD	7 Days	0.2 ug/l
Purgeables, 25 mL Purge (VOA's)	EPA M624/8260 GC/MS	7 Days	2 - 10 ug/l
Base/Neutral Acid Extractables (BNA's)	EPA M625/8270 GC/MS	7 Days	2 - 10 ug/l

1. MDL, reported by ACZ Labs. Reporting limits vary with dilution.
2. Total and dissolved metals.
3. Samples for organics only obtained at GTSW-2

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TABLE 2-4
GEORGETOWN CANYON
GROUND WATER
PARAMETERS AND ANALYTICAL METHODS

Analyte	Analytical Method	Holding Time	Method Detection Limit
FIELD PARAMETERS			
Specific Conductance	Field		10 uS/cm
pH	Field		0.01 units
Temperature	Field		0.1 degree C
Turbidity	Field		0.01 ntu
LABORATORY PARAMETERS			
Wet Chem			
Alkalinity	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Total Dissolved Solids	EPA M160.1 Gravimetric, 180 C	7 Days	10.0 mg/l
Total Suspended Solids	EPA M160.2 Gravimetric, 105 C	7 Days	5.0 mg/l
Specific Conductance	EPA M120.1 Wheatstone Bridge	28 Days	1.0 umhos/cm
Ion Balance	1030F & API		
PH	EPA M150.1 Meter	Immediate	0.1 (units)
Bicarbonate	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Carbonate	SM 2320 B, Titrimetric	14 Days	2.0 mg/l
Chloride	EPA M325.2 Colorimetric	28 Days	1.0 mg/l
Fluoride	EPA M340.2 Ion Specific Electrode	28 Days	0.1 mg/l
Nitrate+Nitrite	EPA M353.2 Automated Colorimetric	28 Days	0.02 mg/l
Sulfate	EPA M300.0 Ion Chromatography	28 Days	0.5 mg/l
Orthophosphate (as P)	EPA M365.1 Automated Colorimetric	28 Days	0.01 mg/l
Metals List –2			
Metals Digestion	EPA M3010		
Aluminum	EPA Method 200.7 ICP	6 Months	30 ug/l
Arsenic	EPA Method 200.8 ICP/MS	6 Months	0.5 ug/l
Antimony	EPA Method 200.8 ICP/MS	6 Months	0.2 ug/l
Barium	EPA Method 200.7 ICP	6 Months	3 ug/l
Beryllium	EPA Method 200.7 ICP	6 Months	2 ug/l
Cadmium	EPA Method 200.7 ICP	6 Months	3 ug/l
Calcium	EPA Method 200.7 ICP	6 Months	200 ug/l
Chromium	EPA Method 200.7 ICP	6 Months	10 ug/l
Copper	EPA Method 200.7 ICP	6 Months	10 ug/l
Iron	EPA Method 200.7 ICP	6 Months	10 ug/l
Magnesium	EPA Method 200.7 ICP	6 Months	200 ug/l
Manganese	EPA Method 200.7 ICP	6 Months	5 ug/l
Molybdenum	EPA Method 200.7 ICP	6 Months	10 ug/l
Mercury	EPA Method 200.8 ICP/MS	28 days	0.05 ug/l
Nickel	EPA Method 200.7 ICP	6 Months	10 ug/l

TABLE 2-4
GEORGETOWN CANYON
GROUND WATER
PARAMETERS AND ANALYTICAL METHODS

Analyte	**Analytical Method**	**Holding Time**	**Method Detection Limit**
Potassium	EPA Method 200.7 ICP	6 Months	300 ug/l
Lead	EPA Method 200.8 ICP/MS	6 Months	0.1 ug/l
Selenium	SM 3114 C, AA-Hydride	6 Months	1.0 ug/l
Sodium	EPA Method 200.7 ICP	6 Months	300 ug/l
Silver	EPA Method 200.8 ICP/MS	6 Months	0.5 ug/l
Thallium	EPA Method 200.8 ICP/MS	6 Months	0.05 ug/l
Vanadium	EPA Method 200.7 ICP	6 Months	5.0 ug/l
Zinc	EPA Method 200.7 ICP	6 Months	10 ug/l
Organic Parameters -3			
TPH (TX method C6 - C28)	TNRCC M1005, GC/FID	7 Days	5.0 ug/l
PCB	EPA M608/8082 GC/ECD	7 Days	0.2 ug/l
Purgeables, 25 mL Purge (VOA's)	EPA M624/8260 GC/MS	7 Days	2 - 10 ug/l
Base/Neutral Acid Extractables (BNA's)	EPA M625/8270 GC/MS	7 Days	2 - 10 ug/l

1. MDL, reported by ACZ Labs. Reporting limits vary with dilution.
2. Total and dissolved will be performed on first round
3. Organics obtained from wells GT-4 and GT-5 and from GT-2, GT-3 and GT-6 in 2005

TABLE 3-1

SELECTED TERRESTRIAL WILDLIFE SPECIES IN THE STUDY AREA

MAMMALS

Common Name	Scientific Name
Black bear	Ursus americanus
Shorttail weasel	Mustela erminea
Longtail weasel	Multela frenata
Mink	Mustea vison
Badger	Taxidea taxus
Striped skunk	Mephitis mephitis
Coyote	Canis latrans
Red fox	Vulpes fulra
Mountain lion	Felis concolor
Bobcat	Lynx rufous
Canada lynx	Lynx canadensis
Yellowbelly marmot	Marmota flaviventris
Richardson ground squirrel	Citellus richardsoni
Utnta ground squirrel	Citellus armatus
Golden mantled squirrel	Citellus lateralis
Least chipmunk	Eutamias minimus
Yellow pine chipmunk	Eutamias amoenus
Northern pocket gopher	Thomamvs talpoides
Beaver	Castor cawadensis
Deer mouse	Peromyscus maniculatus
Muskrat	Ondatra zibethica
Bushy-tailed wood rat	Neotoma cinera
Porcupine	Erithizon dorsatuni
Snowshoe hare	Lepus americanus
Whitetail jackrabbit	Lepus townsendi
Mountain cottontail	Svlvilagus nuttalli
Elk	Cervus canadensis
Mule deer	Odocoileus hemionus
Moose	Alces alces

BIRDS

Common Name	Scientific Name
Turkey vulture	Cathartes aura
Red-tailed hawk	Buteo iamaicensis
Swainson's hawk	Buteo swainsoni
Marsh hawk	Circus cyaneus
Bald eagle	Haliaeetns leneocephalus
Golden eagle	Apuila chrvsuetos

TABLE 3-1 (Continued -2)

SELECTED TERRESTRIAL WILDLIFE SPECIES IN THE STUDY AREA

BIRDS

Common Name	Scientific Name
Prairie falcon	Falco mexicanus
Peregrine falcon	Falco Peregrinus
Sparrow hawk	Falco spariverius
Goshawk	Accipiterentilis
Blue grouse	Dendragapus obscuras
Ruffed grouse	Bonasa unibellus
Sage grouse	Centrocercus urophasianus
Mourning dove	Zenaidura macroura
Great horned owl	Buba virgini anus
Long-eared owl	Asio atus
Common nighthawk	Chordeiles minor
Belted kingfisher	Megacergle alcyon
Bohemian waxwing	Bambvcilla garrula
Loggerhead shrike	Lannus ludoricianus
Yellow warbler	Dendroica petechia
Western meadowlark	Sturnella neglecta
Western tanager	Piranga ludoviciana
Cassin's finch	Carpodacus cass
Green-tailed towhee	Chlorura chlorara
Vesper sparrow	Pooecetes gramineus
Red-shafted flicker	Colaptes cafer
Downy woodpecker	Dendrocopos pubescens
Violet-green swallow	Tachycineta thallassina
Black-billed magpie	Pica pica
Common raven	Corvus coraz
Common crow	Corrus brachvrhnchos
Black-capped chickadee	Parus atricapillus
Robin	Turdus migritorius
Western bluebird	Sialia mexicana
Dipper	Cinclus mexicanus
Green-winged teal duck	Anascarolinensis
Mallard duck	Anas platyrhynchas
Redhead duck	Avthya americana
Pintail duck	Anas acuta
Common goldeneye duck	Bucevhala clanzula
Gadwall duck	Anas strepe ra
Great blue heron	Ardea heroidias
Greater sandhill crane	Grus canadensis
Canada goose	Brawta canadensis
Long-billed curlew	Nunienius americanus
Common snipe	Cavella gallinago

TABLE 3-1 (Continued -3)

SELECTED TERRESTRIAL WILDLIFE SPECIES IN THE STUDY AREA

BIRDS

Common Name	Scientific Name
Spotted snipe	Catoptrophorus semipalmatus
Willet	
California gull	Larus californicus
Franklin's gull	Larus pipixcan

AMPHIBIANS

Common Name	Scientific Name
Tiger salamander	Ambystama tigrenuin
Western toad	Bufo boreas
Leopard frog	Rana pipiens

REPTILES

Common Name	Scientific Name
Sagebrush lizard	Sceloporus graciosus
Gopher snake	Pituophis melanoleucus
Western gartersnake	Thamnophis elegans
Racer	Coluber constrictor
Common gartersnake	Thamnophis sirtalis
Western Rattlesnake	

TABLE 3-2
MONITOR WELL CONSTRUCTION INFORMATION

Well	Date Completed	Elevation Meas. Pt. (ft)	Northing Coordinate (ft)	Easting Coordinate (ft)	Boring Depth (ft)	Well Diameter (in)	Screened Interval (ft)	Casing Interval (ft)	Sand Pack (ft)	Bentonite Seal (ft)	Grout Seal (ft)
GT-1	05/27/04	6963.24	17817.64	14808.84	25.6	4-inch PVC	11 to 21	-2.5 TO 11	8.5 to TD	3 to 8.5	0 to 3
GT-2	06/03/04	6918.3	15464.701	14200.912	45	4-inch PVC	32 to 42	-2.5 TO 32	29.1 TO TD	24.1to 29.1	0 to 24.1
GT-3	06/04/04	6916.8	15263.737	14307.431	45	4-inch PVC	34.5 to 44.5	-2.5 TO 34.5	30.8 TO TD	26.2 to 30.8	0 to 26.2
GT-4	06/06/04	6915.97	14957.54	14293.382	43.5	4-inch PVC	31.5 to 41.5	-2.5 TO 31.5	28.3 TO TD	23.3 to 28.3	0 to 23.3
GT-5	06/08/04	6912.1	15032.019	14118.991	37.5	4-inch PVC	17.5 to 37.5	-2.5 TO 17.5	14.5 TO TD	9.4 to 14.5	0 to 9.4
GT-6	06/10/04	6858.28	13123.317	13900.19	68	4-inch PVC	57.5 to 67.5	-2.5 to 57.5	54 TO TD	49.2 to 54.0	0 to 49.2
GT-7	06/28/04	6923.95	15752.218	14287.623	161	4-inch PVC	140 to 160	-2.5 to 140	136.5 to TD	132.0 to 136.5	0 to 132.0
GT-8	07/01/04	6923.23	15754.885	14275.259	43	4-inch PVC	30.0 to 40.0	-2.5 to 30.0	26.8 to TD	23.2 to 26.8	0 to 23.2
Existing Shallow	Unknown	6934.01	16496.956	14367.067	123.5	14-inch	Unknown	Unknown	Unknown	Unknown	Unknown
Existing Deep	Unknown	6934.41	16503.374	14368.272	220	14-inch	Unknown	Unknown	Unknown	Unknown	Unknown

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TABLE 3-3
RESULTS OF SPECIFIC CAPACITY TESTING -e

Well	Pumping Rate (gpm)	Assumed Gradient -a (ft/ft)	Assumed Porosity -b (percent)	Aquifer Thickness -c (ft)	Specific Capacity -d (gpm/ft)	Delta s	Estimated Transmissivity (ft2/day)	Estimated Hydraulic Conductivity (ft/day)	Estimated Flow Velocity (ft/day)
GT-1	13	0.03	0.45	10	4.52	0.24	1912	191.18	12.75
GT-2	0.75	0.015	0.45	10	0.13	4.25	6	0.62	0.02
GT-3	4.4	0.015	0.45	10	0.96	1.8	86	8.63	0.29
GT-4	0.9	0.015	0.45	10	0.25	2.2	14	1.44	0.05
GT-5	0.55	0.015	0.45	10	0.07	4.13	5	0.47	0.02
GT-6	5.2	0.06	0.45	10	1.25	0.45	408	40.78	5.44
GT-7	16.6	0.004	0.45	20	1.64	0.29	2020	101.01	0.90
GT-8	4.2	0.027	0.45	10	0.92	1.52	98	9.75	0.59

Footnotes:
a - Calculated from June 18, 2004 water level map
b - conservative assumed porosity value; actual values may vary by location
c - Values based on screened alluvial or total bedrock thickness
d - Calculated at the end of pumping except GT-6 at 73 minutes.
e - See Appendix A for test data and plots used to calculate aquifer parameters

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TABLE 3-4
SUMMARY OF SOILS GEOTECHNICAL TESTING

Boring	Sample Depth (ft)	Soil Type (USCS)	Grain Size - ASTM D422-63 (percent passing)	Bulk Density - ASTM 2937-83 (dry pcf)	Compaction - ASTM D698	Specific Gravity - ASTM 854	Moisture Content - ASTM D2216-80 (percent)	Falling Head Permeability - EM - 1110-2-1906 (cm sec^{-1})	Unsaturated Hydraulic Conductivity (cm sec^{-1})	Capillary Moisture - ASTM 3152 (percent)
GTB-3	12	GC	89.8 passing No. 4; 67.7 passing No. 40; 48.8 passing No. 200	115.9		2.749	14.3	1.70E-07	4.02E-07	12.4
	17	CL-ML	100 passing No. 4; 86.5 passing No. 40; 64.2 passing No. 200	104.3		2.745	22.8	2.30E-07	9.39E-08	21.7
GTB-4	10	GC					13.5			
	20	GC	35.2 passing No. 4; 25.2 passing No. 40; 16.5 passing No. 200	122.2		2.83	9.4	4.70E-04		
GTB-7	27	GM	62.3 passing No. 4; 32.4 passing No. 40; 19.7 passing No. 200	114.1		2.725	16.4	5.30E-06	1.09E-06	15.7
GTB-8	18.5	CL-ML	73.2 passing No. 4; 58.6 passing No. 40; 41.8 passing No. 200				18.6			
GTB-10	10	GP	37.1 passing No. 4; 23.8 passing No. 40; 15.2 passing No. 200	125.2		2.762	6.8			10.3
GTB-11	8.5	GP					13	2.20E-05		
GTB-12	12.5	CL-ML					19.4	1.70E-07		
GTB-13	13	GC	67.9 passing No. 4; 37.6 passing No. 40; 30.8 passing No. 200				11.3			
	17	GC					7.7			
GTB-14	8.5	CL-ML	100 passing No. 4; 94.5 passing No. 40; 84.6 passing No. 200	96.3			27.3			
	18	GP					12.5			
GTB-15	10	GM					8.7			

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TABLE 3-4
SUMMARY OF SOILS GEOTECHNICAL TESTING

Boring	Sample Depth (ft)	Soil Type (USCS)	Grain Size - ASTM D422-63 (percent passing)	Bulk Density - ASTM 2937-83 (dry pcf)	Compaction - ASTM D698	Specific Gravity - ASTM 854	Moisture Content - ASTM D2216-80 (percent)	Falling Head Permeability - EM - 1110-2-1906 (cm sec^{-1})	Unsaturated Hydraulic Conductivity (cm sec^{-1})	Capillary Moisture - ASTM 3152 (percent)
	25	GP	32 passing No. 4; 19.6 passing No. 40; 11.6 passing No. 200	124.7			6.4	3.10E-03		
CVM-1	Surface	GM	80 passing No. 4; 65.3 passing No. 40; 44.1 passing No. 200	113.4	115 pcf @ 15.2%		14.8	4.50E-06		
CVM-2	Surface	GM	58.1 passing No. 4; 35.4 passing No. 40; 24.9 passing No. 200	116.7	121.8 pcf @ 10.5 %		8.6	2.70E-06		
CVM-3	Surface	GM	98.9 passing No. 4; 92.4 passing No. 40; 76.2 passing No. 200	86.9	90.1pcf @ 25 %		20.2	3.70E-05		

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TABLE 4-1
SUMMARY OF BACKGROUND SOIL CONCENTRATIONS

Parameter	Units	Min	Max	Mean	Std.Dev.	95 Percent Upper Tolerance Limit	Average Western Soil -a
Aluminum	mg/kg	4,620	23,500	17,855	8,968	74,982	74,000
Antimony	mg/kg	0.1	0.3	ND	ND	1	0.62
Arsenic	mg/kg	4.3	8.2	5.75	1.70	17	7
Barium	mg/kg	19.5	189	112.0	72.3	573	670
Beryllium	mg/kg	0.2	1	0.73	0.36	3	0.97
Cadmium	mg/kg	0.6	3.8	1.78	1.44	11	
Calcium	mg/kg	5,000	42,500	19,800	16,099	122,351	33,000
Chromium	mg/kg	16	54	35.0	16.5	140	56
Copper	mg/kg	5	23	17.8	8.6	73	27
Iron	mg/kg	6,230	26,100	18,308	8,713	73,812	26,000
Lead	mg/kg	4.67	18.7	13.27	6.48	55	20
Magnesium	mg/kg	8,960	20,200	12,160	5,408	46,611	10,000
Manganese	mg/kg	138	1,950	1,139	774	6,072	480
Mercury	mg/kg	<0.05	<0.05	ND	ND	ND	0.065
Molybdenum	mg/kg	1	2	1.67	0.58	5	1.1
Nickel	mg/kg	12	29	23.3	7.6	72	19
pH	units	7.2	7.7	7.45	0.29	9	
Phosphorus	percent	0.072	0.494	0.26	0.22	2	
Potassium	mg/kg	1,210	6,260	4,023	2,114	17,486	15,000
Selenium	mg/kg	<0.05	1.9	0.85	0.70	5	0.39
Silver	mg/kg	0.07	0.32	0.21	0.12	1	
Sodium	mg/kg	70	140	107.5	33.0	318	12,000
Thallium	mg/kg	0.2	0.29	0.26	0.04	1	9.8
Vanadium	mg/kg	15.7	58.6	42.9	20.2	172	88
Zinc	mg/kg	50	130	95.0	34.8	317	65

- a - As reported in Shaklette and Boerngen, 1984

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TABLE 4-2
STATISTICAL SUMMARY OF ORE SAMPLING ANALYSES

ANALYTE	Units	Min	Max	Mean	Std. Dev.
Beryllium, total (3050)	mg/kg	0	0	NA	NA
Calcium, total (3050)	mg/kg	205,000	210,000	207,333	2,517
Aluminum, total (3050)	mg/kg	14,200	14,500	14,367	153
Iron, total (3050)	mg/kg	12,600	13,800	13,367	666
Potassium, total (3050)	mg/kg	4,700	4,900	4,800	100
Magnesium, total (3050)	mg/kg	2,700	3,100	2,867	208
Sodium, total (3050)	mg/kg	1,200	1,500	1,300	173
Zinc, total (3050)	mg/kg	1,080	1,270	1,177	95
Chromium, total (3050)	mg/kg	1,020	1,160	1,090	70
Vanadium, total (3050)	mg/kg	839	1,240	1,060	204
Nickel, total (3050)	mg/kg	190	220	207	15
Manganese, total (3050)	mg/kg	95	275	167	95
Copper, total (3050)	mg/kg	110	130	120	10
Cadmium, total (3050)	mg/kg	69	100	87	16
Barium, total (3050)	mg/kg	68	80	75	6
Uranium, total (3050)	mg/kg	66.7	81.8	74.40	7.55
Selenium, total (3050)	mg/kg	35	39	37	2
Molybdenum, total (3050)	mg/kg	30	40	33	6
Radium 226 (3050)	pCi/g	27	30.8	28.50	2.02
Arsenic, total (3050)	mg/kg	20.6	21.8	21.1	0.6
Lead, total (3050)	mg/kg	11	14.5	12.33	1.89
Radium 228 (3050)	pCi/g	2.17	24.6	10.10	12.57
pH, Corrosivity	units	7.9	8.1	8.00	0.10
Antimony, total (3050)	mg/kg	7.4	8	7.7	0.3
Phosphorus, total	percent	6.06	8.63	7.48	1.31
Silver, total (3050)	mg/kg	5.91	6.91	6	1
Thallium, total (3050)	mg/kg	2.16	3.6	2.91	0.72
Mercury, total	mg/kg	0.42	0.55	0.50	0.07

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TABLE 4-3
COMPARISON OF BACKGROUND SOILS AND PRELIMINARY REMEDIATION GOALS
WITH ON-SITE SURFACE SOIL AND ORE INORGANIC CONCENTRATIONS

Parameter	Units	95 Percent Upper Tolerance Limit of Background	Maximum Conc. Surface Soil and Ore Samples	Number of Surface Soil and Ore Samples Exceeding Background	Preliminary Remediation Goals (PRGs) Residential Soil -b	Preliminary Remediation Goals (PRGs) Industrial Soil -b
Mercury	(mg/kg)	ND	0.55	18	23	310
Silver	(mg/kg)	1	25.9	17	390	5,100
Chromium	(mg/kg)	140	1,160	16	210	450
Sodium	(mg/kg)	318	2,220	16		
Selenium	(mg/kg)	5	39	15	390	5,100
Zinc	(mg/kg)	317	3,150	14	23,000	100,000
Antimony	(mg/kg)	1	8	13	31	410
Vanadium	(mg/kg)	172	1,240	13	78	1,000
Cadmium	(mg/kg)	11	100	12	37	450
Phosphorus	(percent)	2	26.1	11	1.6 - white phosphorous	20 - white phosphorous
Thallium	(mg/kg)	1	7.3	10	5.2	67
Molybdenum	(mg/kg)	5	40	9	390	5,100
Nickel	(mg/kg)	72	220	8	1,600	20,000
Calcium	(mg/kg)	122,351	216,000	7		
Lead	(mg/kg)	55	188	6	400	800
Copper	(mg/kg)	73	130	5	3,100	41,000
Arsenic	(mg/kg)	17	21.8	4	0.39	1.6
Aluminum	(mg/kg)	74,982	30,200	0	76,000	100,000
Barium	(mg/kg)	573	189	0	5,400	67,000
Beryllium	(mg/kg)	3	2	0	150	1,900
Iron	(mg/kg)	73,812	27,500	0	23,000	100,000
Magnesium	(mg/kg)	46,611	20,200	0		
Manganese	(mg/kg)	6,072	1,950	0	1,800	19,000
pH	(units)	9	8.4	0		
Potassium	(mg/kg)	17,486	10,400	0		
Other Parameters -a						
Radium-226	pCi/g		30.8	ND	0.193 -c	3.7 -c
Radium-228	pCi/g		24.6	ND	0.26 -c	8.4 -c
Uranium	(mg/kg)		82	ND	16	200

- a - Acquired from ore samples only
- b- EPA Region 9 PRG Table, dated October 2004
- c- Estimated using EPA Superfund Preliminary Remediation Goals for Radionuclides OSWER No. 9 55.01-83A
ND - Not Determined

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TABLE 4-4
STATISTICAL SUMMARY OF SURFACE SOILS AND
PRELIMINARY REMEDIATION GOAL CONCENTRATIONS

ANALYTE	Units	Min	Max	Mean	Std. Dev.	Preliminary Remediation Goals (PRGs) Residential Soil	Preliminary Remediation Goals (PRGs) Industrial Soil
Aluminum, total (3050)	mg/kg	4,620	30,200	18,801	5,563	76,000	100,000
Antimony, total (3050)	mg/kg	0.1	5.9	1.55	1.68	31	410
Arsenic, total (3050)	mg/kg	3	10.9	6.89	2.38	0.39	1.6
Barium, total (3050)	mg/kg	19.5	189	101.0	36.2	5400	67,000
Beryllium, total (3050)	mg/kg	0.2	2	0.9	0.4	150	1,900
Cadmium, total (3050)	mg/kg	0.6	40	11.3	11.5	37	450
Calcium, total (3050)	mg/kg	5,000	216,000	93,768	69,773		
Chromium, total (3050)	mg/kg	16	440	198	153	210	450
Copper, total (3050)	mg/kg	5	120	39	25	3,100	41,000
Iron, total (3050)	mg/kg	6,230	27,500	15,589	6,508	23,000	100,000
Lead, total (3050)	mg/kg	4.67	188	42.0	45.9	400	800
Magnesium, total (3050)	mg/kg	3,600	20,200	9,821	4,952		
Manganese, total (3050)	mg/kg	138	1,950	833	517	1800	19,000
Mercury, total	mg/kg	0.04	0.51	0.24	0.16	23	310
Molybdenum, total (3050)	mg/kg	1	12	5	4	390	5,100
Nickel, total (3050)	mg/kg	12	100	48	25	1600	20,000
pH, Saturated Paste	units	6.2	8.4	7.7	0.5		
Phosphorus, total	percent	0.072	26.1	4	6	white phosphorous only	white phosphorous only
Potassium, total (3050)	pCi/g	1,210	10,400	5,839	2,117		
Selenium, total (3050)	mg/kg	1.5	19.1	7.9	6.4	390	5,100
Silver, total (3050)	mg/kg	0.07	25.9	3.8	6.3	390	5,100
Sodium, total (3050)	pCi/g	70	2,220	674	663		
Thallium, total (3050)	mg/kg	0.2	7.3	1	2	5.2	67
Vanadium, total (3050)	mg/kg	15.7	534	194.9	172.3	78	1,000
Zinc, total (3050)	percent	50	3,150	568	885	23,000	100,000

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TABLE 4-5
ORGANICS DETECTED IN SURFACE SOILS AND
PRELIMINARY REMEDIATION GOALS

LABID	SAMPLE ID	CAS No.	ANALYTE	RESULT	QUAL	UNITS	MDL	Preliminary Remediation Goals (PRGs) Residential Soil (mg/kg)	Preliminary Remediation Goals (PRGs) Industrial Soil (mg/kg)
L47751-02	GTSO-5	000095-63-6	1,2,4-Trimethylbenzene	0.008	J	mg/Kg	0.004	52	170
L46771-16	GTB-8 1-3	011096-82-5	Aroclor 1260	0.62		mg/Kg	0.03	0.22	0.74
L47751-01	GTSO-7	011096-82-5	Aroclor 1260	0.09		mg/Kg	0.03	0.22	0.74
L47751-02	GTSO-5	000065-85-0	Benzoic acid	0.7	J	mg/Kg	0.3	100,000	100,000
L47751-03	GTSO-6	000065-85-0	Benzoic acid	0.6	J	mg/Kg	0.3	100,000	100,000
L47751-01	GTSO-7	000065-85-0	Benzoic acid	0.7	J	mg/Kg	0.3	100,000	100,000
L47751-02	GTSO-5	000117-84-0	Di-n-octyl phthalate	0.2	J	mg/Kg	0.07	1,200	10,000
L47751-04	GTSO-8	000117-84-0	Di-n-octyl phthalate	0.19	J	mg/Kg	0.07	1,200	10,000
L47751-02	GTSO-5	000075-09-2	Methylene Chloride	0.185		mg/Kg	0.004	9.1	21
L47751-03	GTSO-6	000075-09-2	Methylene Chloride	0.075		mg/Kg	0.004	9.1	21
L47751-01	GTSO-7	000075-09-2	Methylene Chloride	0.084		mg/Kg	0.004	9.1	21
L47751-01	GTSO-7	000087-86-5	Pentachlorophenol	1.3	J	mg/Kg	0.3	3	9
L46764-10	GTB-17 1-3		TPH C10 to C28	13	J	mg/Kg	3	NA	NA
L46764-01	GTB-7 1-3		TPH C10 to C28	77		mg/Kg	3	NA	NA
L46771-16	GTB-8 1-3		TPH C10 to C28	59		mg/Kg	3	NA	NA

NA - Not Applicable

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TABLE 4-6
STATISTICAL SUMMARY OF DETECTABLE
CONCENTRATION IN SEDIMENTS

Parameter	Units	Min	Max	Mean	Std. Dev.	Location of Max Concentration
Aluminum, total (3050)	mg/kg	14,500	22300	17480	3228	GTSED-7
Antimony, total (3050)	mg/kg	0.8	10.5	3.6	4.2	GTSED-7
Arsenic, total (3050)	mg/kg	4.71	36.40	14.50	13.37	GTSED-7
Barium, total (3050)	mg/kg	77.9	152.0	105.2	29.5	GTSED-3
Beryllium, total (3050)	mg/kg	0.7	2.0	1.1	0.5	GTSED-7
Cadmium, total (3050)	mg/kg	5.2	95.0	33.6	37.6	GTSED-7
Calcium, total (3050)	mg/kg	44300	134000	97660	34947	GTSED-7
Chromium, total (3050)	mg/kg	139	1090	443	408	GTSED-7
Copper, total (3050)	mg/kg	29	102	55	34	GTSED-7
Iron, total (3050)	mg/kg	10900	20100	15000	3489	GTSED-7
Lead, total (3050)	mg/kg	7.4	100.0	29.0	39.7	GTSED-7
Magnesium, total (3050)	mg/kg	6300	12200	8174	2383	GTSED-1
Manganese, total (3050)	mg/kg	427	788	557	158	GTSED-3
Mercury, total	mg/kg	0.07	0.31	0.18	0.11	GTSED-7
Molybdenum, total (3050)	mg/kg	5	31	15	12	GTSED-7
Nickel, total (3050)	mg/kg	46	197	98	67	GTSED-7
Phosphorus, total	Percent	0.62	1.44	1.01	0.34	GTSED-4
Potassium, total (3050)	mg/kg	3790	7000	5234	1246	GTSED-7
Selenium, total (3050)	mg/kg	10.6	49.0	25.0	16.7	GTSED-7
Silver, total (3050)	mg/kg	1.13	26.80	7.05	11.12	GTSED-7
Sodium, total (3050)	mg/kg	240	1000	702	281	GTSED-7
Thallium, total (3050)	mg/kg	0.41	7.77	2.33	3.09	GTSED-7
Vanadium, total (3050)	mg/kg	114	1290	471	499	GTSED-7
Zinc, total (3050)	mg/kg	217	2160	772	810	GTSED-7

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TABLE 4-6A
SUMMARY OF TCLP RESULTS FROM CLARIFIER SEDIMENTS

CLIENTID	CAS	ANALYTE	METHOD	RESULT	UNITS	MDL	REGULATORY LIMIT
GTSED-7	007440-38-2	Arsenic (TCLP)	M6010B ICP	0.34	mg/L	0.04	5.0 mg/l
GTSED-7	007440-39-3	Barium (TCLP)	M6010B ICP	0.203	mg/L	0.003	100 mg/l
GTSED-7	007440-43-9	Cadmium (TCLP)	M6010B ICP	ND	mg/L	0.005	1 mg/l
GTSED-7	007440-47-3	Chromium (TCLP)	M6010B ICP	0.01	mg/L	0.01	5 mg/l
GTSED-7	007439-92-1	Lead (TCLP)	M6010B ICP	ND	mg/L	0.04	5 mg/l
GTSED-7	007439-97-6	Mercury (TCLP)	M7470 CVAA	0.0002	mg/L	0.0002	0.2 mg/l
GTSED-7	007782-49-2	Selenium (TCLP)	M6010B ICP	ND	mg/L	0.04	1.0 mg/l
GTSED-7	007440-22-4	Silver (TCLP)	M6010B ICP	ND	mg/L	0.01	5.0 mg/l

* ND is less than detection limit

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TABLE 4-7
STATISTICAL SUMMARY OF VADOSE ZONE SOILS
AND COMPARISON WITH SURFACE SOILS AND PRGs

ANALYTE	Units	VADOSE ZONE SOILS				SURFACE SOILS				Preliminary Remediation Goals (PRGs) Residential Soil	Preliminary Remediation Goals (PRGs) Industrial Soil
		Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.		
Aluminum, total (3050)	mg/kg	11,800	33,600	20,800	7,030	4,620	30,200	18,801	5,563	76,000	100,000
Antimony, total (3050)	mg/kg	0.1	5.3	1	1	0.1	5.9	1.55	1.68	31	410
Arsenic, total (3050)	mg/kg	2.5	11.1	6	2	3	10.9	6.89	2.38	0.039	1.6
Barium, total (3050)	mg/kg	44.8	234	116	47	19.5	189	101.0	36.2	5400	67,000
Beryllium, total (3050)	mg/kg	0.4	5.7	1	1	0.2	2	0.9	0.4	150	1,900
Cadmium, total (3050)	mg/kg	1	44	8	11	0.6	40	11.3	11.5	37	450
Calcium, total (3050)	mg/kg	8,890	262,000	92,739	73,413	5,000	216,000	93,768	69,773		
Chromium, total (3050)	mg/kg	27	450	127	123	16	440	198	153	210	450
Copper, total (3050)	mg/kg	9	155	31	28	5	120	39	25	3,100	41,000
Iron, total (3050)	mg/kg	4,240	31,200	16,348	6,982	6230	27500	15,589	6,508	23,000	100,000
Lead, total (3050)	mg/kg	5.34	105	20	25	4.67	188	42.0	45.9	400	800
Magnesium, total (3050)	mg/kg	3,180	27,200	10,973	6,335	3600	20200	9,821	4,952		
Manganese, total (3050)	mg/kg	179	3,310	942	703	138	1950	833	517	1,800	19,000
Mercury, total	mg/kg	0.05	29.2	3	10	0.04	0.51	0.24	0.16	23	310
Molybdenum, total (3050)	mg/kg	1	26	6	6	1	12	5	4	390	5,100
Nickel, total (3050)	mg/kg	14	90	37	19	12	100	48	25	1,600	20,000
pH, Saturated Paste	units	5.1	8.9	8	1	6.2	8.4	7.7	0.5		
Phosphorus, total	percent	0.11	6.13	2	2	0.072	26.1	4	6	white phosphorous only	white phosphorous only
Potassium, total (3050)	pCi/g	2,600	9,710	5,896	1,851	1,210	10,400	5,839	2,117		
Selenium, total (3050)	mg/kg	0.6	18.7	5	6	1.5	19.1	7.9	6.4	390	5,100
Silver, total (3050)	mg/kg	0.04	12.8	1	3	0.07	25.9	3.8	6.3	390	5,100
Sodium, total (3050)	pCi/g	140	3,400	698	904	70	2,220	674	663		
Thallium, total (3050)	mg/kg	0.13	4.14	1	1	0.2	7.3	1	2	5.2	67
Vanadium, total (3050)	mg/kg	23.3	554	138	153	15.7	534	194.9	172.3	78	1,000
Zinc, total (3050)	percent	60	715	258	204	50	3150	568	885	23,000	100,000
TPH C10 to C28	mg/kg	4	647	216	295	13	77	49.7	33	NA	NA

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TABLE 4-8
ORGANIC SOIL RESULTS FROM FORMER UST SITE

LABID	SAMPLE ID	COLLECT DATE	ANALYTE	RESULT (ug/kg)	QUAL	UNITS	MDL	Idaho Tier 0 Soil Cleanup Levels (ug/kg)
L53778-07	B-24 10-11.5	10/13/05	2-Methylnaphthalene	62,000		ug/Kg	1000	NA
L53779-15	B-22 22-23.5	10/13/05	2-Methylnaphthalene	34,300		ug/Kg	700	NA
L53778-04	B-23 19-20.5	10/13/05	2-Methylnaphthalene	5,200		ug/Kg	100	NA
L53778-10	B-24 23-24.5	10/13/05	2-Methylnaphthalene	1,750		ug/Kg	70	NA
L53778-09	B-24 19-20.5	10/13/05	2-Methylnaphthalene	1,450		ug/Kg	70	NA
L53778-08	B-24 14-15.5	10/13/05	2-Methylnaphthalene	520		ug/Kg	70	NA
L53778-05	B-23 23-24.5	10/13/05	2-Methylnaphthalene	480		ug/Kg	70	NA
L53778-02	B-23 9-10.5	10/13/05	2-Methylnaphthalene	290	J	ug/Kg	70	NA
L53778-07	B-24 10-11.5	10/13/05	Acenaphthene	2,000		ug/Kg	70	11,200
L53779-15	B-22 22-23.5	10/13/05	Acenaphthene	1,400		ug/Kg	70	11,200
L53778-04	B-23 19-20.5	10/13/05	Acenaphthene	540		ug/Kg	70	11,200
L53778-05	B-23 23-24.5	10/13/05	Acenaphthene	110	J	ug/Kg	70	11,200
L53778-09	B-24 19-20.5	10/13/05	Acenaphthene	100	J	ug/Kg	70	11,200
L53778-10	B-24 23-24.5	10/13/05	Acenaphthene	90	J	ug/Kg	70	11,200
L46771-16	GTB-8 1-3	07/13/04	Aroclor 1260	620		ug/Kg	30	NA
L53778-07	B-24 10-11.5	10/13/05	Benzene	5	J	ug/Kg	2	60
L53779-15	B-22 22-23.5	10/13/05	Benzene	1.2		ug/Kg	0.3	60
L53778-05	B-23 23-24.5	10/13/05	Benzene	1	J	ug/Kg	0.6	60
L53779-05	B-20 16-17.5	10/13/05	Benzene	0.6	J	ug/Kg	0.3	60
L53779-14	B-22 17-8.5	10/13/05	Benzene	0.4	J	ug/Kg	0.3	60
L53778-07	B-24 10-11.5	10/13/05	Dibenzofuran	2,230		ug/Kg	70	NA
L53779-15	B-22 22-23.5	10/13/05	Dibenzofuran	1,190		ug/Kg	70	NA
L53778-04	B-23 19-20.5	10/13/05	Dibenzofuran	530		ug/Kg	70	NA
L53778-08	B-24 14-15.5	10/13/05	Dibenzofuran	160	J	ug/Kg	70	NA
L53778-09	B-24 19-20.5	10/13/05	Dibenzofuran	150	J	ug/Kg	70	NA
L53778-05	B-23 23-24.5	10/13/05	Dibenzofuran	110	J	ug/Kg	70	NA
L53778-10	B-24 23-24.5	10/13/05	Dibenzofuran	100	J	ug/Kg	70	NA
L53778-07	B-24 10-11.5	10/13/05	Ethylbenzene	289		ug/Kg	1	10,000
L53779-15	B-22 22-23.5	10/13/05	Ethylbenzene	142		ug/Kg	0.2	10,000
L53778-04	B-23 19-20.5	10/13/05	Ethylbenzene	37		ug/Kg	1	10,000
L53778-09	B-24 19-20.5	10/13/05	Ethylbenzene	12.8		ug/Kg	0.4	10,000
L53778-10	B-24 23-24.5	10/13/05	Ethylbenzene	4.4		ug/Kg	0.2	10,000
L53778-05	B-23 23-24.5	10/13/05	Ethylbenzene	3.8		ug/Kg	0.4	10,000

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TABLE 4-8
ORGANIC SOIL RESULTS FROM FORMER UST SITE

LABID	SAMPLE ID	COLLECT DATE	ANALYTE	RESULT (ug/kg)	QUAL	UNITS	MDL	Idaho Tier 0 Soil Cleanup Levels (ug/kg)
L53778-08	B-24 14-15.5	10/13/05	Ethylbenzene	1	J	ug/Kg	1	10,000
L53779-05	B-20 16-17.5	10/13/05	Ethylbenzene	0.7	J	ug/Kg	0.2	10,000
L53778-07	B-24 10-11.5	10/13/05	Fluoranthene	150	J	ug/Kg	70	9,000
L53778-07	B-24 10-11.5	10/13/05	Fluorene	3,370		ug/Kg	70	8,700
L53779-15	B-22 22-23.5	10/13/05	Fluorene	2,080		ug/Kg	70	8,700
L53778-04	B-23 19-20.5	10/13/05	Fluorene	810		ug/Kg	70	8,700
L53778-08	B-24 14-15.5	10/13/05	Fluorene	190	J	ug/Kg	70	8,700
L53778-05	B-23 23-24.5	10/13/05	Fluorene	180	J	ug/Kg	70	8,700
L53778-09	B-24 19-20.5	10/13/05	Fluorene	180	J	ug/Kg	70	8,700
L53778-10	B-24 23-24.5	10/13/05	Fluorene	140	J	ug/Kg	70	8,700
L53778-07	B-24 10-11.5	10/13/05	m p Xylene	1,350		ug/Kg	2	7,000
L53779-15	B-22 22-23.5	10/13/05	m p Xylene	247		ug/Kg	0.4	7,000
L53778-04	B-23 19-20.5	10/13/05	m p Xylene	40		ug/Kg	2	7,000
L53778-09	B-24 19-20.5	10/13/05	m p Xylene	24.8		ug/Kg	0.8	7,000
L53778-10	B-24 23-24.5	10/13/05	m p Xylene	19.4		ug/Kg	0.4	7,000
L53778-05	B-23 23-24.5	10/13/05	m p Xylene	7.7		ug/Kg	0.8	7,000
L53779-05	B-20 16-17.5	10/13/05	m p Xylene	1.3	J	ug/Kg	0.4	7,000
L53779-01	B-20 1-2.5	10/13/05	m p Xylene	0.6	J	ug/Kg	0.4	7,000
L53779-14	B-22 17-8.5	10/13/05	m p Xylene	0.5	J	ug/Kg	0.4	7,000
L53778-06	B-24 5-6.5	10/13/05	m p Xylene	0.5	J	ug/Kg	0.4	7,000
L53779-02	B-20 3.5-5	10/13/05	m p Xylene	0.4	J	ug/Kg	0.4	7,000
L53779-08	B-21 7-9.5	10/13/05	m p Xylene	0.4	J	ug/Kg	0.4	7,000
L53778-07	B-24 10-11.5	10/13/05	Naphthalene	3,700		ug/Kg	70	5,500
L53779-15	B-22 22-23.5	10/13/05	Naphthalene	3,530		ug/Kg	70	5,500
L53778-04	B-23 19-20.5	10/13/05	Naphthalene	200	J	ug/Kg	70	5,500
L53778-09	B-24 19-20.5	10/13/05	Naphthalene	170	J	ug/Kg	70	5,500
L53778-10	B-24 23-24.5	10/13/05	Naphthalene	140	J	ug/Kg	70	5,500
L53778-02	B-23 9-10.5	10/13/05	Naphthalene	70	J	ug/Kg	70	5,500
L53778-07	B-24 10-11.5	10/13/05	o Xylene	344		ug/Kg	1	7,000
L53779-15	B-22 22-23.5	10/13/05	o Xylene	22		ug/Kg	0.2	7,000
L53778-04	B-23 19-20.5	10/13/05	o Xylene	6		ug/Kg	1	7,000
L53778-10	B-24 23-24.5	10/13/05	o Xylene	5		ug/Kg	0.2	7,000
L53778-09	B-24 19-20.5	10/13/05	o Xylene	3.5		ug/Kg	0.4	7,000

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TABLE 4-8
ORGANIC SOIL RESULTS FROM FORMER UST SITE

LABID	SAMPLE ID	COLLECT DATE	ANALYTE	RESULT (ug/kg)	QUAL	UNITS	MDL	Idaho Tier 0 Soil Cleanup Levels (ug/kg)
L53778-05	B-23 23-24.5	10/13/05	o Xylene	1.5	J	ug/Kg	0.4	7,000
L53779-05	B-20 16-17.5	10/13/05	o Xylene	0.6	J	ug/Kg	0.2	7,000
L53779-01	B-20 1-2.5	10/13/05	o Xylene	0.2	J	ug/Kg	0.2	7,000
L53778-07	B-24 10-11.5	10/13/05	Phenanthrene	4,260		ug/Kg	70	15,000
L53779-15	B-22 22-23.5	10/13/05	Phenanthrene	2,640		ug/Kg	70	15,000
L53778-04	B-23 19-20.5	10/13/05	Phenanthrene	1,110		ug/Kg	70	15,000
L53778-08	B-24 14-15.5	10/13/05	Phenanthrene	330		ug/Kg	70	15,000
L53778-05	B-23 23-24.5	10/13/05	Phenanthrene	270	J	ug/Kg	70	15,000
L53778-09	B-24 19-20.5	10/13/05	Phenanthrene	200	J	ug/Kg	70	15,000
L53778-10	B-24 23-24.5	10/13/05	Phenanthrene	170	J	ug/Kg	70	15,000
L53778-07	B-24 10-11.5	10/13/05	Pyrene	110	J	ug/Kg	70	10,000
L53778-07	B-24 10-11.5	10/13/05	Toluene	12		ug/Kg	1	5,400
L53779-15	B-22 22-23.5	10/13/05	Toluene	6.2		ug/Kg	0.2	5,400
L53778-04	B-23 19-20.5	10/13/05	Toluene	4	J	ug/Kg	1	5,400
L53779-13	B-22 12-13.5	10/13/05	Toluene	2	J	ug/Kg	1	5,400
L53779-12	B-22 7-8.5	10/13/05	Toluene	1	J	ug/Kg	1	5,400
L53779-05	B-20 16-17.5	10/13/05	Toluene	0.9	J	ug/Kg	0.2	5,400
L53778-05	B-23 23-24.5	10/13/05	Toluene	0.9	J	ug/Kg	0.4	5,400
L53779-07	B-21 3-4.5	10/13/05	Toluene	0.8	J	ug/Kg	0.2	5,400
L53779-08	B-21 7-9.5	10/13/05	Toluene	0.8	J	ug/Kg	0.2	5,400
L53778-09	B-24 19-20.5	10/13/05	Toluene	0.8	J	ug/Kg	0.4	5,400
L53778-06	B-24 5-6.5	10/13/05	Toluene	0.7	J	ug/Kg	0.2	5,400
L53779-03	B-20 8-9.5	10/13/05	Toluene	0.6	J	ug/Kg	0.2	5,400
L53779-14	B-22 17-8.5	10/13/05	Toluene	0.6	J	ug/Kg	0.2	5,400
L53779-01	B-20 1-2.5	10/13/05	Toluene	0.5	J	ug/Kg	0.2	5,400
L53779-09	B-21 12-13.5	10/13/05	Toluene	0.5	J	ug/Kg	0.2	5,400
L53779-02	B-20 3.5-5	10/13/05	Toluene	0.4	J	ug/Kg	0.2	5,400
L53779-04	B-20 12-13.5	10/13/05	Toluene	0.3	J	ug/Kg	0.2	5,400
L53779-10	B-21 17-18.5	10/13/05	Toluene	0.3	J	ug/Kg	0.2	5,400
L53779-11	B-21 22-23.5	10/13/05	Toluene	0.3	J	ug/Kg	0.2	5,400
L53778-10	B-24 23-24.5	10/13/05	Toluene	0.3	J	ug/Kg	0.2	5,400
L53778-07	B-24 10-11.5	10/13/05	TPH C10 to C28	4,550		mg/Kg	70	NA
L53779-15	B-22 22-23.5	10/13/05	TPH C10 to C28	2,480		[illegible]	[illegible]	[illegible]

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TABLE 4-8
ORGANIC SOIL RESULTS FROM FORMER UST SITE

LABID	SAMPLE ID	COLLECT DATE	ANALYTE	RESULT (ug/kg)	QUAL	UNITS	MDL	Idaho Tier 0 Soil Cleanup Levels (ug/kg)
L53778-04	B-23 19-20.5	10/13/05	TPH C10 to C28	2,460		mg/Kg	30	NA
L53778-09	B-24 19-20.5	10/13/05	TPH C10 to C28	1,110		mg/Kg	20	NA
L46764-03	GTB-7 14.0-16.0	07/13/04	TPH C10 to C28	647		mg/Kg	7	NA
L46764-04	GTB-7 16-18	07/13/04	TPH C10 to C28	620		mg/Kg	7	NA
L53778-08	B-24 14-15.5	10/13/05	TPH C10 to C28	469		mg/Kg	7	NA
L53778-05	B-23 23-24.5	10/13/05	TPH C10 to C28	282		mg/Kg	3	NA
L46764-05	GTB-7 22-24	07/13/04	TPH C10 to C28	217		mg/Kg	3	NA
L53778-10	B-24 23-24.5	10/13/05	TPH C10 to C28	152		mg/Kg	3	NA
L46764-01	GTB-7 1.0-3.0	07/13/04	TPH C10 to C28	77		mg/Kg	3	NA
L46771-16	GTB-8 1-3	07/13/04	TPH C10 to C28	59		mg/Kg	3	NA
L53778-02	B-23 9-10.5	10/13/05	TPH C10 to C28	58		mg/Kg	3	NA
L53778-06	B-24 5-6.5	10/13/05	TPH C10 to C28	46		mg/Kg	3	NA
L53779-13	B-22 12-13.5	10/13/05	TPH C10 to C28	35		mg/Kg	3	NA
L53778-03	B-23 14-15.5	10/13/05	TPH C10 to C28	21		mg/Kg	3	NA
L53779-01	B-20 1-2.5	10/13/05	TPH C10 to C28	18	J	mg/Kg	3	NA
L46771-17	GTB-8 5-7	07/13/04	TPH C10 to C28	16	J	mg/Kg	3	NA
L46764-10	GTB-17 1-3	07/14/04	TPH C10 to C28	13	J	mg/Kg	3	NA
L53778-01	B-23 5-6.5	10/13/05	TPH C10 to C28	7	J	mg/Kg	3	NA
L46771-18	GTB-8 25-27	07/13/04	TPH C10 to C28	5	J	mg/Kg	3	NA
L53779-03	B-20 8-9.5	10/13/05	TPH C10 to C28	4	J	mg/Kg	3	NA
L53779-12	B-22 7-8.5	10/13/05	TPH C10 to C28	4	J	mg/Kg	3	NA
L46764-12	GTB-17 13-14	07/14/04	TPH C10 to C28	4	J	mg/Kg	3	NA
L46764-11	GTB-17 7-9	07/14/04	TPH C10 to C28	4	J	mg/Kg	3	NA

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TABLE 4-9
RANGE OF SURFACE WATER CONCENTRATIONS
GTSW-1 THROUGH GTSW-11

Analyte	Minimum Detectable Concentration (mg/l)	Maximum Concentration (mg/l)	Cold Water Biota Based on 100 mg/l Total Hardness (mg/l) -1	Location of Largest Concentration
Aluminum, dissolved	ND	0.14		GTSW-7
Aluminum, total	0.03	13.4		GTSW-7
Antimony, dissolved	ND	0.0017		GTSW-7
Antimony, total	0.0002	0.0067		GTSW-7
Arsenic, dissolved	ND	0.012	0.15	GTSW-7
Arsenic, total	0.0003	0.0223		GTSW-7
Barium, dissolved	ND	0.049		GTSW-2
Barium, total	0.005	0.065		GTSW-9
Beryllium, dissolved	ND	ND		
Beryllium, total	ND	ND		GTSW-7
Cadmium, dissolved	ND	ND	0.001	
Cadmium, total	0.005	0.029		GTSW-7
Calcium, dissolved	13.4	89.6		GTSW-4
Calcium, total	31	91.6		GTSW-4
Chloride	1	6		GTSW-7
Chromium, dissolved	ND	ND	0.074	
Chromium, total	0.03	0.4		GTSW-7
Copper, dissolved	ND	0.02	0.011	GTSW-7
Copper, total	0.01	0.06		GTSW-7
Fluoride	0.1	14.4		GTSW-7
Iron, dissolved	ND	0.14		GTSW-7
Iron, total	0.02	14.5		GTSW-7
Lead, dissolved	ND	0.0002	0.0025	GTSW-3, GTSW-4
Lead, total	0.0001	0.0111		GTSW-7
Magnesium, dissolved	2.5	23.2		GTSW-4
Magnesium, total	7	22.5		GTSW-11
Manganese, dissolved	ND	0.069		GTSW-7
Manganese, total	0.007	0.457		GTSW-7
Mercury, dissolved	ND	0.0002		GTSW-2, GTSW-7
Mercury, total	ND	0.0003		GTSW-6
Molybdenum, dissolved	ND	0.03		GTSW-7
Molybdenum, total	0.01	0.54		GTSW-7
Nickel, dissolved	ND	0.01	0.052	GTSW-7
Nickel, total	0.01	0.14		GTSW-7
Nitrate/Nitrite as N	0.02	8.2		GTSW-3
pH (lab)	6.8	8.8		GTSW-7
Phosphorus, ortho dissolved	0.01	5.5		GTSW-7
Potassium, dissolved	0.5	15.1		GTSW-7
Potassium, total	0.5	17		GTSW-7
Selenium, dissolved	ND	0.041		GTSW-6
Selenium, total	0.003	0.066	0.005	GTSW-5
Silver, dissolved	ND	0.00011		GTSW-6
Silver, total	0.00005	0.00349		GTSW-7
Sodium, dissolved	0.9	4.1		GTSW-7

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TABLE 4-9
RANGE OF SURFACE WATER CONCENTRATIONS
GTSW-1 THROUGH GTSW-11

Analyte	**Minimum Detectable Concentration (mg/l)**	**Maximum Concentration (mg/l)**	**Cold Water Biota Based on 100 mg/l Total Hardness (mg/l) -1**	**Location of Largest Concentration**
Sodium, total	2.7	4.7		GTSW-7
Sulfate	2.1	32.4		GTSW-5
TDS (calculated)	119	309		GTSW-4
Thallium, dissolved	ND	0.0007		GTSW-1
Thallium, total	0.00006	0.0052		GTSW-4
Vanadium, dissolved	ND	0.066		GTSW-7
Vanadium, total	0.007	0.548		GTSW-7
Zinc, dissolved	ND	0.03	0.118	GTSW-2
Zinc, total	0.01	0.73		GTSW-7

Footnote:

1 - Chronic Continuous Criteria, Whetstone Associates

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TABLE 4-10
RANGE OF TOTAL AND DISSOLVED GROUND WATER CONCENTRATIONS
MONITOR WELLS GT-1 THROUGH GT-8

ANALYTE	Unit	Minimum Detectable Concentration	Max Conc.	Well with Max Conc.	State of Idaho Primary Constituent Standards	State of Idaho Secondary Constituent Standards
Aluminum, dissolved	mg/l	0.03	0.23	GT-5		
Aluminum, total	mg/l	0.04	127	GT-6		0.2
Antimony, dissolved	mg/l	0.0002	0.0054	GT-5		
Antimony, total	mg/l	0.0002	0.0062	GT-5	0.006	
Arsenic, dissolved	mg/l	0.0007	0.124	GT-5		
Arsenic, total	mg/l	0.0024	0.131	GT-5	0.05	
Barium, dissolved	mg/l	0.003	0.289	GT-2		
Barium, total	mg/l	0.051	2.86	GT-2	2	
Beryllium, dissolved	mg/l	ND	ND	GT-5		
Beryllium, total	mg/l	0.003	0.006	GT-6	0.004	
Cadmium, dissolved	mg/l	ND	ND	GT-5		
Cadmium, total	mg/l	0.005	0.048	GT-5	0.005	
Calcium, dissolved	mg/l	53.1	178	GT-4		
Calcium, total	mg/l	61.7	385	GT-6		
Chloride	mg/l	1	20	GT-4		
Chromium, dissolved	mg/l	ND	ND	GT-5		
Chromium, total	mg/l	0.02	0.5	GT-5	0.1	
Copper, dissolved	mg/l	0.04	0.04	GT-3		
Copper, total	mg/l	0.01	0.27	GT-5	1.3	
Fluoride	mg/l	0.1	1.3	GT-4	4	
Iron, dissolved	mg/l	0.01	11.6	GT-4		
Iron, total	mg/l	0.02	146	GT-6		0.3
Lead, dissolved	mg/l	0.0001	0.007	GT-5		
Lead, total	mg/l	0.0001	0.107	GT-5	0.015	
Magnesium, dissolved	mg/l	12	115	GT-5		
Magnesium, total	mg/l	16.4	154	GT-5		
Manganese, dissolved	mg/l	0.013	1.76	GT-2		
Manganese, total	mg/l	0.015	7.62	GT-6		0.05
Mercury, dissolved	mg/l	ND	0.0007	GT-5		
Mercury, total	mg/l	0.0002	0.0014	GT-5	0.002	
Molybdenum, dissolved	mg/l	0.03	0.04	GT-5		
Molybdenum, total	mg/l	0.01	0.06	GT-4		
Nickel, dissolved	mg/l	0.01	0.03	GT-6		
Nickel, total	mg/l	0.01	0.25	GT-6		
Nitrate/Nitrite as N	mg/l	0.02	81.5	GT-5	10	
pH (lab)	mg/l	7	8.3	GT-2		
Phosphorus, ortho dissolved	mg/l	0.01	98	GT-5		
Potassium, dissolved	mg/l	0.5	38.9	GT-2		
Potassium, total	mg/l	0.7	38.8	GT-2		
Residue, Filterable (TDS) @180	mg/l	230	870	GT-5		
Selenium, dissolved	mg/l	0.001	0.081	GT-1		
Selenium, total	mg/l	0.001	0.065	GT-1	0.05	
Silver, dissolved	mg/l	0.00012	0.0003	GT-2		
Silver, total	mg/l	0.00008	0.0168	GT-5		0.1
Sodium, dissolved	mg/l	2.9	110	GT-2		

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TABLE 4-10
RANGE OF TOTAL AND DISSOLVED GROUND WATER CONCENTRATIONS
MONITOR WELLS GT-1 THROUGH GT-8

ANALYTE	Unit	Minimum Detectable Concentration	Max Conc.	Well with Max Conc.	State of Idaho Primary Constituent Standards	State of Idaho Secondary Constituent Standards
Sodium, total	mg/l	2.9	110	GT-5		
Sulfate	mg/l	3	186	GT-4		250
TDS (calculated)	mg/l	208	836	GT-2		500
Thallium, dissolved	mg/l	0.00006	0.0014	GT-5		
Thallium, total	mg/l	0.00006	0.00353	GT-5	0.002	
Vanadium, dissolved	mg/l	0.005	0.271	GT-5		
Vanadium, total	mg/l	0.006	0.785	GT-5		
Zinc, dissolved	mg/l	0.01	0.03	GT-1		
Zinc, total	mg/l	0.02	1	GT-5		5

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TABLE 4-11
SUMMARY OF DETECTED ORGANIC COMPOUNDS IN GROUND WATER

LABID	SAMPLE ID	COLLECTDATE	ANALYTE	RESULT	QUAL	UNITS	MDL	CAS No.
L51839-04	GT-2	06/22/05	1,2,4-Trimethylbenzene	6	J	ug/L	4	
L46666-08	GT-4	07/09/04	1,2,4-Trimethylbenzene	9	J	ug/L	4	000095-63-6
L48077-01	GT-4	09/29/04	1,2,4-Trimethylbenzene	9	J	ug/L	4	000095-63-6
L52956-02	GT-4	08/25/05	1,2,4-Trimethylbenzene	9	J	ug/L	4	
L47428-02	GT-5	08/24/04	1,2,4-Trimethylbenzene	12		ug/L	4	000095-63-6
L51075-14	GT-2	05/11/05	2-Methylnaphthalene	12		ug/L	2	
L51839-01	GT-2	06/22/05	2-Methylnaphthalene	37		ug/L	2	
L46666-08	GT-4	07/09/04	2-Methylnaphthalene	32		ug/L	2	000091-57-6
L47428-01	GT-4	08/24/04	2-Methylnaphthalene	30		ug/L	2	000091-57-6
L48077-01	GT-4	09/29/04	2-Methylnaphthalene	20		ug/L	2	000091-57-6
L51075-15	GT-4	05/11/05	2-Methylnaphthalene	15		ug/L	2	
L51839-02	GT-4	06/22/05	2-Methylnaphthalene	26		ug/L	2	
L52340-01	GT-4	07/20/05	2-Methylnaphthalene	30		ug/L	2	
L52956-02	GT-4	08/25/05	2-Methylnaphthalene	17		ug/L	2	
L51839-01	GT-2	06/22/05	Acenaphthene	2	J	ug/L	2	
L46666-08	GT-4	07/09/04	Acenaphthene	9	J	ug/L	2	000083-32-9
L48077-01	GT-4	09/29/04	Acenaphthene	9	J	ug/L	2	000083-32-9
L51075-15	GT-4	05/11/05	Acenaphthene	4	J	ug/L	2	
L51839-02	GT-4	06/22/05	Acenaphthene	7	J	ug/L	2	
L52340-01	GT-4	07/20/05	Acenaphthene	9	J	ug/L	2	
L52956-02	GT-4	08/25/05	Acenaphthene	8	J	ug/L	2	
L52956-04	GT-2	08/25/05	Benzoic acid	10	J	ug/L	10	
L51839-07	GT-3	06/22/05	Benzoic acid	20	J	ug/L	10	
L47428-01	GT-4	08/24/04	Benzoic acid	14	J	ug/L	9	000065-85-0
L48077-01	GT-4	09/29/04	Benzoic acid	20	J	ug/L	10	000065-85-0
L51839-02	GT-4	06/22/05	Benzoic acid	30	J	ug/L	10	
L52956-02	GT-4	08/25/05	Benzoic acid	20	J	ug/L	10	
L52340-02	GT-5	07/20/05	Benzoic acid	14	J	ug/L	9	
L52956-03	GT-5	08/26/05	Benzoic acid	10	J	ug/L	10	
L46666-08	GT-4	07/09/04	Bis(2-ethylhexyl) phthalate	5	J	ug/L	4	000117-81-7
L47428-01	GT-4	08/24/04	Bis(2-ethylhexyl) phthalate	6	J	ug/L	4	000117-81-7
L48077-01	GT-4	09/29/04	Bis(2-ethylhexyl) phthalate	5	J	ug/L	4	000117-81-7
L51075-15	GT-4	05/11/05	Bis(2-ethylhexyl) phthalate	12	J	ug/L	4	
L52340-01	GT-4	07/20/05	Bis(2-ethylhexyl) phthalate	6	J	ug/L	4	
L46666-08	GT-4	07/09/04	Dibenzofuran	10		ug/L	2	000132-64-9

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TABLE 4-11
SUMMARY OF DETECTED ORGANIC COMPOUNDS IN GROUND WATER

LABID	SAMPLE ID	COLLECTDATE	ANALYTE	RESULT	QUAL	UNITS	MDL	CAS No.
L47428-01	GT-4	08/24/04	Dibenzofuran	10		ug/L	2	000132-64-9
L48077-01	GT-4	09/29/04	Dibenzofuran	10		ug/L	2	000132-64-9
L51839-02	GT-4	06/22/05	Dibenzofuran	9	J	ug/L	2	
L52340-01	GT-4	07/20/05	Dibenzofuran	11		ug/L	2	
L52956-02	GT-4	08/25/05	Dibenzofuran	10	J	ug/L	2	
L46666-08	GT-4	07/09/04	Fluorene	12		ug/L	2	000086-73-7
L47428-01	GT-4	08/24/04	Fluorene	12		ug/L	2	000086-73-7
L48077-01	GT-4	09/29/04	Fluorene	12		ug/L	2	000086-73-7
L51075-15	GT-4	05/11/05	Fluorene	5	J	ug/L	2	
L51839-02	GT-4	06/22/05	Fluorene	11		ug/L	2	
L52340-01	GT-4	07/20/05	Fluorene	12		ug/L	2	
L52956-02	GT-4	08/25/05	Fluorene	11		ug/L	2	
L46666-08	GT-4	07/09/04	Isopropylbenzene	9	J	ug/L	4	000098-82-8
L48077-01	GT-4	09/29/04	Isopropylbenzene	9	J	ug/L	4	000098-82-8
L51075-15	GT-4	05/11/05	Isopropylbenzene	4	J	ug/L	4	
L51839-03	GT-4	06/22/05	Isopropylbenzene	5	J	ug/L	4	
L52340-01	GT-4	07/20/05	Isopropylbenzene	4	J	ug/L	4	
L52956-02	GT-4	08/25/05	Isopropylbenzene	9	J	ug/L	4	
L47428-02	GT-5	08/24/04	Isopropylbenzene	11		ug/L	4	000098-82-8
L51075-14	GT-2	05/11/05	Naphthalene	6	J	ug/L	2	
L51839-04	GT-2	06/22/05	Naphthalene	29		ug/L	3	
L51839-01	GT-2	06/22/05	Naphthalene	23		ug/L	2	
L46666-08	GT-4	07/09/04	Naphthalene	3	J	ug/L	2	000091-20-3
L47428-01	GT-4	08/24/04	Naphthalene	3	J	ug/L	2	000091-20-3
L52340-01	GT-4	07/20/05	Naphthalene	3	J	ug/L	2	
L52956-02	GT-4	08/25/05	Naphthalene	4	J	ug/L	3	
L52956-02	GT-4	08/25/05	Naphthalene	2	J	ug/L	2	
L47428-02	GT-5	08/24/04	Naphthalene	4	J	ug/L	3	000091-20-3
L48077-01	GT-4	09/29/04	Pentachlorophenol	10	J	ug/L	10	000087-86-5
L46666-08	GT-4	07/09/04	Phenanthrene	7	J	ug/L	2	000085-01-8
L47428-01	GT-4	08/24/04	Phenanthrene	8	J	ug/L	2	000085-01-8
L48077-01	GT-4	09/29/04	Phenanthrene	8	J	ug/L	2	000085-01-8
L51075-15	GT-4	05/11/05	Phenanthrene	3	J	ug/L	2	
L51839-02	GT-4	06/22/05	Phenanthrene	7	J	ug/L	2	
L52340-01	GT-4	07/20/05	Phenanthrene	8	J	ug/L	2	

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TABLE 4-11
SUMMARY OF DETECTED ORGANIC COMPOUNDS IN GROUND WATER

LABID	SAMPLE ID	COLLECTDATE	ANALYTE	RESULT	QUAL	UNITS	MDL	CAS No.
L52956-02	GT-4	08/25/05	Phenanthrene	5	J	ug/L	2	
L51839-01	GT-2	06/22/05	TPH C10 to C28	0.3	J	mg/L	0.1	
L52956-04	GT-2	08/25/05	TPH C10 to C28	0.26	J	mg/L	0.09	
L51839-07	GT-3	06/22/05	TPH C10 to C28	1.5		mg/L	0.1	
L46666-08	GT-4	07/09/04	TPH C10 to C28	2.86		mg/L	0.09	
L47428-01	GT-4	08/24/04	TPH C10 to C28	3.4		mg/L	0.1	
L48077-01	GT-4	09/29/04	TPH C10 to C28	3.5		mg/L	0.1	
L51075-15	GT-4	05/11/05	TPH C10 to C28	1.16		mg/L	0.09	
L51839-02	GT-4	06/22/05	TPH C10 to C28	1.4		mg/L	0.1	
L52340-01	GT-4	07/20/05	TPH C10 to C28	2.01		mg/L	0.09	
L52956-02	GT-4	08/25/05	TPH C10 to C28	1.71		mg/L	0.09	
L46666-09	GT-5	07/09/04	TPH C10 to C28	0.1	J	mg/L	0.09	
L47428-02	GT-5	08/24/04	TPH C10 to C28	0.19	J	mg/L	0.09	
L48077-02	GT-5	09/29/04	TPH C10 to C28	0.1	J	mg/L	0.1	
L51075-13	GT-5	05/11/05	TPH C10 to C28	0.09	J	mg/L	0.09	
L52340-02	GT-5	07/20/05	TPH C10 to C28	0.54		mg/L	0.09	
L52956-03	GT-5	08/26/05	TPH C10 to C28	0.2	J	mg/L	0.1	

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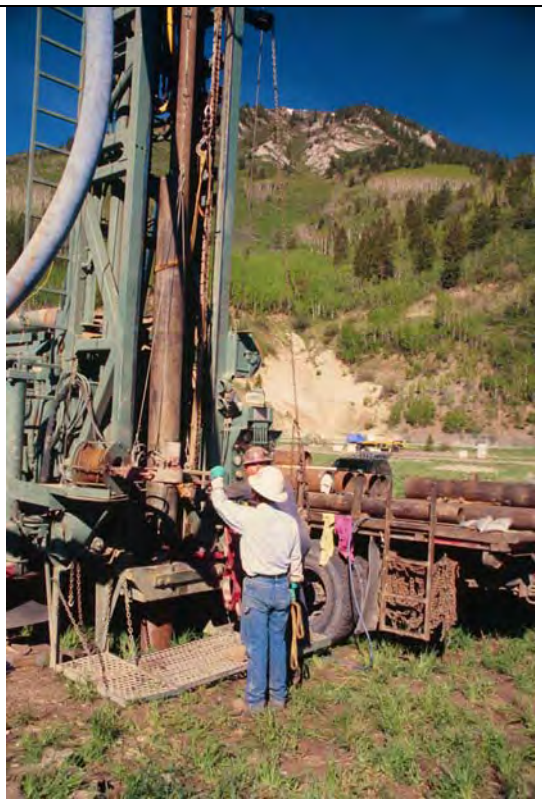


DRILLING MONITOR WELL GT-4

DRILLING WELL GT-7 LOOKING DOWN CANYON

WELL DEVELOPMENT – WELL GT-1

DRILLING WELL GT-8

DRILLING DEEP WELL GT-7

SURFACE SAMPLING PHOSPHATE ORE - PHOSPHORIA GULCH

WELL DEVELOPMENT AND DRILLING WELLS GT-7 AND GT-8

DRILLING BORING GTB-14

DRILLING BORING GTB-9

SOIL SAMPLE COLLECTION – VADOSE ZONE INVESTIGATION

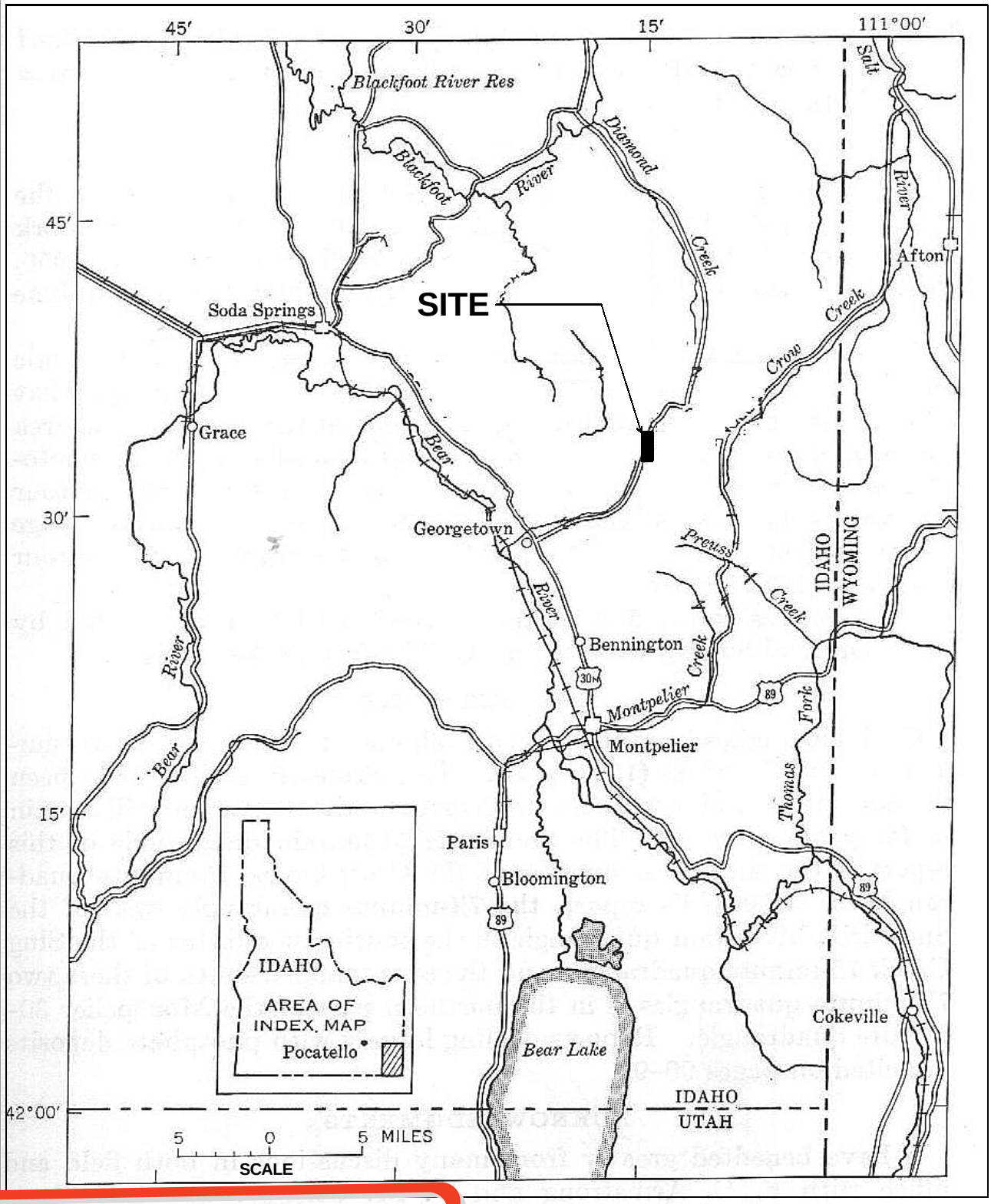
WELL DEVELOPMENT AND PUMP TESTING WELL GT-8

DRILLING WELL GT-5 LOOKING UP PHOSPHORIA GULCH

DRILLING FORMER UST SITE UNDER SHOP

VIEW OF SITE FROM MINE ROAD

PHOS ORE STOCKPILE IN PHOSPHORIA GULCH



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N

REFERENCE:
GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO
USGS BULLETIN 1153, 1964, PLATE 4.

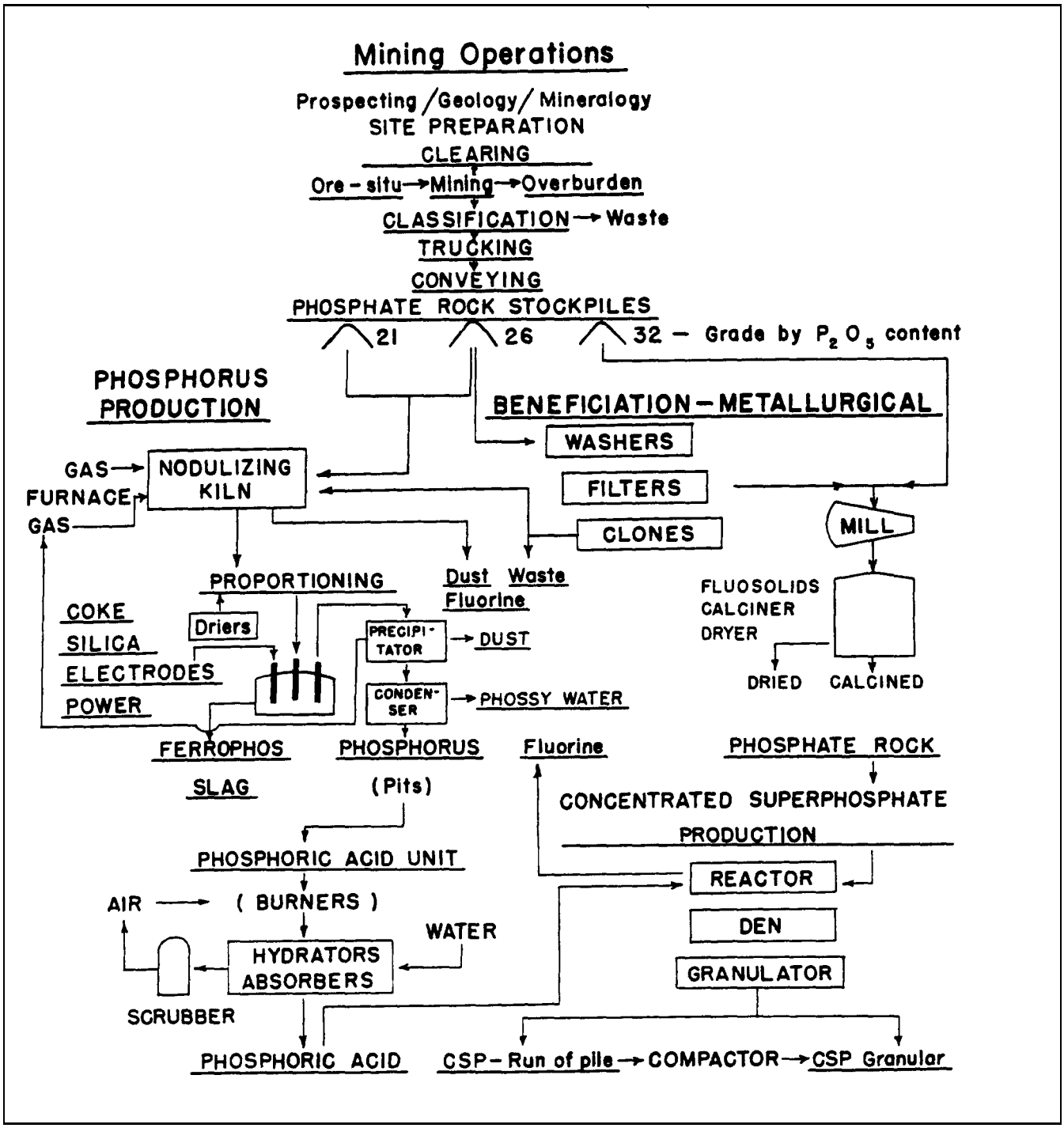
FINAL SITE INVESTIGATION REPORT

LOCATION MAP OF CLOSED CENTRAL FARMERS FERTILIZER PLANT IN GEORGETOWN CANYON, IDAHO

NU-WEST INDUSTRIES INC.
AND NU-WEST MINING INC.

FIGURE 1-1

FLOW OPERATIONS
IPW – CFFC



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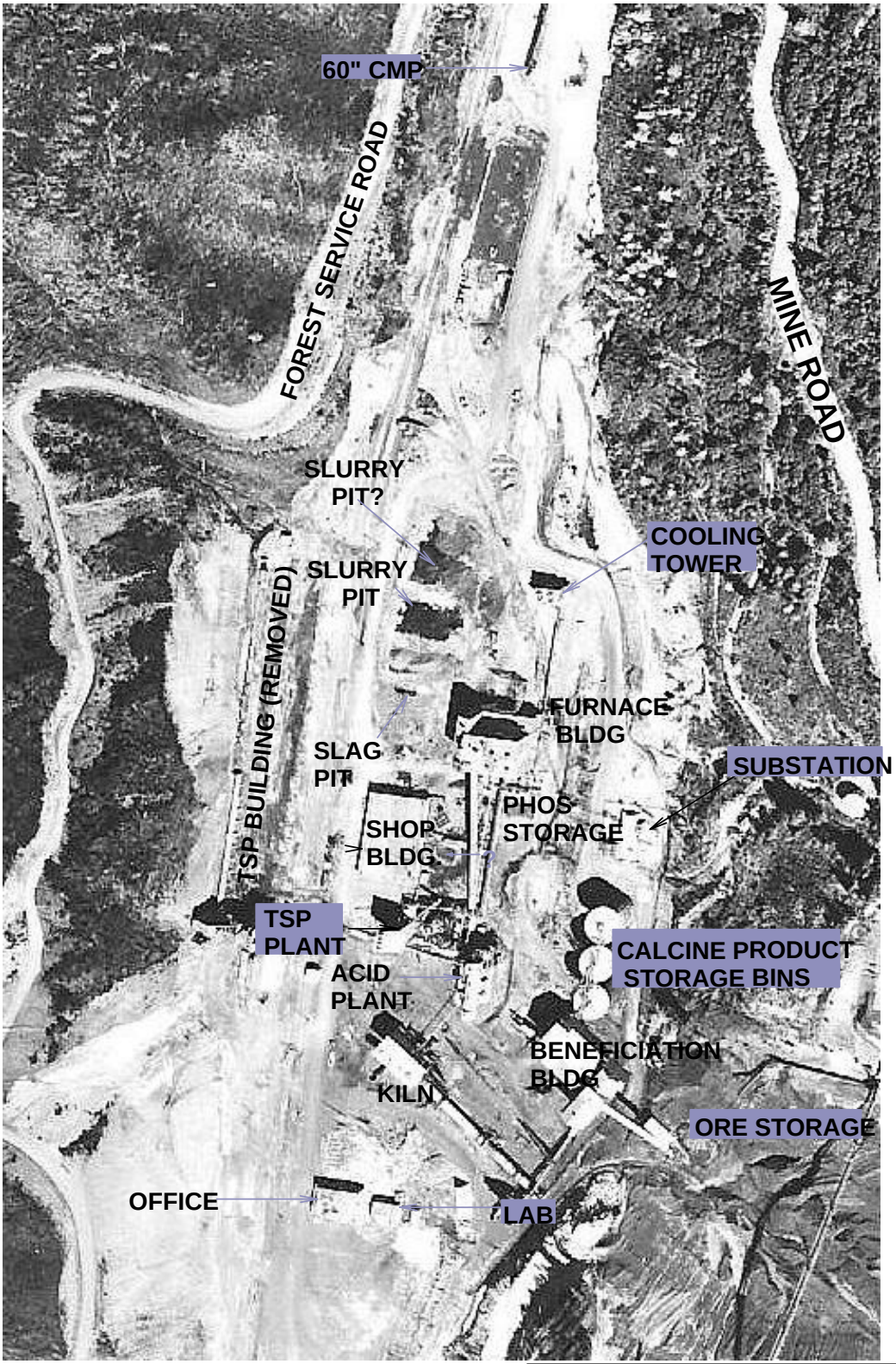
REFERENCE: COX, 1963

FINAL SITE INVESTIGATION REPORT

FERTILIZER PRODUCTION AND PROCESSING FLOW SHEET

FIGURE 1-2



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REFERENCE:
KOOGLE AND POULS ENGINEERING, ALBEQUERQUE, NM
AUGUST 11, 1965 AERIAL PHOTOGRAPHY

FINAL SITE INVESTIGATION REPORT

LOCATION MAP OF CENTRAL FARMERS FERTILIZER FACILITY SITE FEATURES

CENTRALFARMERSSITEFEATURES.TCW

FIGURE 1-3

PART
SECTIONS 24 AND 25,
BEAR LAKE C

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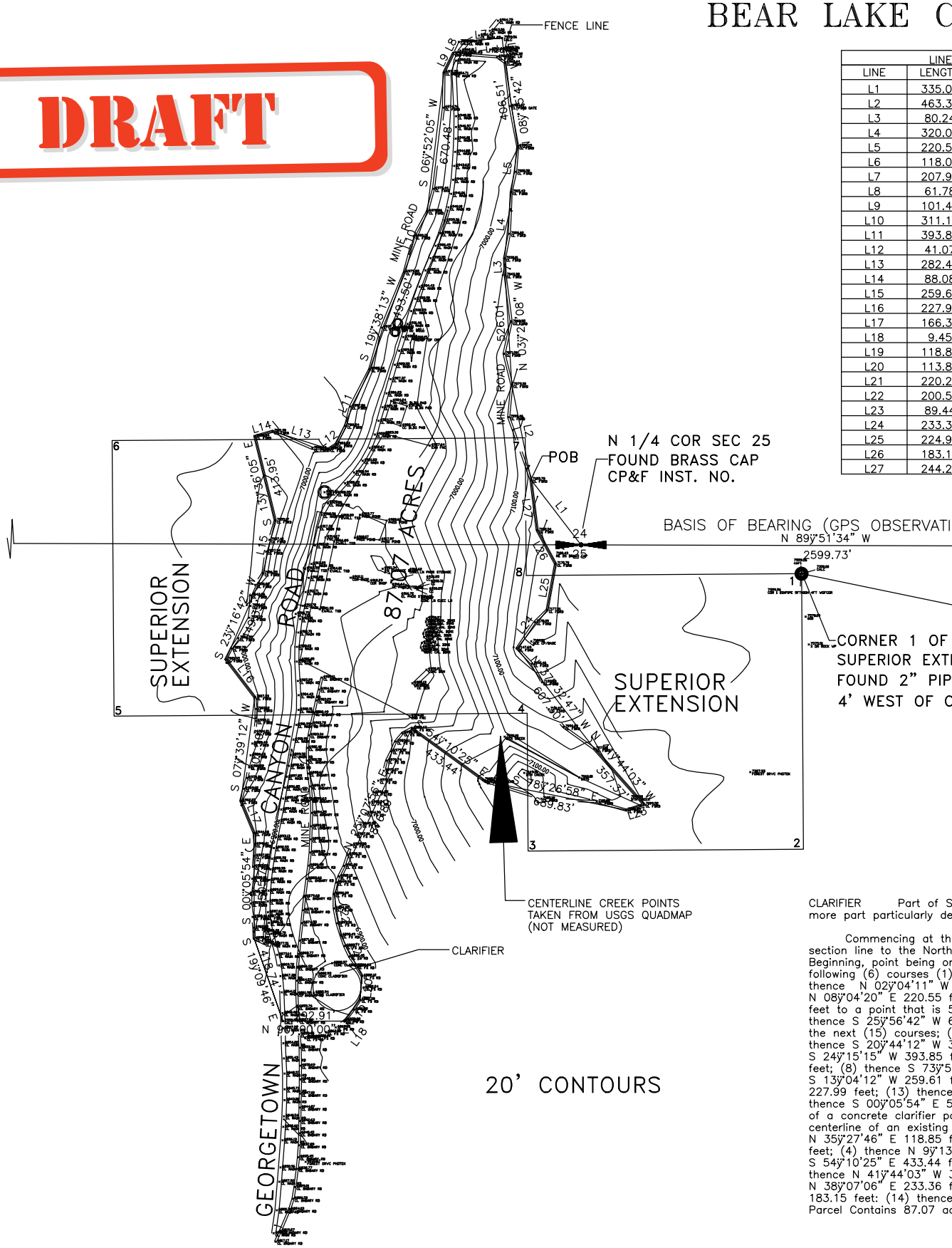


LINE	LINE LENGT
L1	335.0
L2	463.3
L3	80.24
L4	320.0
L5	220.5
L6	118.0
L7	207.9
L8	61.78
L9	101.4
L10	311.1
L11	393.8
L12	41.07
L13	282.4
L14	88.08
L15	259.6
L16	227.9
L17	166.3
L18	9.45
L19	118.8
L20	113.8
L21	220.2
L22	200.5
L23	89.44
L24	233.3
L25	224.9
L26	183.1
L27	244.2

CLARIFIER Part of S
more part particularly de

Commencing at th
section line to the North
Beginning, point being or
following (6) courses (1)
thence N 02ÿ04'11" W
N 08ÿ04'20" E 220.55 f
feet to a point that is 5
thence S 25ÿ56'42" W 6
the next (15) courses; (
thence S 20ÿ44'12" W 3
S 24ÿ15'15" W 393.85 f
feet; (8) thence S 73ÿ5
S 13ÿ04'12" W 259.61 f
227.99 feet; (13) thence
thence S 00ÿ05'54" E 5
of a concrete clarifier po
centerline of an existing
N 35ÿ27'46" E 118.85 f
feet; (4) thence N 9ÿ13
S 54ÿ10'25" E 433.44 f
thence N 41ÿ44'03" W 3
N 38ÿ07'06" E 233.36 f
183.15 feet: (14) thence
Parcel Contains 87.07 ac

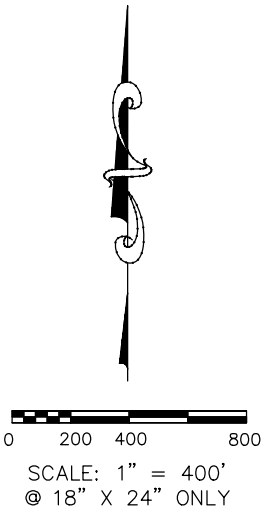
T OF
T. 10 S., R. 44 E.B.M.
COUNTY, IDAHO

RECORDER'S CERTIFICATE

Instrument No. — —
Time of Day _
Date
Recorded in Bear Lake County, Idaho

County Recorder

TABLE	
TH	BEARING
08	N21ÿ11'10"W
57	N11ÿ25'17"W
4	N02ÿ04'11"W
08	N05ÿ43'24"E
55	N08ÿ04'20"E
06	N06ÿ42'10"W
9	S84ÿ55'29"W
8	S25ÿ56'42"W
4	S25ÿ56'42"W
1	S20ÿ44'12"W
55	S24ÿ15'15"W
7	S56ÿ14'49"W
9	N72ÿ36'10"W
8	S73ÿ54'24"W
1	S13ÿ04'12"W
9	S37ÿ24'46"E
0	S22ÿ18'45"E
	N52ÿ38'58"E
5	N35ÿ27'46"E
3	N05ÿ07'58"E
8	N27ÿ35'32"W
1	N09ÿ13'17"W
4	N72ÿ33'36"E
6	N38ÿ07'06"E
2	N10ÿ14'11"E
5	N28ÿ36'12"W
4	N07ÿ03'40"W



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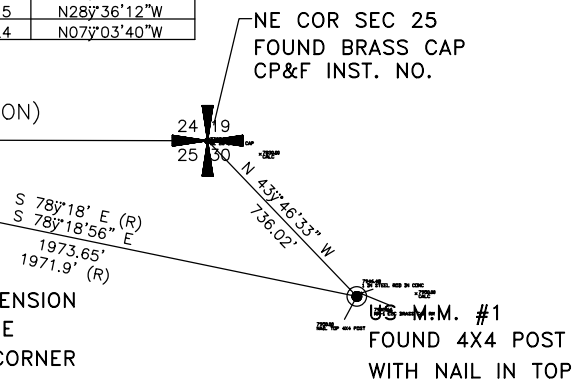

LEGEND

(R)	As Per Mineral Survey
	Section Corner Control
	Placed 1/2" X 24" Iron rod with cap marked P.L.S. 5360
1	Corner No. 1 Superior Extension Claim

LEGAL DESCRIPTION

Sections 24 & 25, Township 10 South, Range 44 E.B.M. Bear Lake County, Idaho
escribed as:

e NE corner of said section 25 and N 89ÿ51'34" W 2599.73 feet along the
1/4 of said section 25 and N 21ÿ11'10" W 335.08 feet to the True Point of
the centerline of a mining road. Thence along said mining road for the
N 11ÿ25'17" W 463.37 feet; (2) thence N 03ÿ28'08" W 526.01 feet (3)
80.24 feet; (4) thence N 05ÿ43'24" E 320.08 feet (5) thence
feet; (6) thence N 08ÿ35'42" W 406.51 feet; thence N 06ÿ42'10" W 118.06
50.00 feet north of an existing fence line thence S 84ÿ55'29" W 207.99 feet;
61.78 feet to the centerline of a mining road; thence along said mining road
1) S 25ÿ56'42" W 101.44 feet; (2) thence S 06ÿ52'05" W 670.48 feet; (3)
311.11 feet; (4) thence S 19ÿ38'13" W 493.50 feet; (5) thence
feet; (6) thence S 56ÿ14'49" W 41.07 feet; (7) thence N 72ÿ36'10" W 282.49
4'24" W 88.08 feet; (9) thence S 13ÿ36'05" E 413.95 feet; (10) thence
feet; (11) thence S 23ÿ16'42" W 449.35 feet; (12) thence S 37ÿ24'46" E
S 07ÿ39'12" W 501.50 feet; (14) thence S 22ÿ18'45" E 166.30 feet; (15)
505.74 feet; thence S 19ÿ09''46" E 418.74 feet to a point that is 50 feet south
ond; thence S 90ÿ00'00" E 292.91 feet; thence N 52ÿ38'58" E 9.45 feet to the
mining road; thence along said road the next (14) courses; (1) thence
feet; (2) thence N 05ÿ07'58" E 113.83 feet; (3) thence N 27ÿ35'32" W 220.28
'17" W 200.51 feet; (5) N 25ÿ07'56" E 876.89 feet; (6) thence
feet (7) S 78ÿ26'58" E 689.83 feet; (8) thence N 72ÿ33'36" E 89.44 feet; (9)
357.37 feet; (10) thence N 37ÿ32'47" W 607.30 feet; (11) thence
feet; (12) thence N 10ÿ14'11" E 224.92 feet; (13) thence N 28ÿ36'12" W
e N 7ÿ03'40" W 244.24 feet to the point of beginning.
cres

FIGURE 2-1

SURVEYORS CERTIFICATE

I, Bryce D. Jolley, a Registered Professional Land Surveyor in the State of Idaho do hereby certify that this plat is an accurate representation of the survey completed under my supervision.

Bryce D. Jolle License No. 5360 Date

REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF IDAHO
BRYCE D. JOLLEY

RECORD OF SURVEY

AGRIUM U.S. INC.

EC. 25, T. 10 S., R. 44 E.B.M.

ARPER-LEAVITT ENGINEERING, INC.
PROFESSIONAL ENGINEERS AND LAND SURVEYORS

800 W. Judicial P.O. Box 566
Blackfoot, Idaho 83221
(208) 785-2977
Fax (208) 785-2990

985 N. Capital Ave. P.O. Box 50691
Idaho Falls, Idaho 83405
(208) 524-0212
Fax (208) 524-0229

ATE:	01/13/
RWN. BY:	S.A.J.

SHEET 1 OF 1

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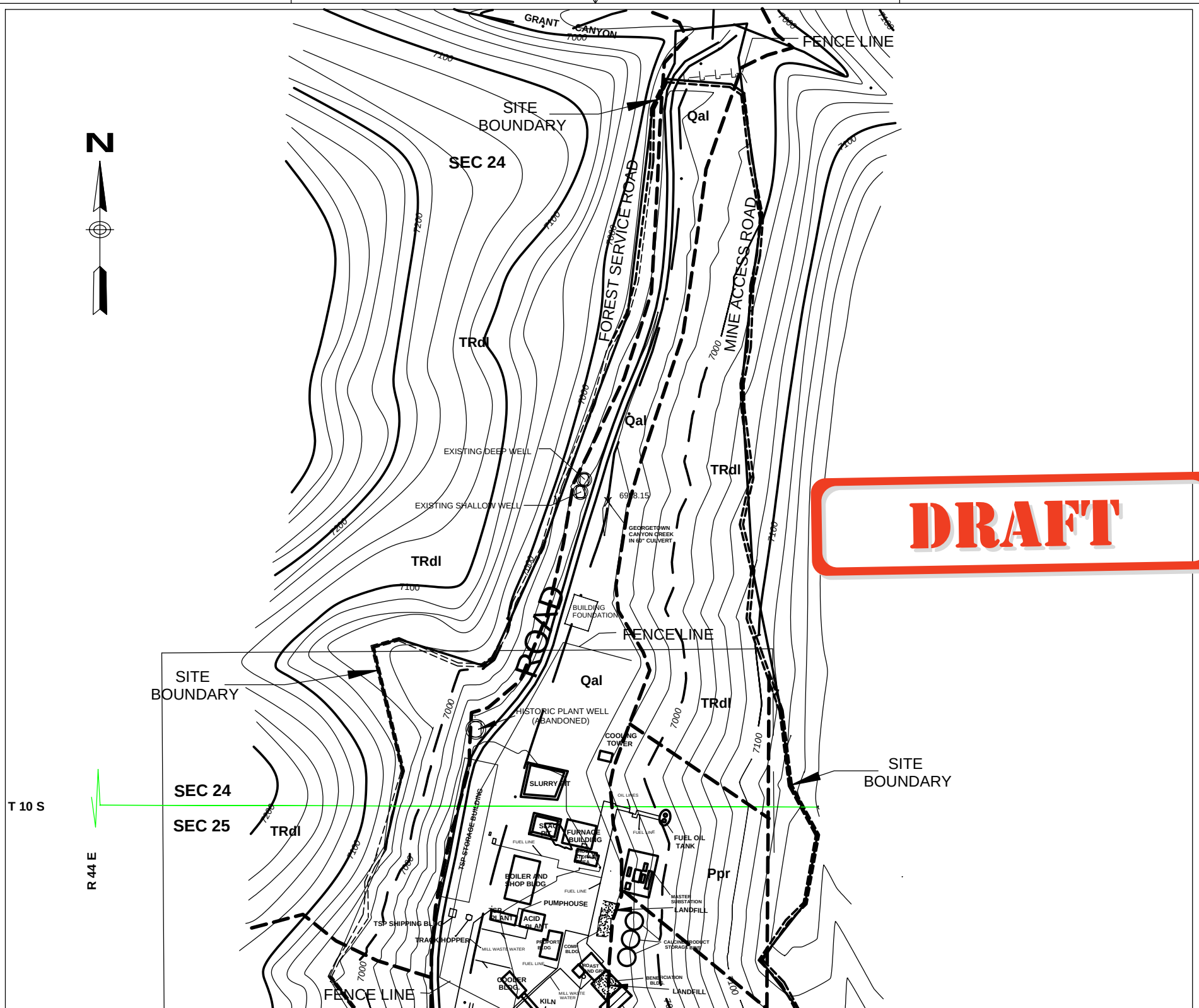
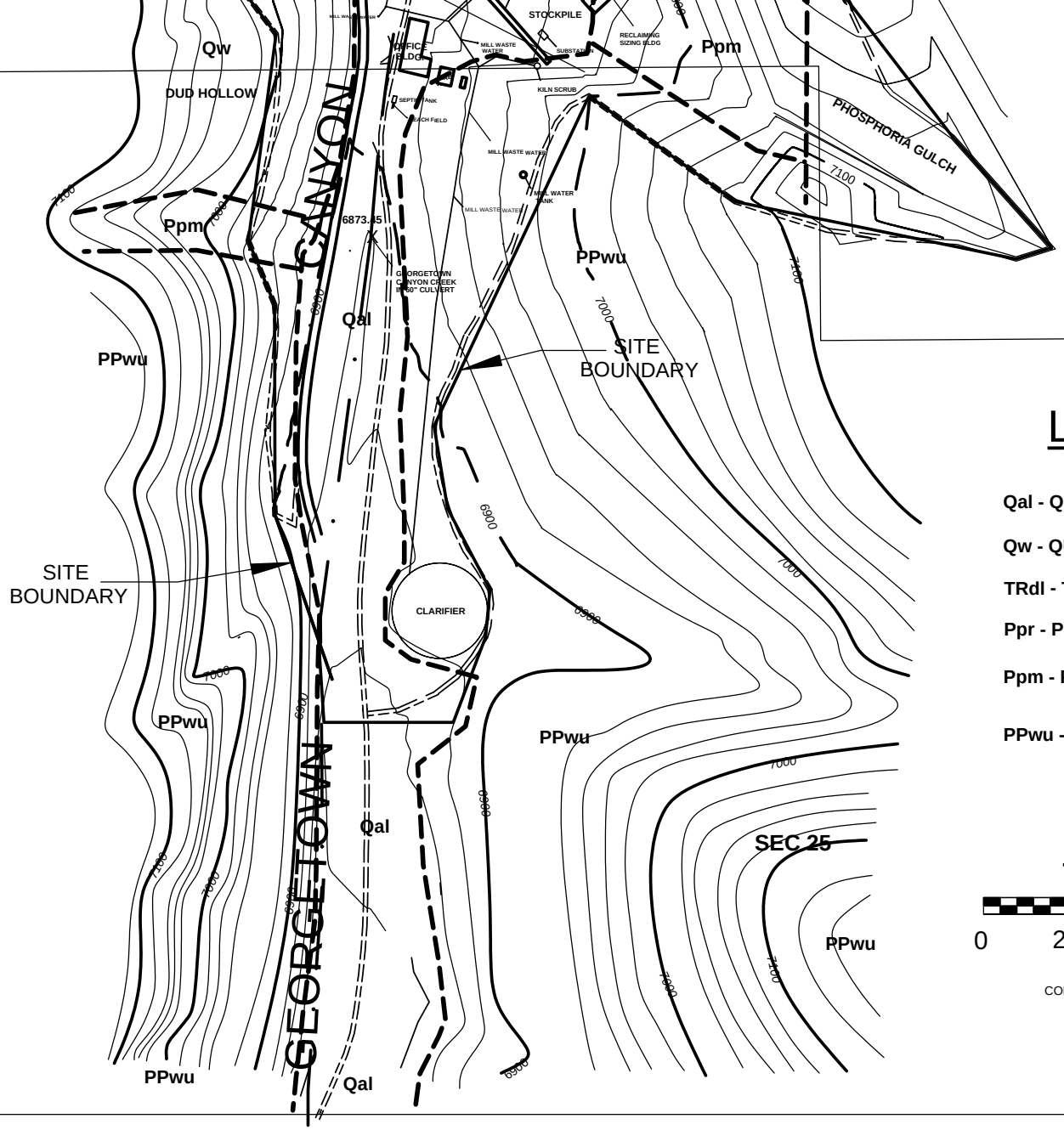

A
B
C
D
8
7
6
5
N
GRANT CANYON
7000
7100
7200
FENCE LINE
SITE BOUNDARY
Qal
SEC 24
FOREST SERVICE ROAD
MINE ACCESS ROAD
TRdl
EXISTING DEEP WELL
EXISTING SHALLOW WELL
6918.15
GEORGETOWN CANYON CREEK IN 60" CULVERT
BUILDING FOUNDATION
ROAD
HISTORIC PLANT WELL (ABANDONED)
COOLING TOWER
SLURRY PIT
OIL LINES
FUEL OIL TANK
FURNACE BUILDING
FUEL LINE
BOILER AND SHOP BLDG
PUMPHOUSE
TSP STORAGE BUILDING
TSP SHIPPING BLDG
TRACK HOPPER
MILL WASTE WATER
ACID PLANT
REPORT BLDG
COMP BLDG
COOLER BLDG
KILN
MASTER SUBSTATION
LANDFILL
CALCINE PRODUCT STORAGE BLDG
BENEFICIATION BLDG
Ppr
SEC 25
T 10 S
R 44 E
DRAFT



LEGEND

Qal - QUATERNARY ALLUVIUM

Qw - QUATERNARY HILL WASH

TRdl - TRIASSIC LOWER DINWOODY FM.

Ppr - PERMIAN REX CHERT FM.

Ppm - PERMIAN PHOSPHORIA FM.

PPwu - PERMIAN-PENNSYLVANNIAN UPPER WELLS FM.

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, N 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

DRAFT

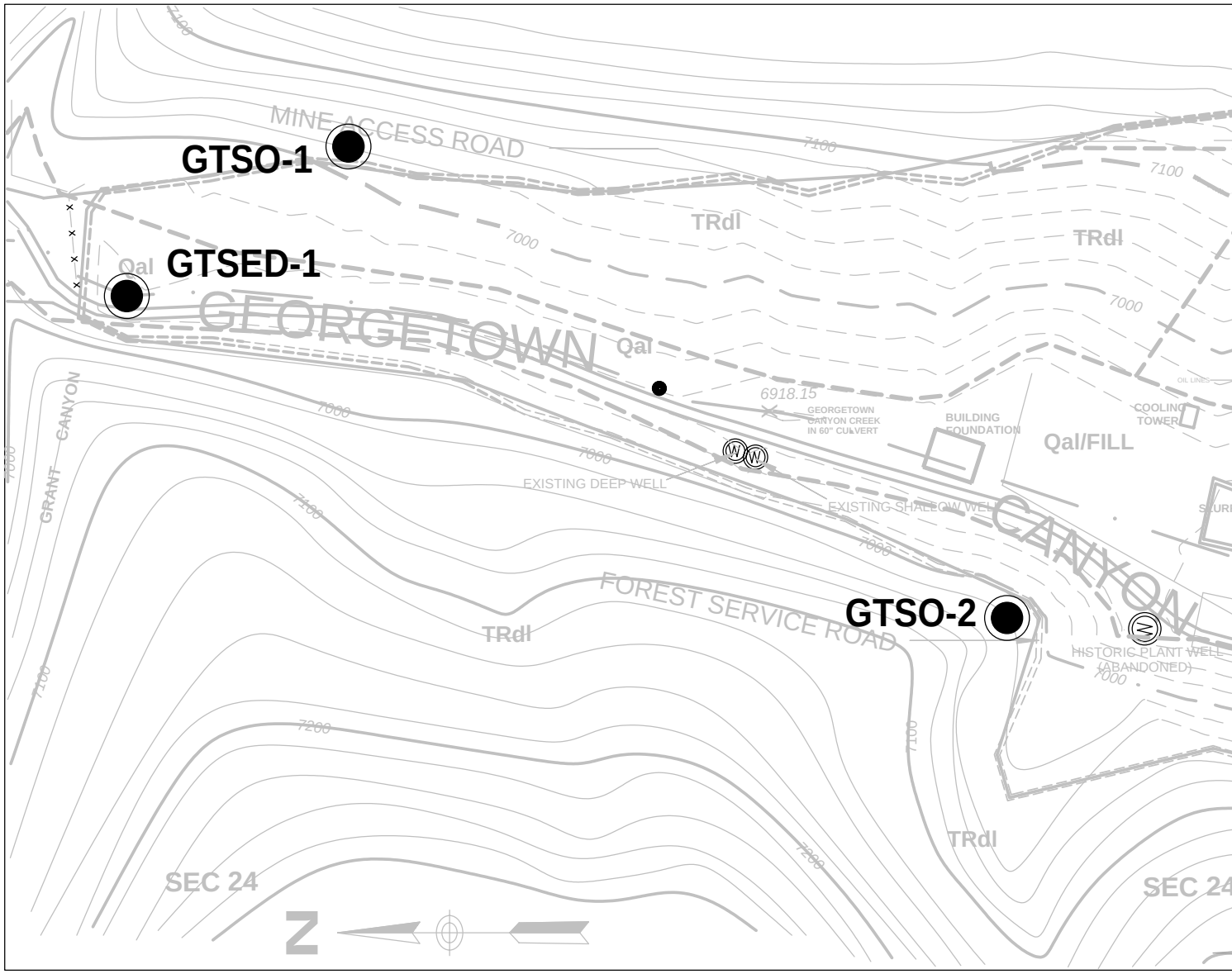
FINAL SITE INVESTIGATION REPORT

TITLE

LOCATION OF FEATURES AND GEOLOGY CENTRAL FARMERS FERTILIZER PLANT

SIZE	CAGE CODE	DWG NO	REV
D		GEORGETOWN CANYON BASE MAP	0
SCALE AS SHOWN		2/6/05	SHEET FIGURE 2-2

DRAWN BY J.S. BROWN



KEY

GTSED-1 — **SEDIMENT SAMPLING LOCATION AND SAMPLE ID DESIGNATION**

GTSO-1 — **SURFACE SOIL (BACKGROUND) SAMPLING LOCATION AND SAMPLE ID DESIGNATION GT-SO5 THROUGH GT-SO8 WILL INCLUDE SELECTED ORGANICS ANALYSES**

GTORE-1 — **ORE STOCKPILE SAMPLING LOCATION AND SAMPLE ID DESIGNATION**

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

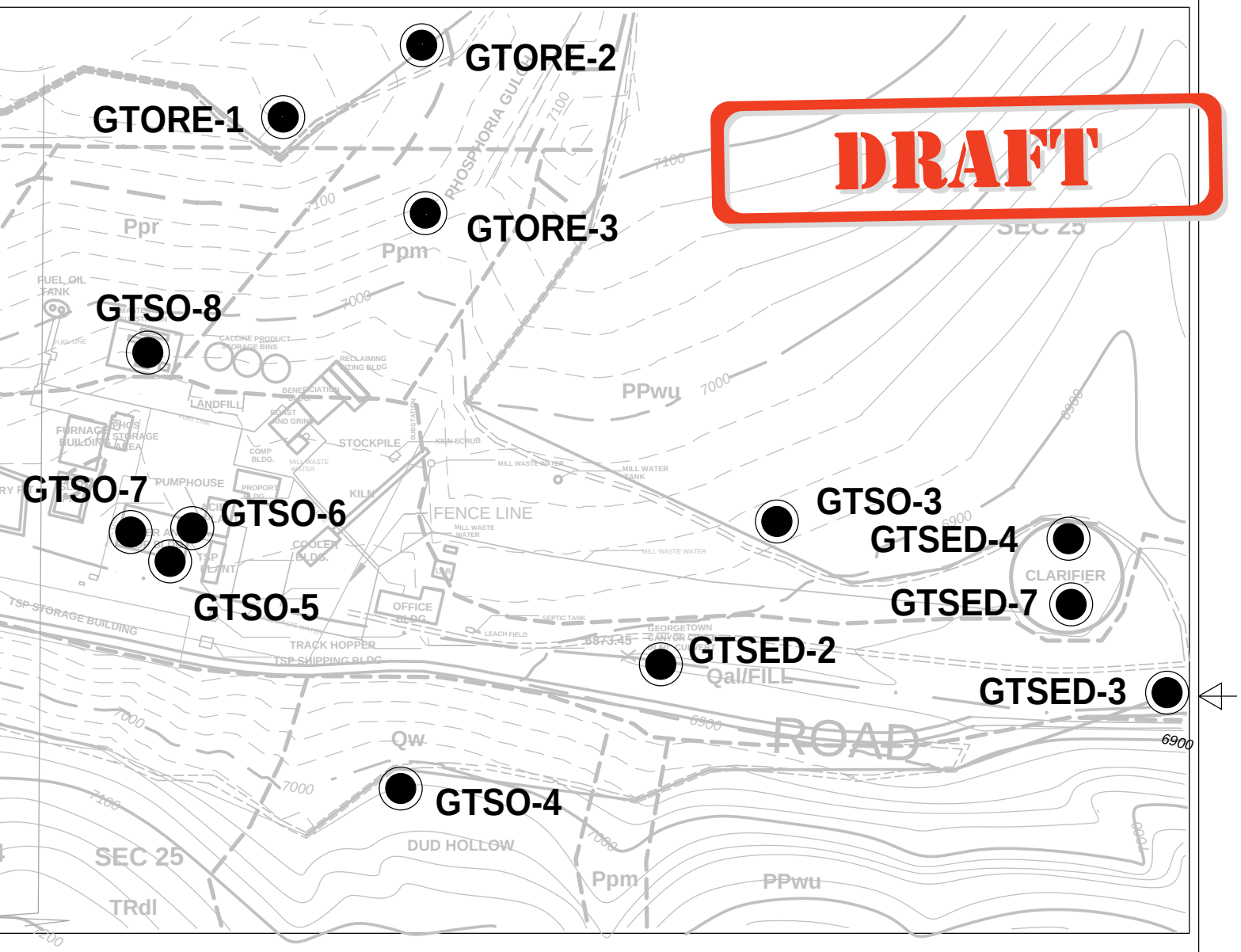
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WE

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

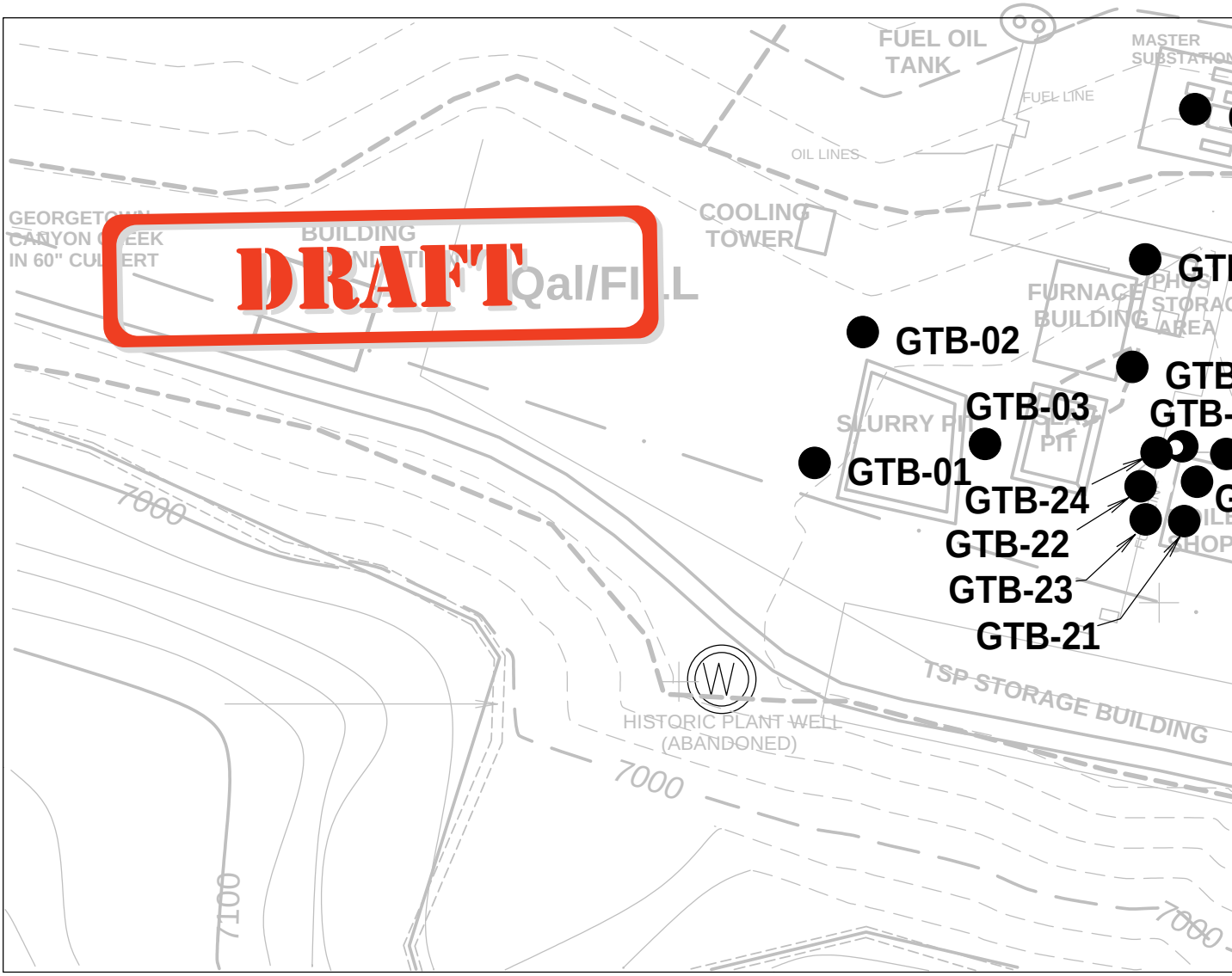
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT
	TITLE SURFACE SOIL, ORE STOCKPILE AND SEDIMENT SAMPLE SITES CENTRAL FARMERS FERTILIZER FACILITY
08/09/06	SIZE B / CAGE CODE / DWG NO / REV
DRAWN BY J.S. BROWN, P.G.	SCALE / SHEET FIGURE 2-3



KEY

● GTB-01 SOIL AUGER BORING LOCATION AND DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

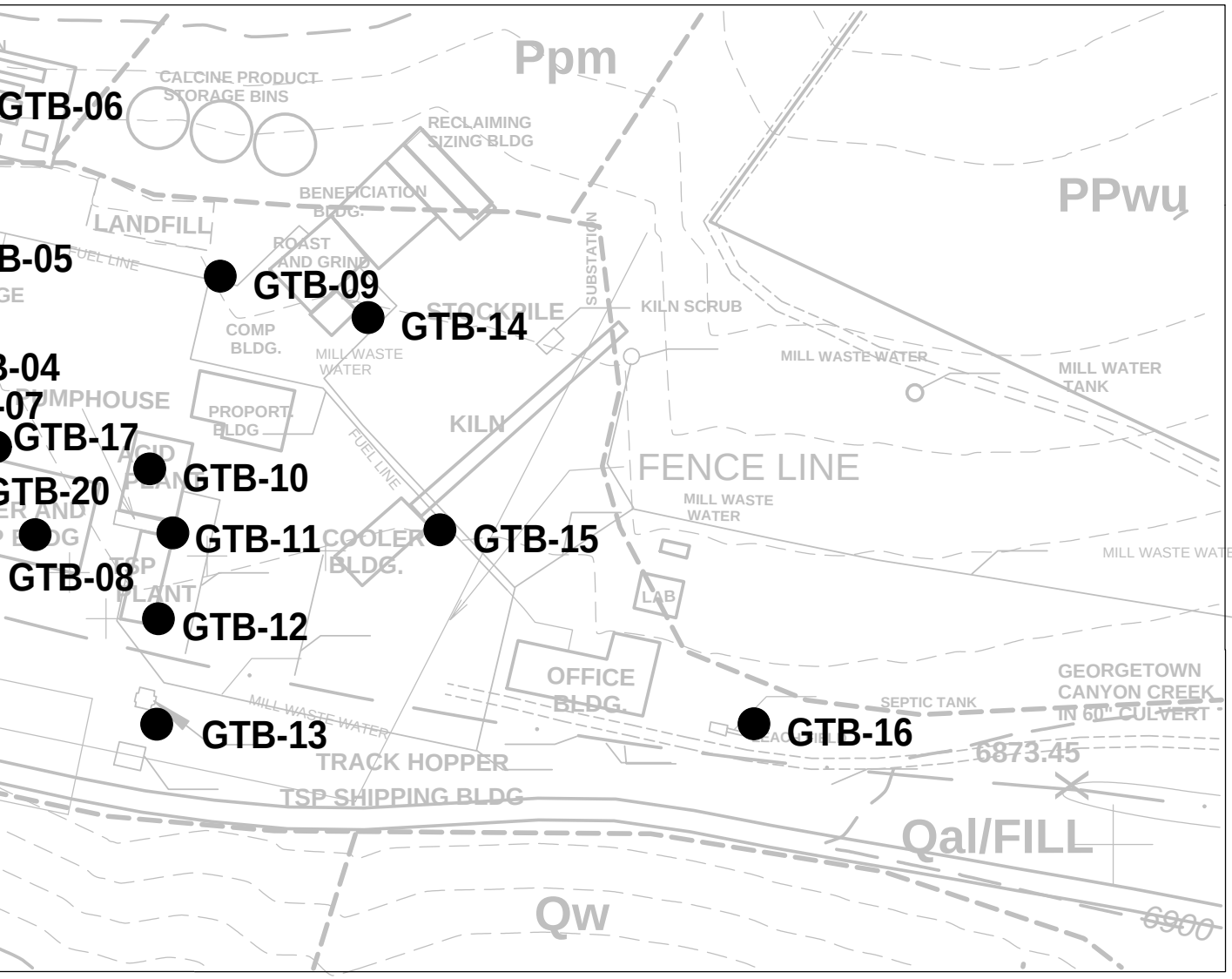
PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.



MAP SCALE

0 200 400

CONTOUR INTERVAL = 20 FEET

UM

ASH

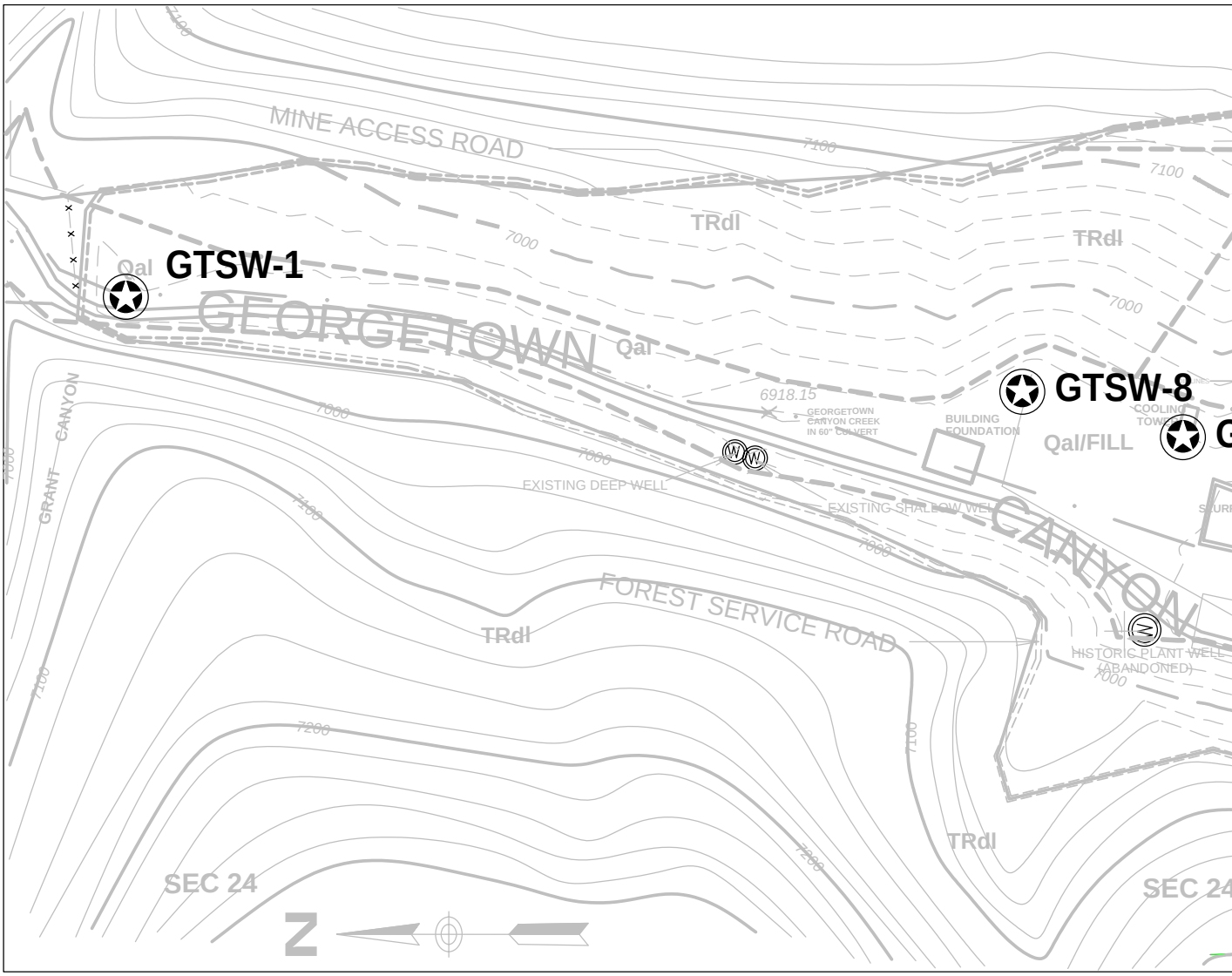
WOODY FM.

FM.

IA FM.

VANIAN

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE SOIL BORING LOCATIONS CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 2-4	



KEY

GTSW-7 SURFACE WATER SAMPLING LOCATION AND SAMPLE ID DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

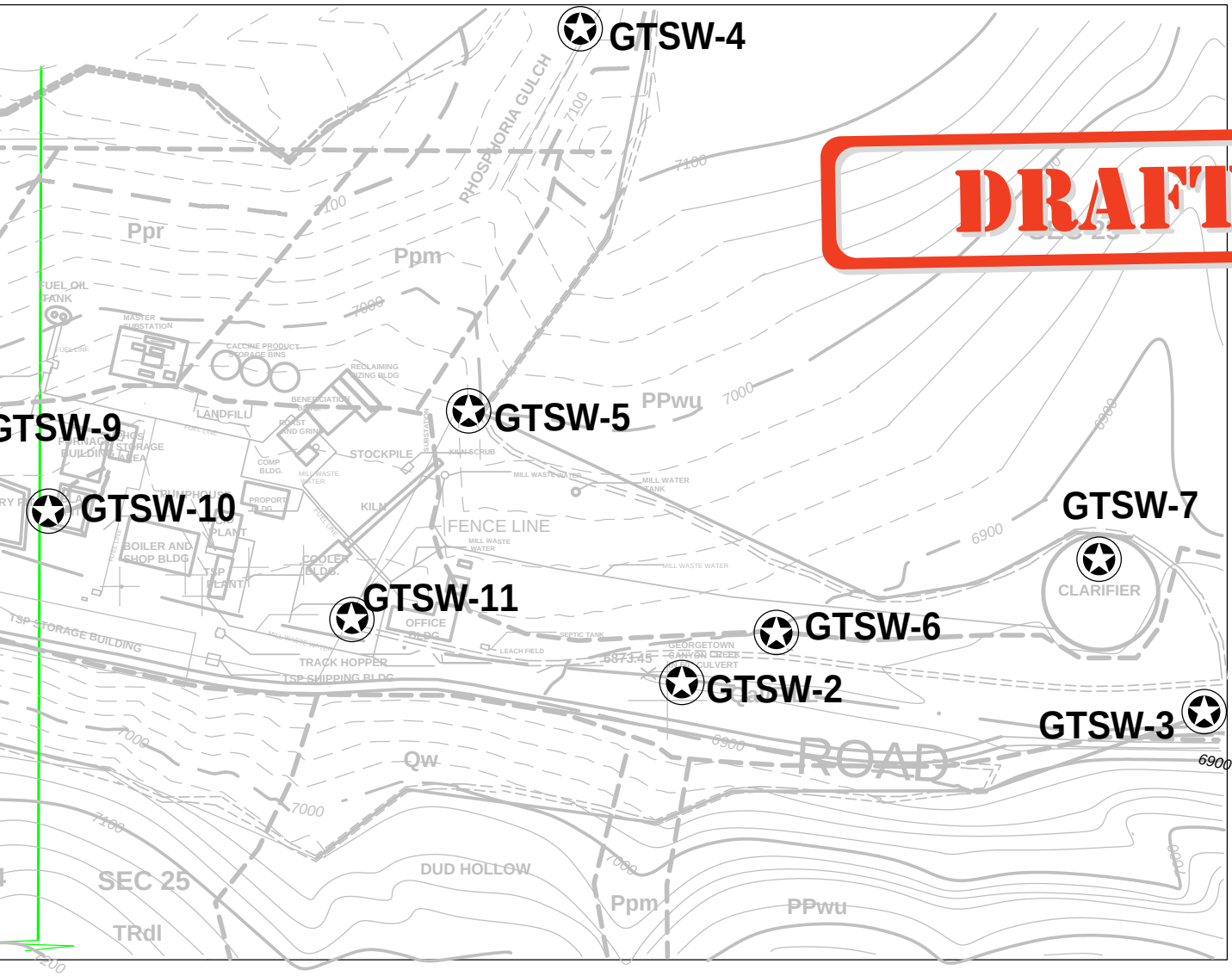
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

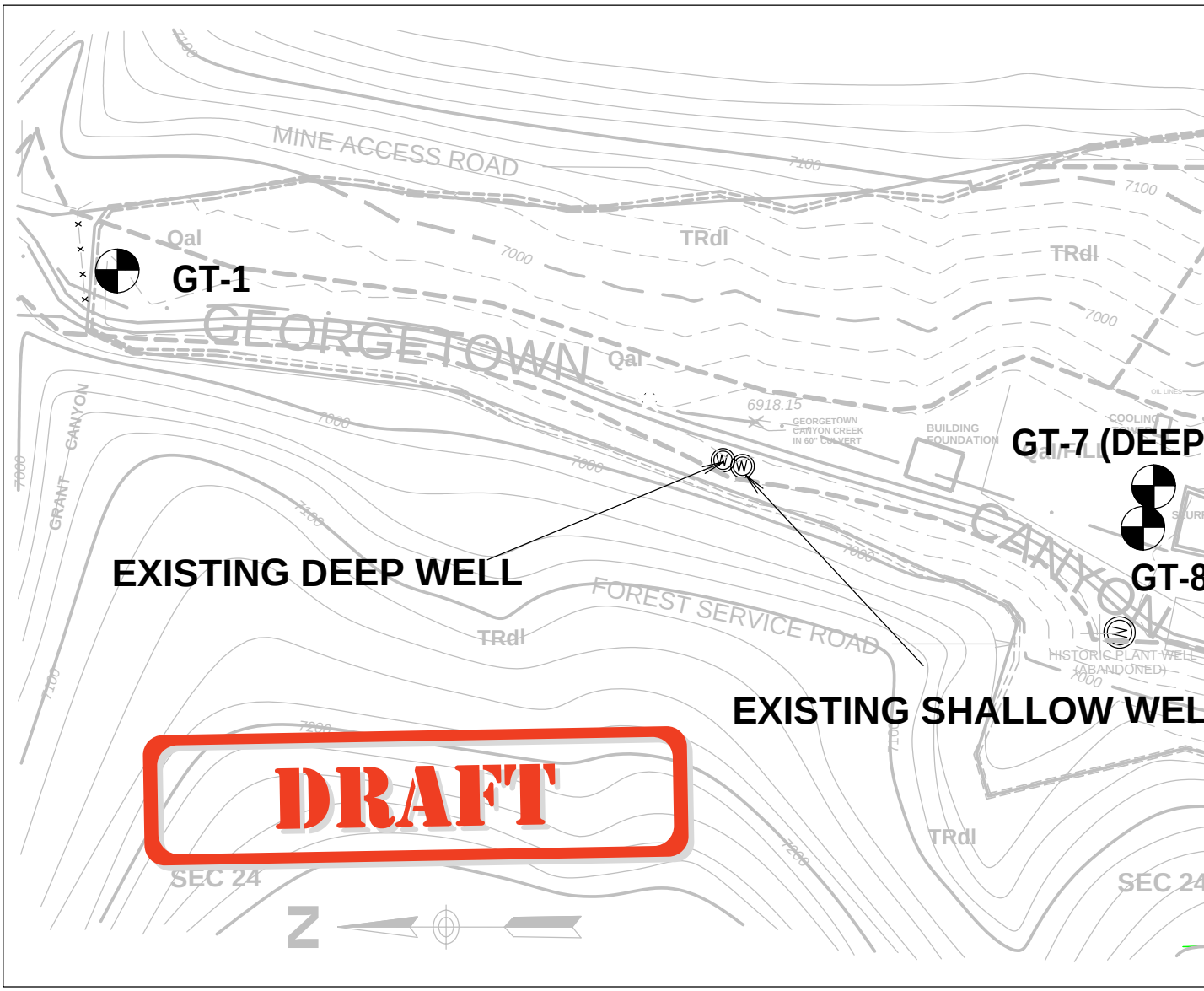
WOODY FM.

FM.

IA FM.

VANIAN

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE SURFACE WATER SAMPLE SITES CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 2-5	



KEY

GT-1 — MONITOR WELL INSTALLATION LOCATION AND DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

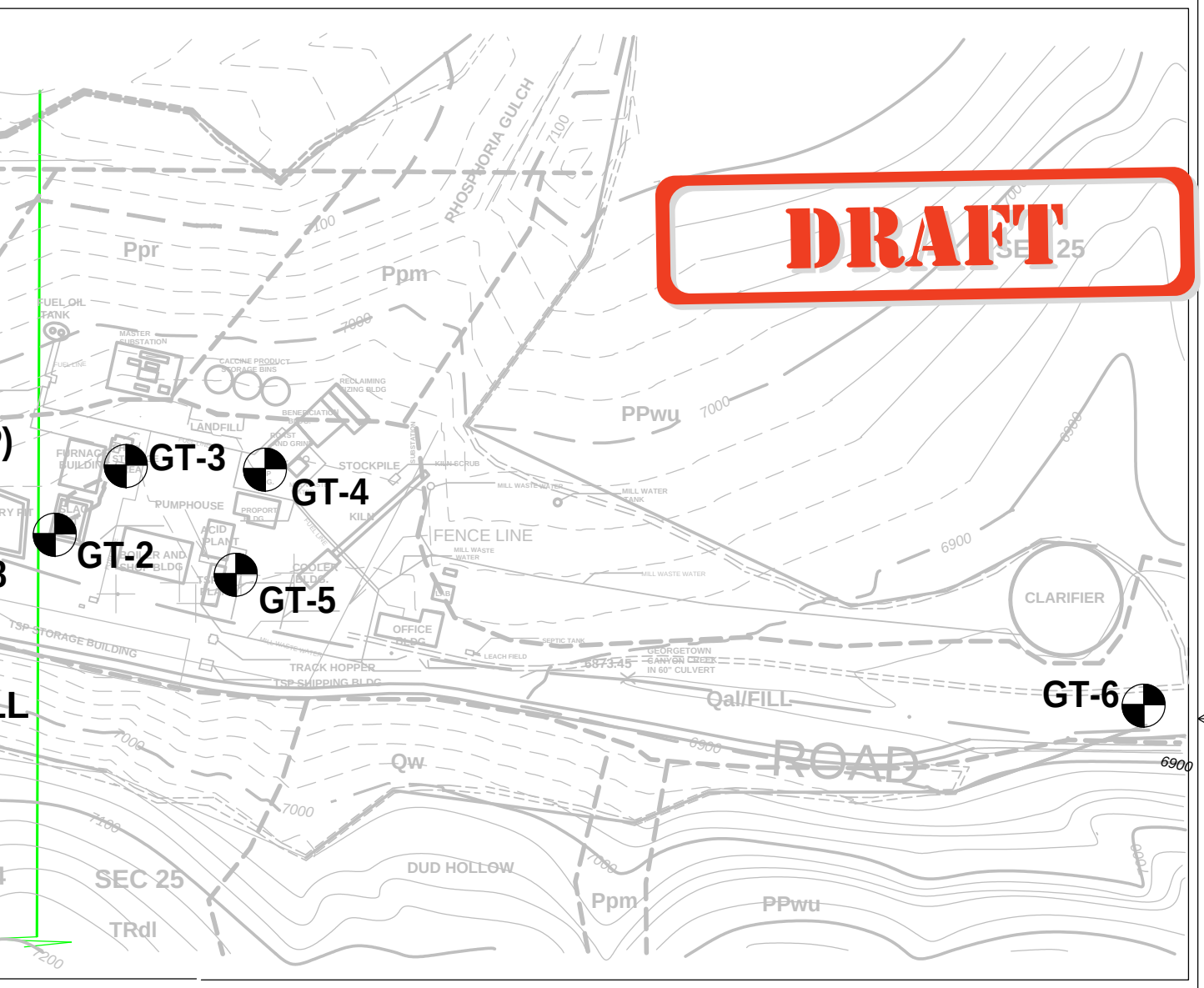
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

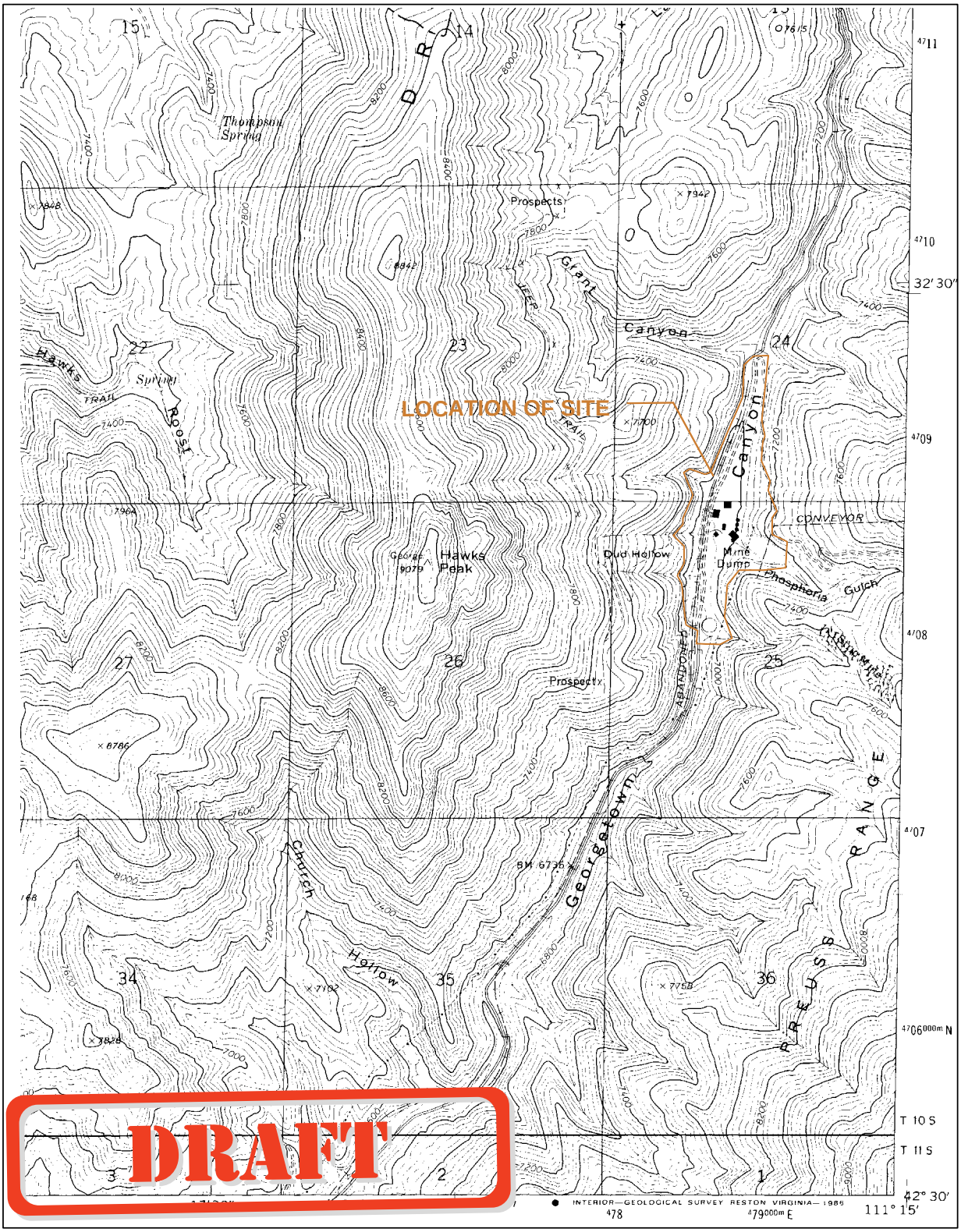
WOODY FM.

FM.

IA FM.

VANIAN

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE LOCATION MAP OF MONITORING WELLS AT THE CENTRAL FARMERS FERTILIZER FACILITY			
2/21/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 2-6	



FINAL SITE INVESTIGATION REPORT

LOCATION MAP OF CENTRAL FARMERS FERTILIZER FACILITY

SCALE

0 500 1000

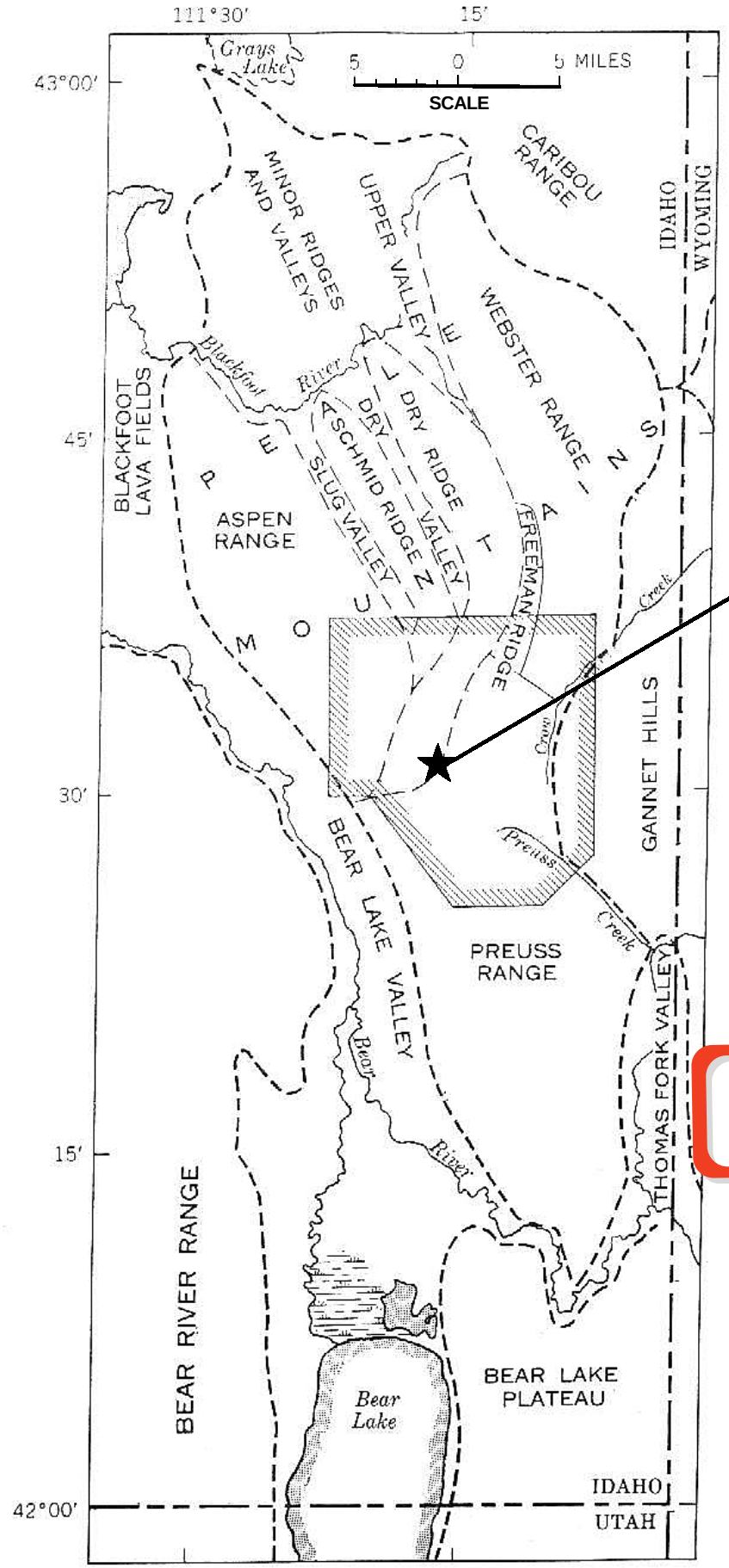
SCALE (feet)

N

QUADRANGLE LOCATION

REFERENCE: HARRINGTON PEAK, IDAHO
USGS 15 MINUTE QUAFRANGLE
DATED 1970, PHOTOINSPECTED 1980

FIGURE 3-1



N

LOCATION OF THE CENTRAL FARMERS FERTILIZER PLANT

REFERENCE:
GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO
USGS BULLETIN 1153, 1964.

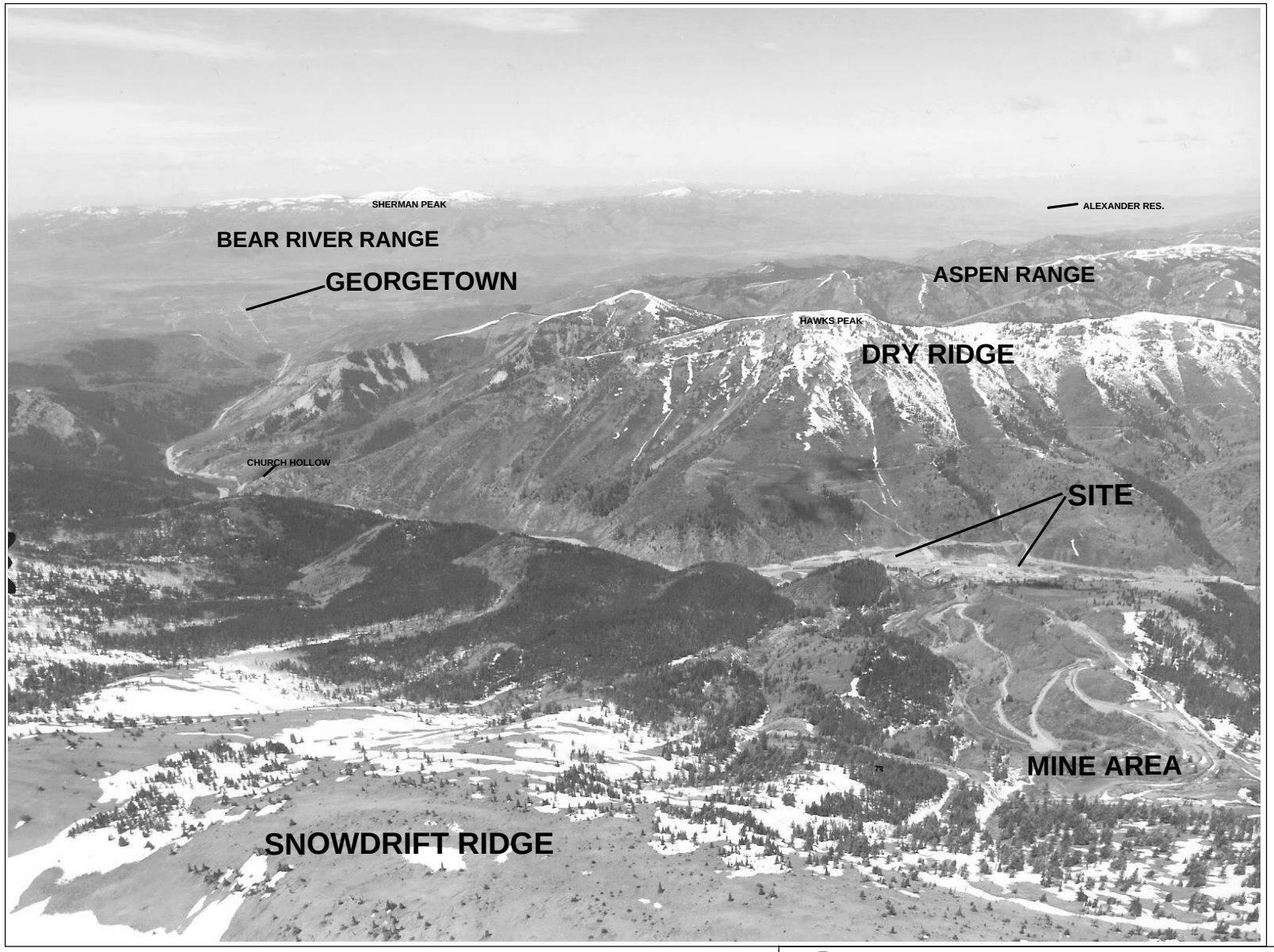
DRAFT

FINAL SITE INVESTIGATION REPORT

REGIONAL PHYSIOGRAPHIC FEATURES IN THE VICINITY OF GEORGETOWN CANYON

NU-WEST INDUSTRIES INC.
AND NU-WEST MINING INC.

FIGURE 3-2



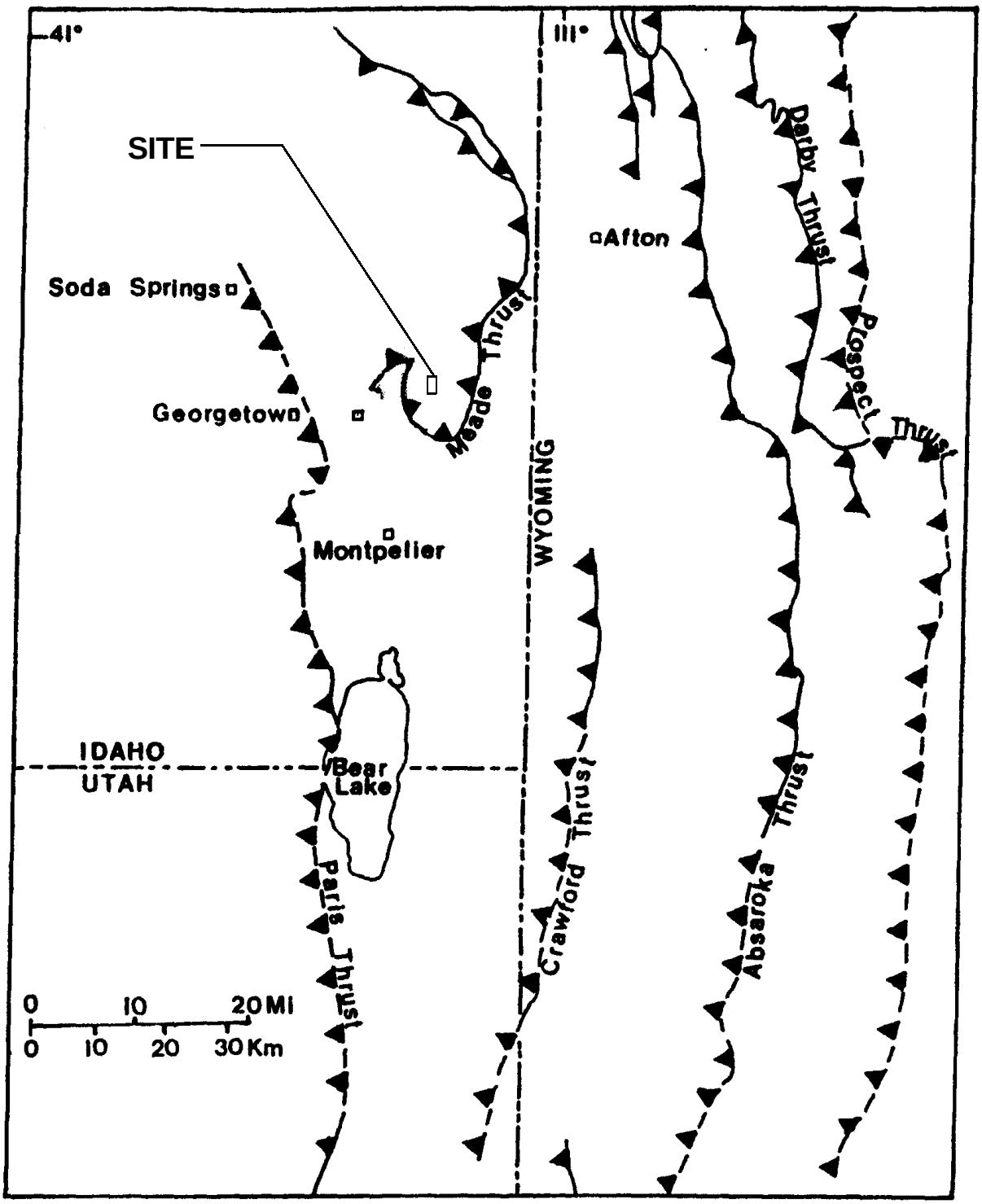
CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

REFERENCE: OLYMPUS AERIAL SURVEYS
OF SALT LAKE CITY, UTAH - NO DATE GIVEN

TITLE	AERIAL VIEW OF GEORGETOWN CANYON LOOKING WEST			
SIZE	CAGE CODE	DWG NO		REV
A				0
SCALE		NU-WEST MINING, INC.	SHEET	FIGURE-3-2A

DRAWN BY J.S.BROWN

DATE: 03/01/05



REFERENCE:
BORDEN, 1986, STRUCTURAL GEOLOGY AND STRATIGRAPHY OF THE SOUTHWESTERN MARGIN OF THE MEADE THRUST HARRINGTON PEAK, GEORGETOWN AND MEADE PEAK QUADRANGLES, SOUTHEASTERN IDAHO

DRAFT

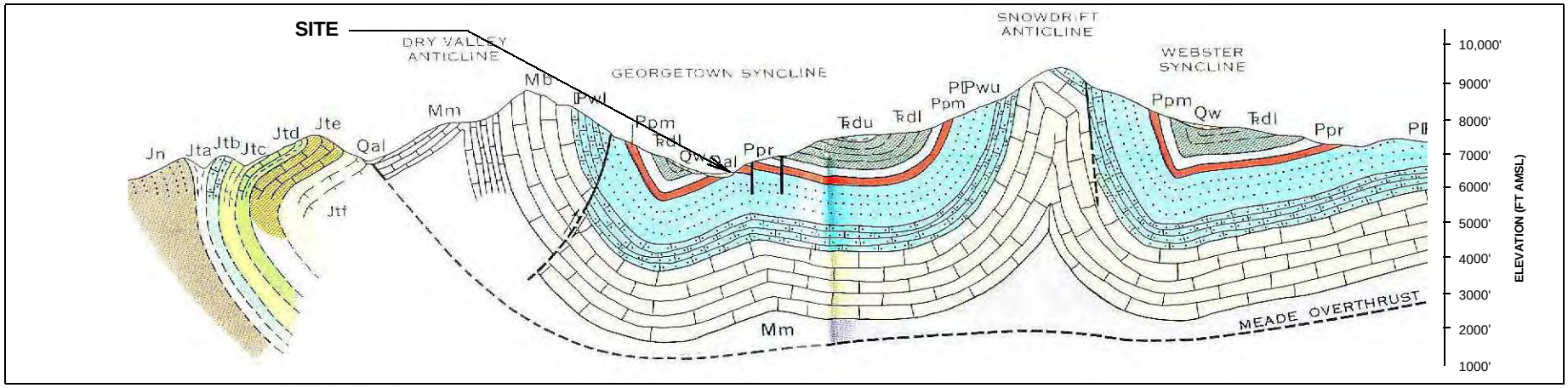
N

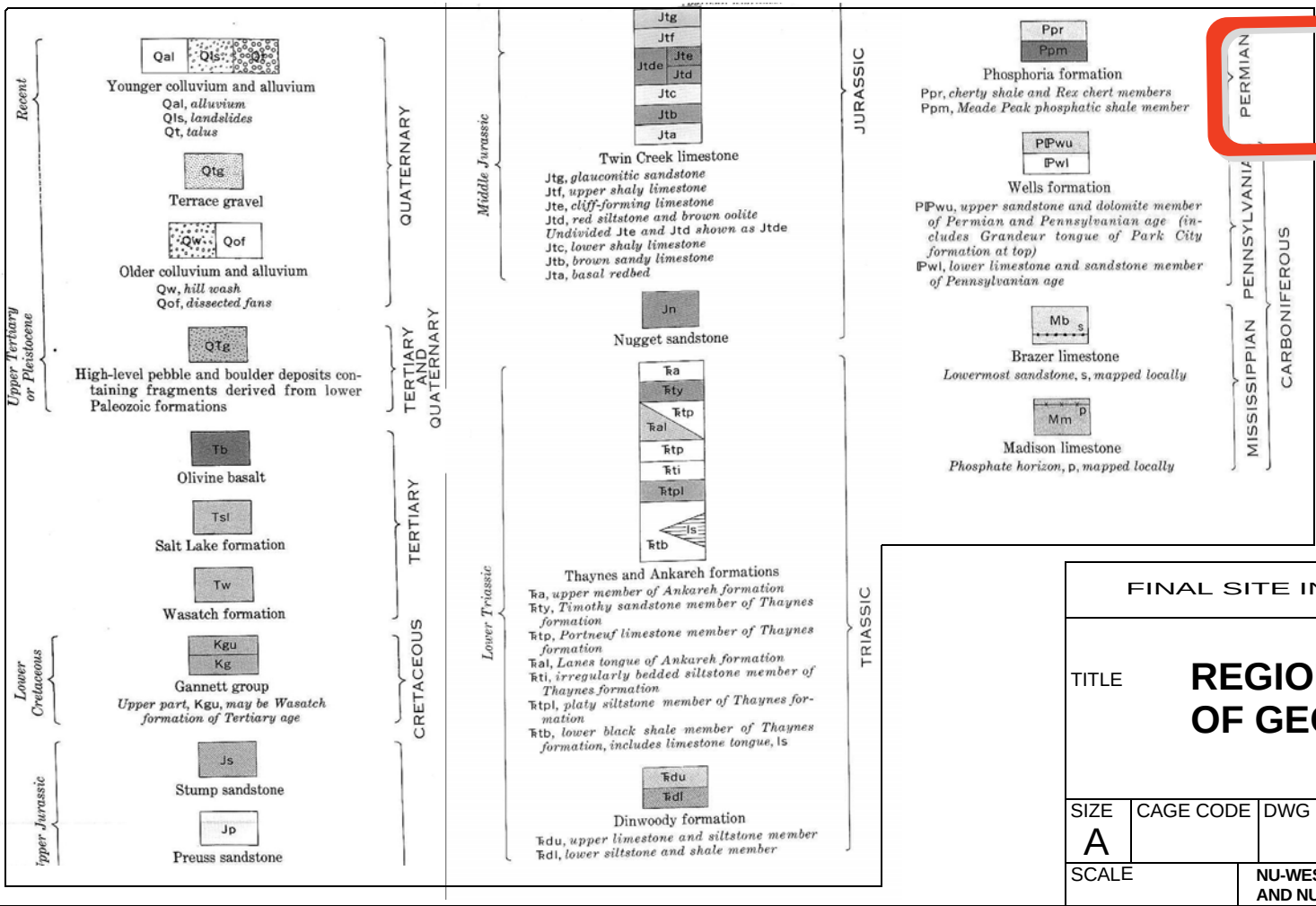
FINAL SITE INVESTIGATION REPORT

LOCATION OF SITE AND REGIONAL OVERTHRUST FEATURES

NU-WEST INDUSTRIES INC.
AND NU-WEST MINING INC.

FIGURE 3-3





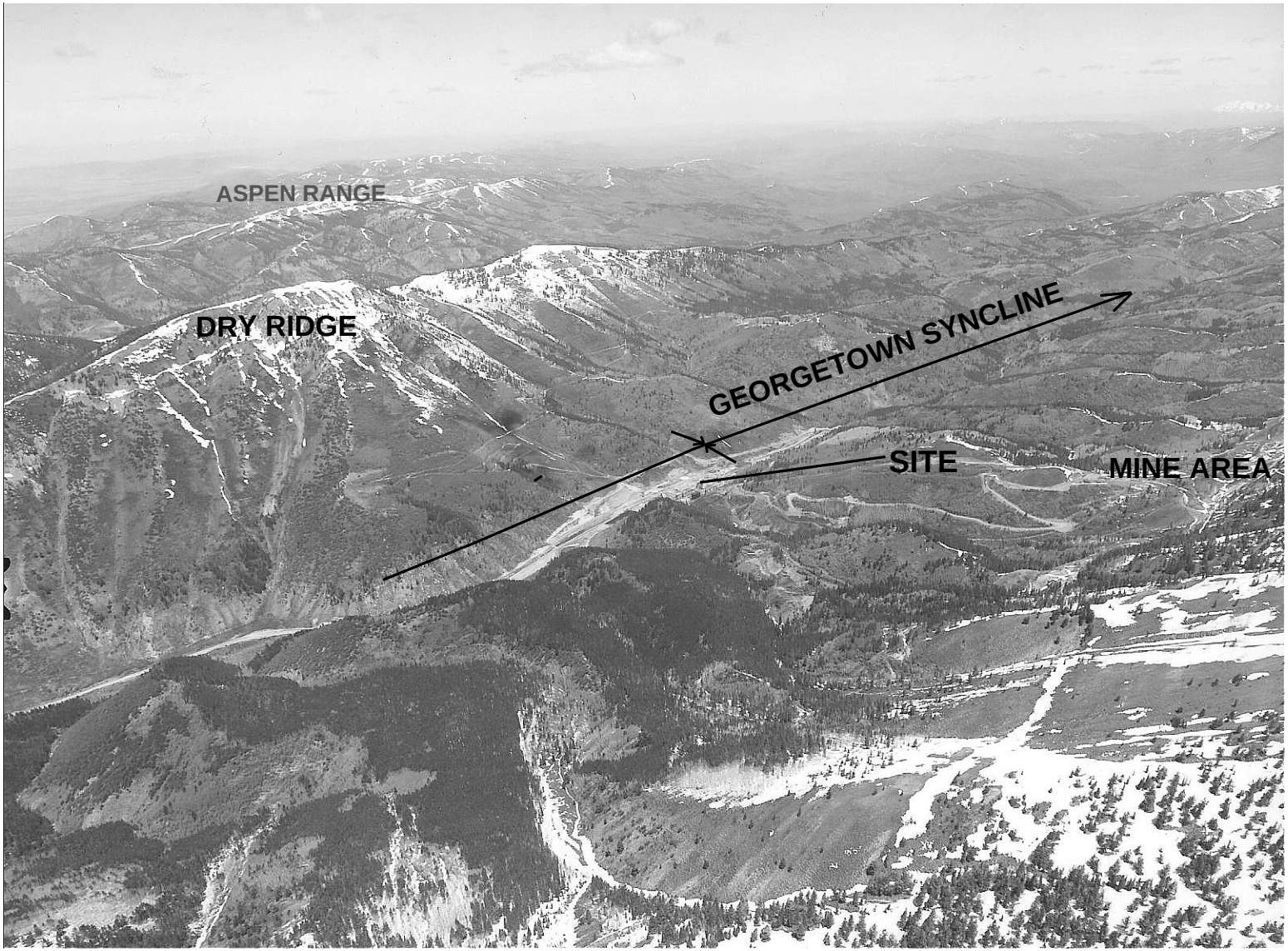
DRAFT

REFERENCE:
GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO
USGS BULLETIN 1153, 1964, PLATE 4.

FINAL SITE INVESTIGATION REPORT

TITLE **REGIONAL CROSS SECTION OF GEORGETOWN CANYON**

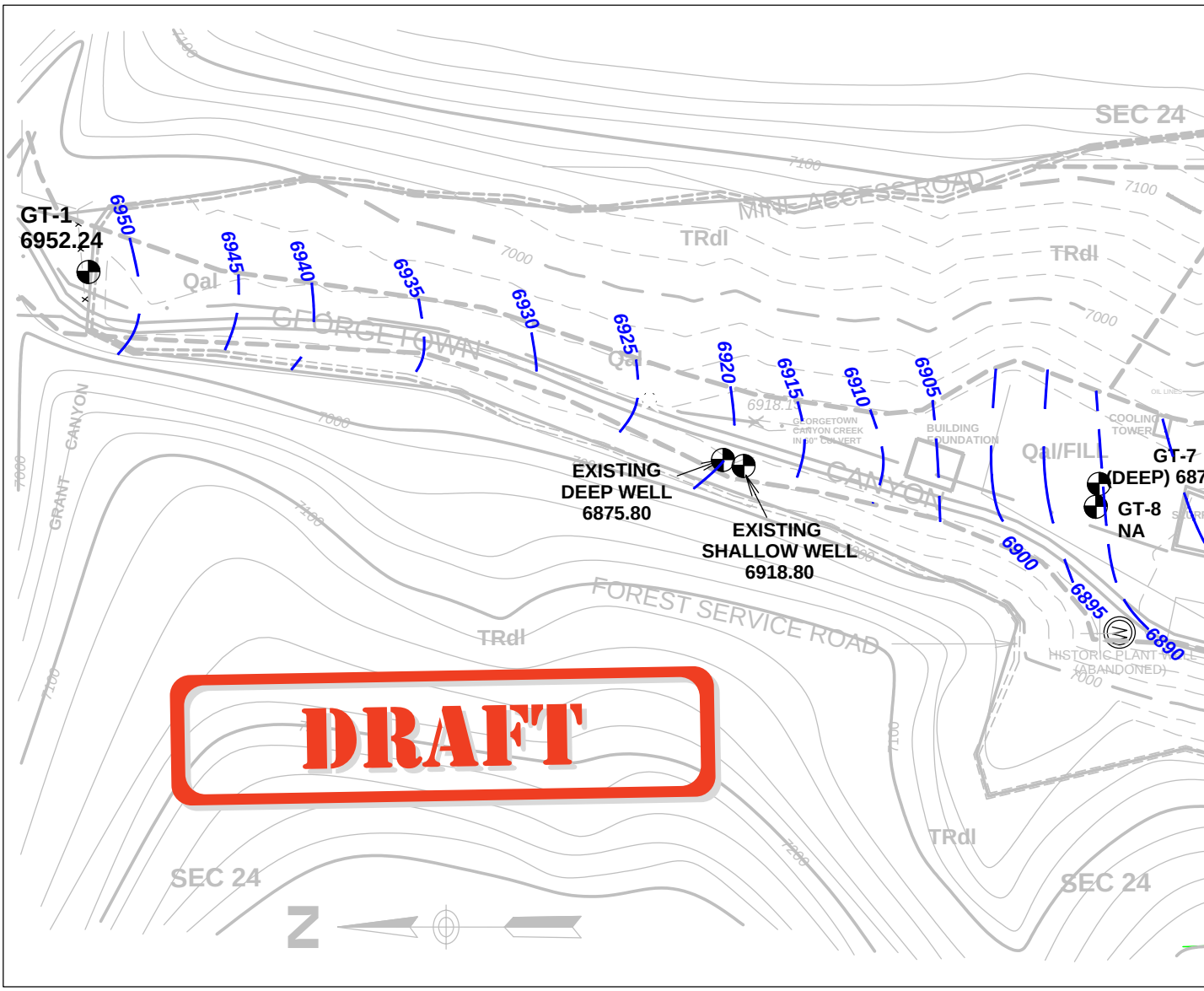
SIZE	CAGE CODE	DWG NO	REV
A			
SCALE	NU-WEST INDUSTRIES INC. AND NU-WEST MINING INC.	SHEET	**FIGURE 3-4**



CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

REFERENCE: OLYMPUS AERIAL SURVEYS
OF SALT LAKE CITY, UTAH - NO DATE GIVEN

TITLE	AERIAL VIEW OF GEORGETOWN CANYON LOOKING NORTH WEST			
DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 03/01/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-3-4A



KEY

GT-1 6952.24 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895 — GROUND WATER LEVEL ELEVATION AND CONTOUR

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

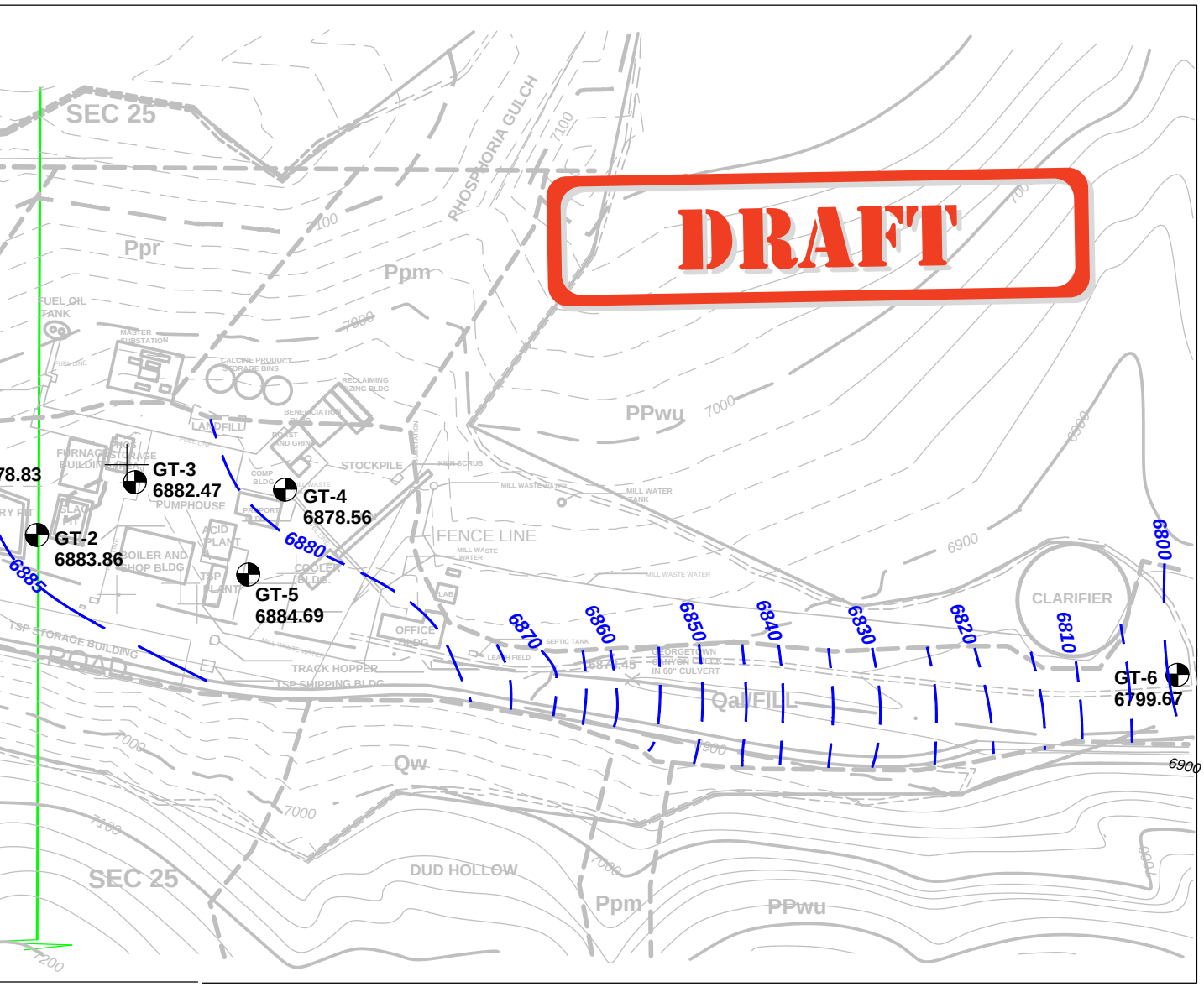
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

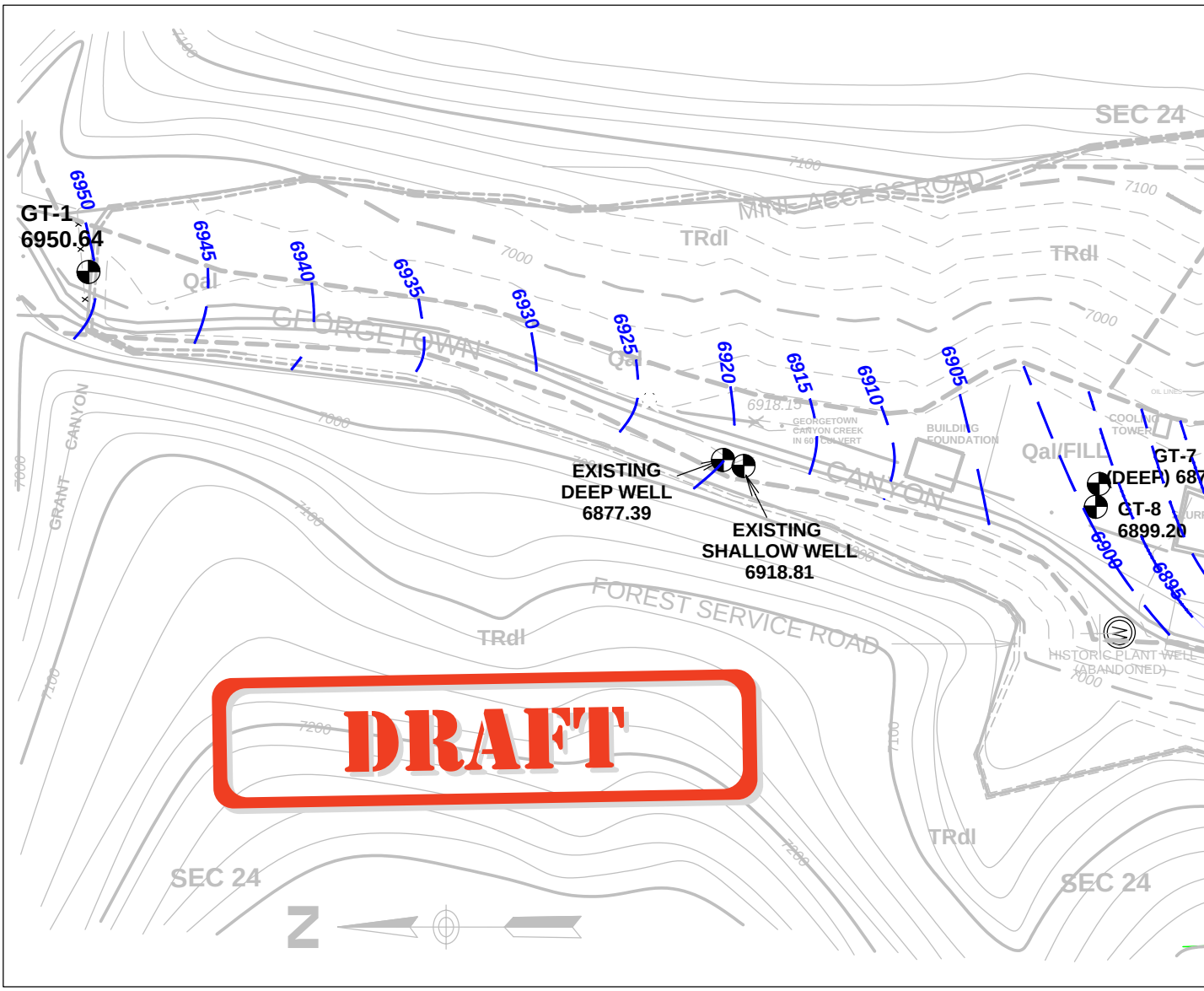
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER JUNE 18, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-5	



KEY

GT-1
6950.64

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

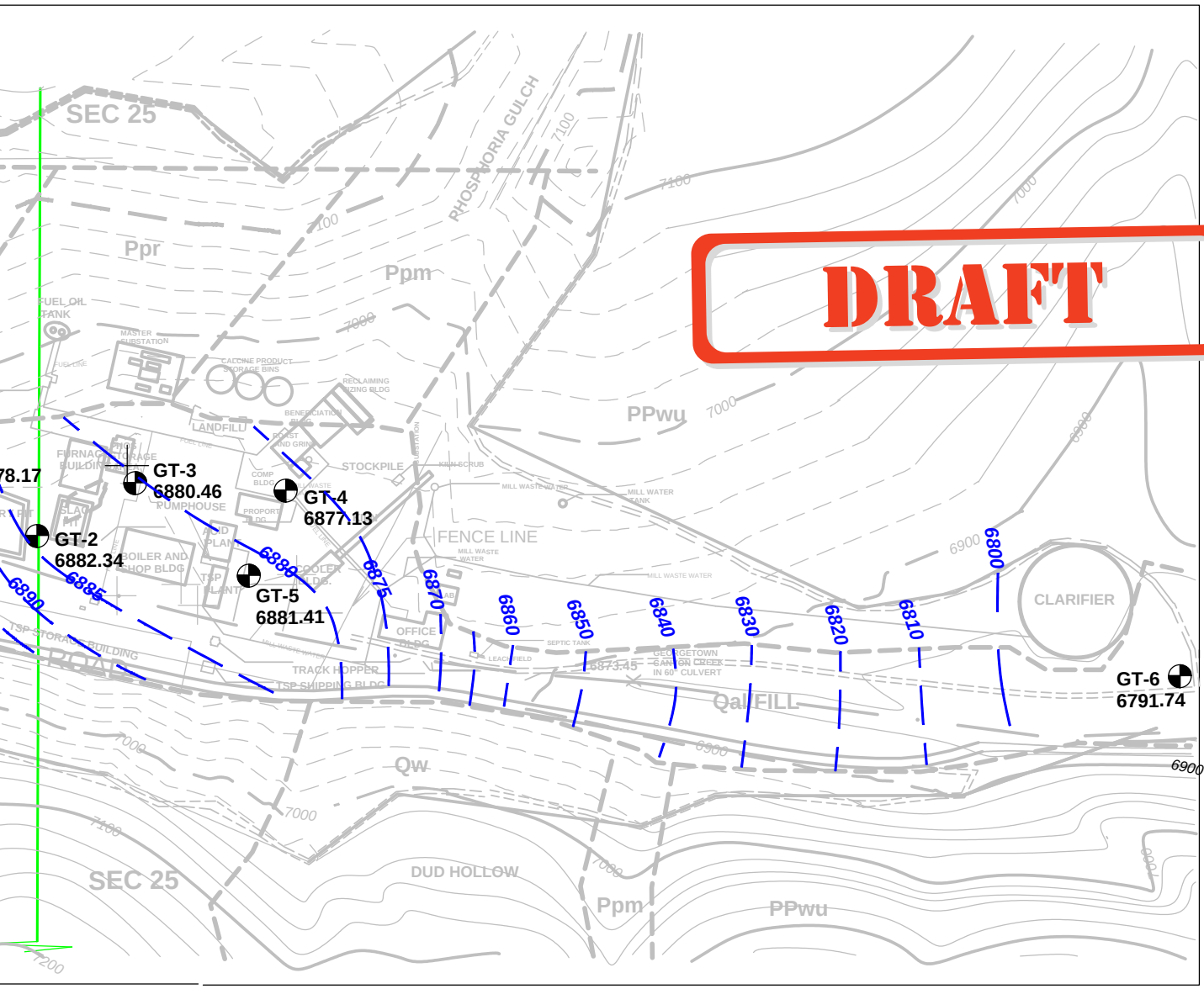
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

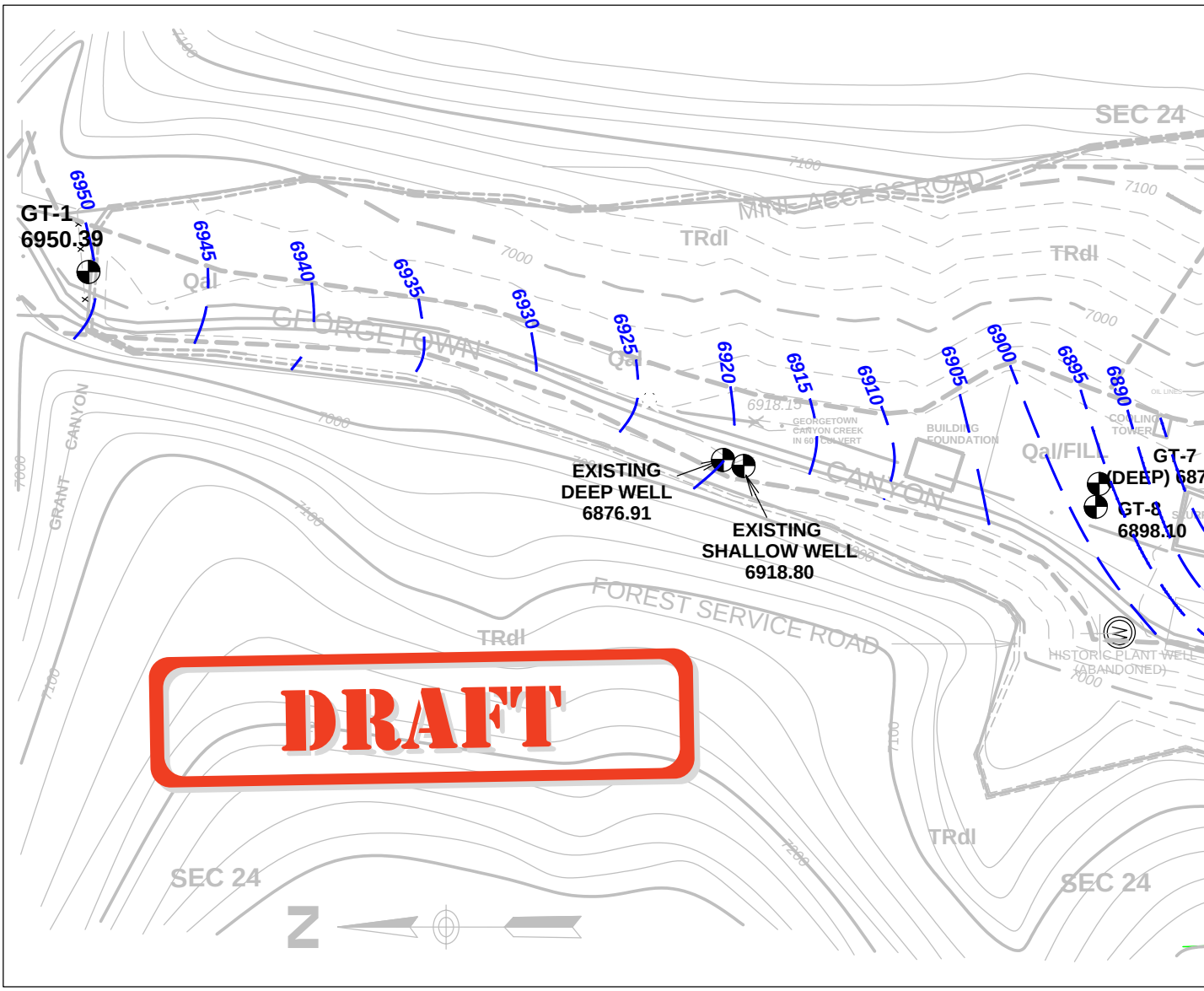
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT				
	TITLE	GROUND WATER LEVEL MAP SHALLOW AQUIFER JULY 8, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 3-6	



KEY

GT-1
6950.39

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

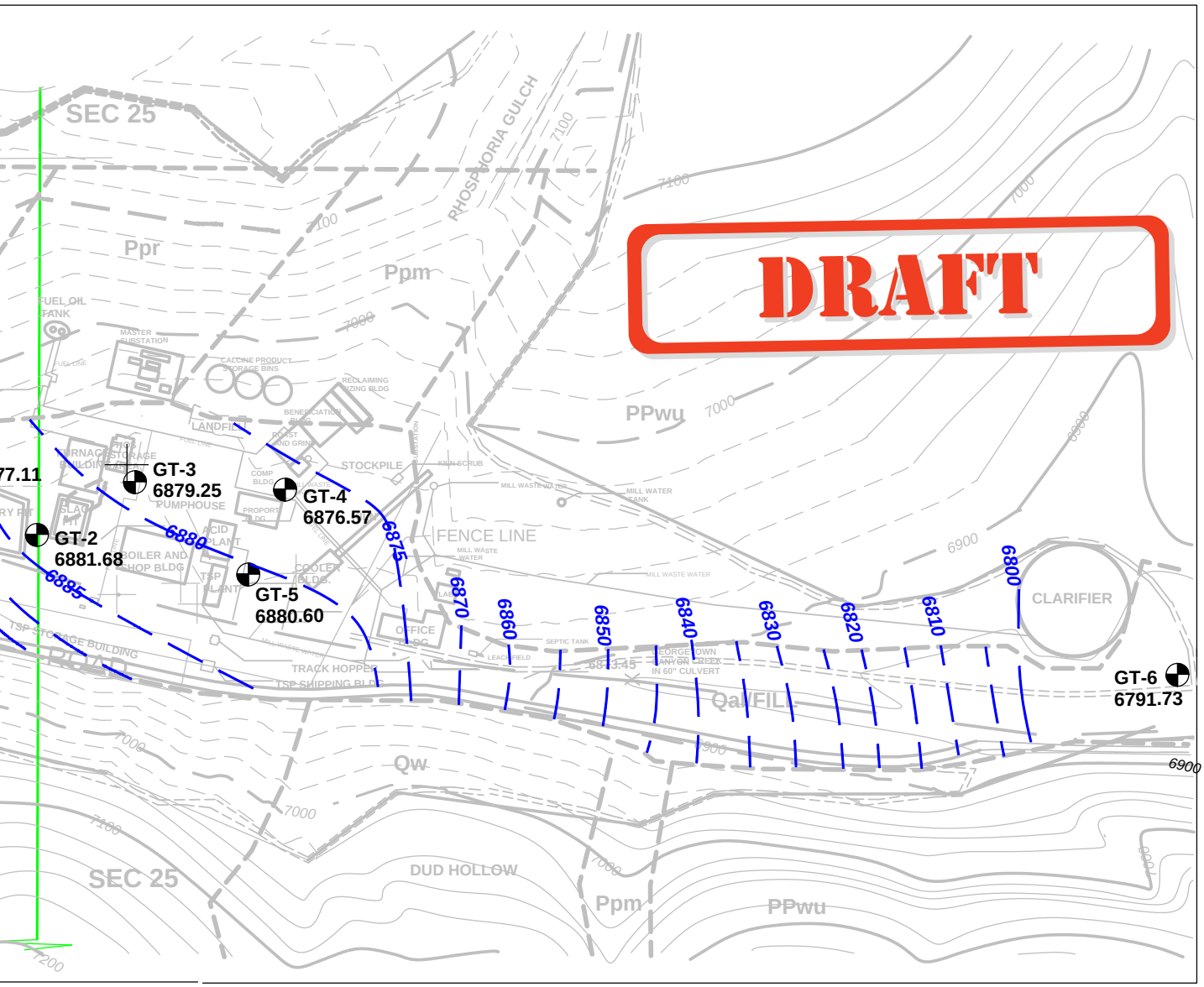
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

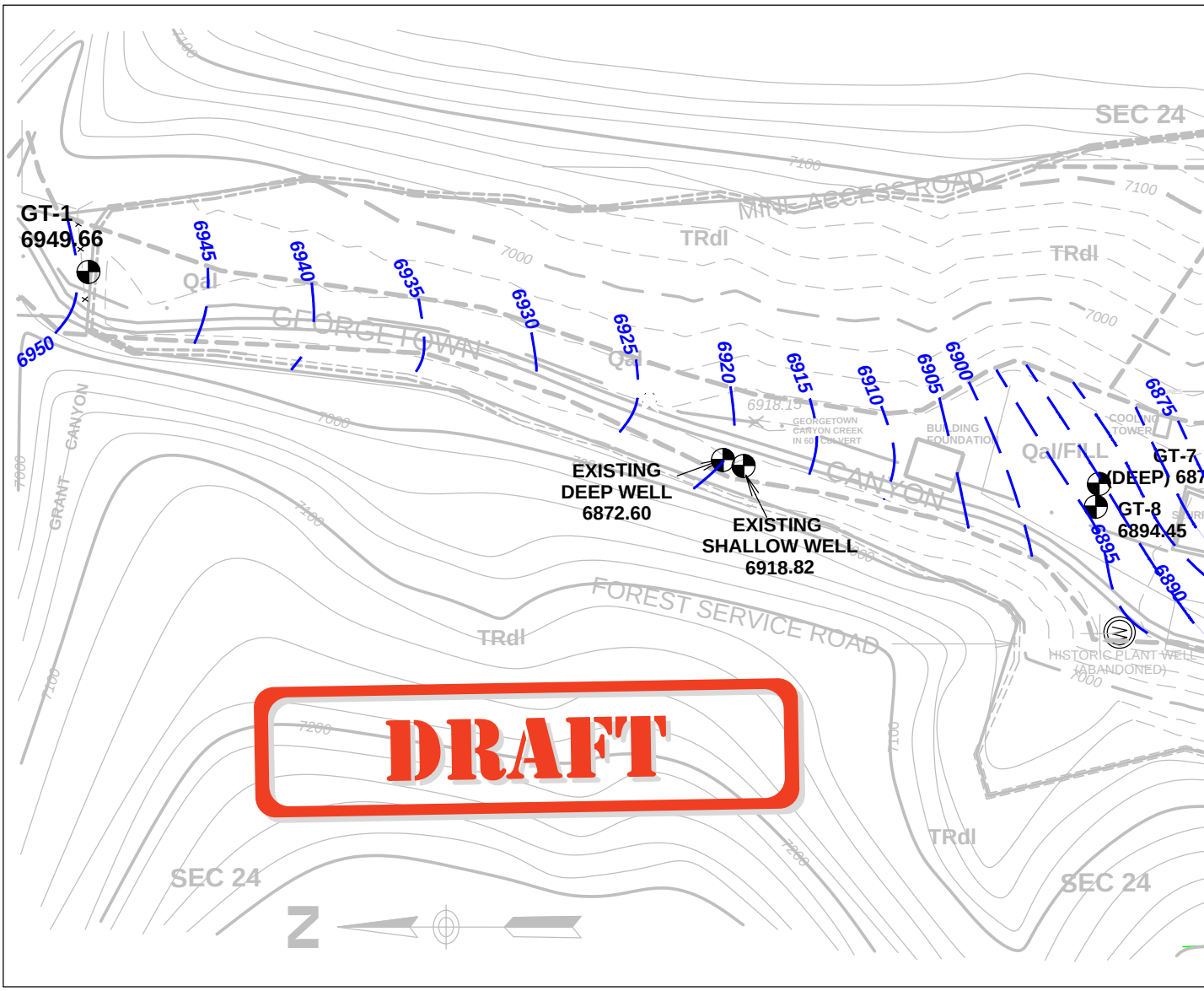
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT				
	TITLE	GROUND WATER LEVEL MAP SHALLOW AQUIFER JULY 16, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 3-7	



KEY

GT-1
6949.66

MONITORING WELL AND
GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL
ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE
SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25,
T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN
AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

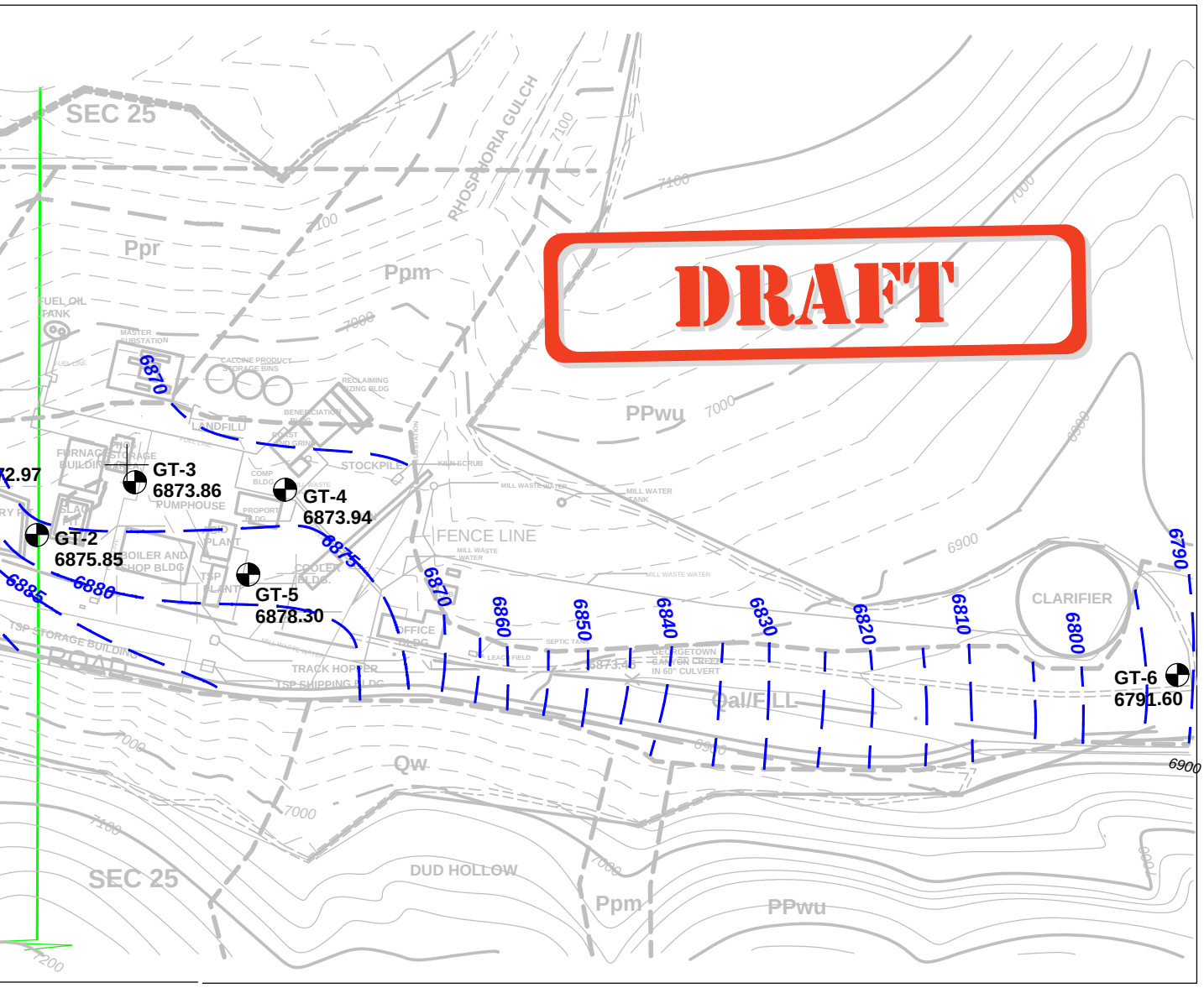
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV
UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

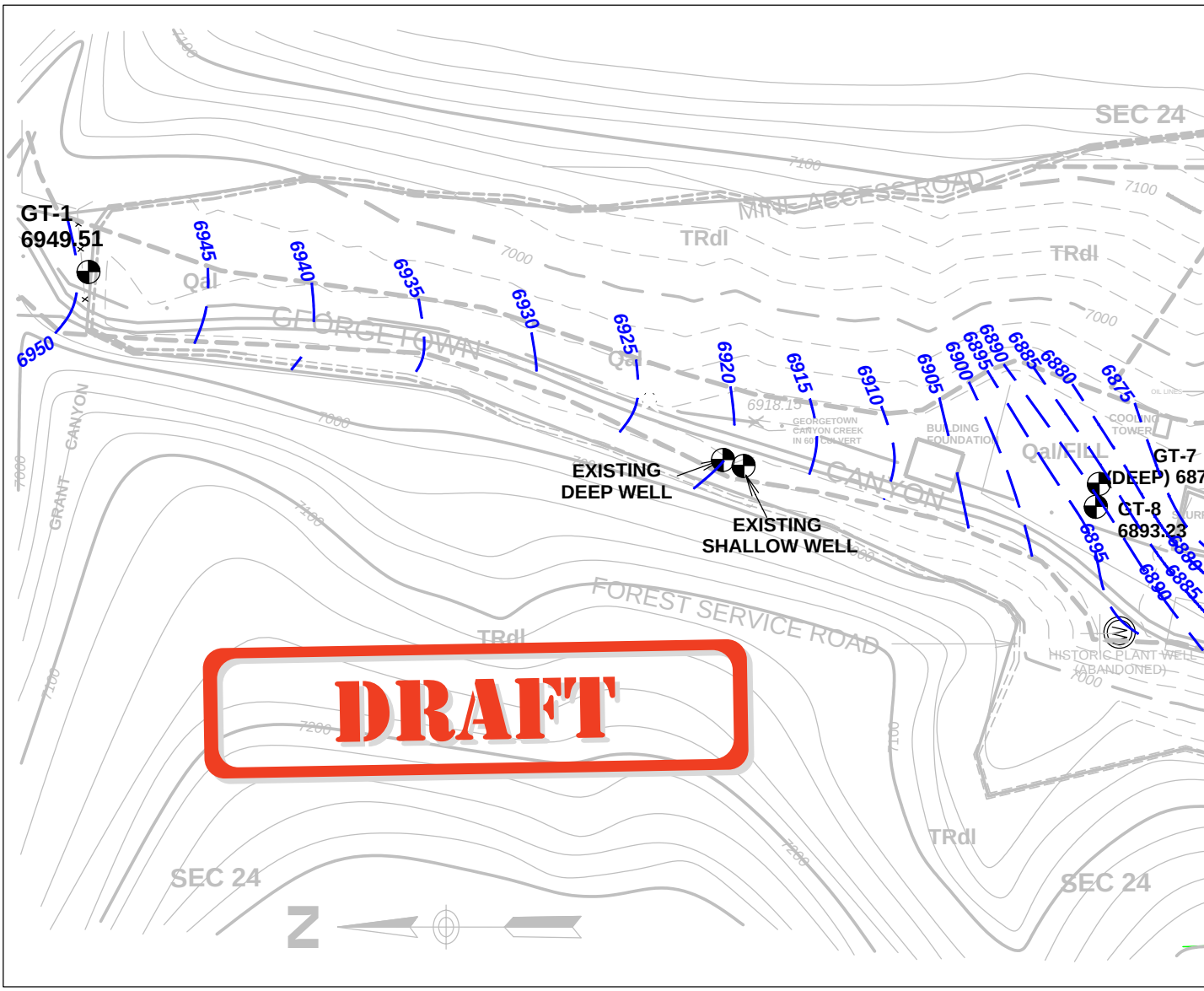
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER AUGUST 23, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-8	



KEY

GT-1
6949.51

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

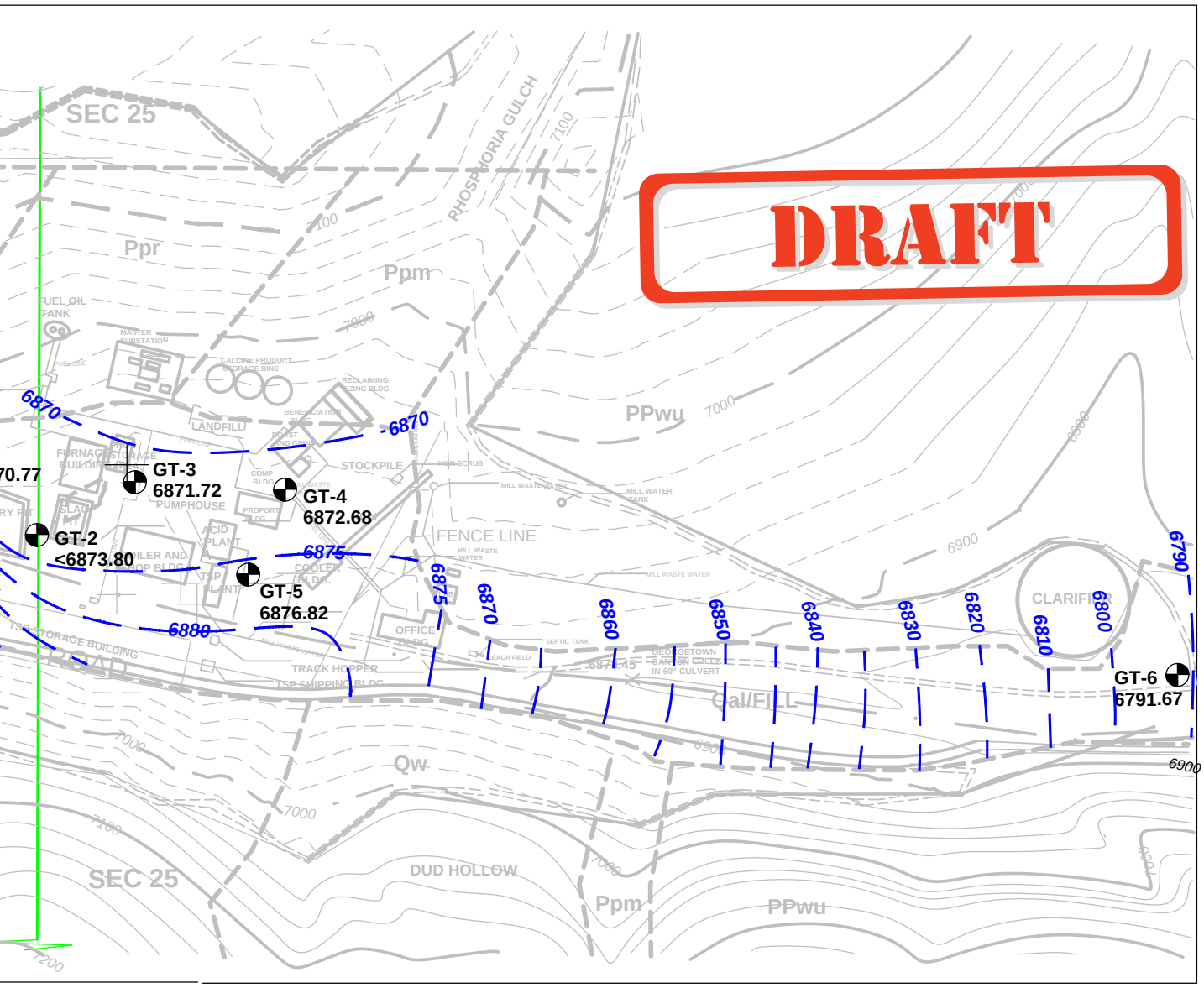
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

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WOODY FM.

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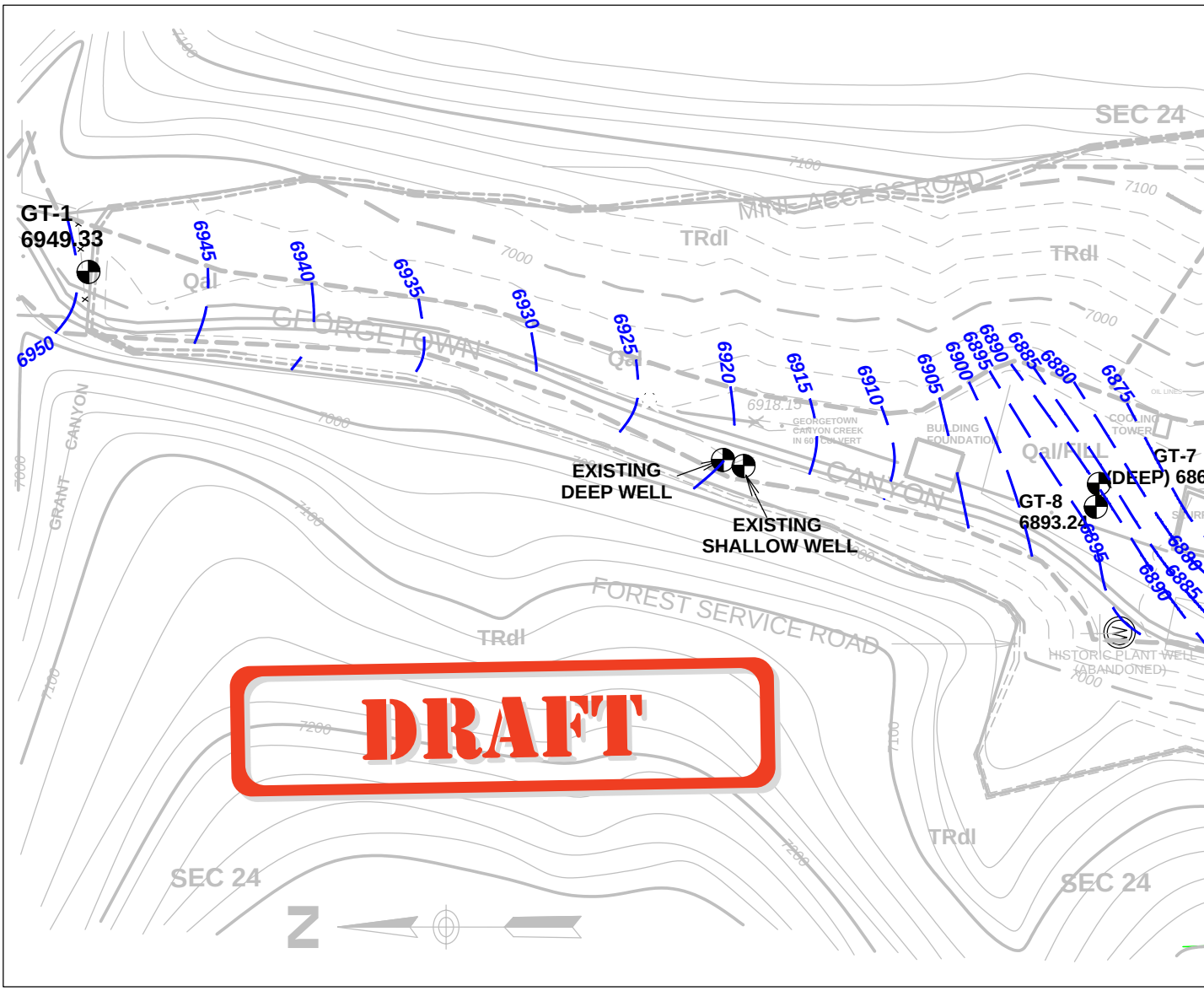
IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER SEPTEMBER 28, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-9	



KEY

GT-1
6949.33

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

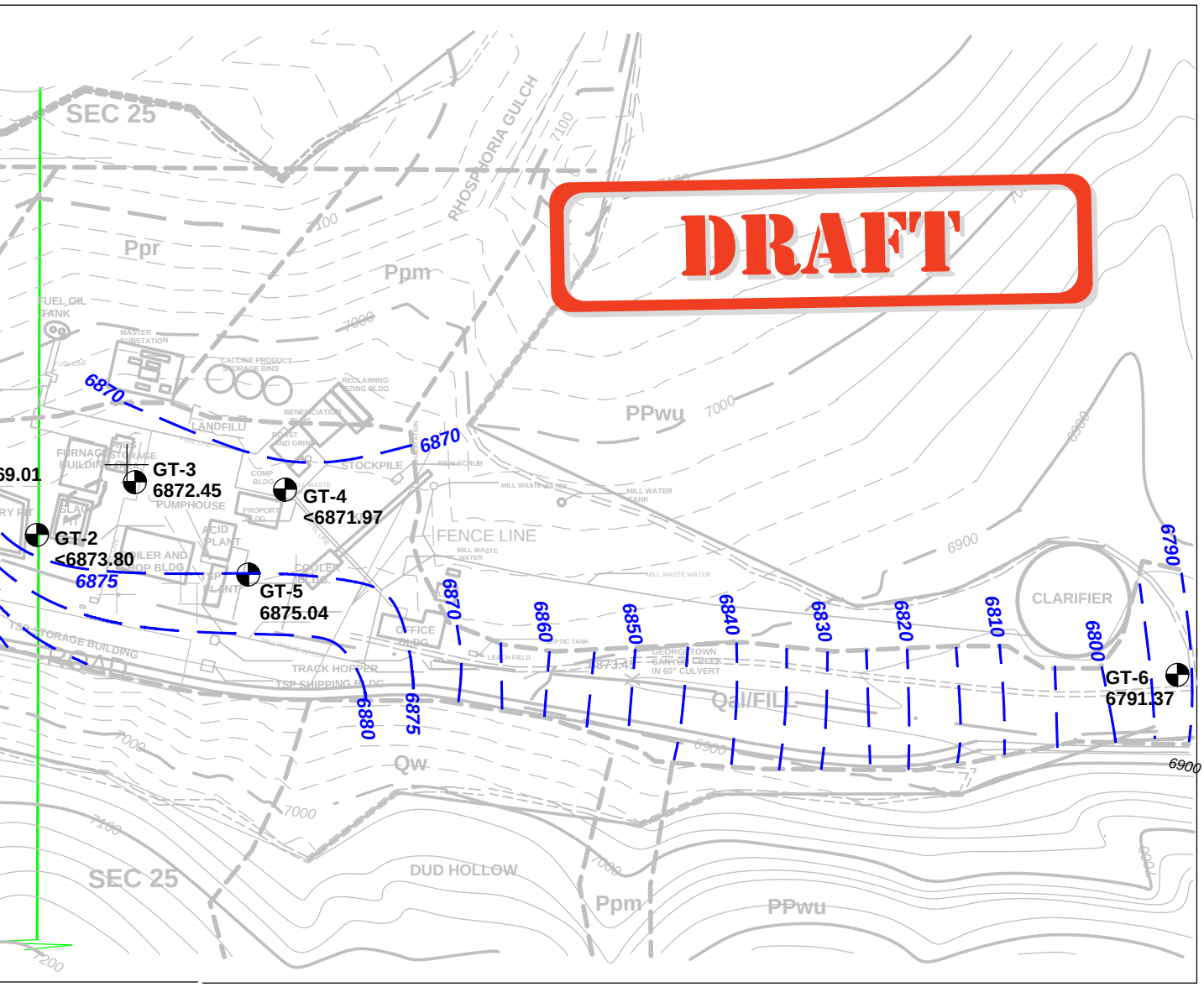
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

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WOODY FM.

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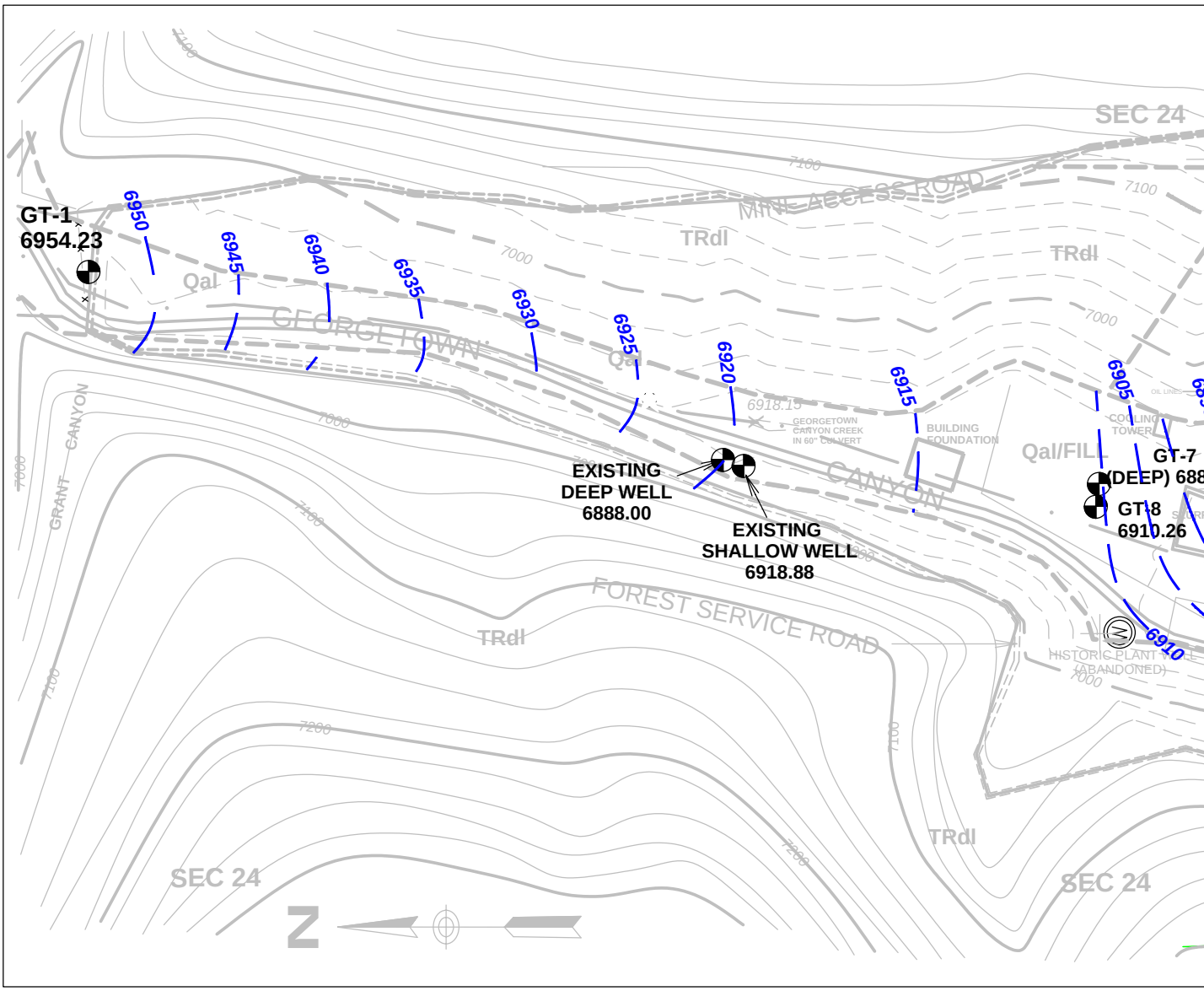
IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER NOVEMBER 5, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-10	



KEY

GT-1
6954.23

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

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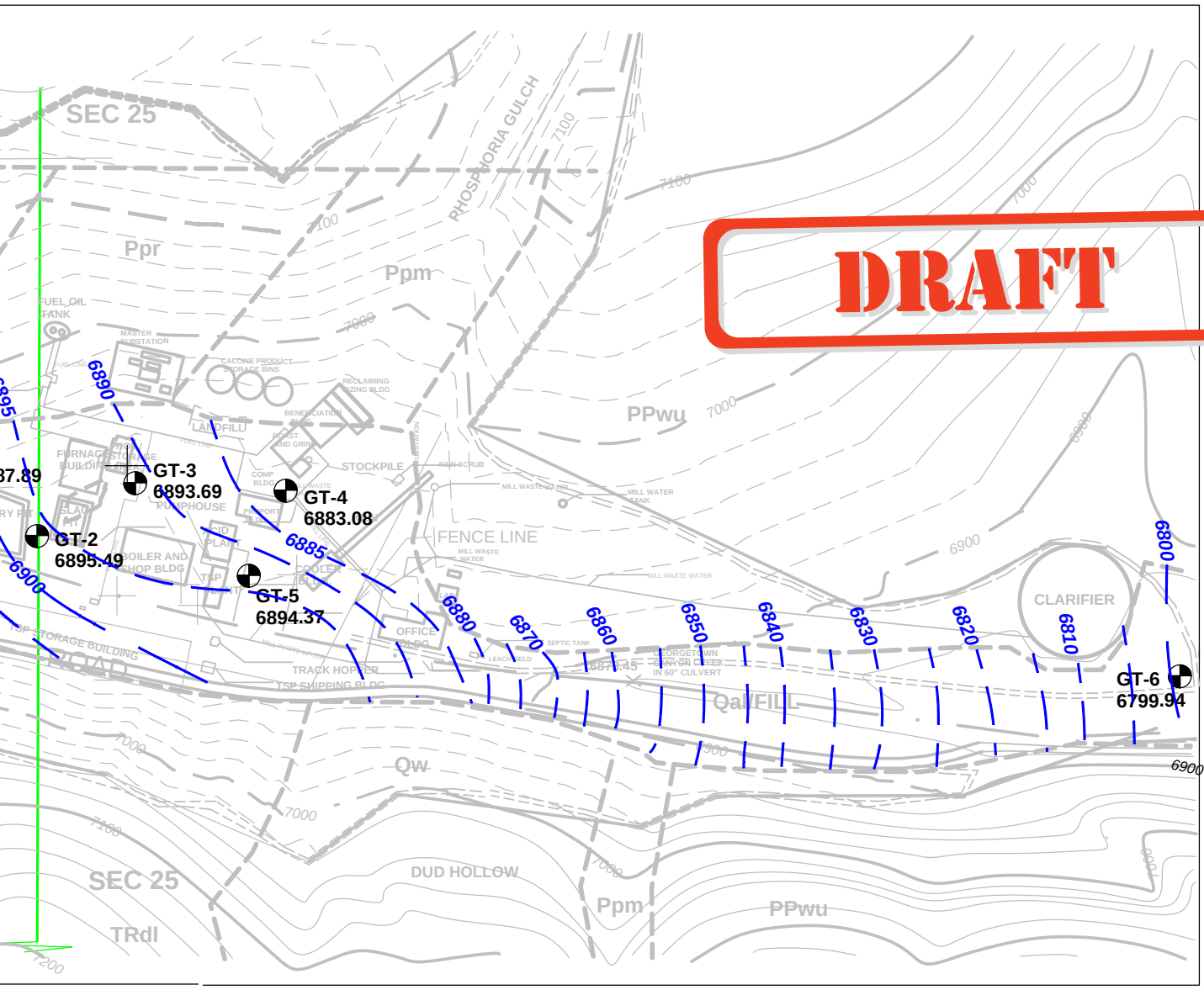
T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

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WOODY FM.

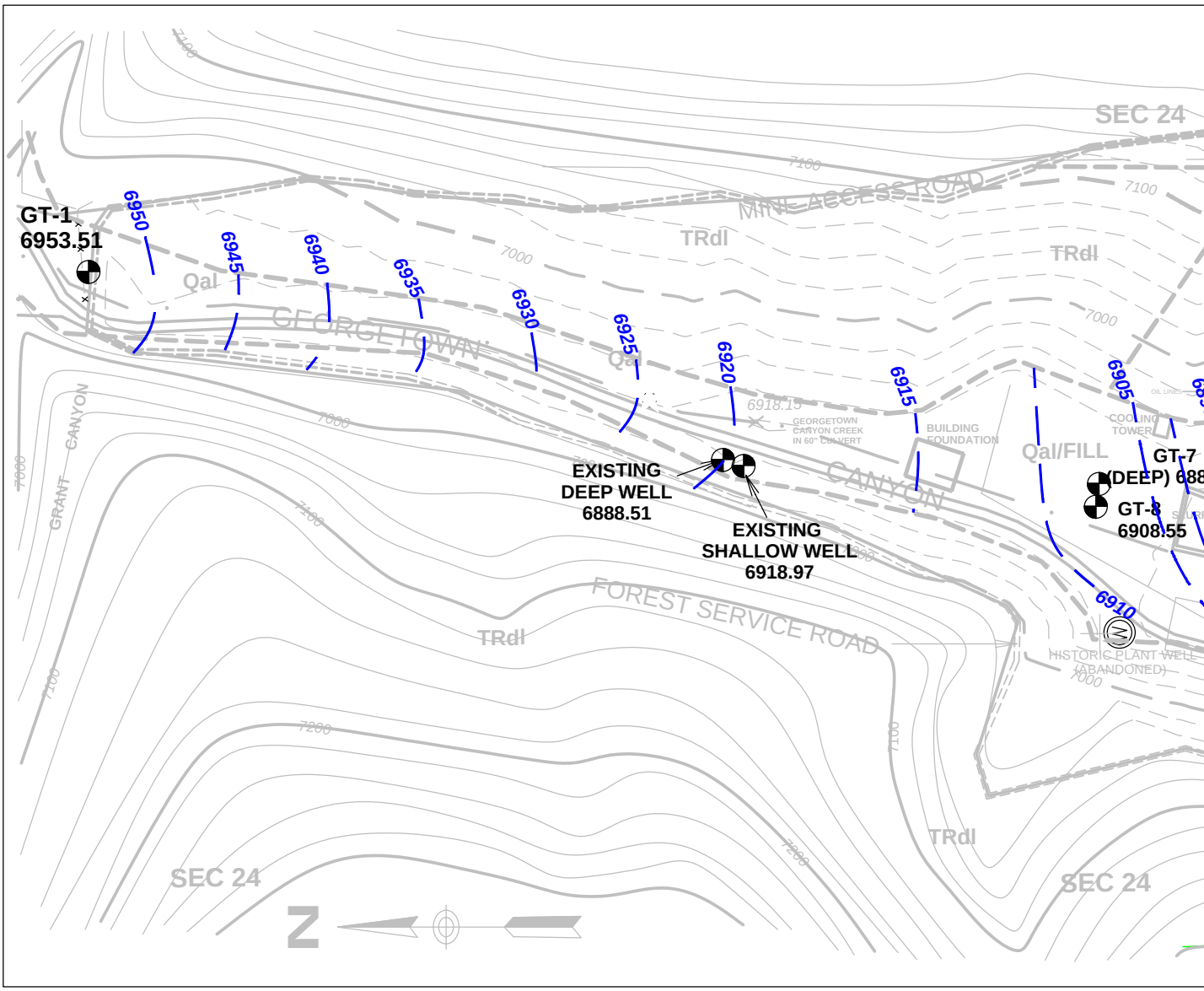
FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT				
	TITLE	GROUND WATER LEVEL MAP SHALLOW AQUIFER MAY 11, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
1/10/06	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 3-11	

2 1



KEY

GT-1
6953.51

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

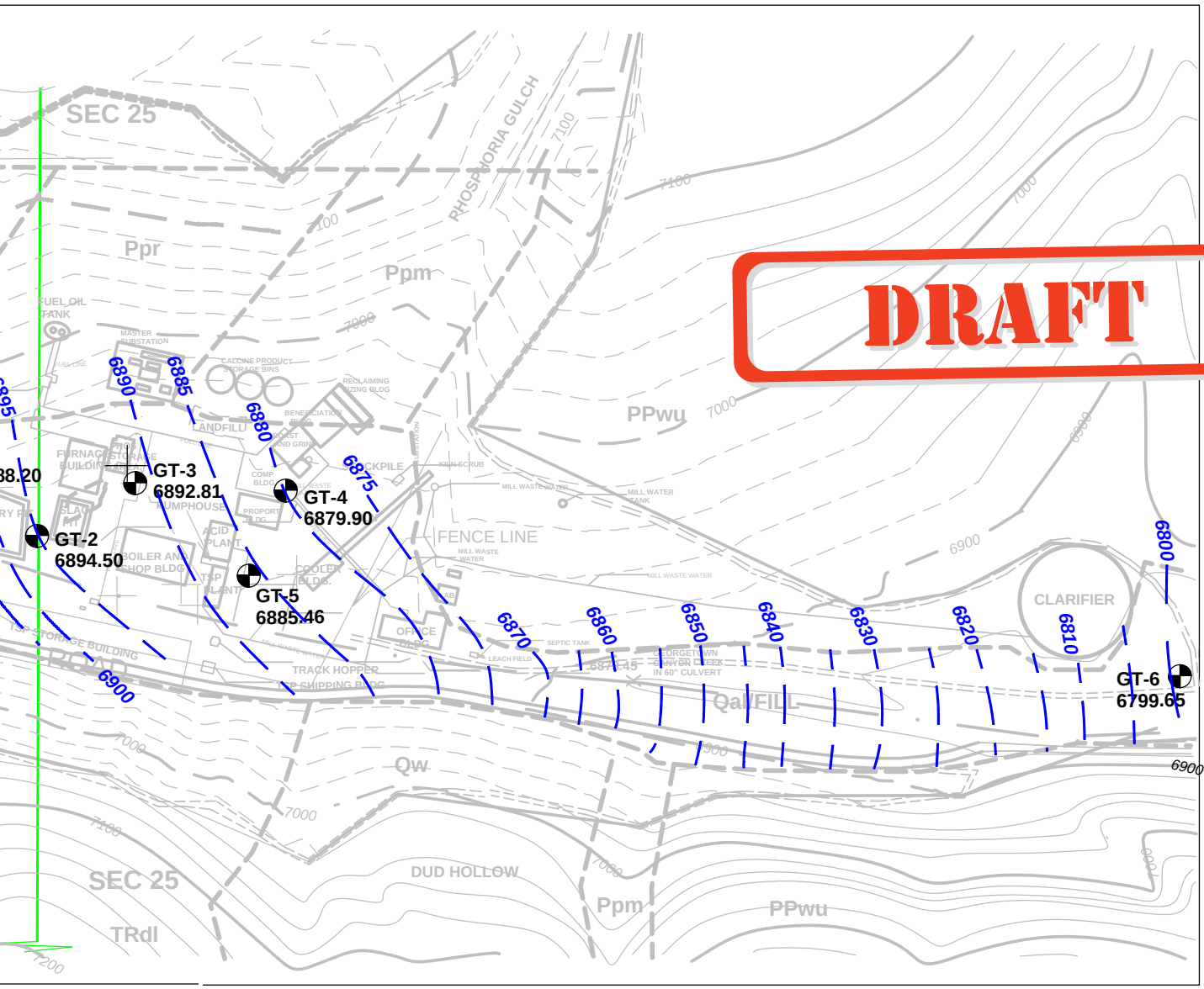
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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WOODY FM.

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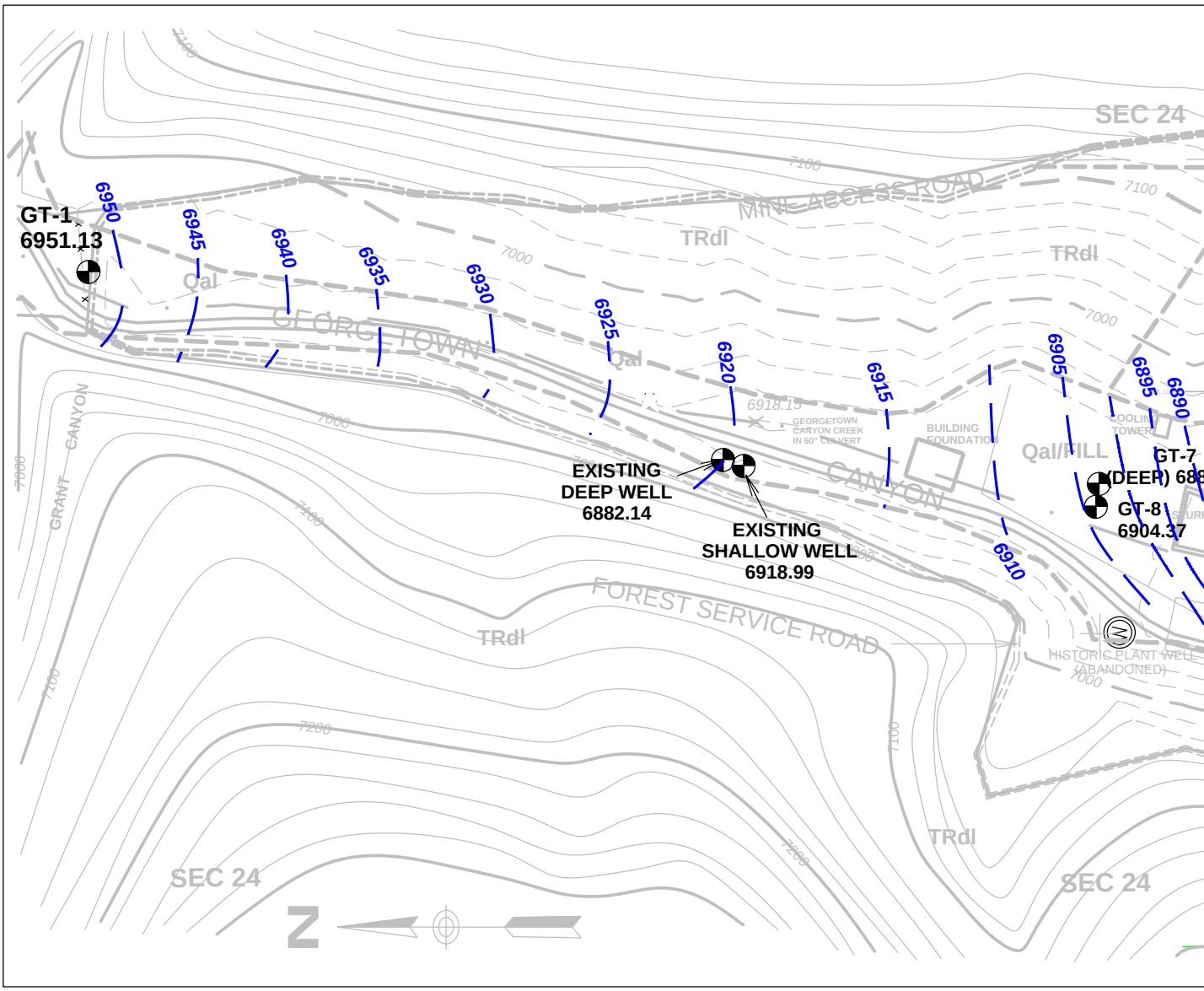
VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER JUNE 22, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-12	



KEY

GT-1
6951.13

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

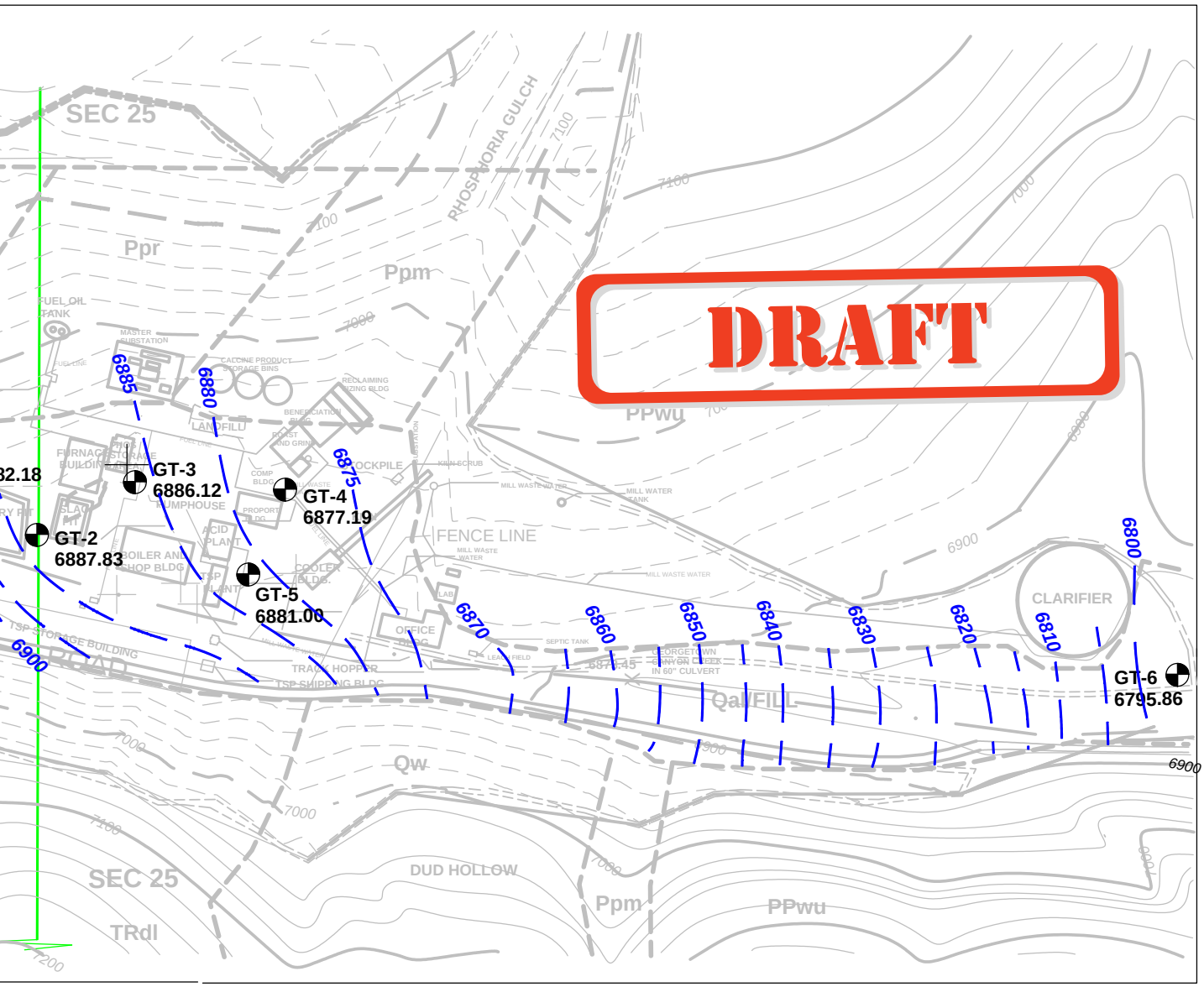
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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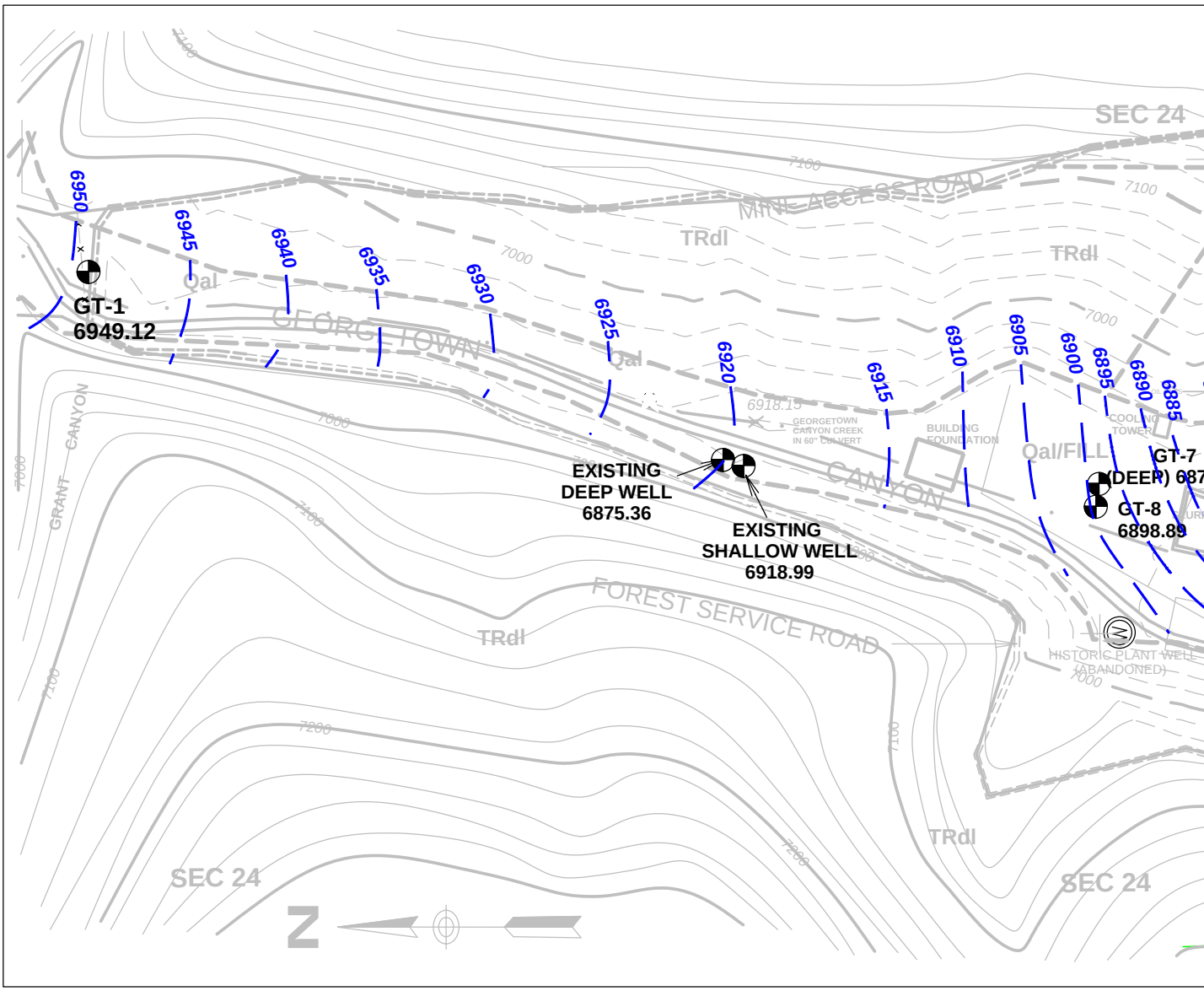
VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE GROUND WATER LEVEL MAP SHALLOW AQUIFER JULY 19, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-13	



KEY

GT-1
6949.12

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

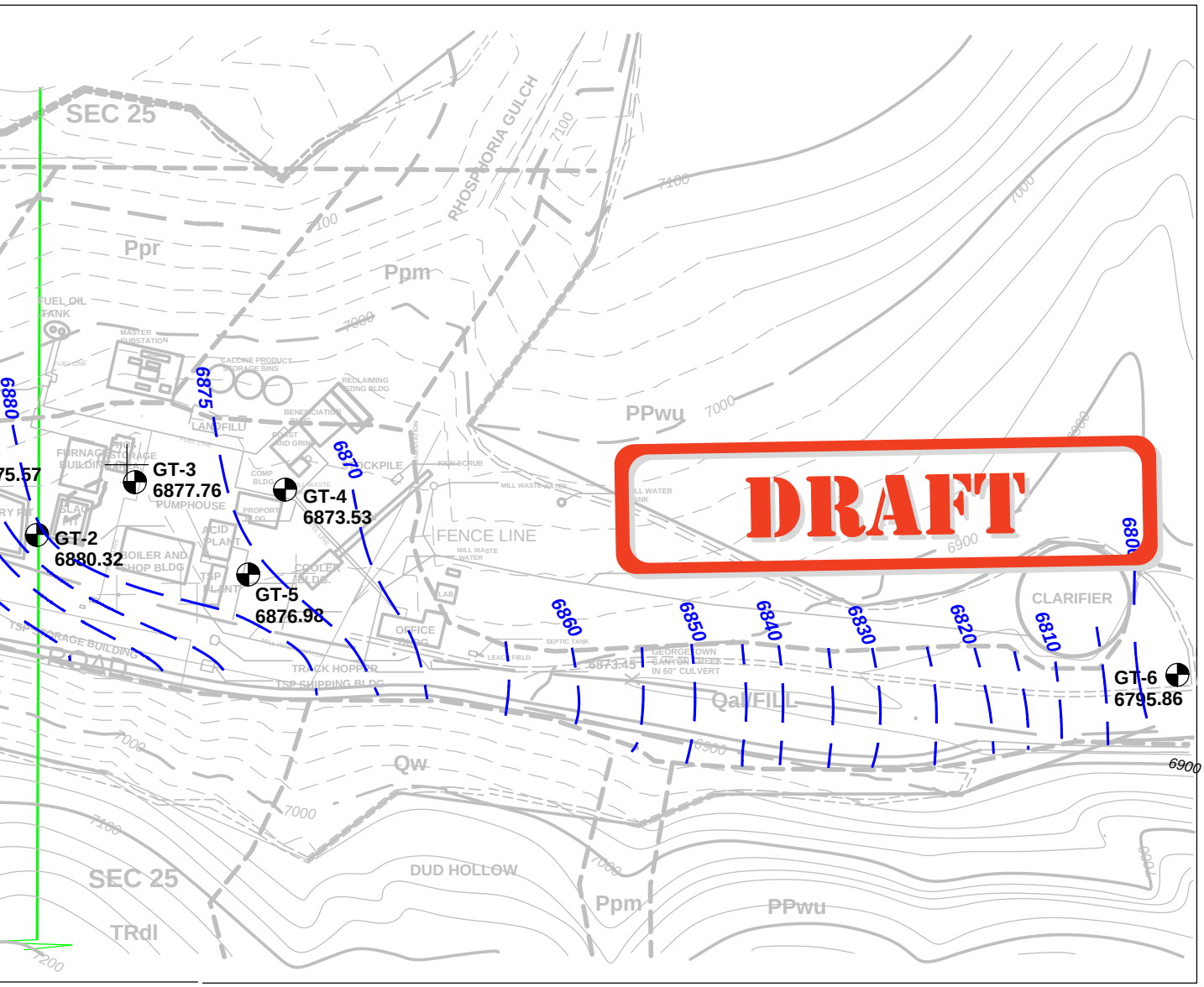
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

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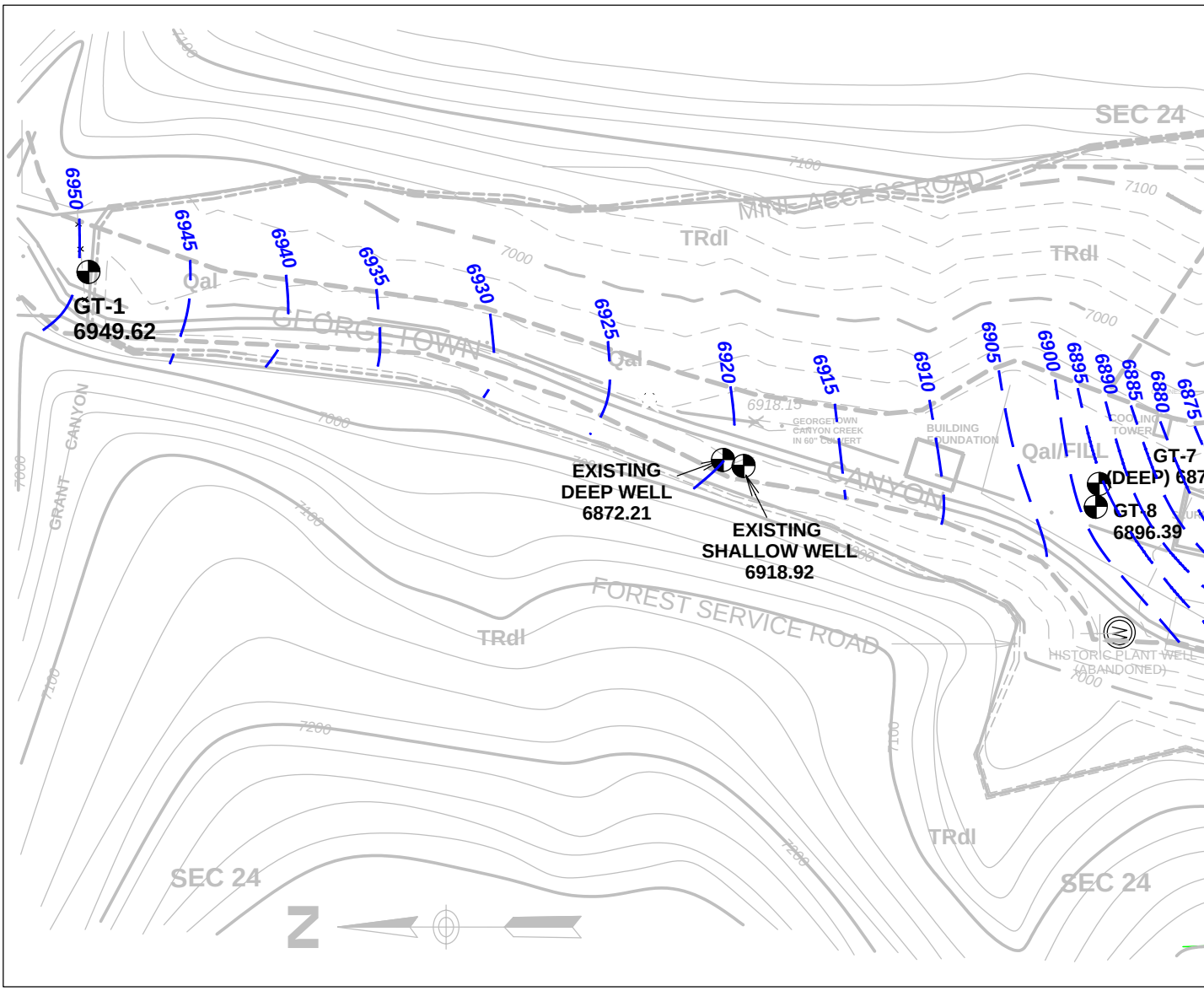
VANIAN

	FINAL SITE INVESTIGATION REPORT				
	TITLE	GROUND WATER LEVEL MAP SHALLOW AQUIFER AUGUST 25, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 3-14	



KEY

GT-1
6949.62

MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6895

GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

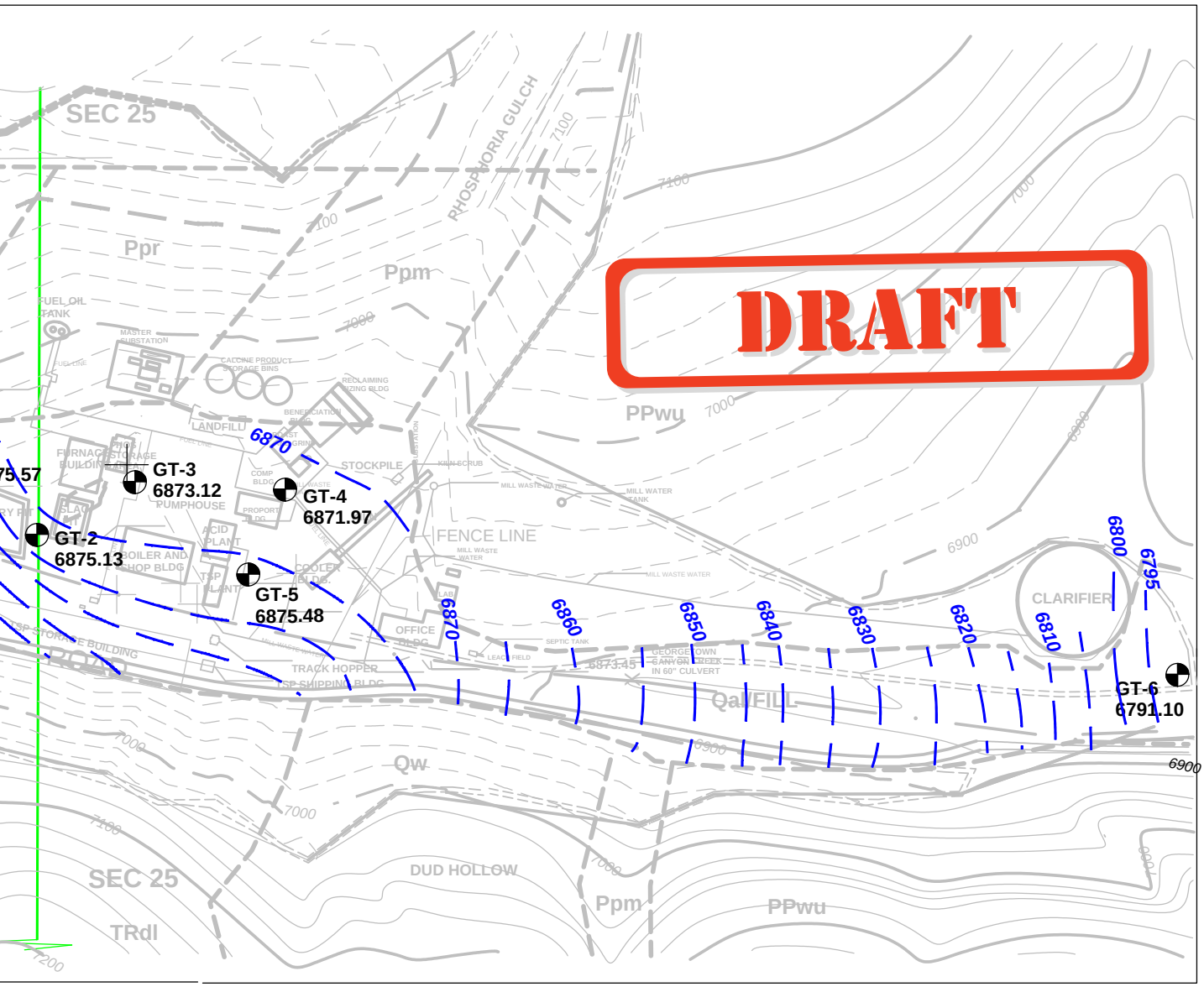
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

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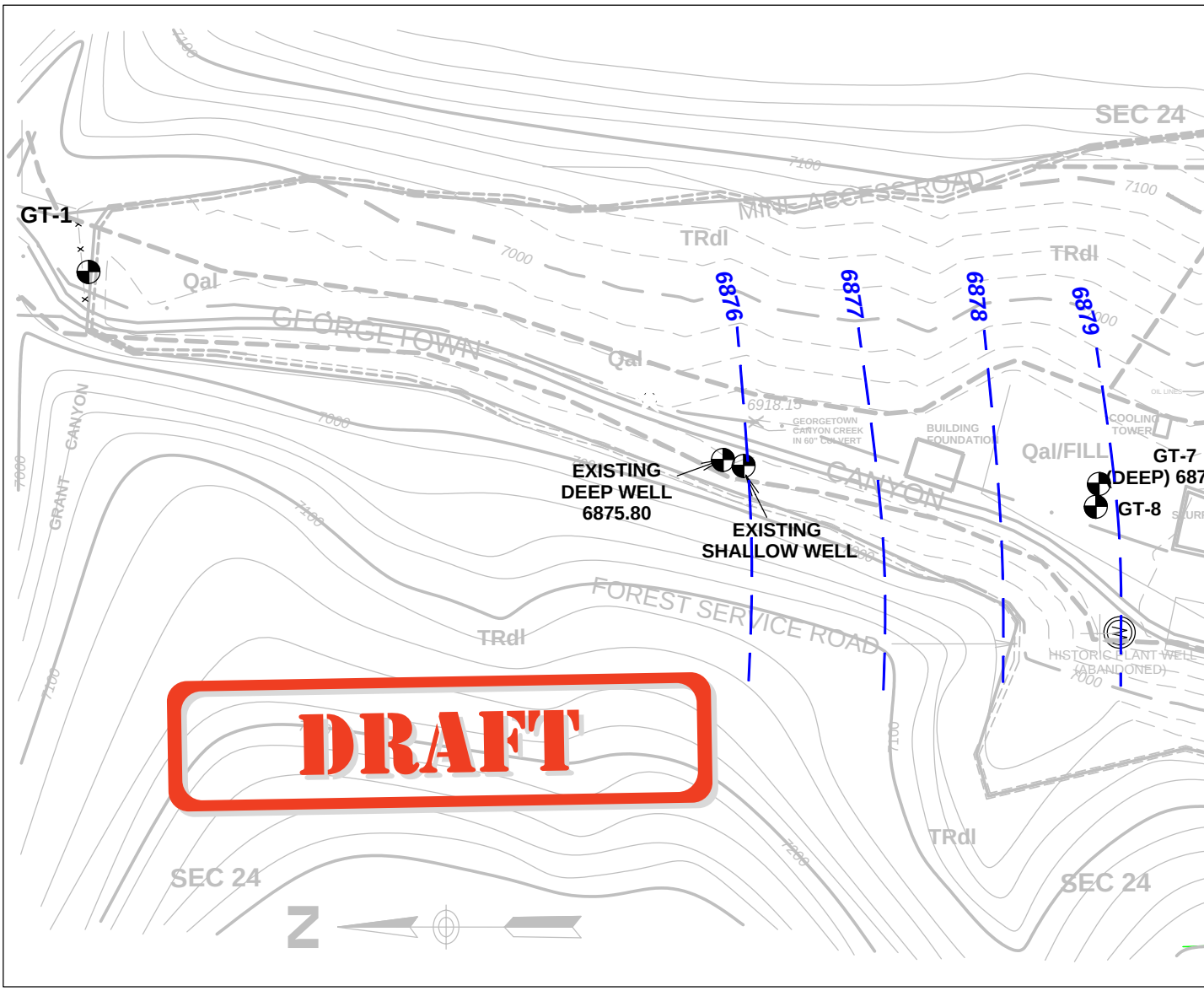
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP SHALLOW AQUIFER OCTOBER 11, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-15



KEY

EXISTING DEEP WELL 6875.80

DEEP WELL AND BEDROCK GROUND WATER LEVEL ELEVATION

6876

BEDROCK GROUND WATER LEVEL ELEVATION AND CONTOUR

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

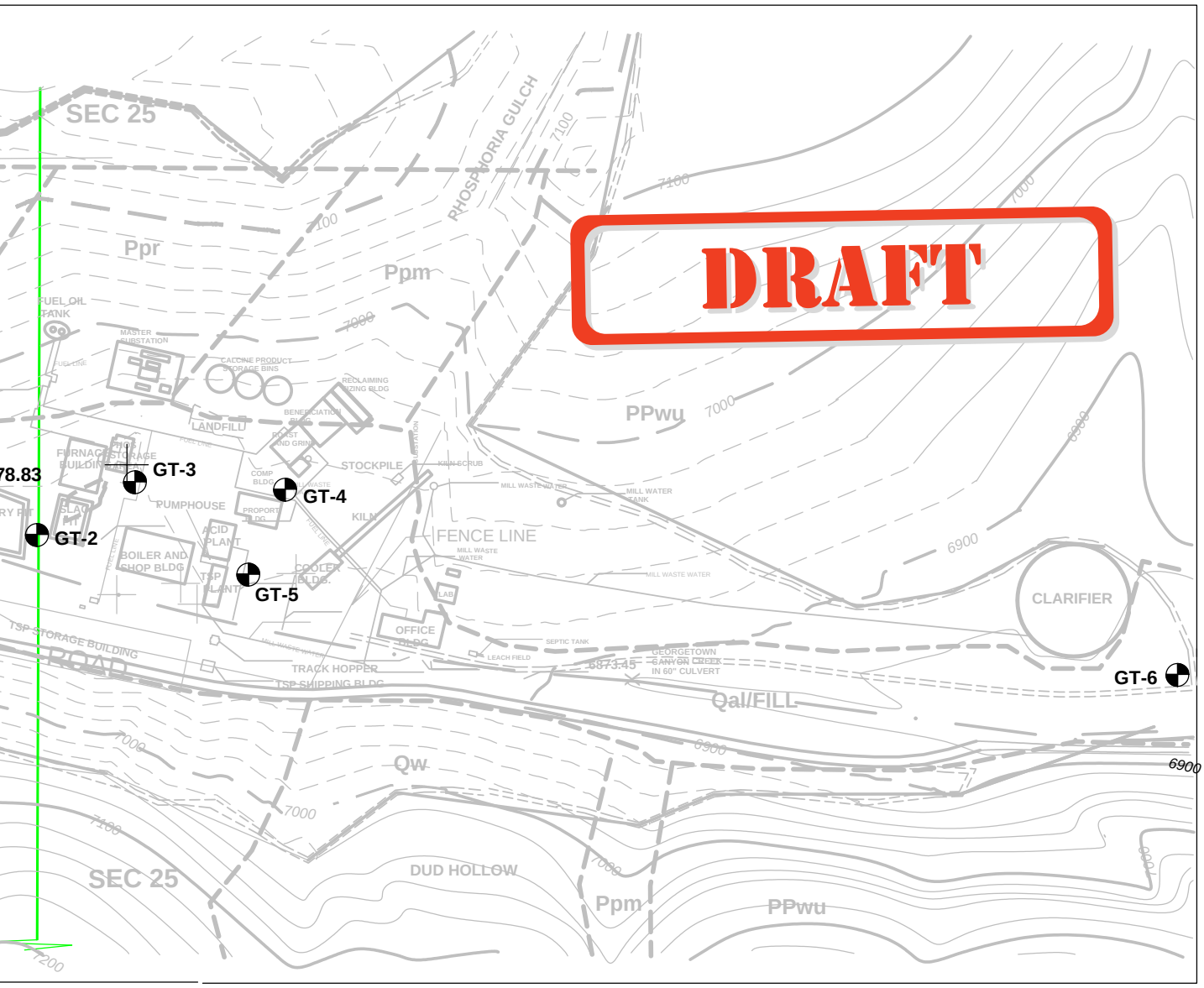
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

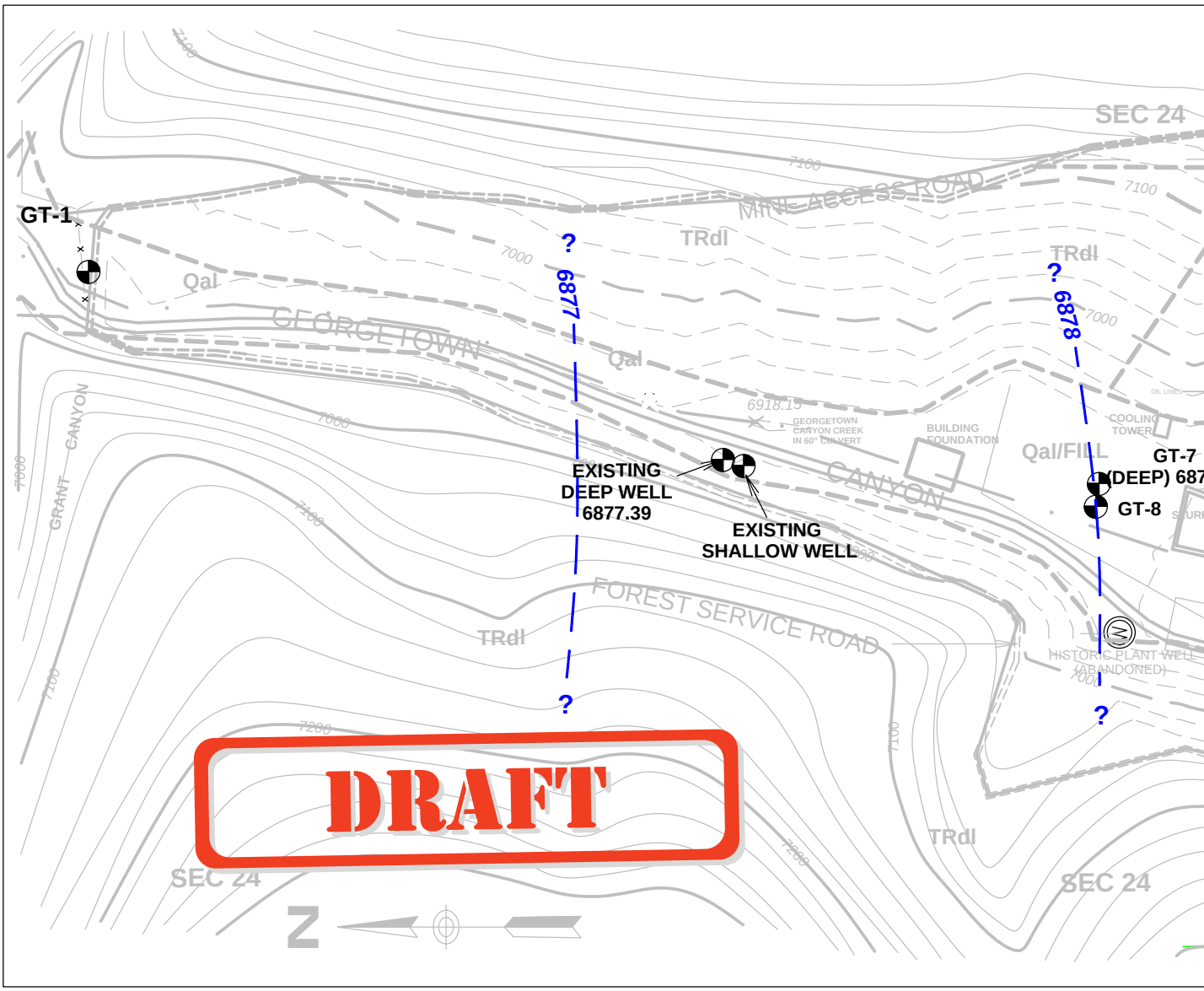
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP BEDROCK AQUIFER JUNE 18, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
11/19/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 3-16	



KEY

EXISTING DEEP WELL 6877.39

DEEP WELL AND BEDROCK GROUND WATER LEVEL ELEVATION

6878

BEDROCK GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

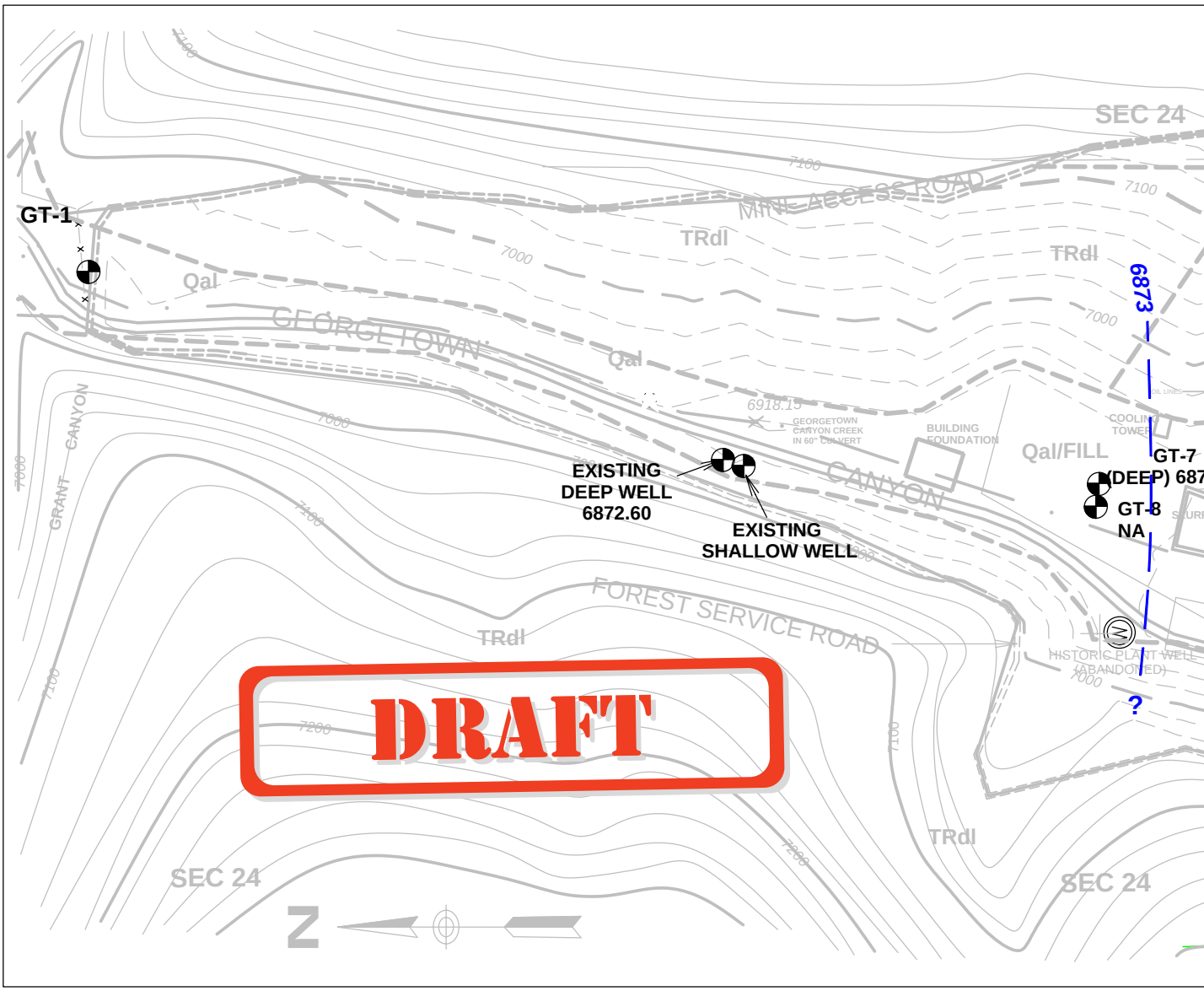
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP BEDROCK AQUIFER JULY 8, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
01/13/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-17



KEY

EXISTING DEEP WELL 6877.39

DEEP WELL AND BEDROCK GROUND WATER LEVEL ELEVATION

6878

BEDROCK GROUND WATER LEVEL ELEVATION AND CONTOUR

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

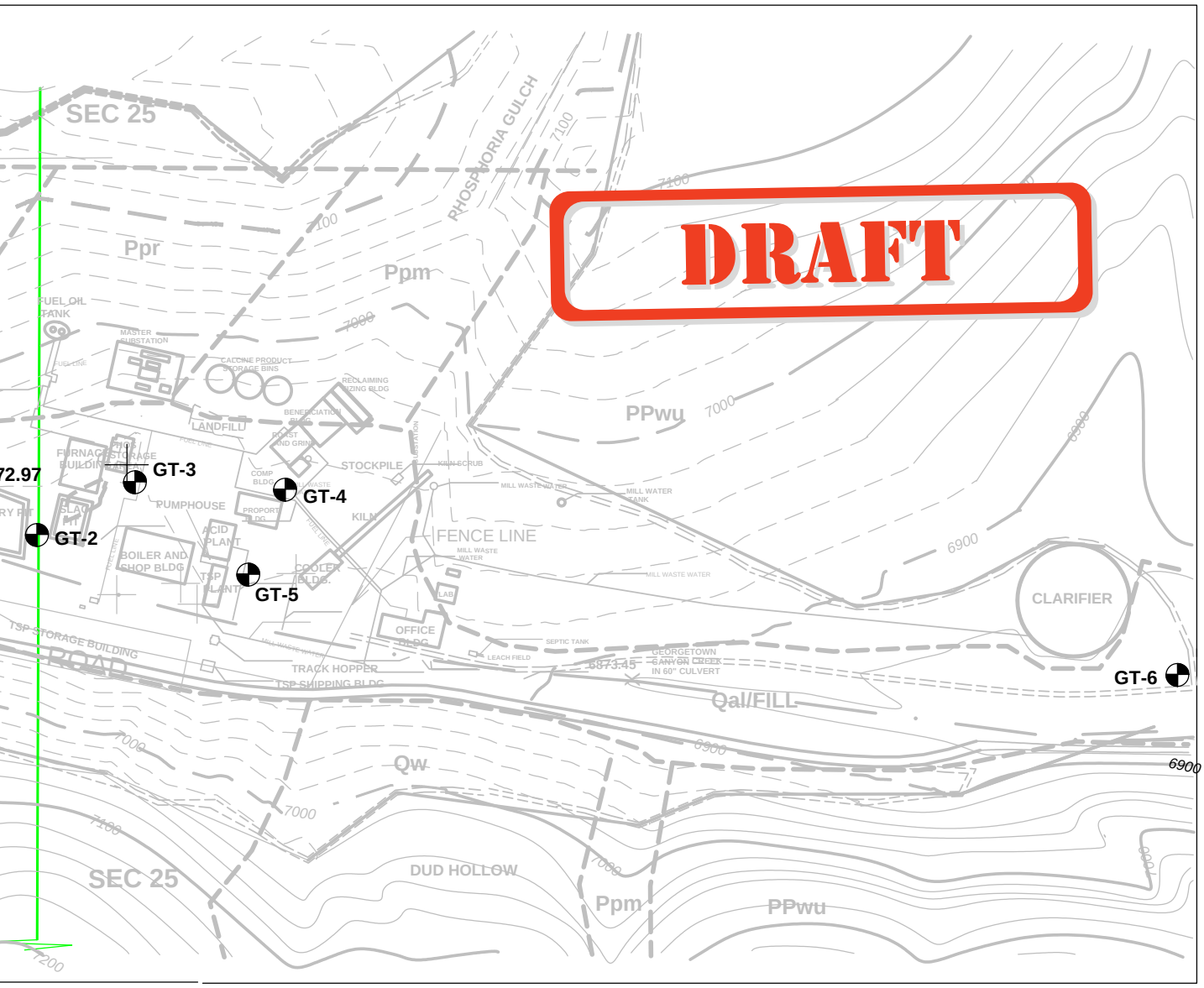
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP BEDROCK AQUIFER AUGUST 23, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
01/13/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-18

KEY

EXISTING DEEP WELL 6877.39

DEEP WELL AND BEDROCK GROUND WATER LEVEL ELEVATION

6878

BEDROCK GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

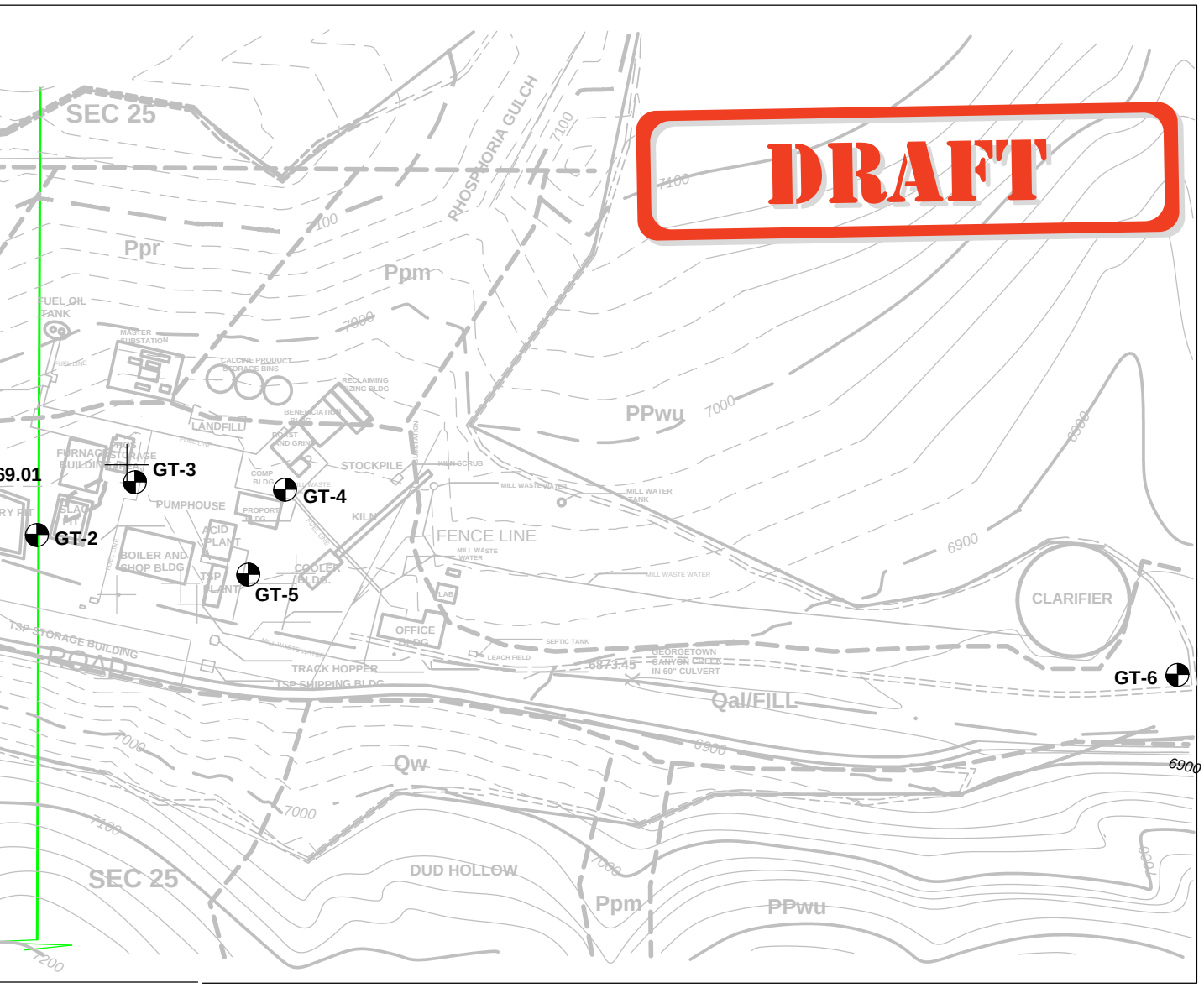
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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WOODY FM.

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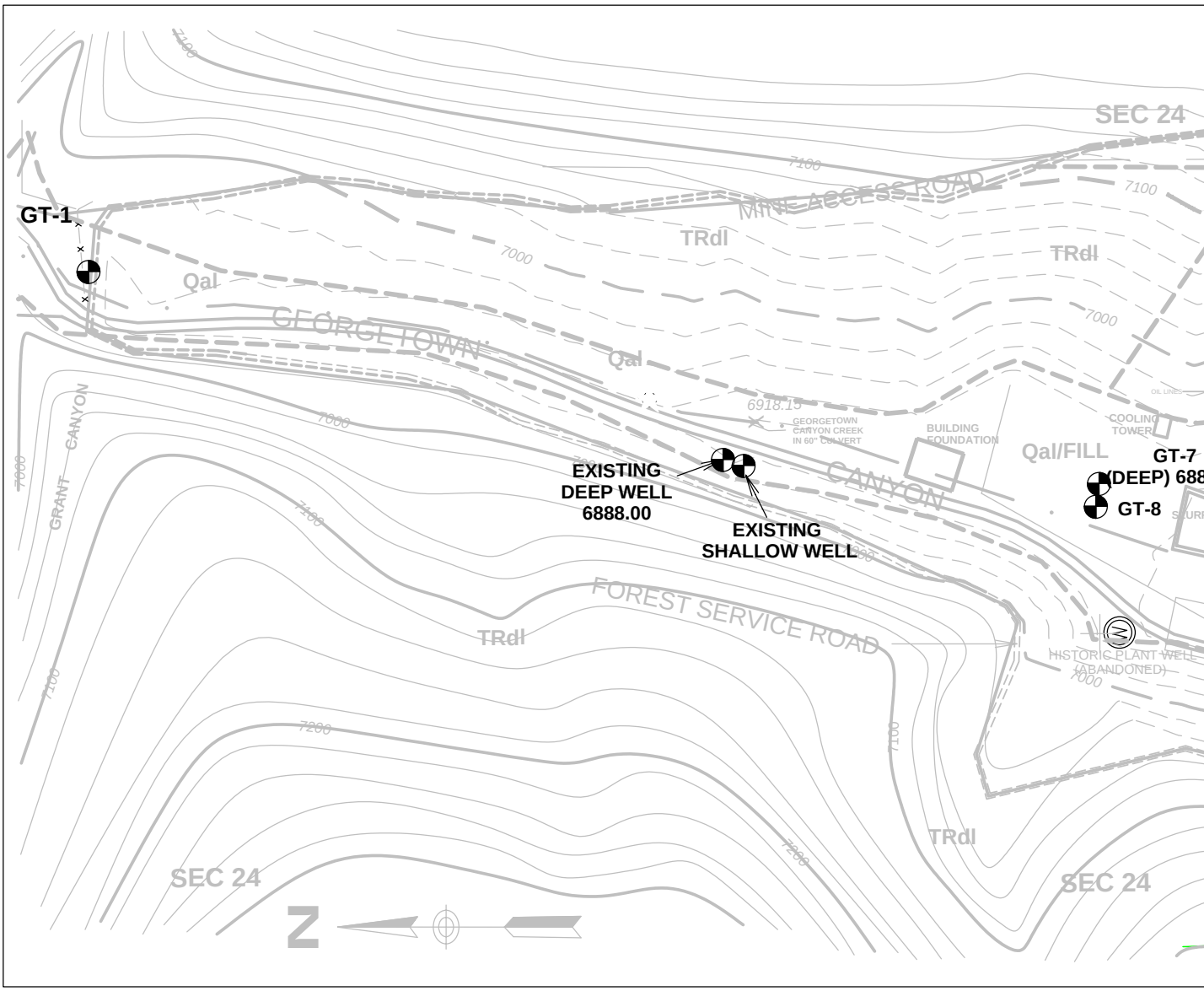
VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP BEDROCK AQUIFER NOVEMBER 5, 2004 CENTRAL FARMERS FERTILIZER FACILITY			
01/13/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-19



KEY

EXISTING DEEP WELL 6888.00 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6885 — GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

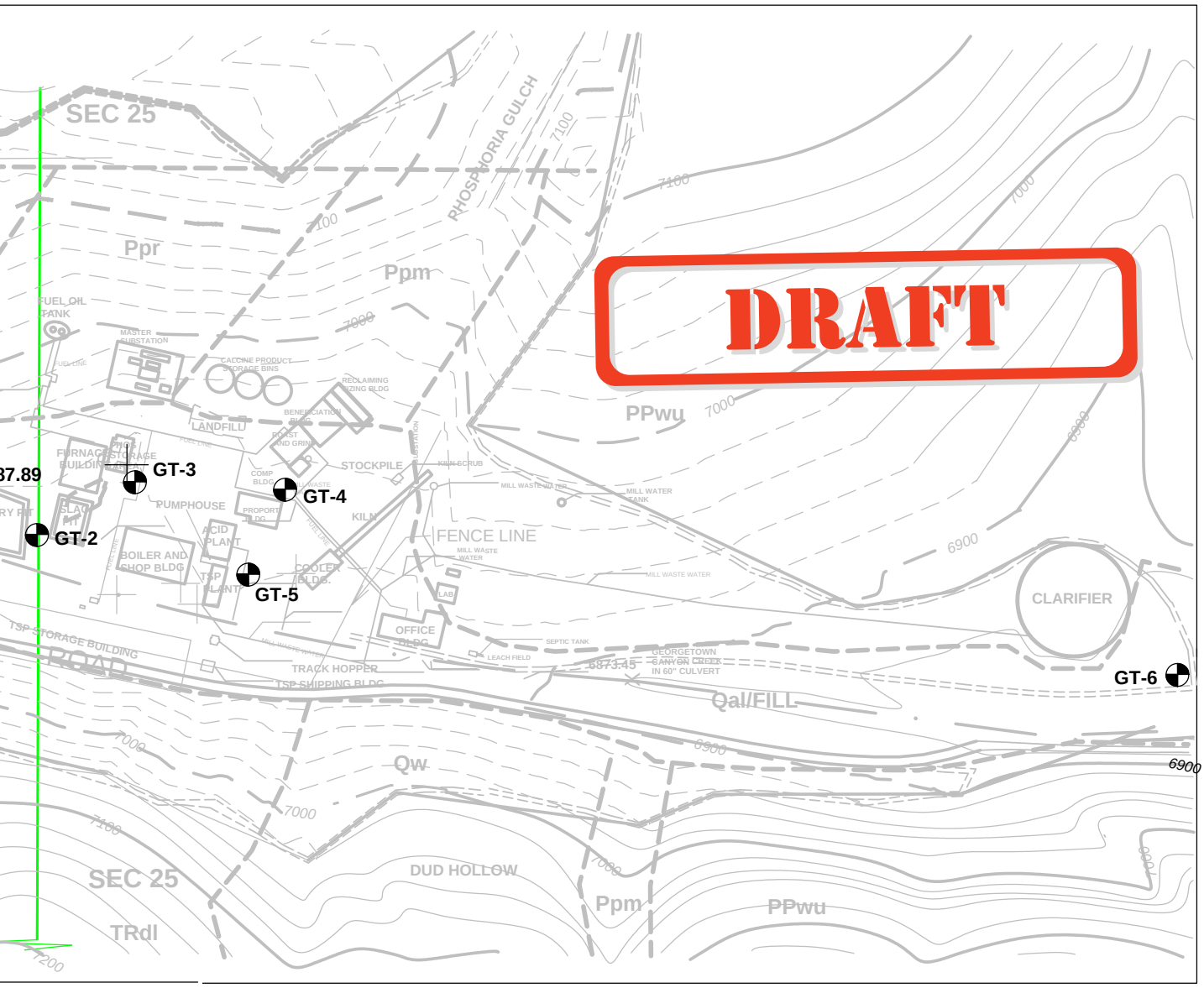
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

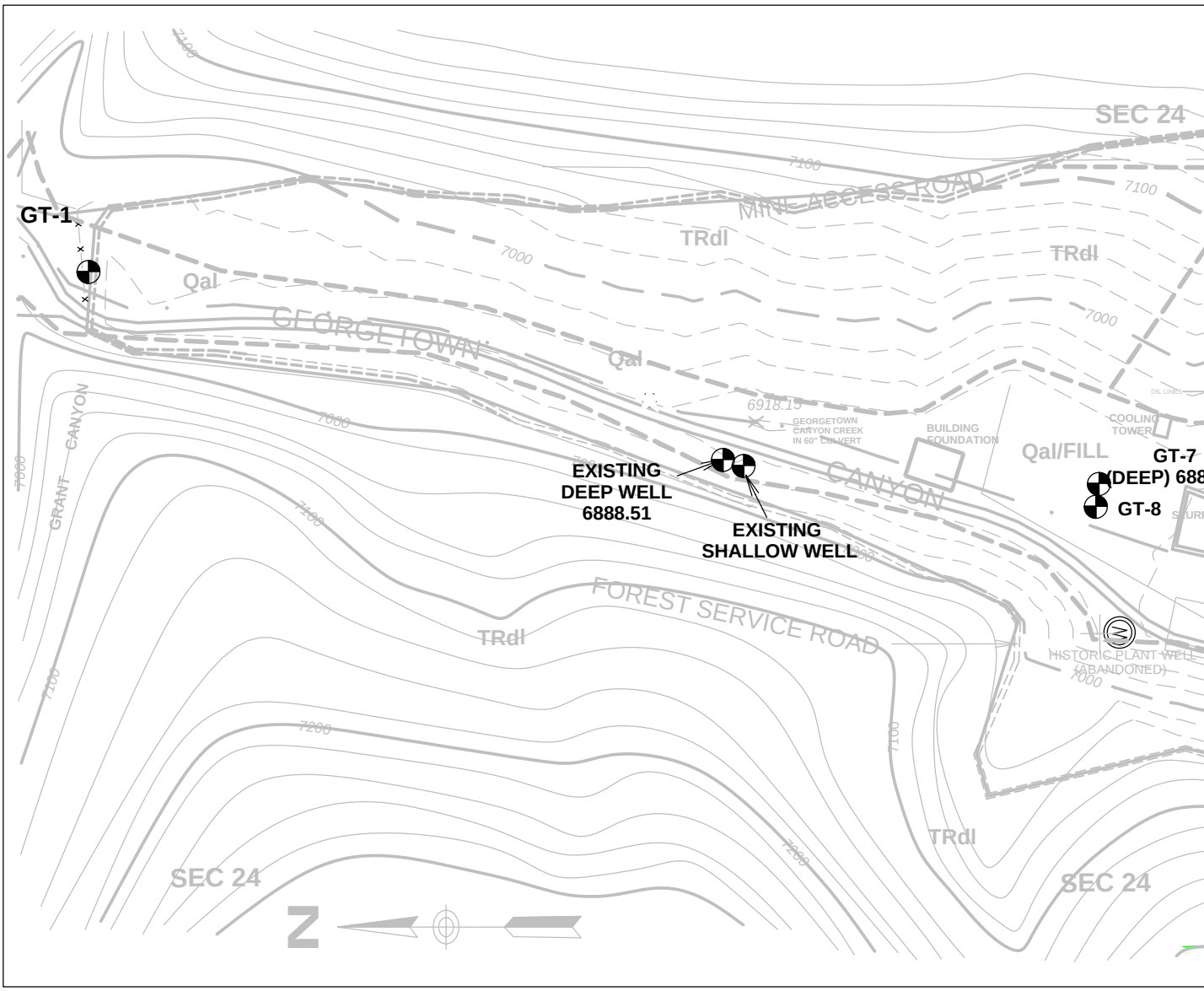
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP DEEP AQUIFER MAY 11, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-20



KEY

EXISTING DEEP WELL 6888.51 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6885 — GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

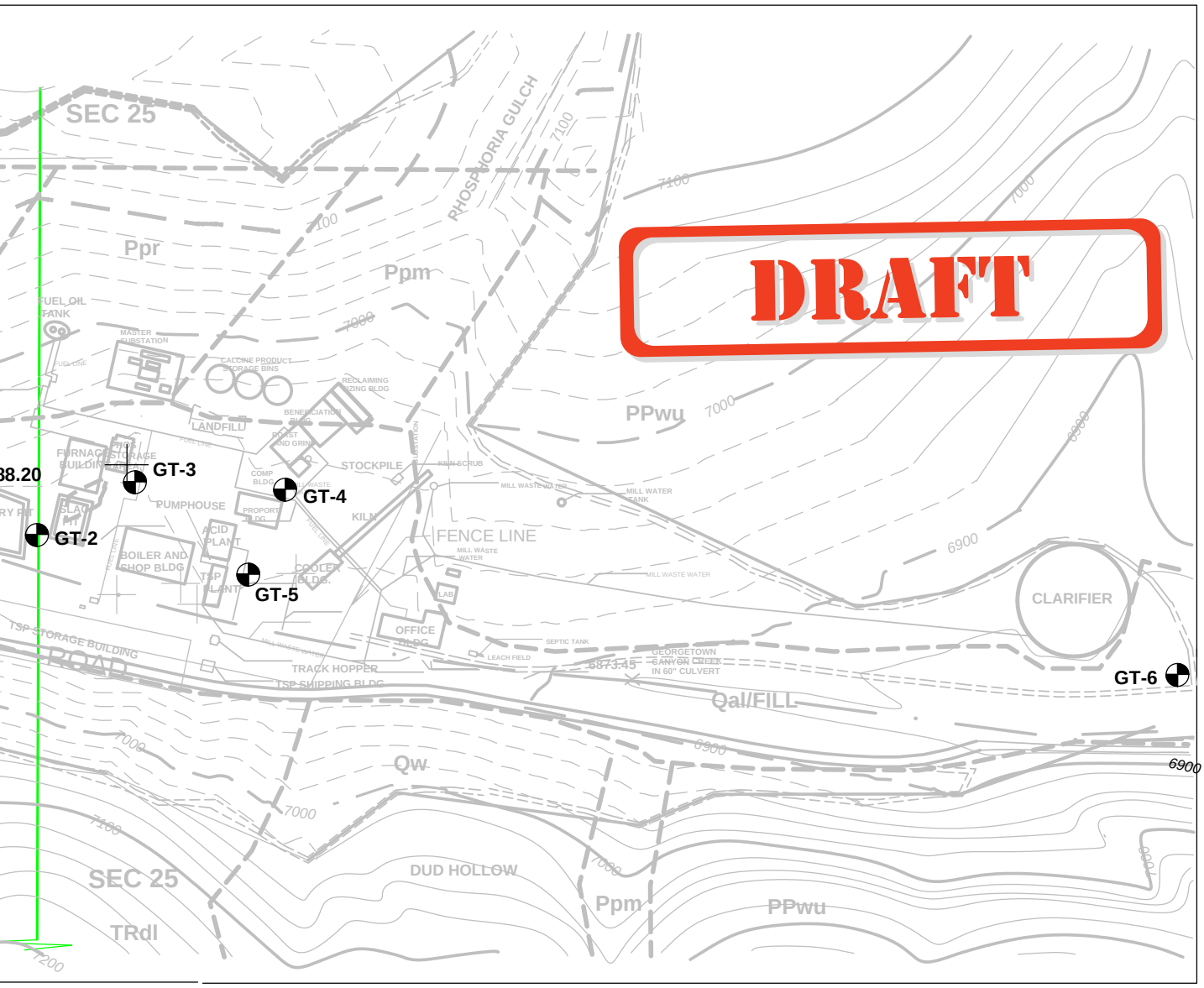
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

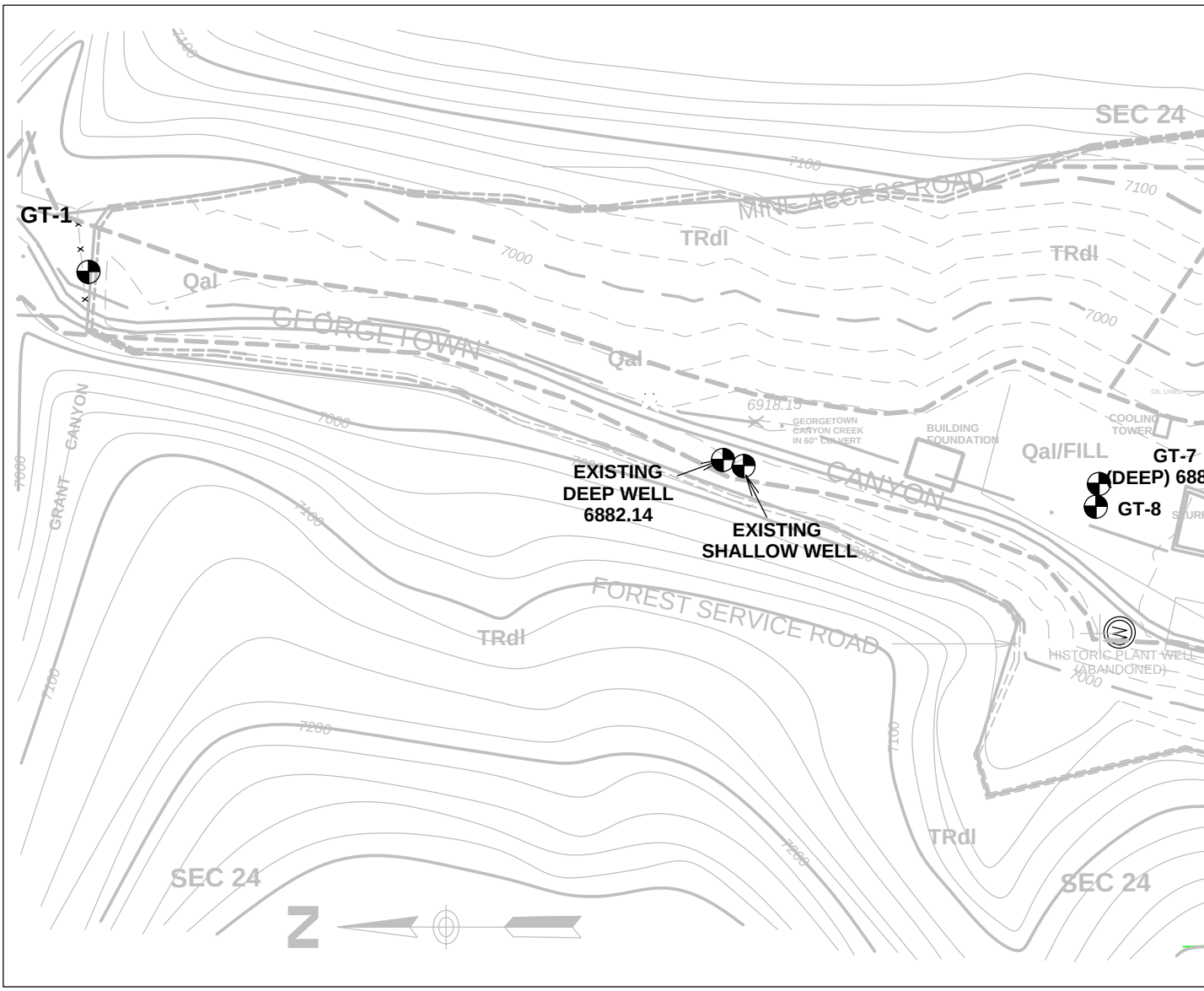
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP DEEP AQUIFER JUNE 22, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-21



KEY

EXISTING DEEP WELL 6882.14 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6885 — GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

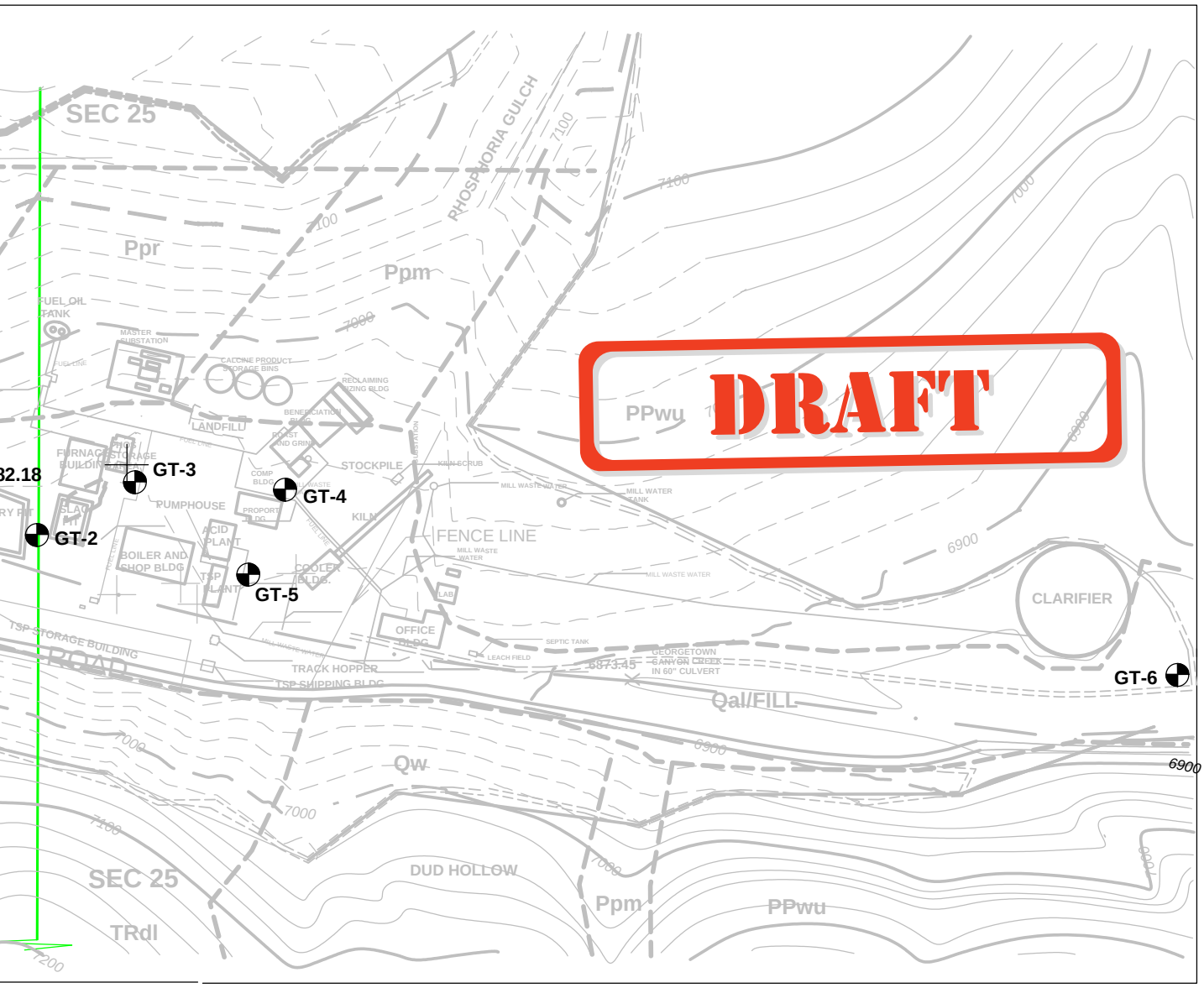
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

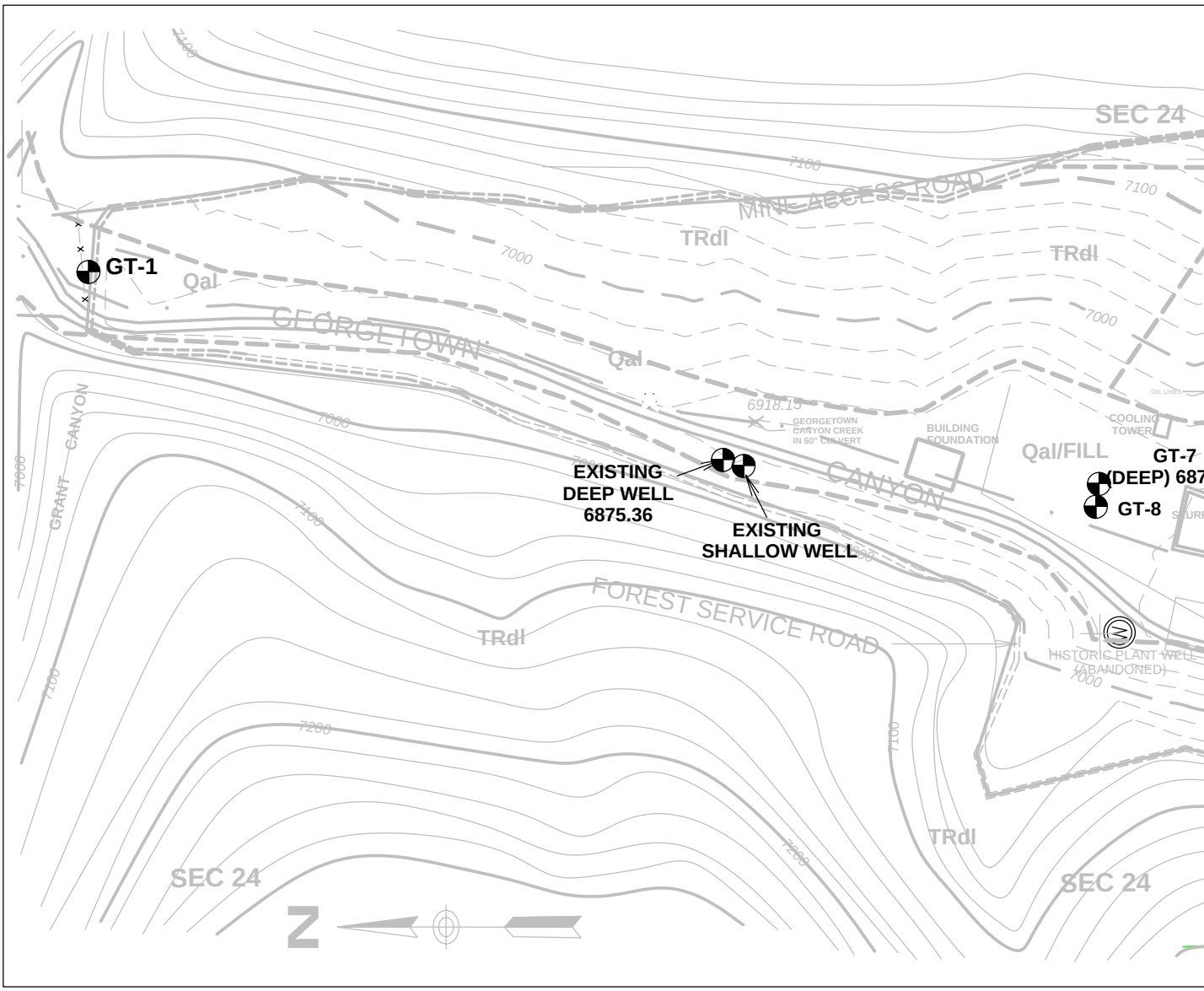
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT				
	TITLE	GROUND WATER LEVEL MAP DEEP AQUIFER JULY 19, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET	FIGURE 3-22



KEY

EXISTING DEEP WELL 6875.36 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6885 — GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

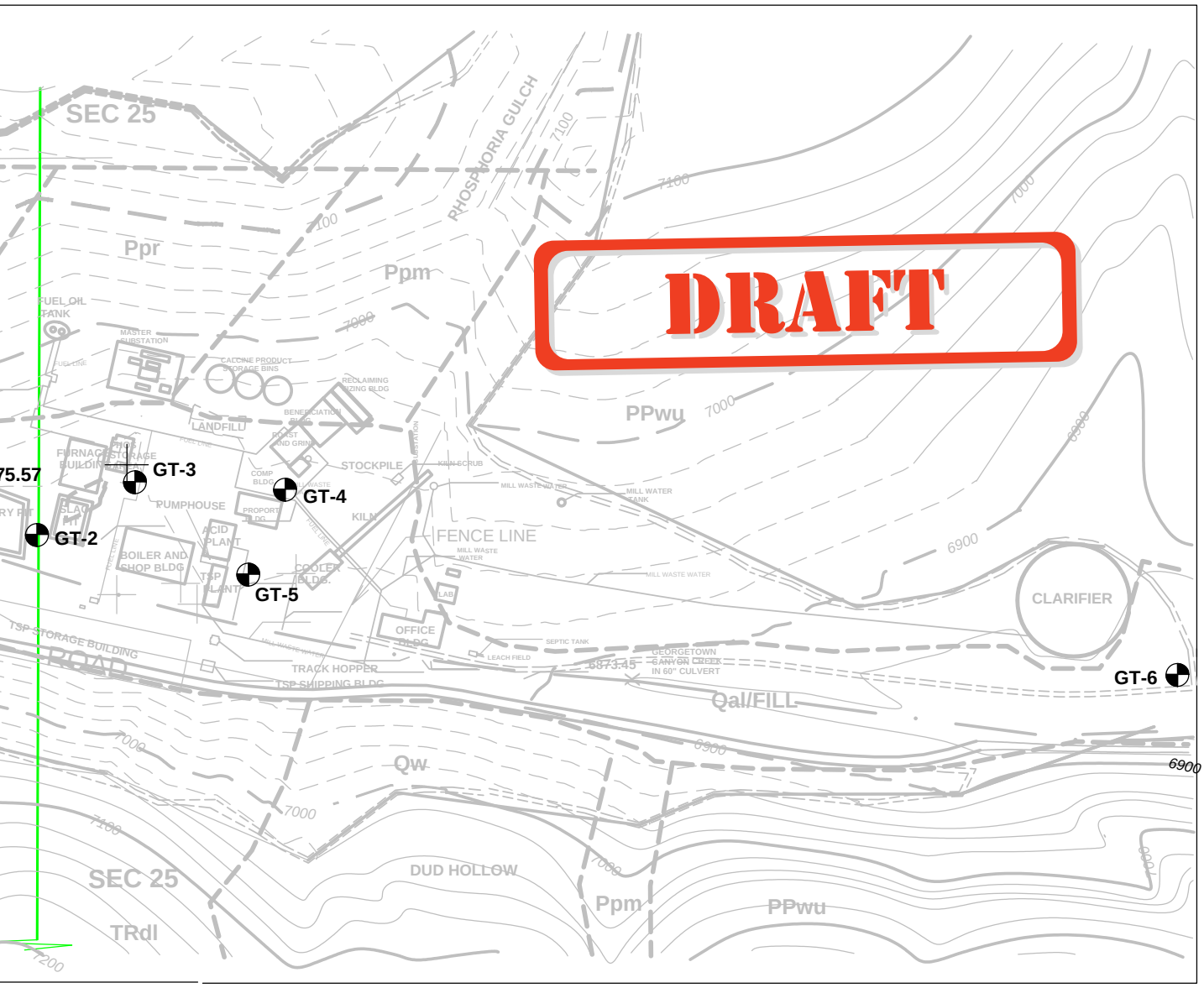
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

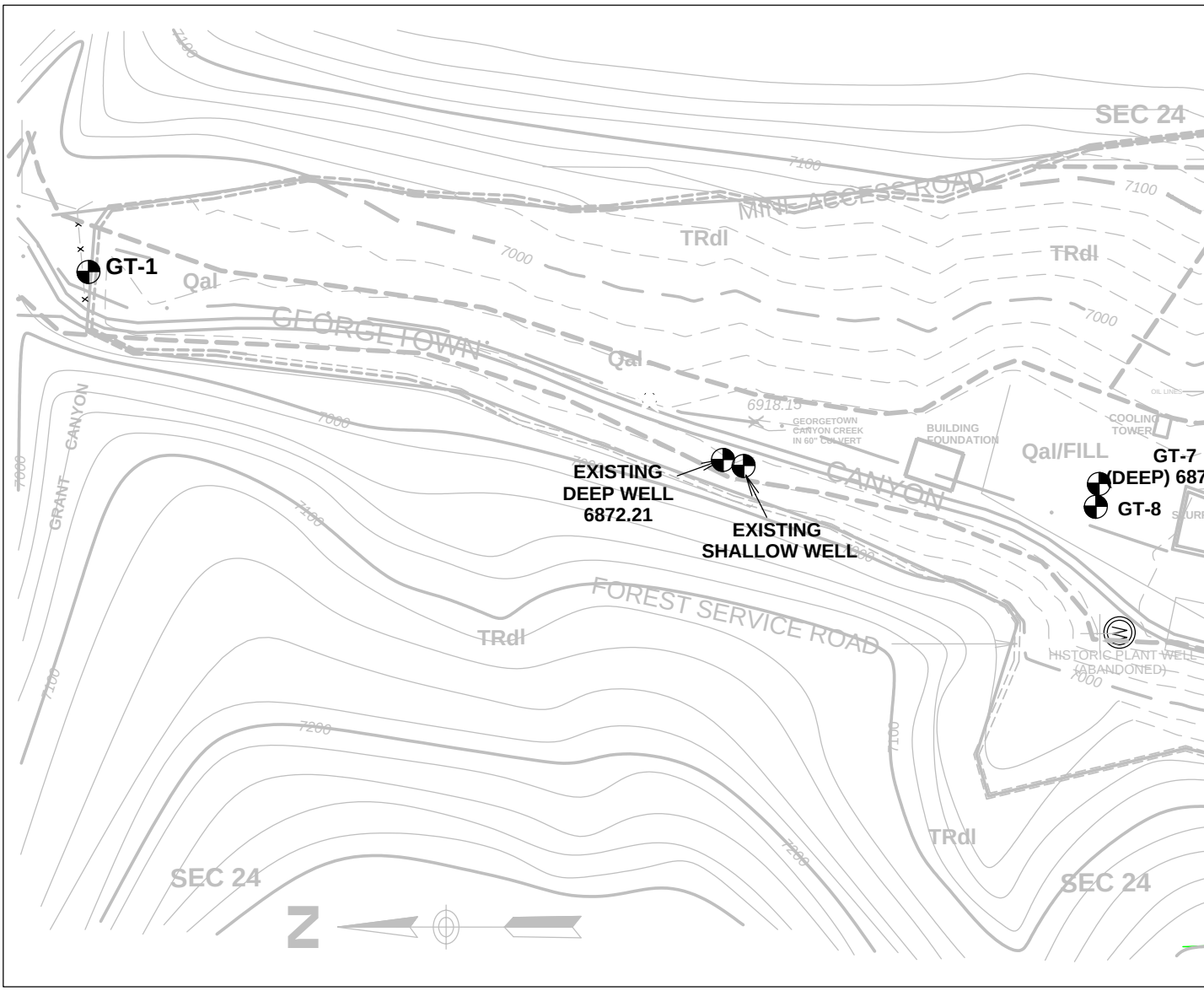
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP DEEP AQUIFER AUGUST 25, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-23



KEY

EXISTING DEEP WELL 6872.21 — MONITORING WELL AND GROUND WATER LEVEL ELEVATION

6885 — GROUND WATER LEVEL ELEVATION AND CONTOUR

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

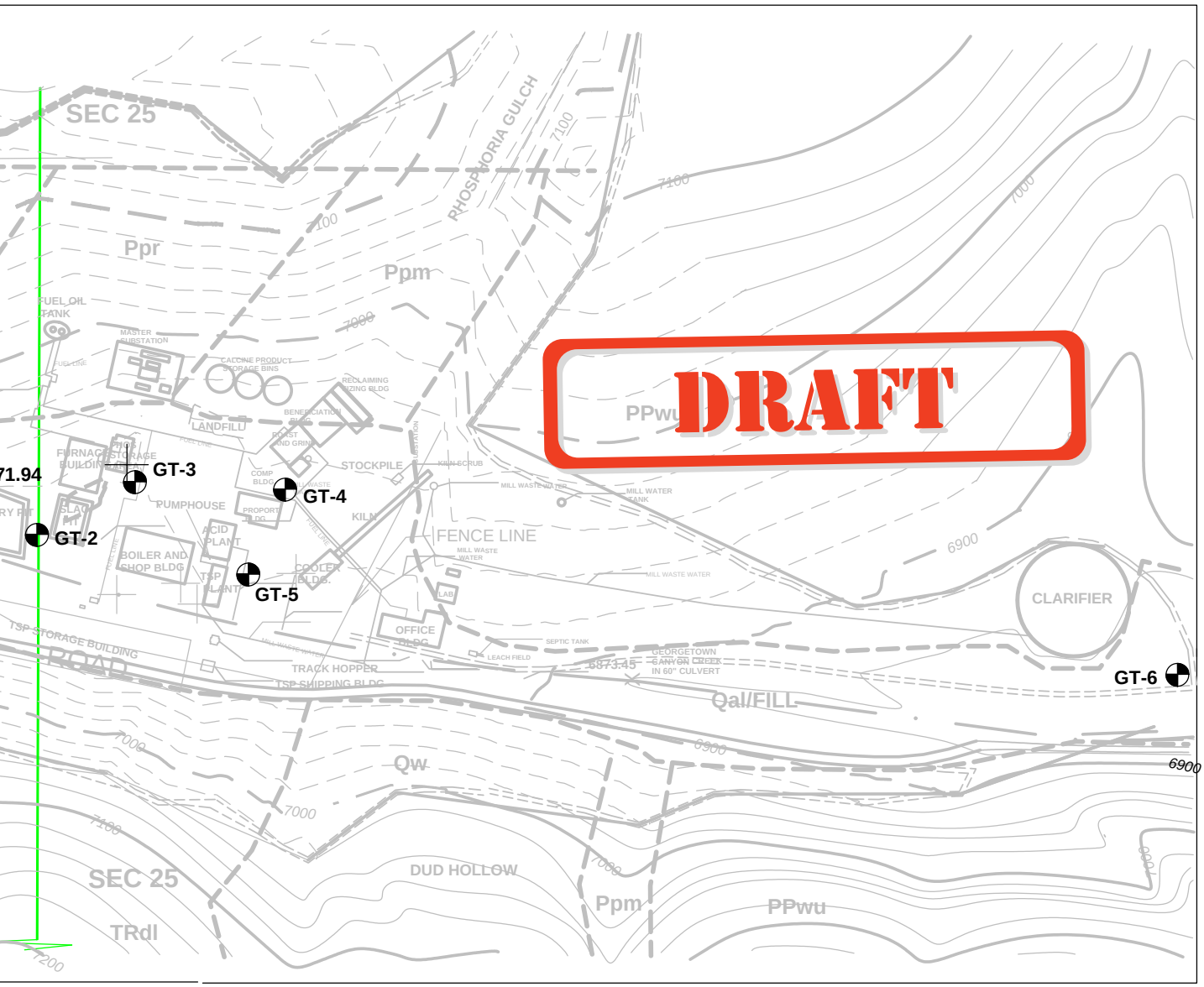
TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

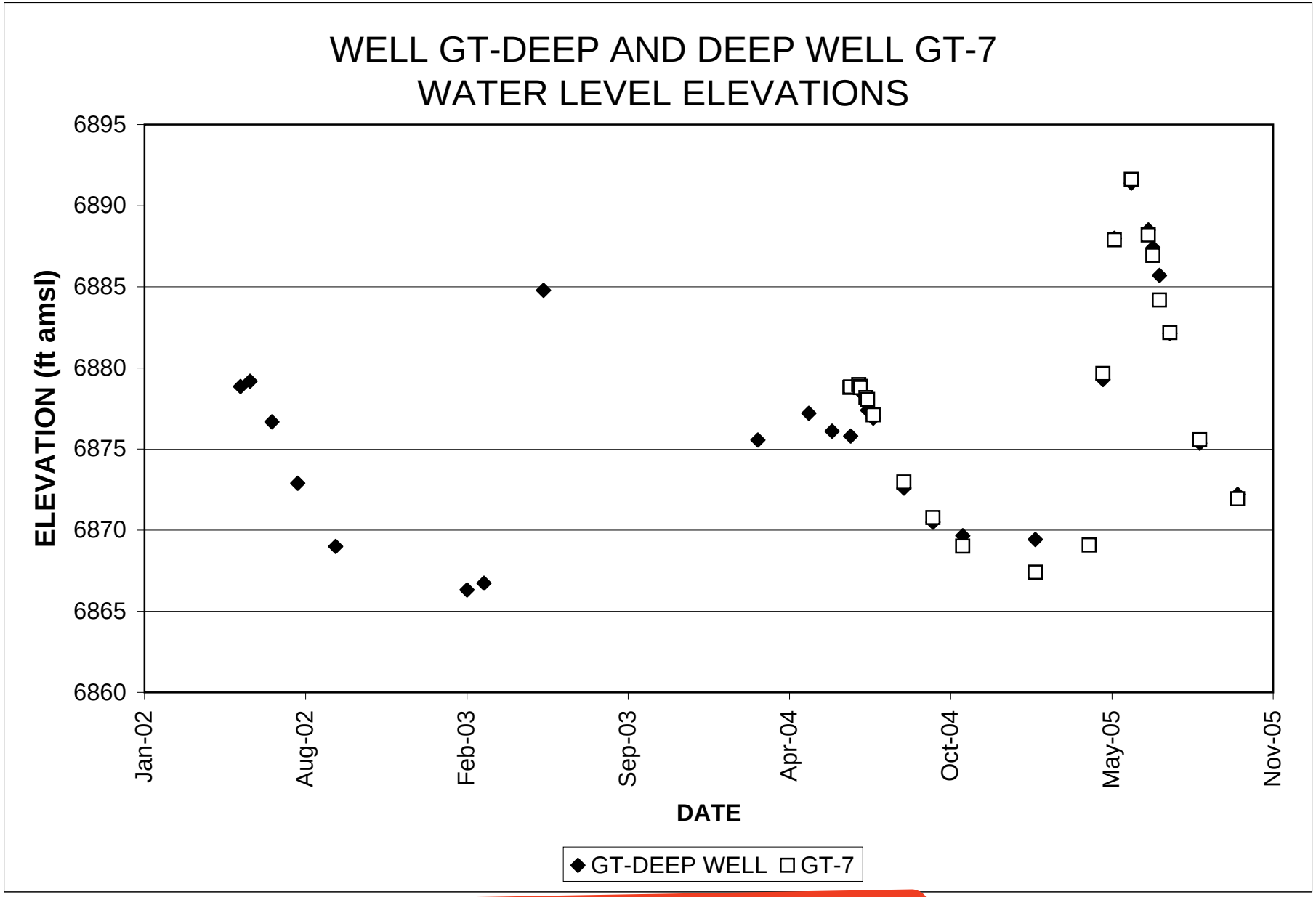
WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE: GROUND WATER LEVEL MAP DEEP AQUIFER OCTOBER 11, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/29/05	SIZE: B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 3-24



DRAFT

FIGURE 3-25

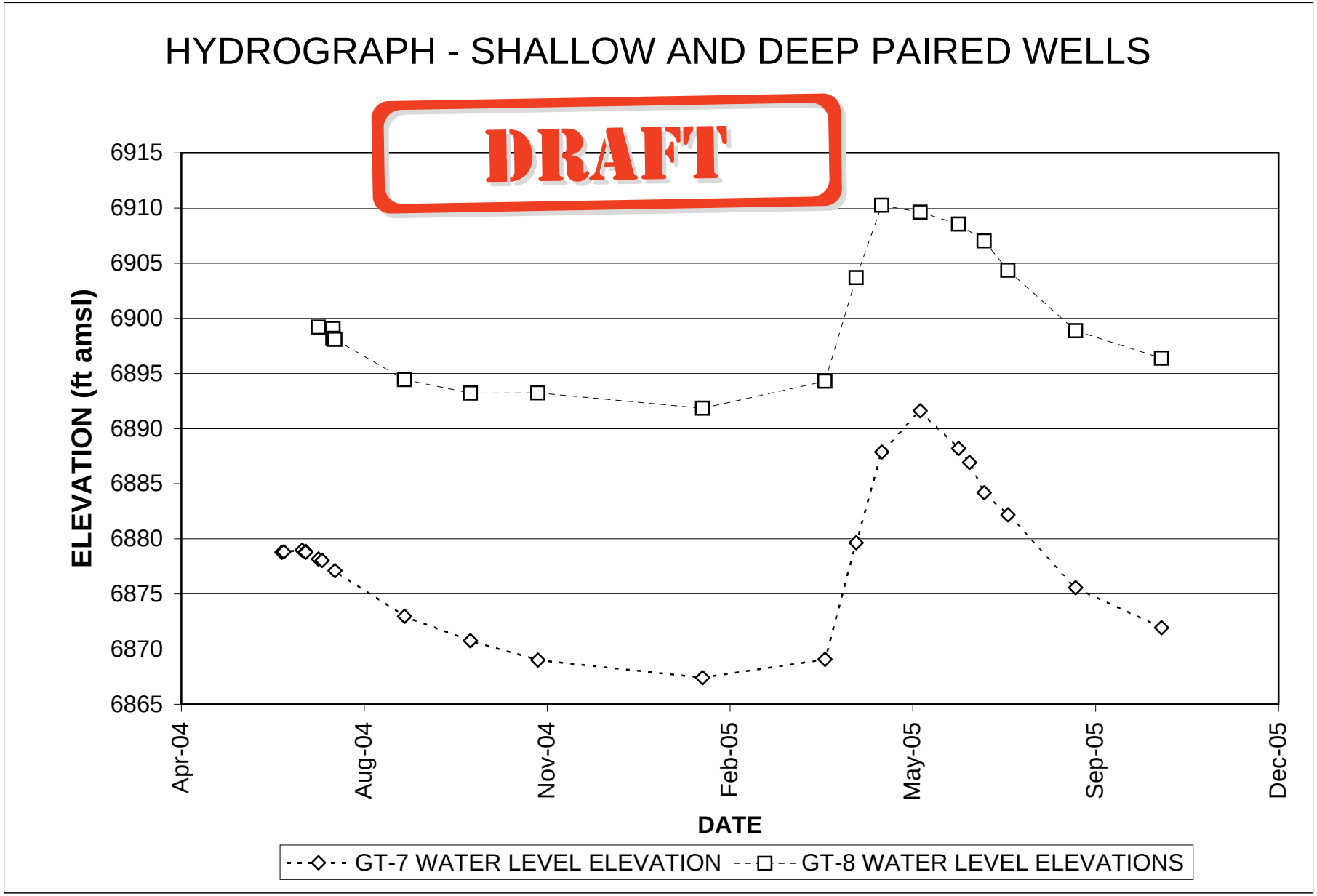

HYDROGRAPH - SHALLOW AND DEEP PAIRED WELLS
DRAFT
ELEVATION (ft amsl)
6915
6910
6905
6900
6895
6890
6885
6880
6875
6870
6865
Apr-04
Aug-04
Nov-04
Feb-05
May-05
Sep-05
Dec-05
DATE
GT-7 WATER LEVEL ELEVATION
GT-8 WATER LEVEL ELEVATIONS

FIGURE 3-26

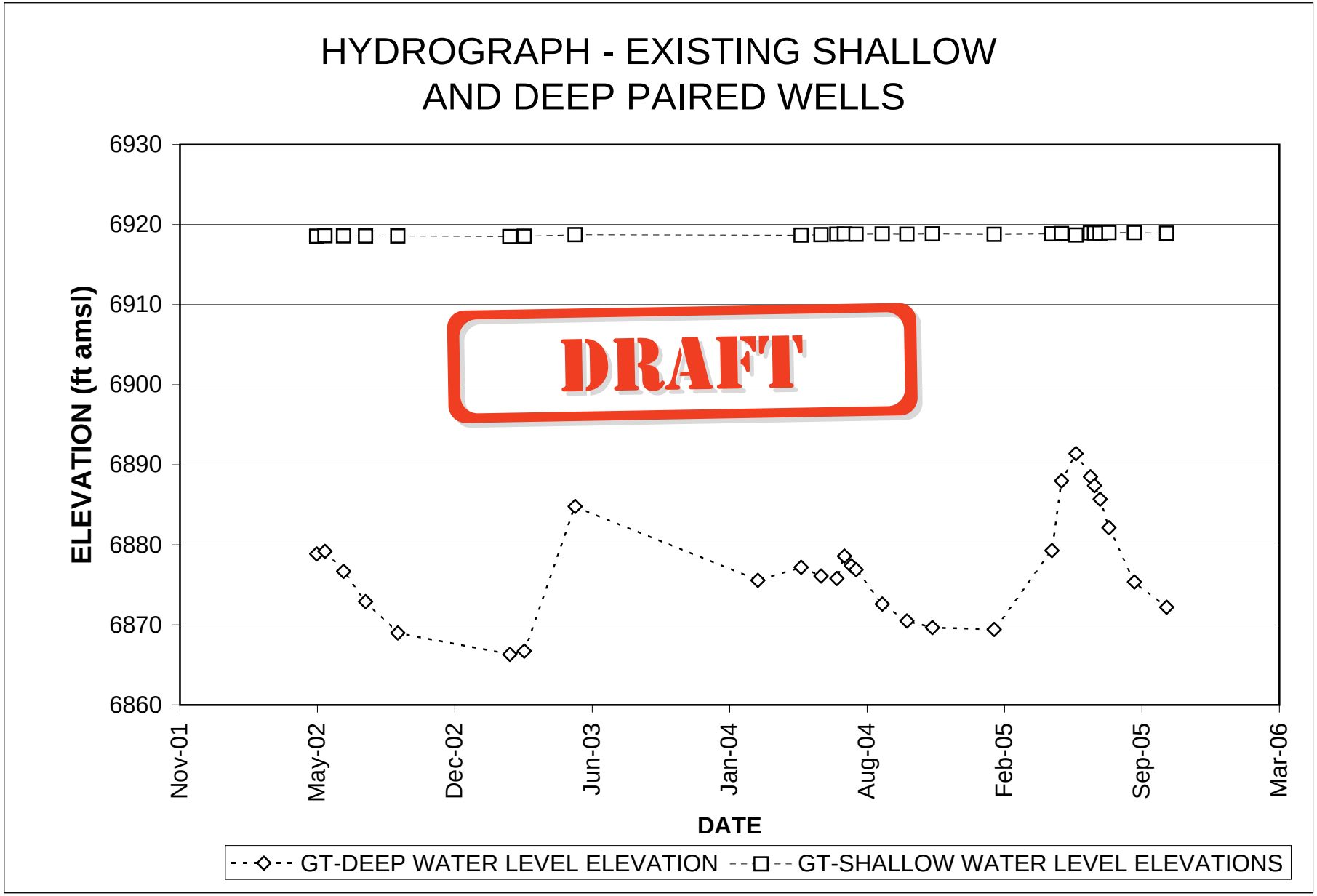

HYDROGRAPH - EXISTING SHALLOW
AND DEEP PAIRED WELLS
ELEVATION (ft amsl)
6930
6920
6910
6900
6890
6880
6870
6860
Nov-01
May-02
Dec-02
Jun-03
Jan-04
Aug-04
Feb-05
Sep-05
Mar-06
DATE
DRAFT
GT-DEEP WATER LEVEL ELEVATION
GT-SHALLOW WATER LEVEL ELEVATIONS

FIGURE 3-27

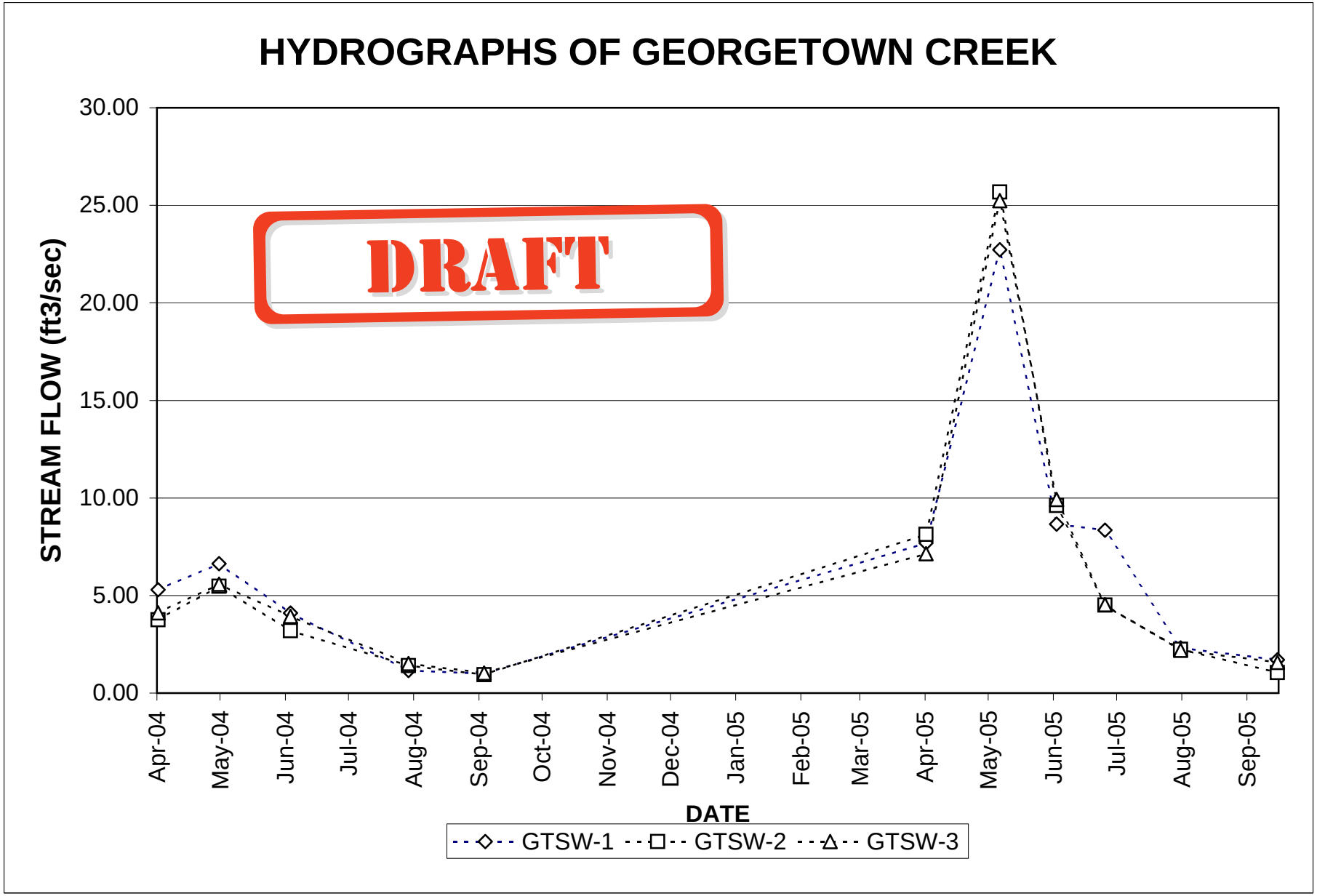
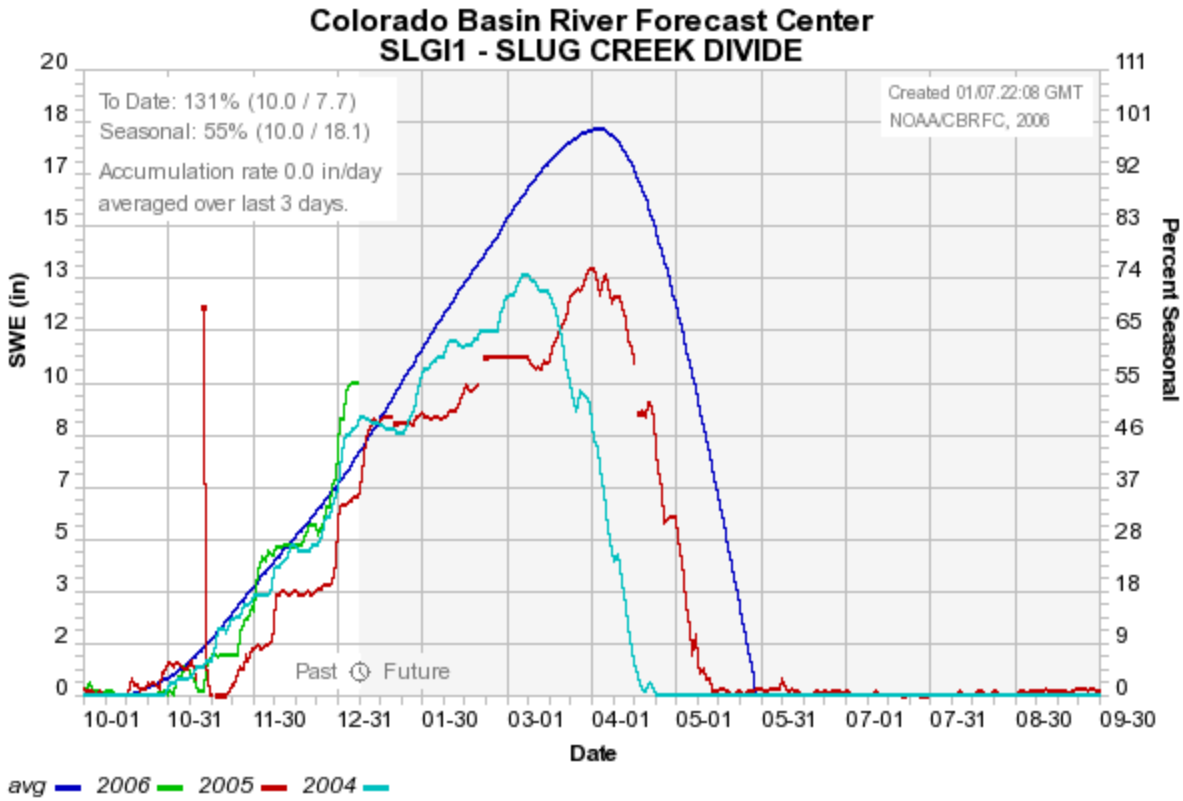
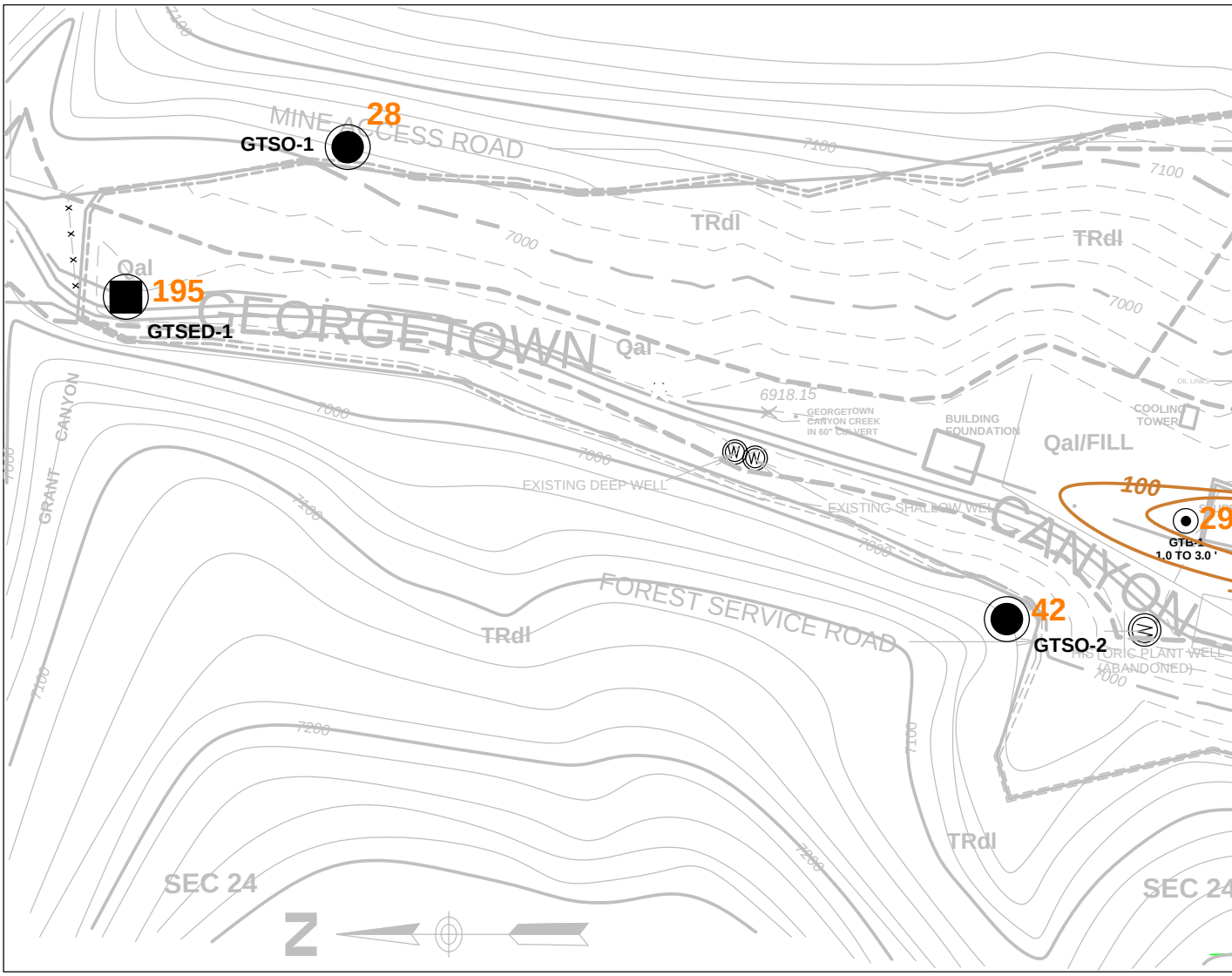

HYDROGRAPHS OF GEORGETOWN CREEK
DRAFT
STREAM FLOW (ft3/sec)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
DATE
GTSW-1
GTSW-2
GTSW-3

FIGURE 3-28



DRAFT

FIGURE 3-29



KEY

195 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

28 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

1090 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

298 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

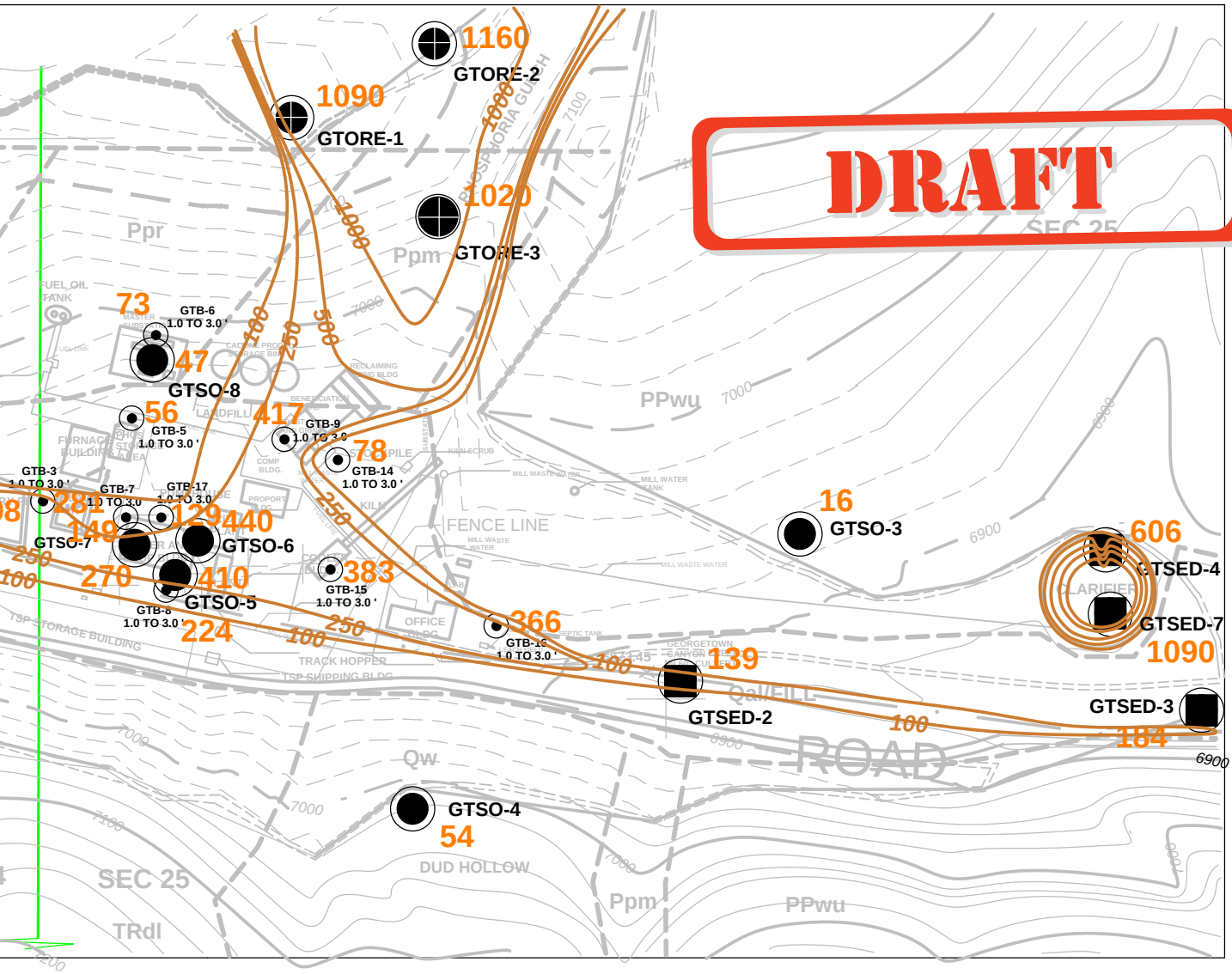
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

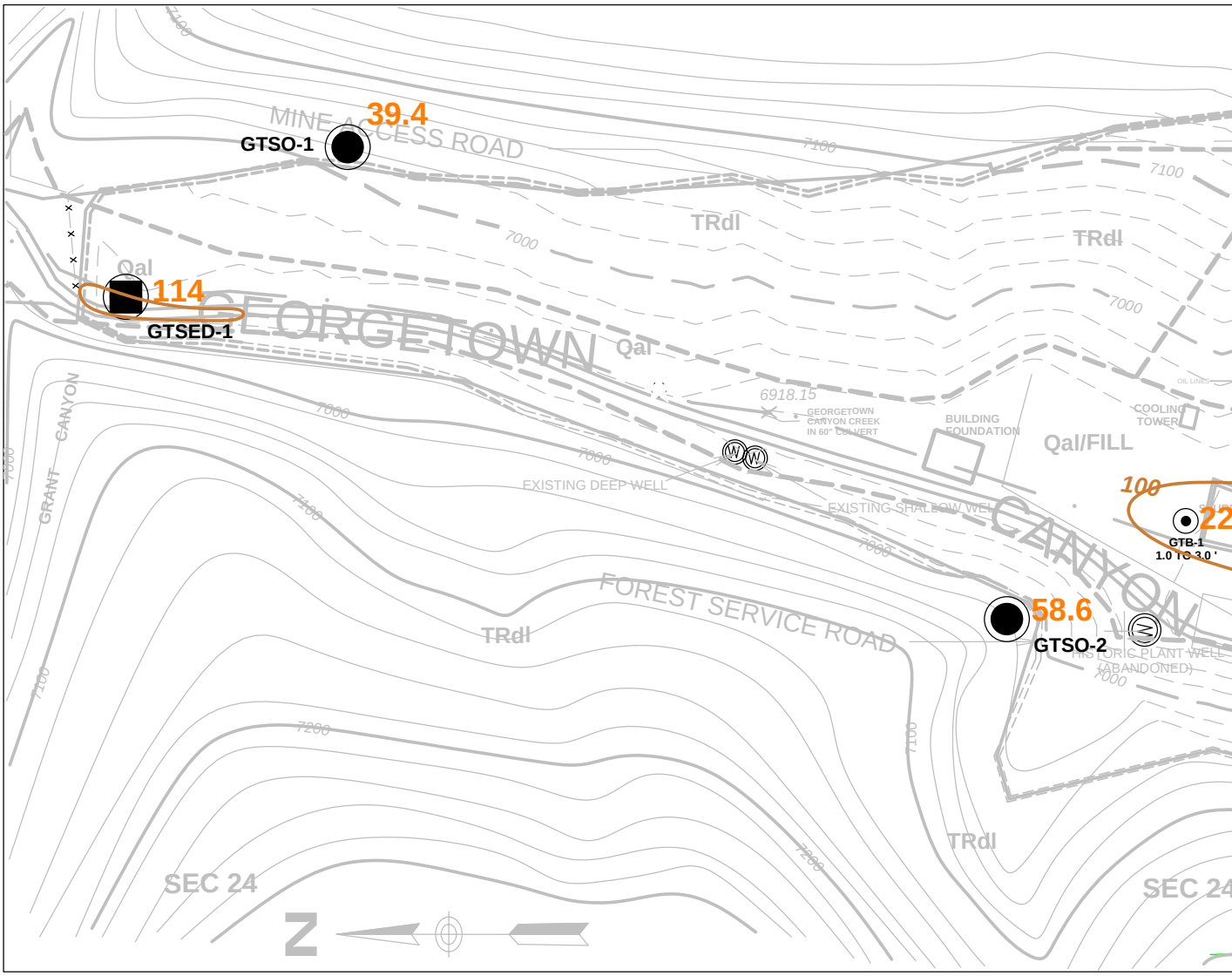
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE CHROMIUM CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-1	



KEY

114 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

39.4 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

839 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

221 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

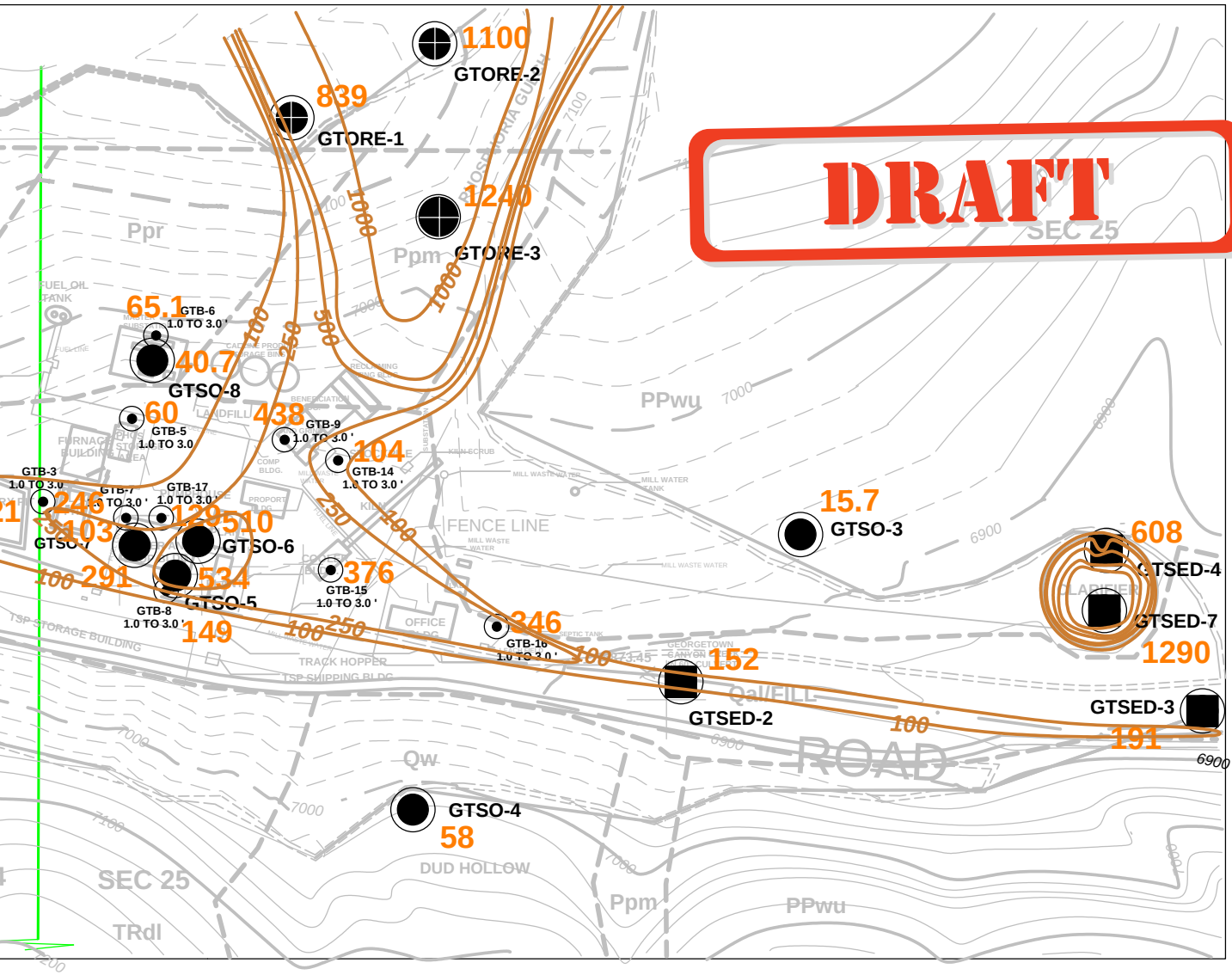
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

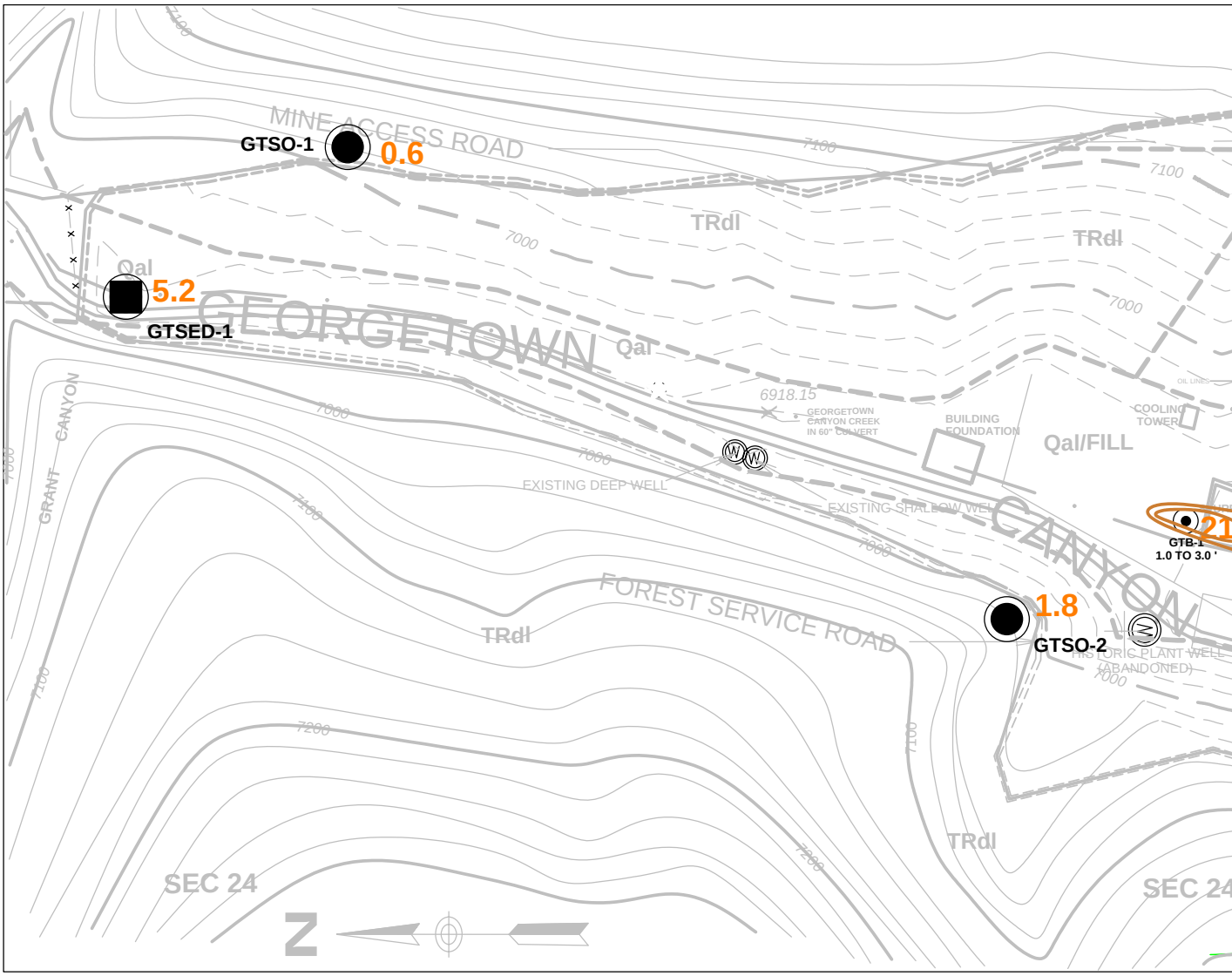
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE VANADIUM CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-2	



KEY

5.2 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

0.6 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

69 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

21.9 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

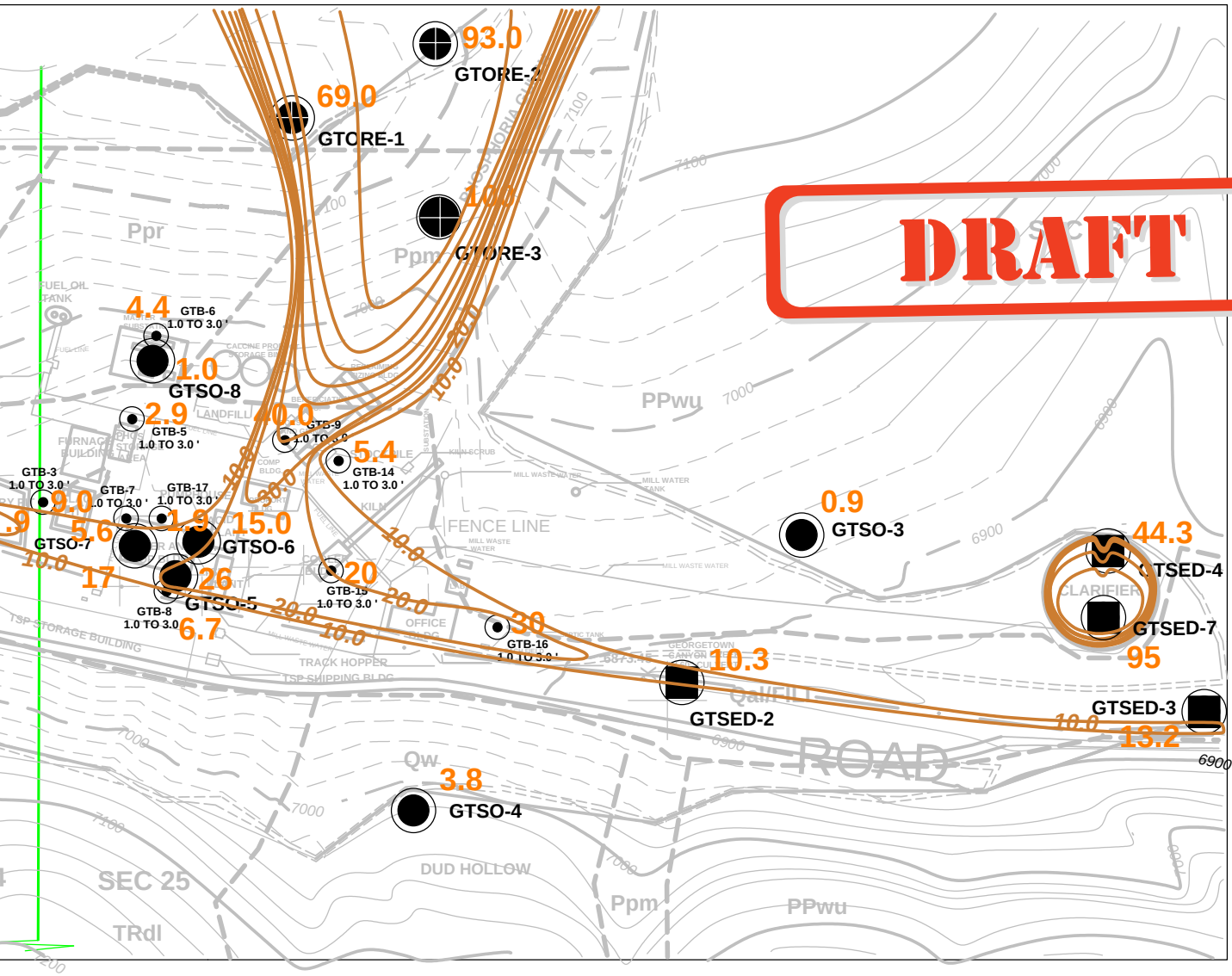
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

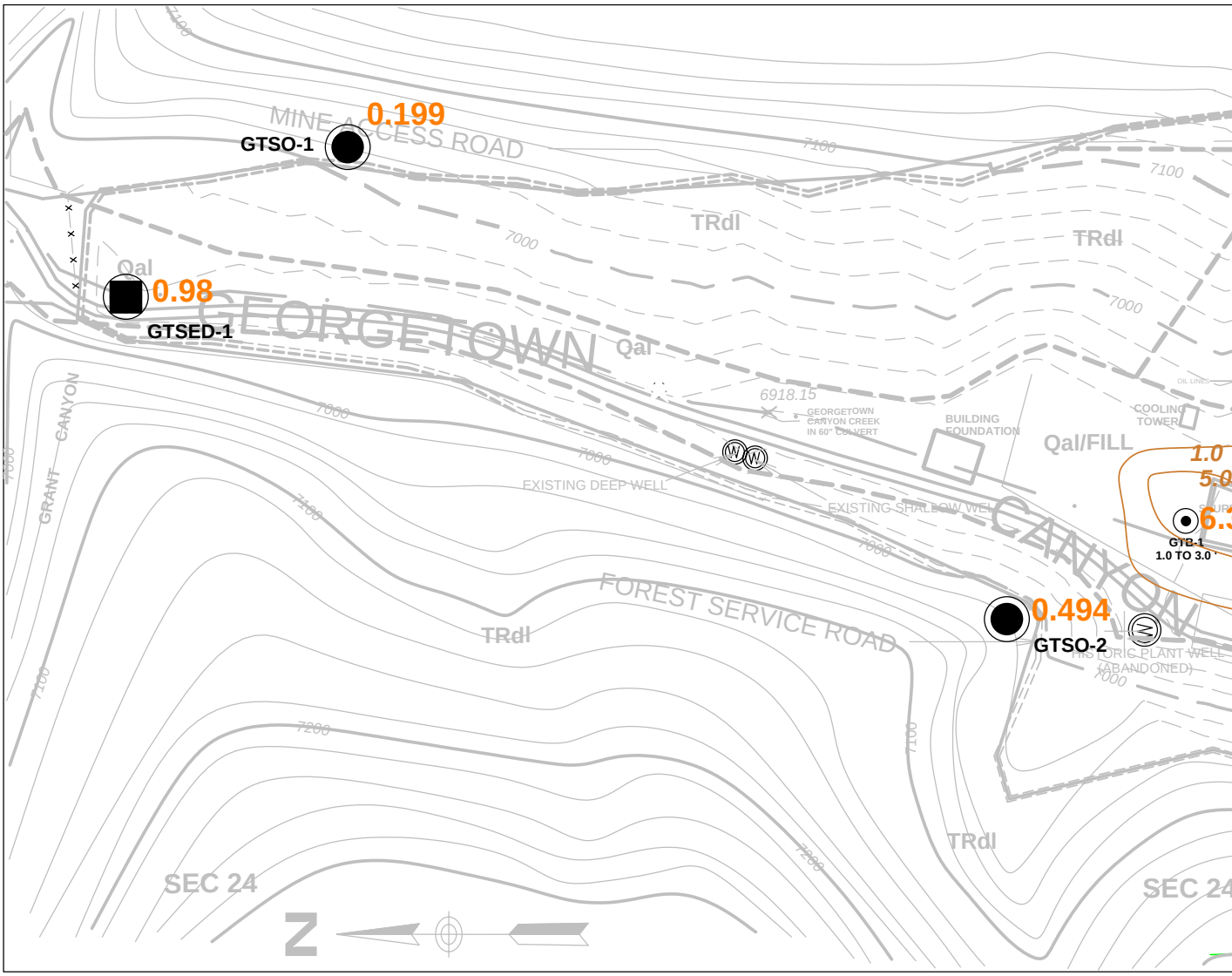
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE CADMIUM CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-3	



KEY

0.98 GTSED-1	SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN PERCENT
0.199 GTSO-1	SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN PERCENT
6.06 GTORE-1	ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN PERCENT
6.37 GTB-1 1.0 TO 3.0 '	SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN PERCENT

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

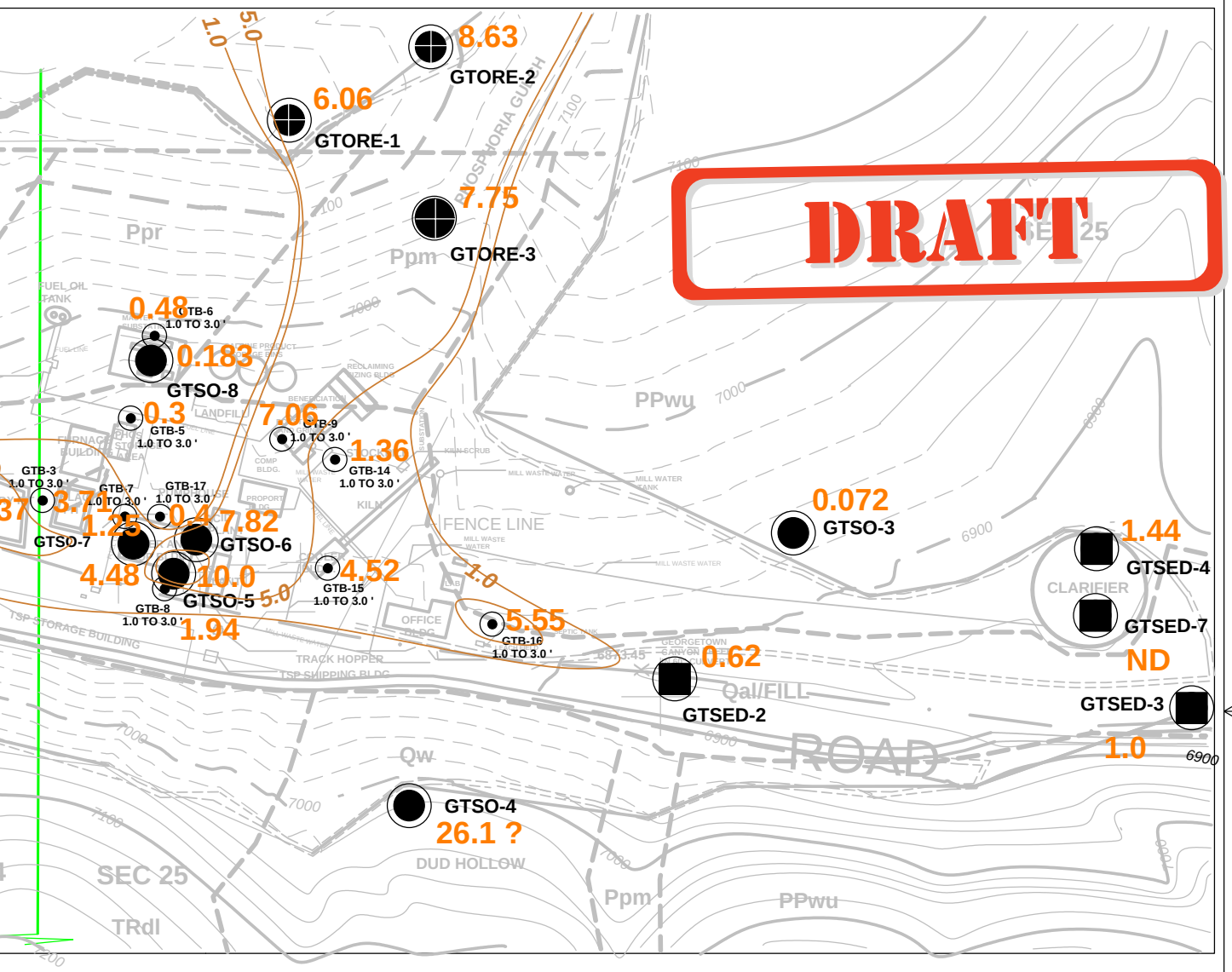
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

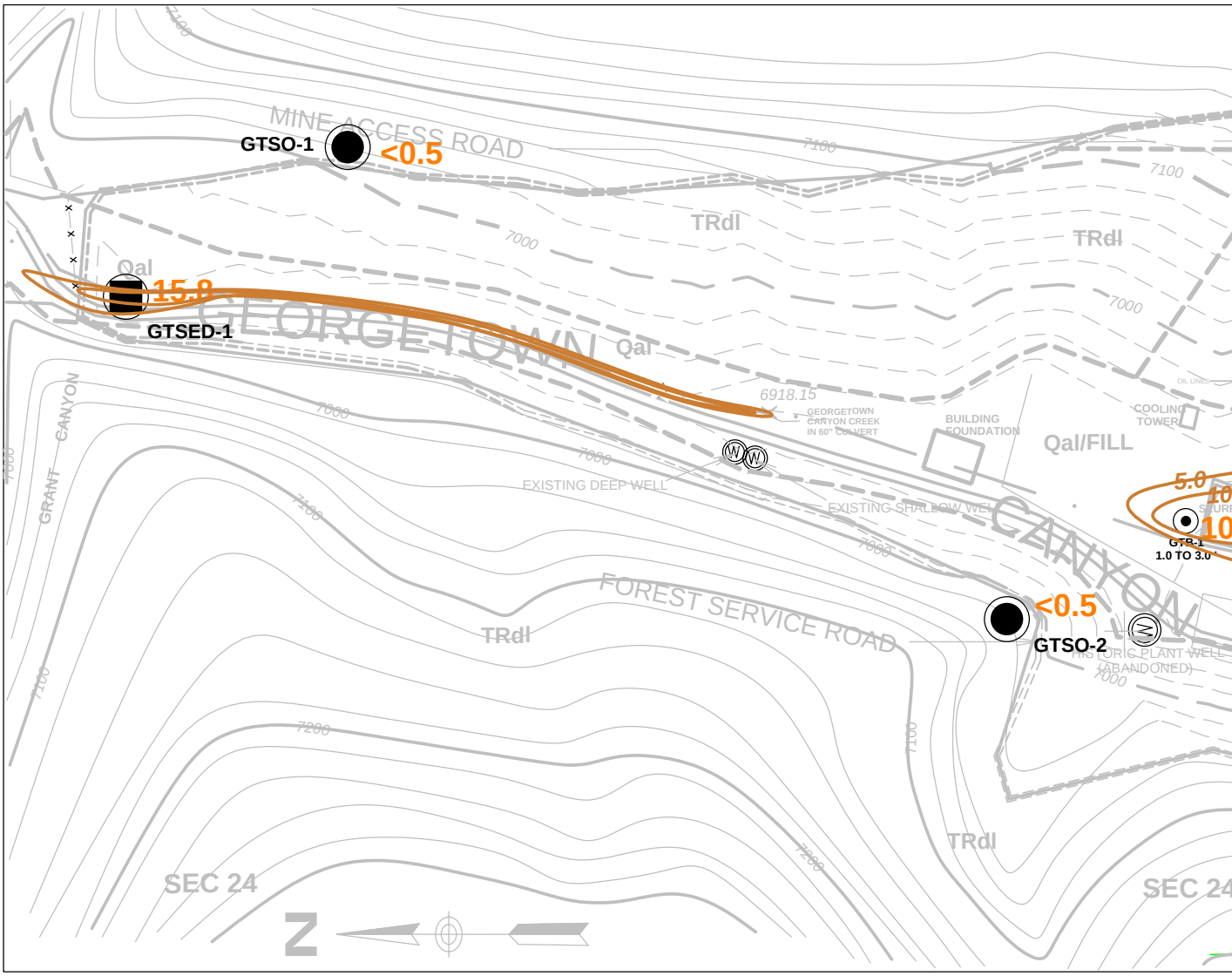
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE PHOSPHOROUS CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-4	



KEY

15.8 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

<0.5 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

36 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

10.3 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

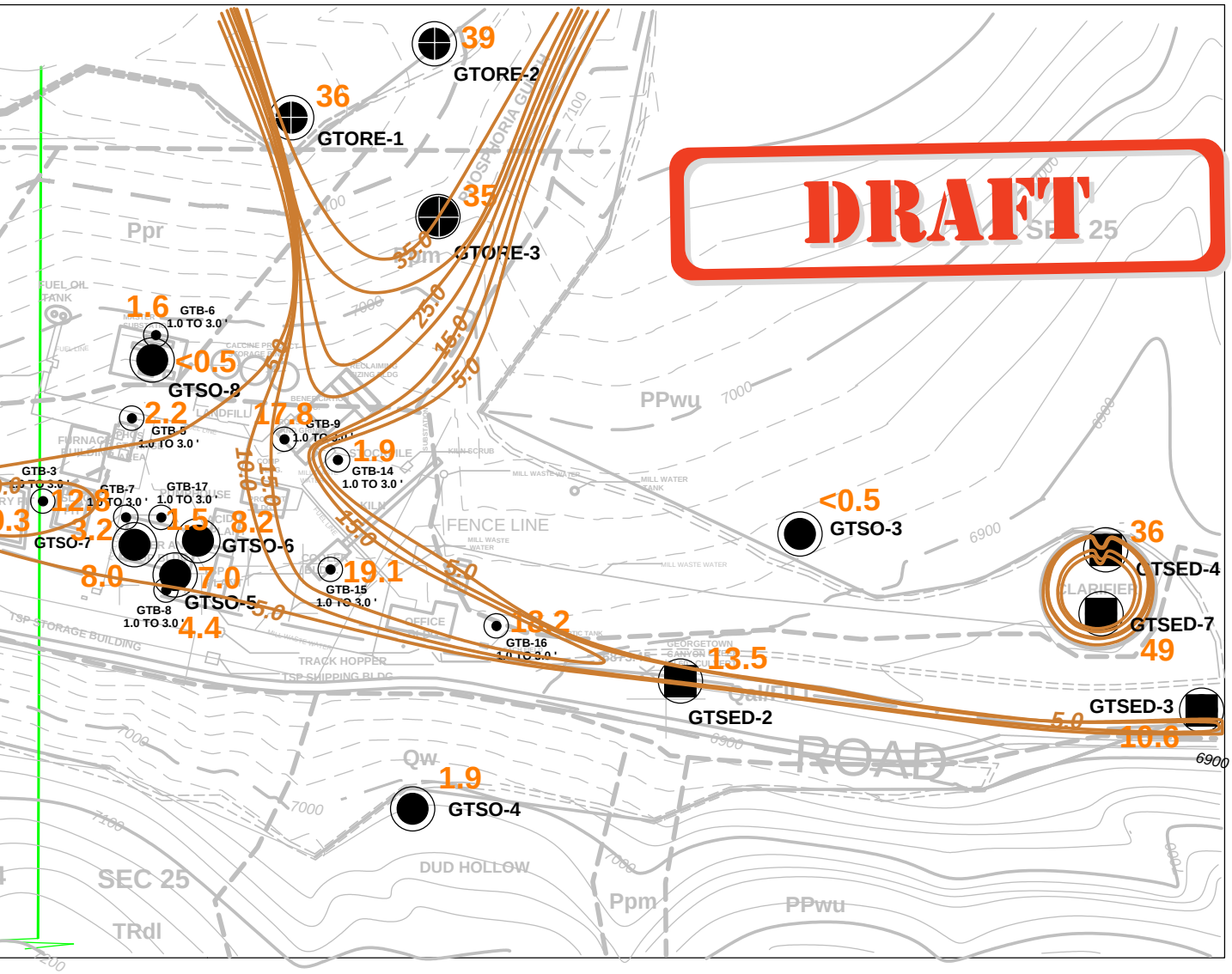
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEL

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

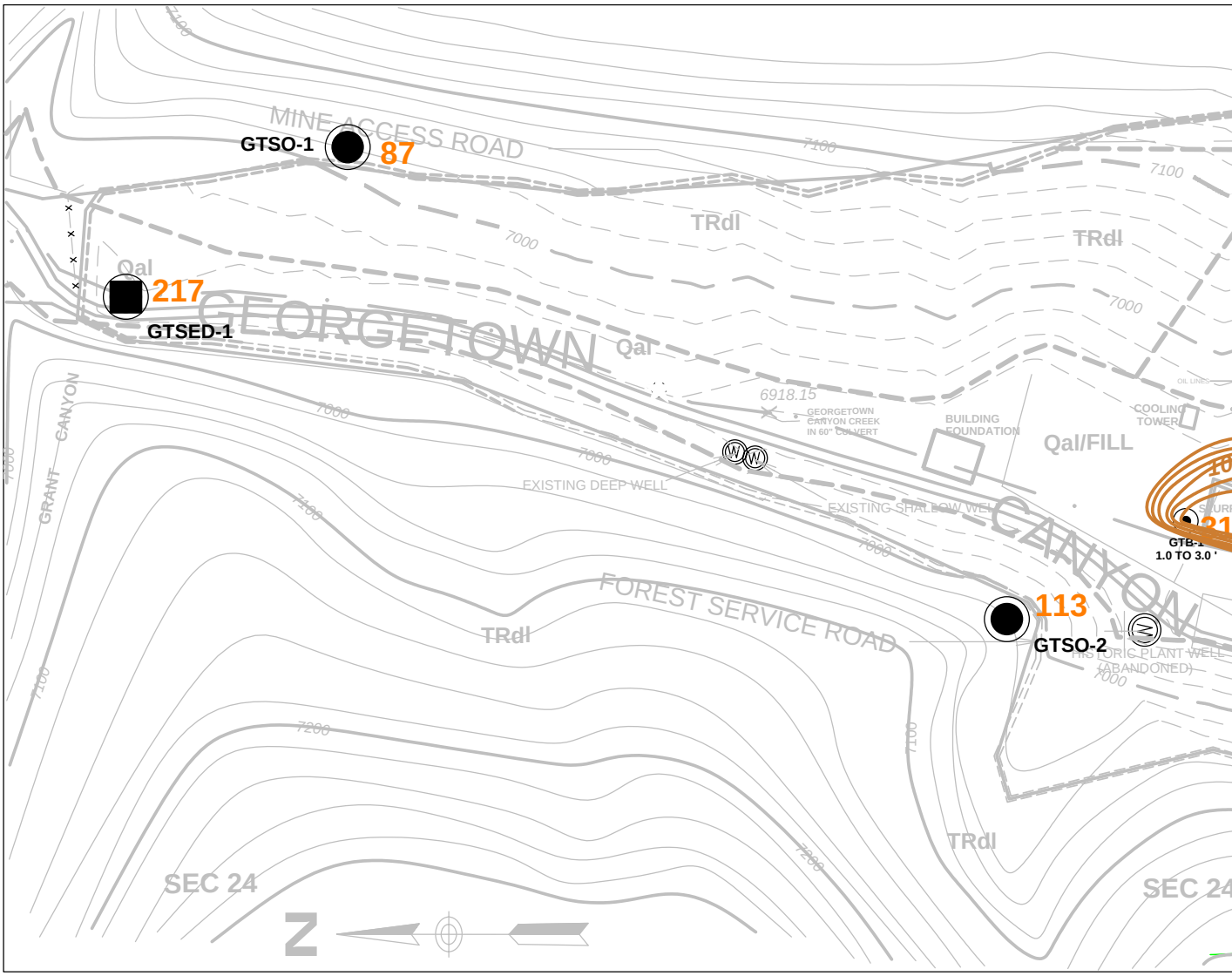
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE SELENIUM CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-5	



KEY

217 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

87 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

1080 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

3150 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

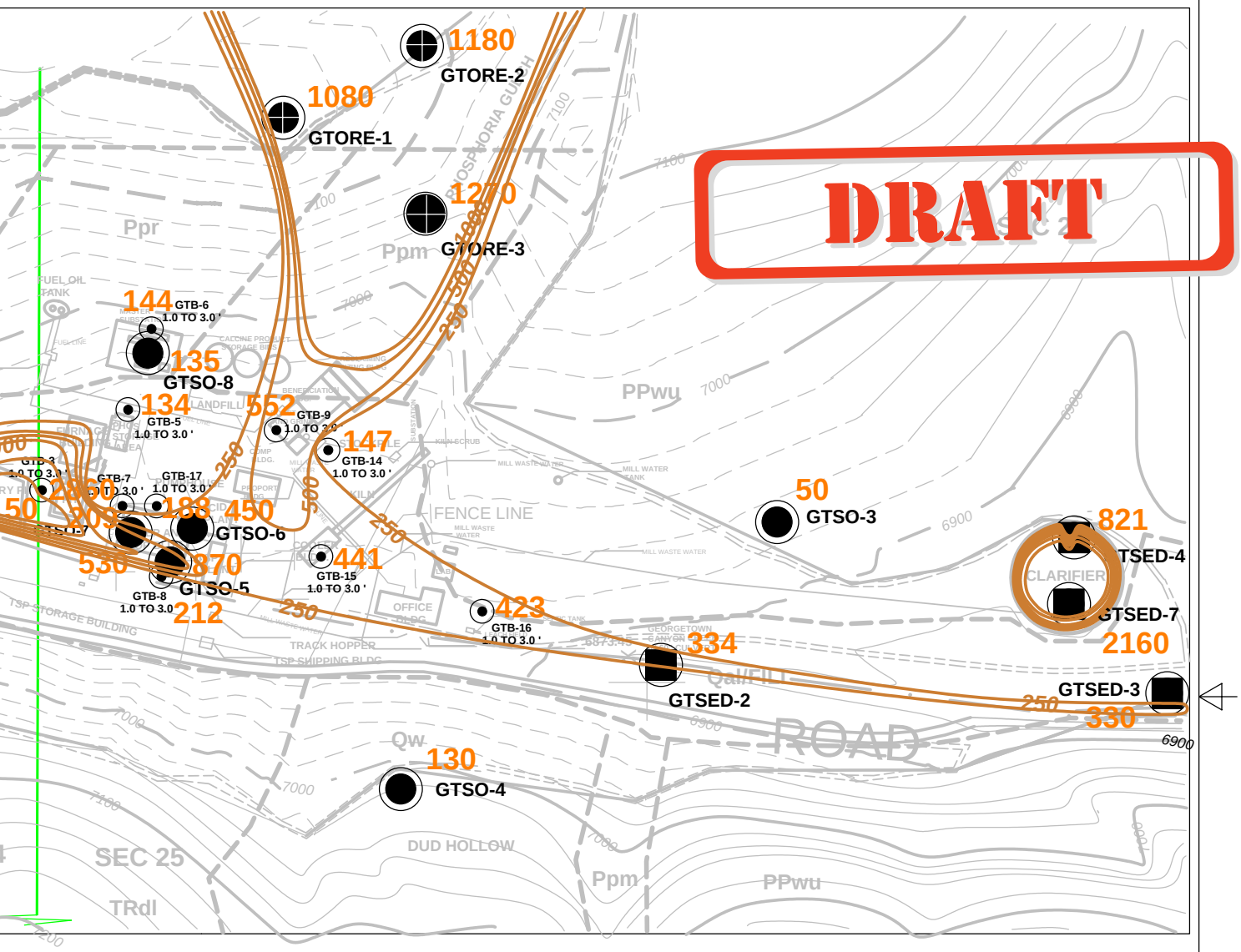
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

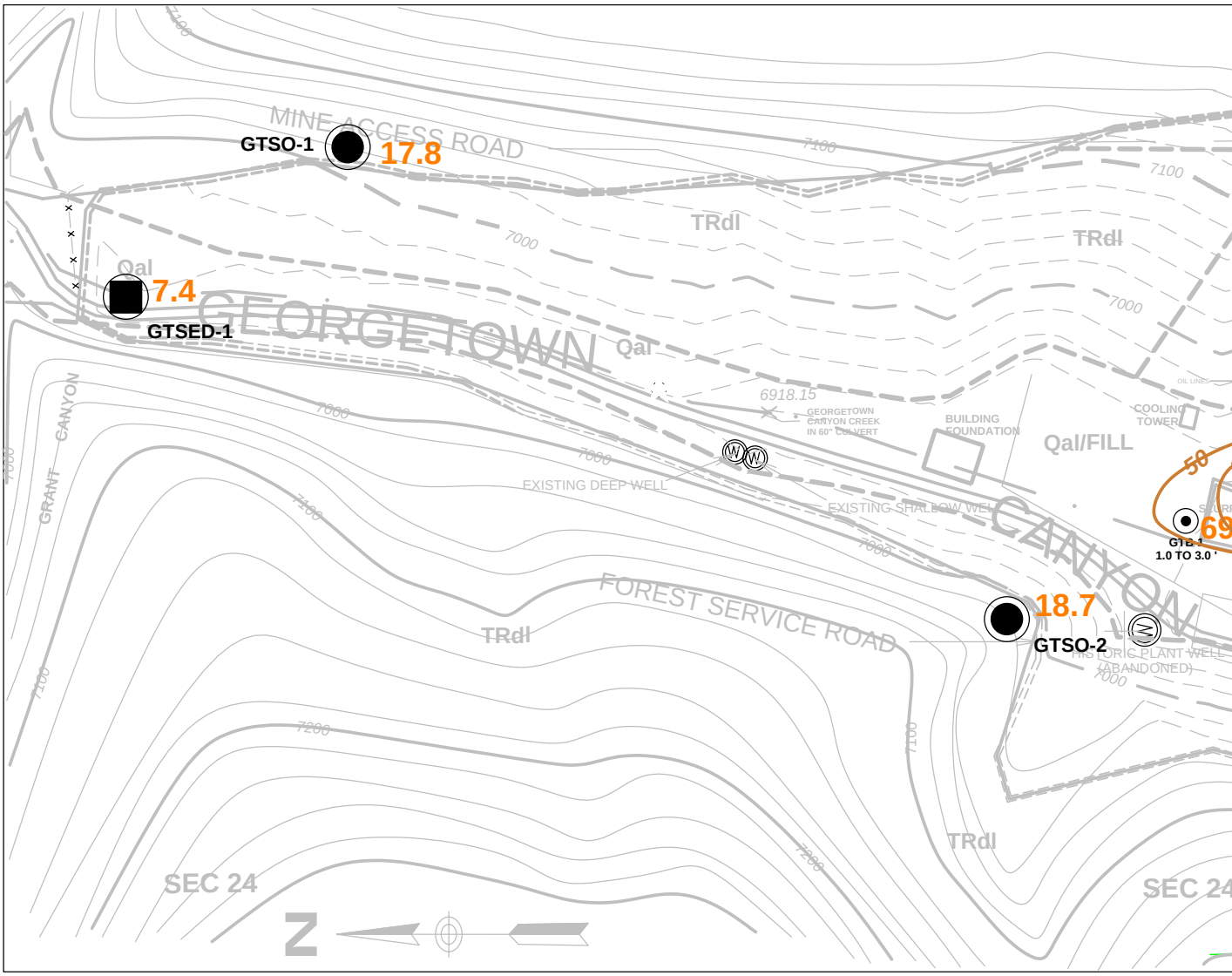
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE ZINC CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-6	



KEY

7.4 GTSED-1	SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG
17.8 GTSO-1	SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG
11.0 GTORE-1	ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG
69.8 GTB-1 1.0 TO 3.0 '	SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

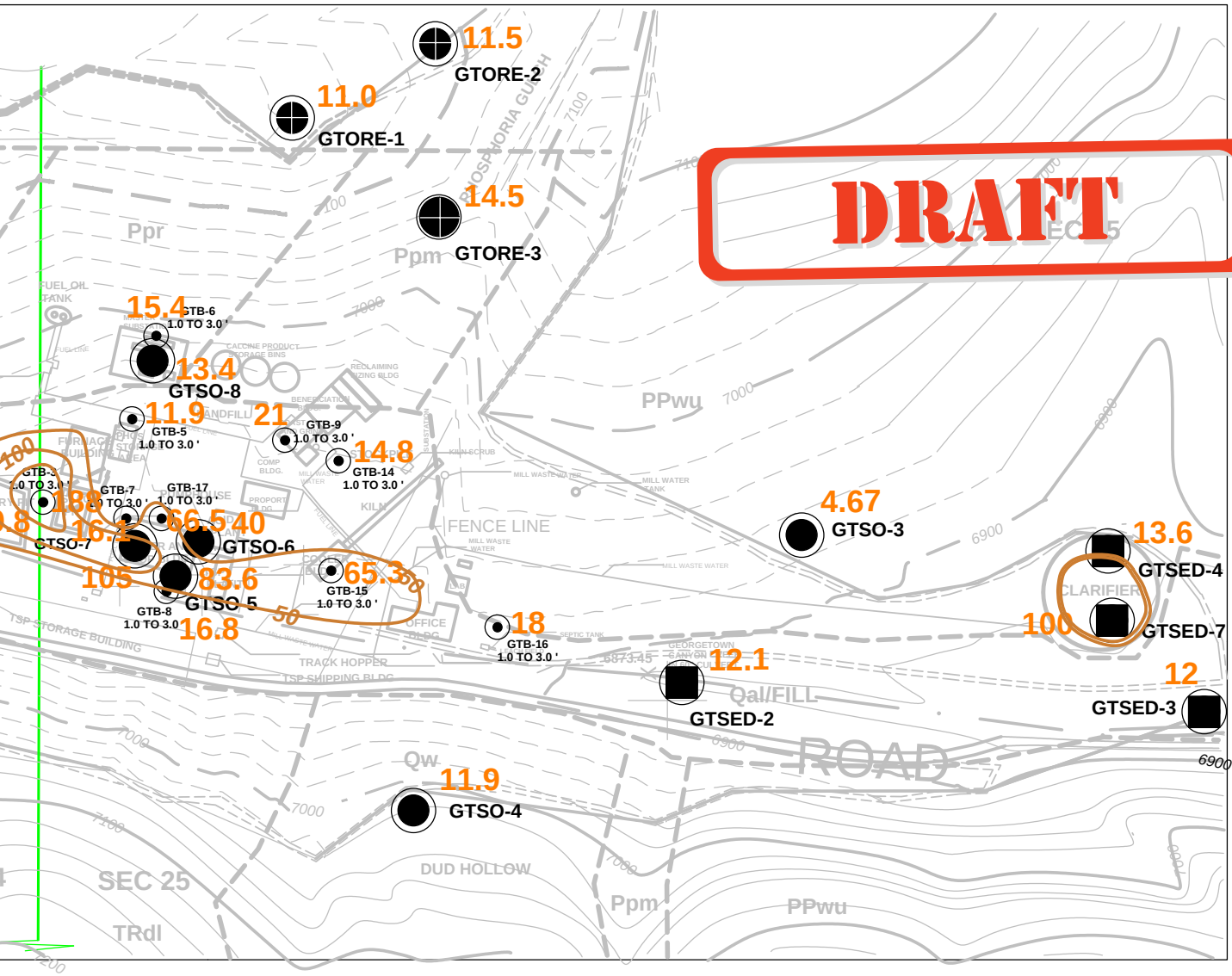
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

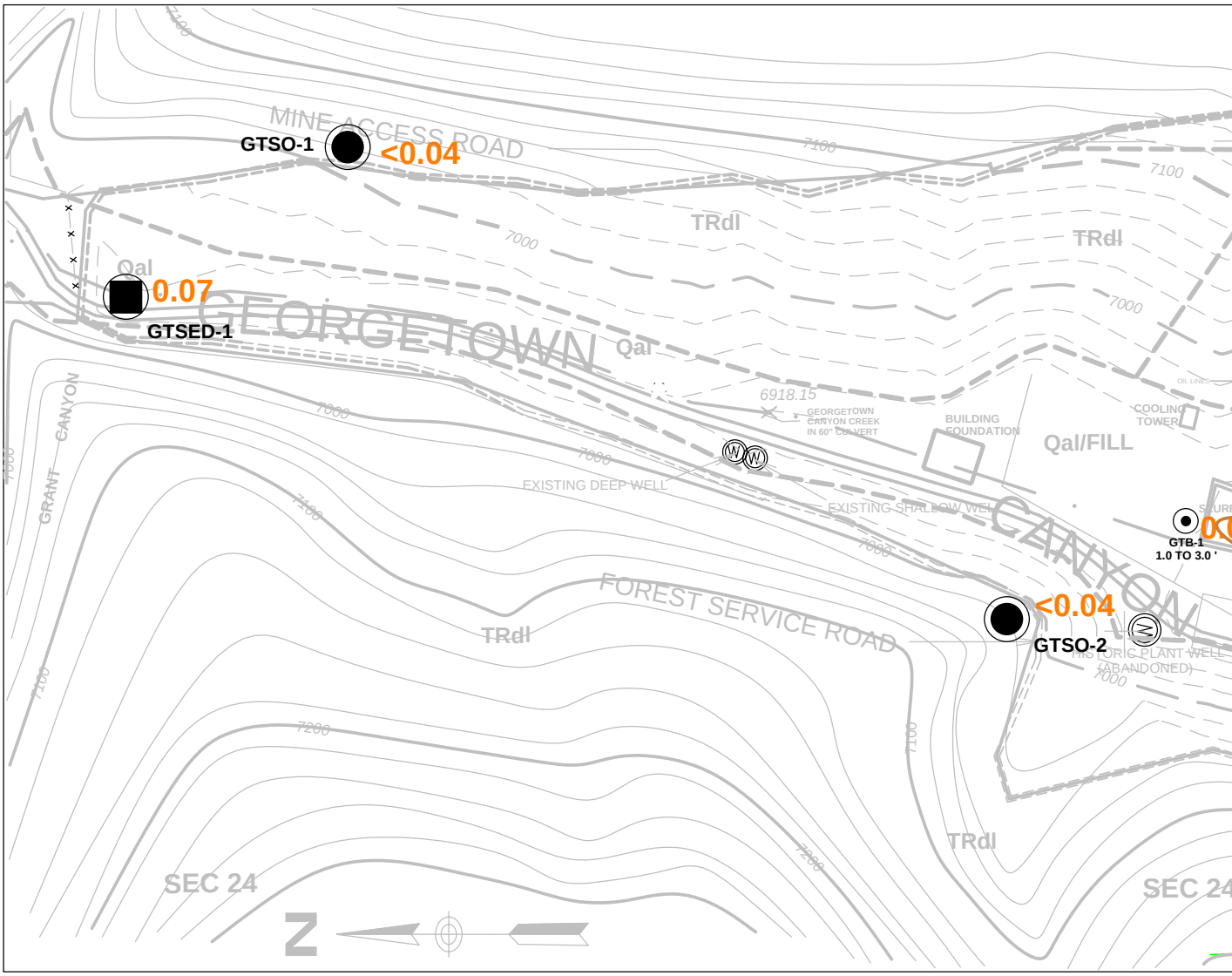
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE LEAD CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-7	



KEY

0.07 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

<0.04 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

0.53 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

0.08 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

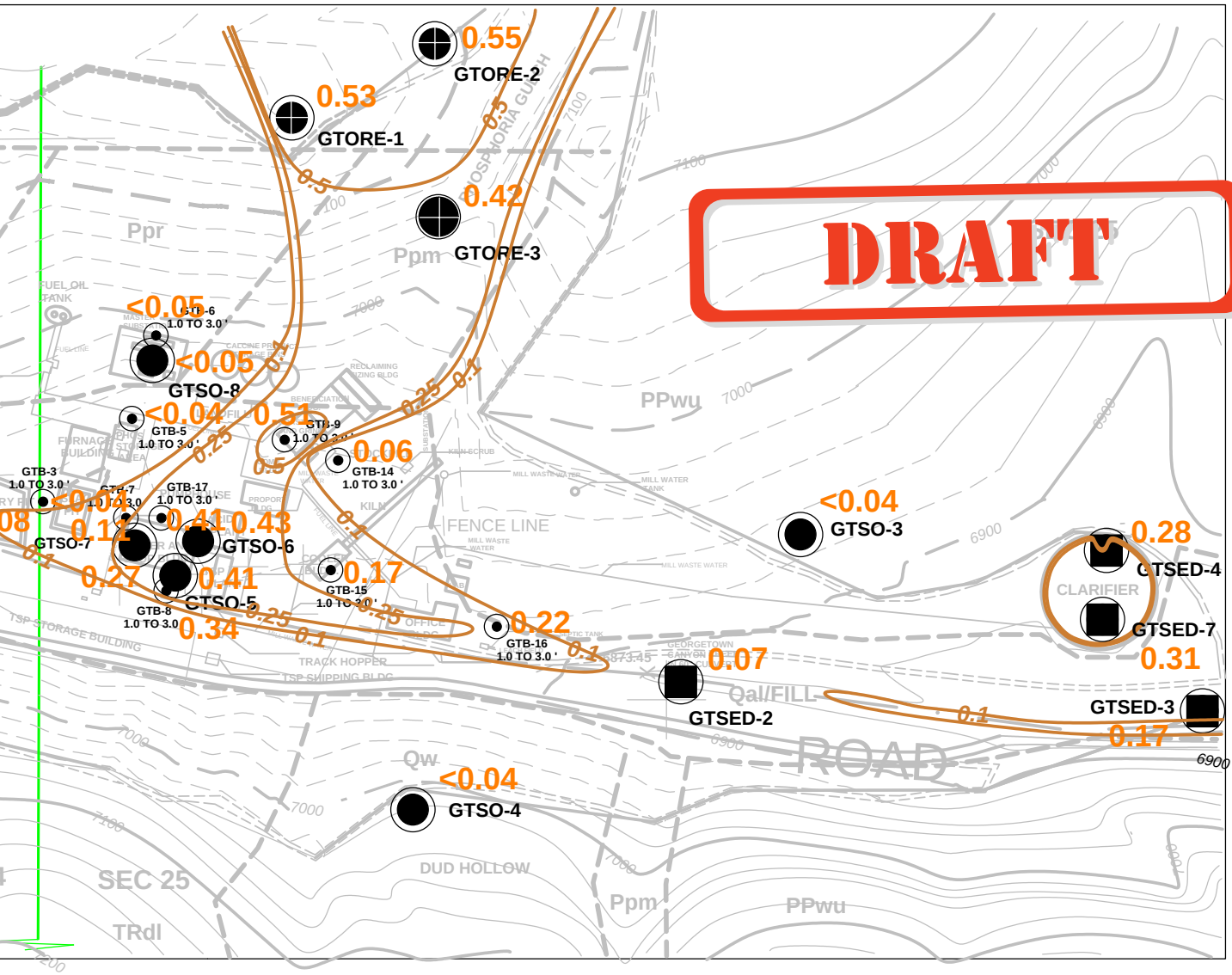
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

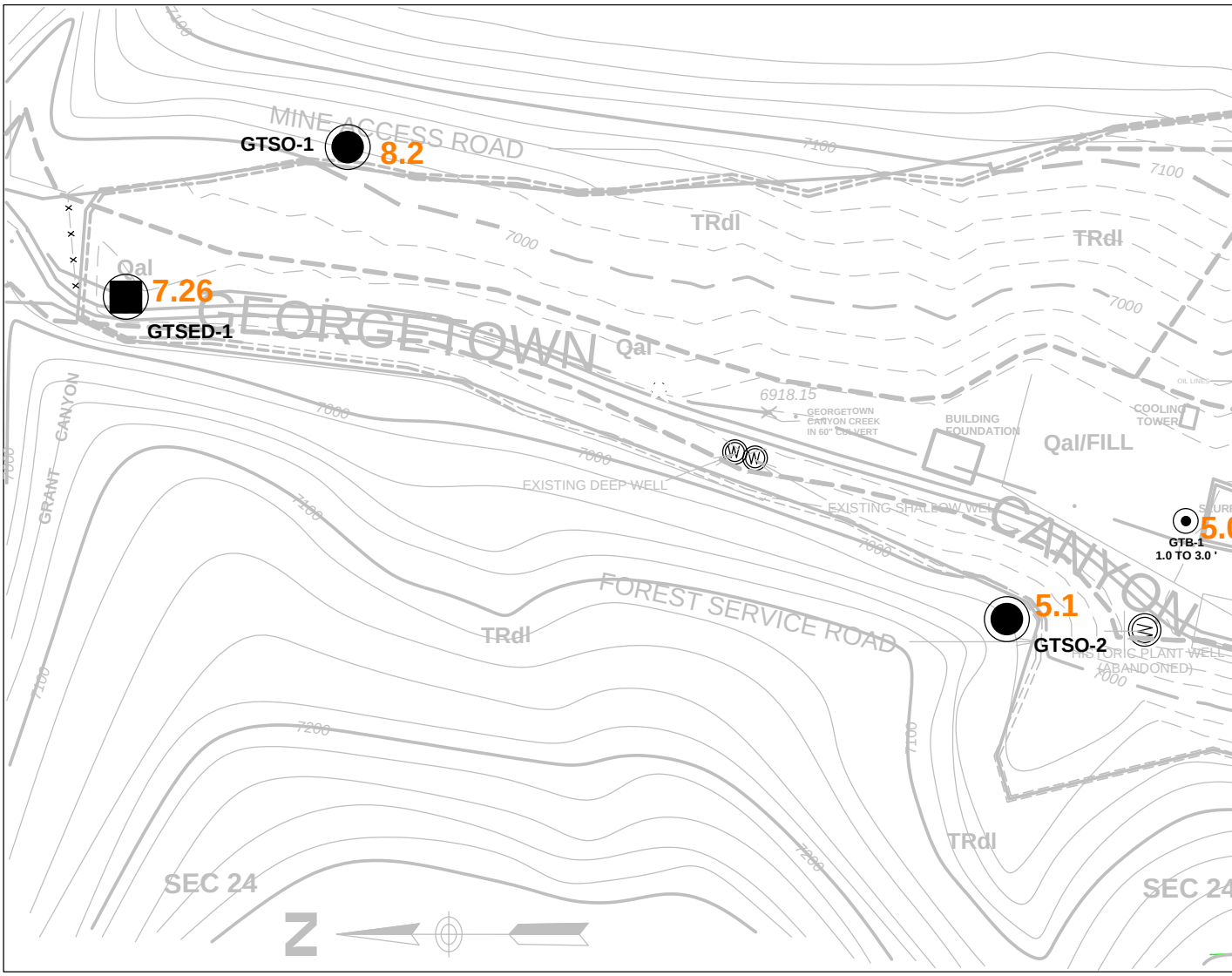
OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE MERCURY CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE 4-8	



KEY

7.26 GTSED-1 — SEDIMENT SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

8.2 GTSO-1 — SURFACE SOIL SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

21.0 GTORE-1 — ORE STOCKPILE SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

5.0 GTB-1 1.0 TO 3.0 ' — SOIL AUGER BORING SAMPLING LOCATION, SAMPLE ID AND CONCENTRATION IN MG/KG

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY

Qw - QUATERNARY

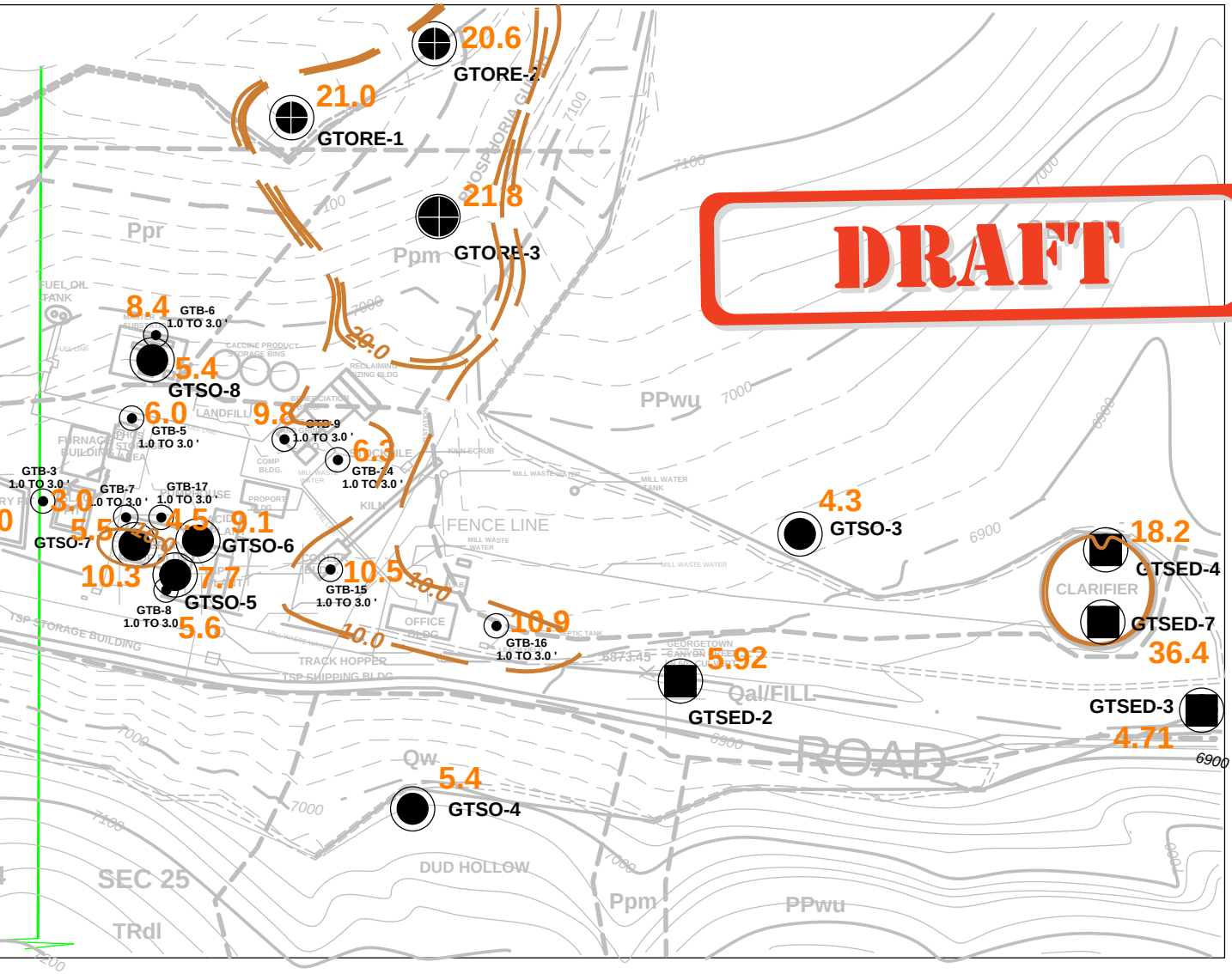
TRdl - TRIASSIC LO

Ppr - PERMIAN REX

Ppm - PERMIAN PH

PPwu - PERMIAN-P UPPER WEI

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

C

Y ALLUVIUM

Y HILL WASH

OWER DINWOODY FM.

X CHERT FM.

HOSPHORIA FM.

PENNSYLVANIAN
LLS FM.

	CENTRAL FARMERS FERTILIZER FACILITY FINAL SITE INVESTIGATION REPORT			
	TITLE ARSENIC CONCENTRATIONS IN SURFACE SOIL, ORE STOCKPILE, SEDIMENT AND SHALLOW AUGER BORINGS CENTRAL FARMERS FERTILIZER FACILITY			
8/10/06	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN, P.G.	SCALE		SHEET FIGURE 4-8A	

GEORGETOWN CANYON MONITORING SURFACE WATER 2004 TO 2005

FRI 12-23-19:5 12:12:22.20

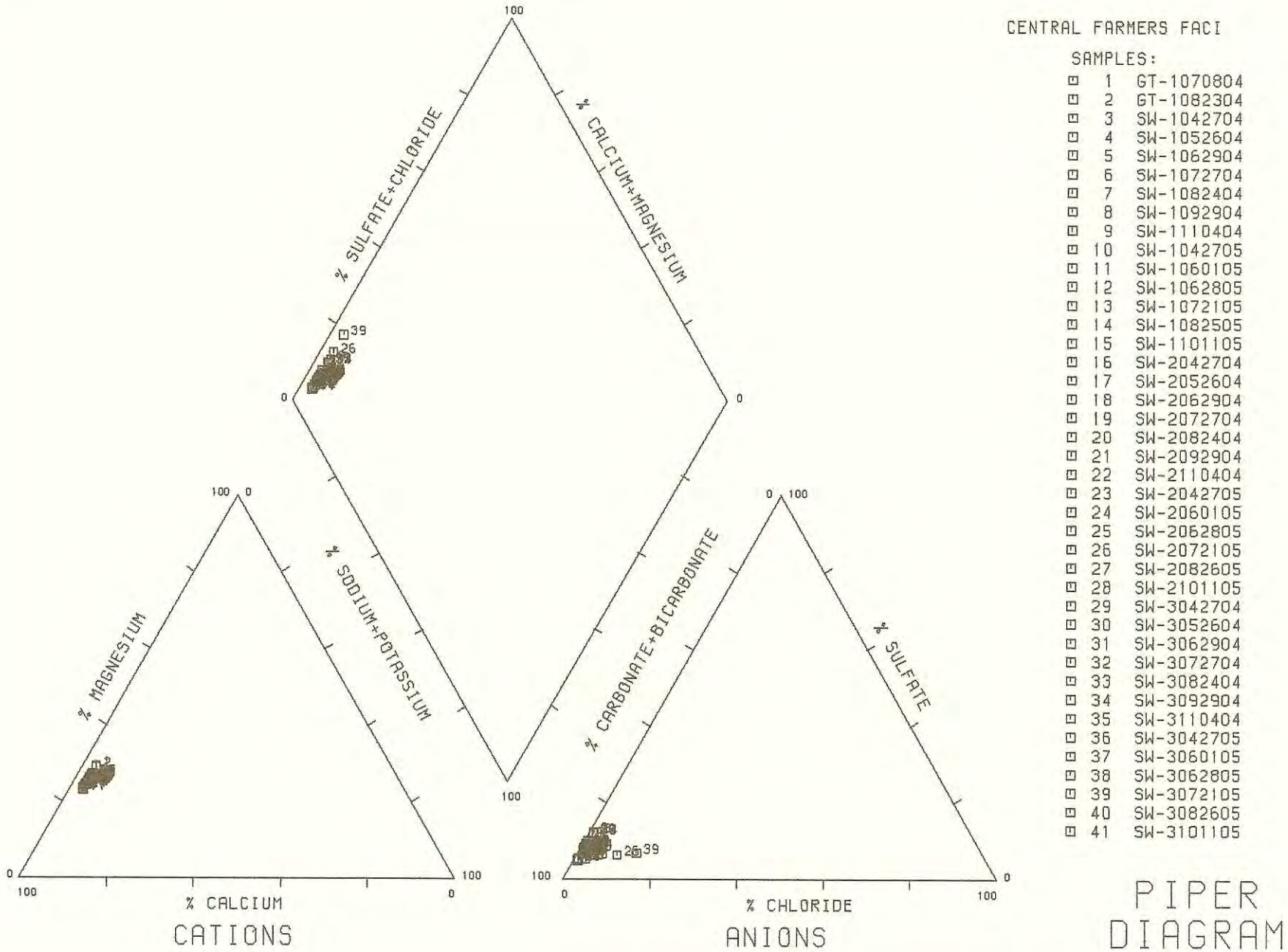
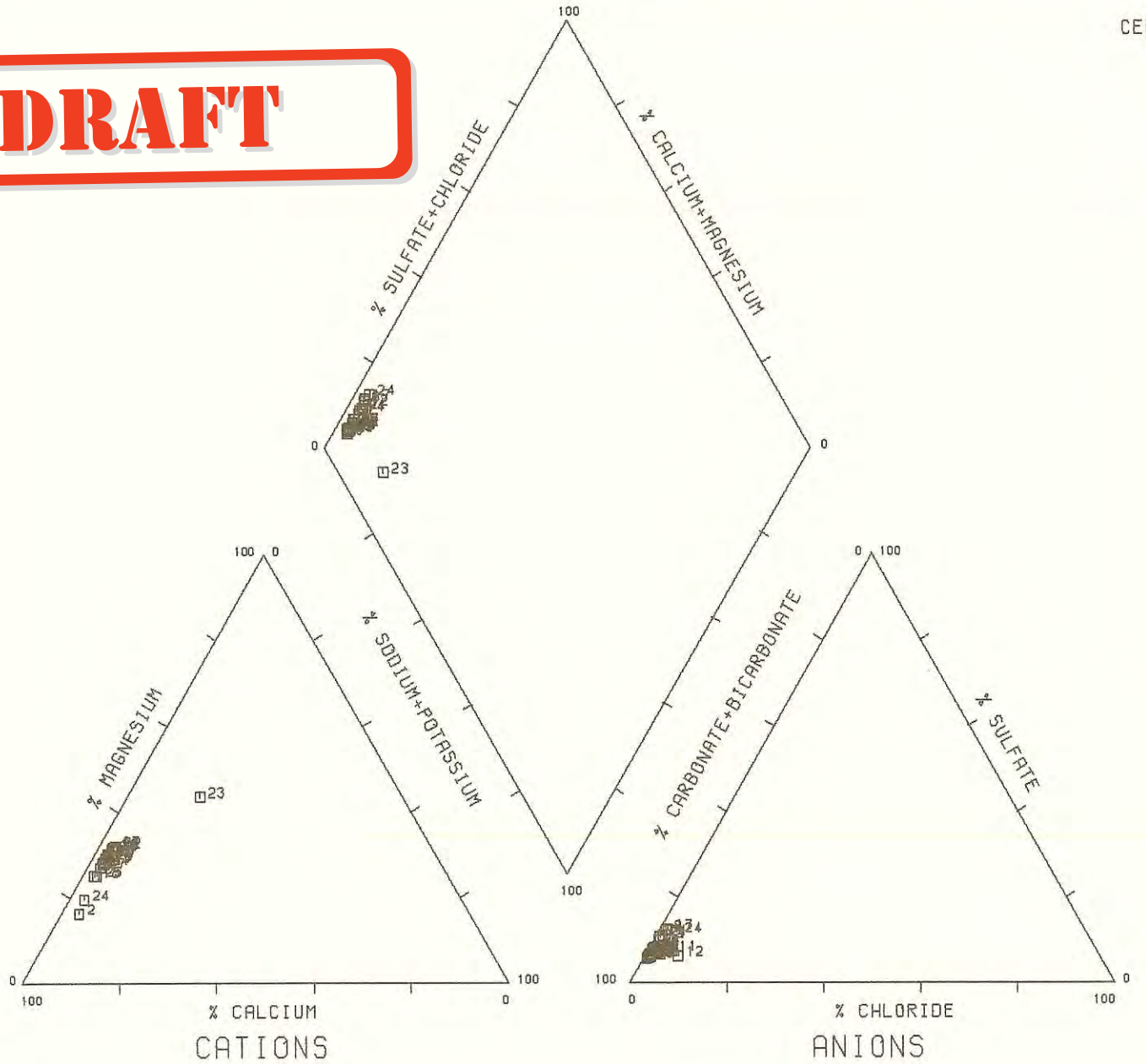


FIGURE 4-9

GEORGETOWN CANYON MONITORING SURFACE WATER 2004 TO 2005

FRI 12-23-19:5 12:13:06.20

DRAFT



CENTRAL FARMERS FACI

SAMPLES:

1	SW-4042804
2	SW-4052604
3	SW-4062904
4	SW-4072704
5	SW-4082404
6	SW-4092904
7	SW-4110404
8	SW-4042705
9	SW-4060105
10	SW-4062805
11	SW-4072105
12	SW-4082505
13	SW-4101105
14	SW-5042804
15	SW-5052604
16	SW-5062904
17	SW-5042705
18	SW-5060105
19	SW-5062805
20	SW-5072105
21	SW-6042804
22	SW-6052604
23	SW-6062904
24	SW-6042705
25	SW-6060105
26	SW-6062805
27	SW-6072105

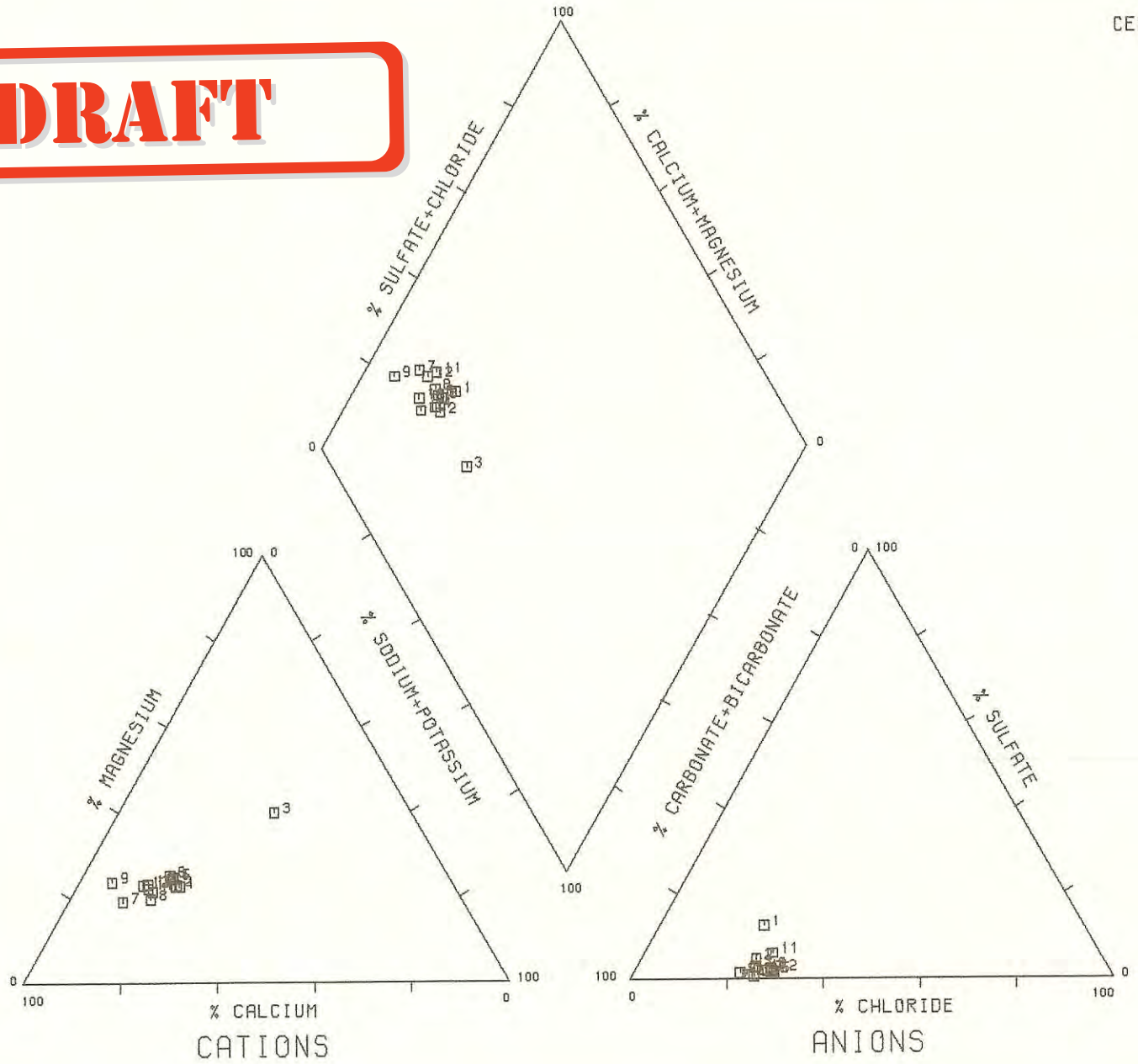
PIPER DIAGRAM

FIGURE 4-10

GEORGETOWN CANYON MONITORING SURFACE WATER 2004 TO 2005

FRI 12-23-19:5 12:14:13.76

DRAFT



CENTRAL FARMERS FACI

SAMPLES:

1	SW-7042804
2	SW-7052604
3	SW-7062904
4	SW-7072704
5	SW-7082404
6	SW-7092904
7	SW-7110404
8	SW-7042705
9	SW-7060105
10	SW-7062805
11	SW-7072105
12	SW-7082505
13	SW-7101105

PIPER DIAGRAM

FIGURE 4-11

GEORGETOWN CANYON MONITORING SURFACE WATER 2004 TO 2005

FRI 12-23-19:5 12:14:55.50

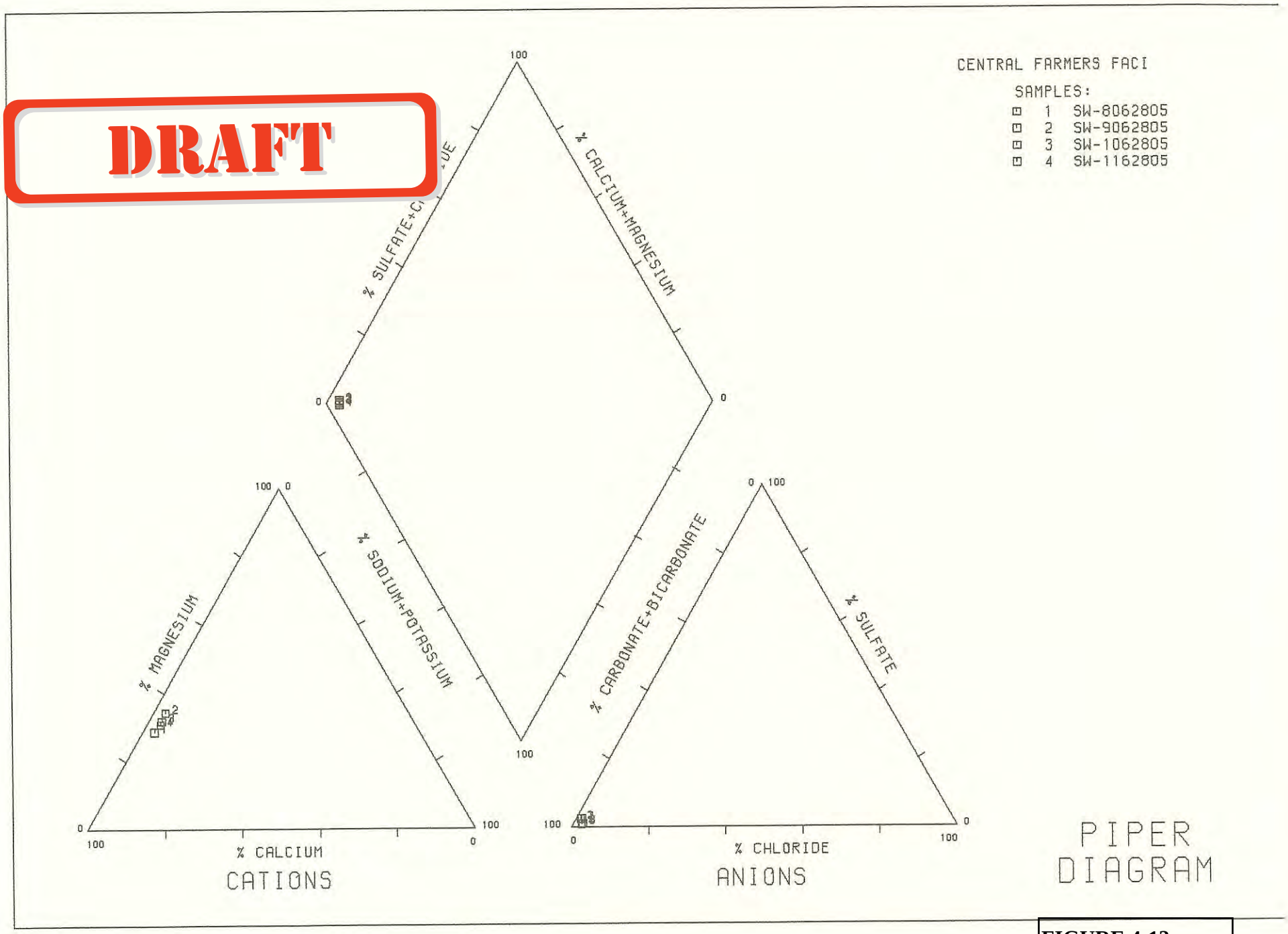


FIGURE 4-12

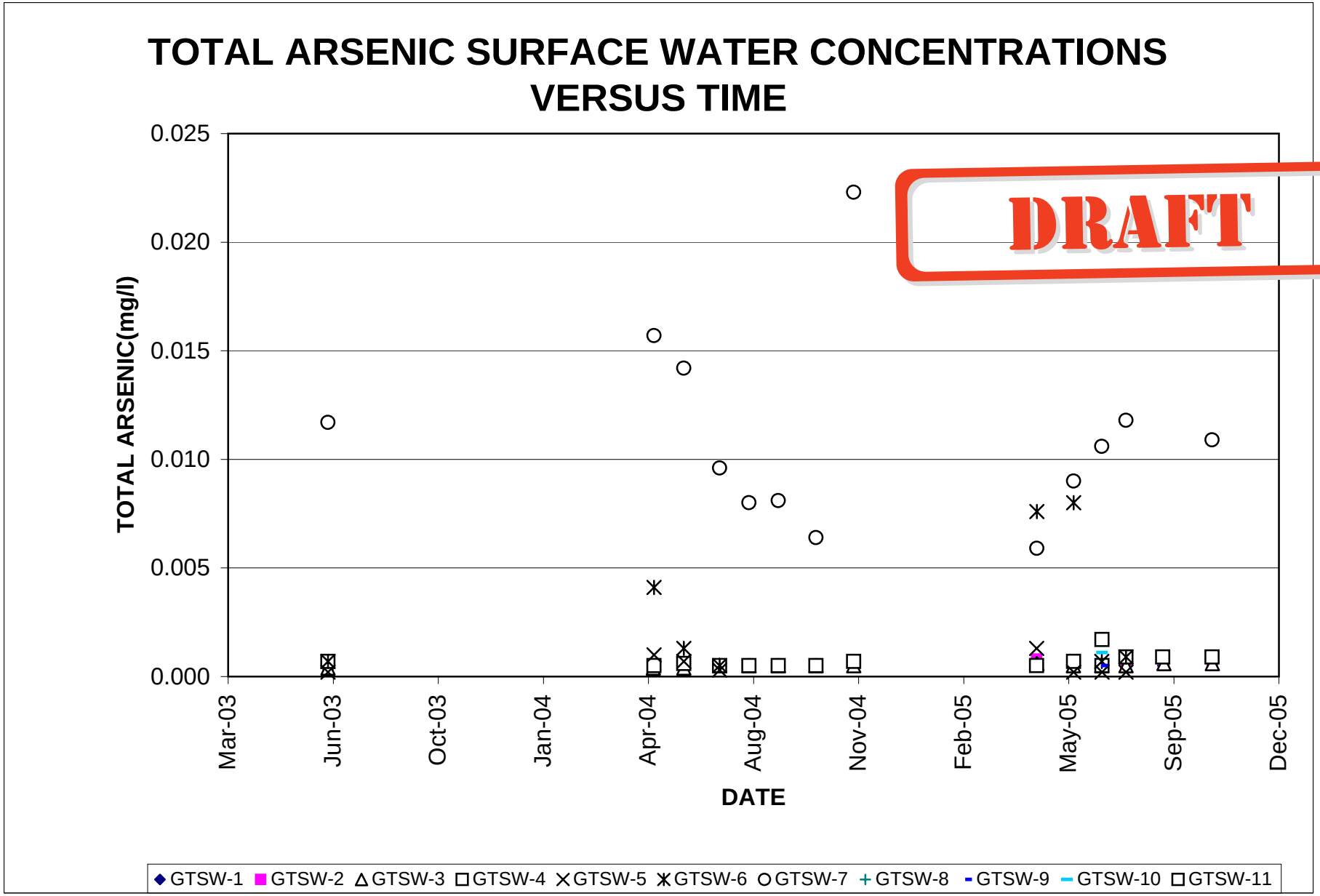
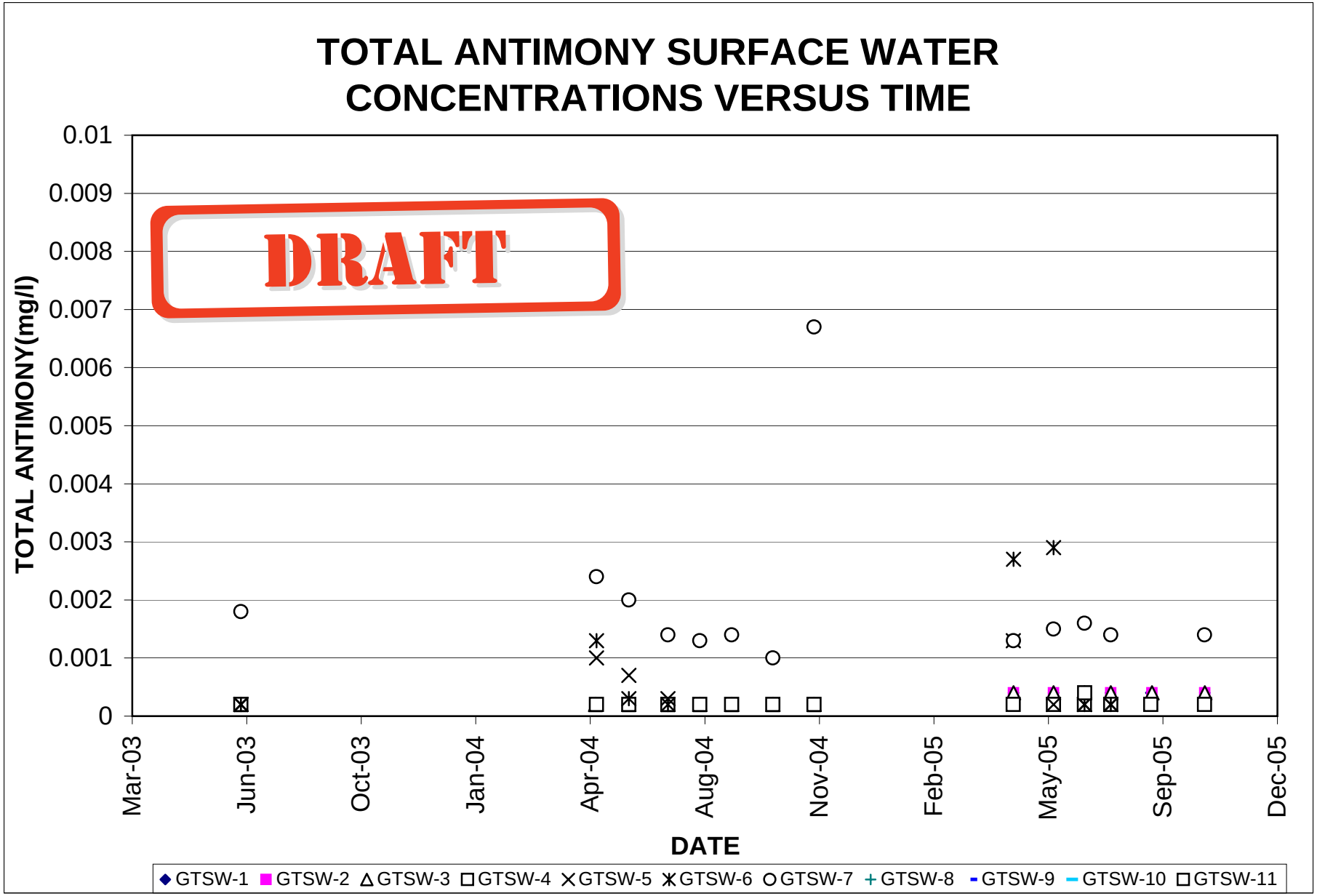
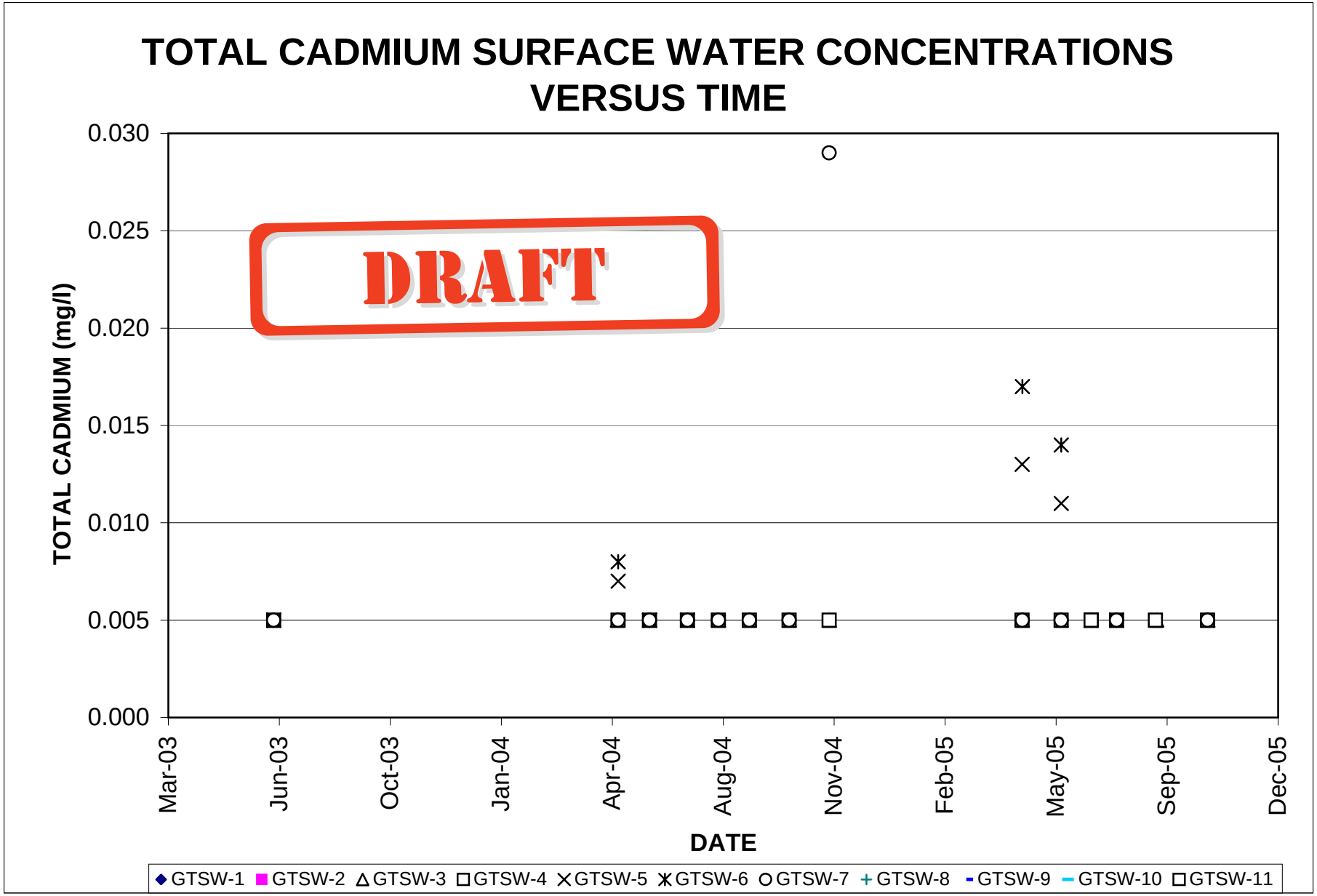

TOTAL ARSENIC SURFACE WATER CONCENTRATIONS VERSUS TIME
DRAFT
TOTAL ARSENIC(mg/l)
0.025
0.020
0.015
0.010
0.005
0.000
Mar-03
Jun-03
Oct-03
Jan-04
Apr-04
Aug-04
Nov-04
Feb-05
May-05
Sep-05
Dec-05
DATE
GTSW-1
GTSW-2
GTSW-3
GTSW-4
GTSW-5
GTSW-6
GTSW-7
GTSW-8
GTSW-9
GTSW-10
GTSW-11

FIGURE 4-13



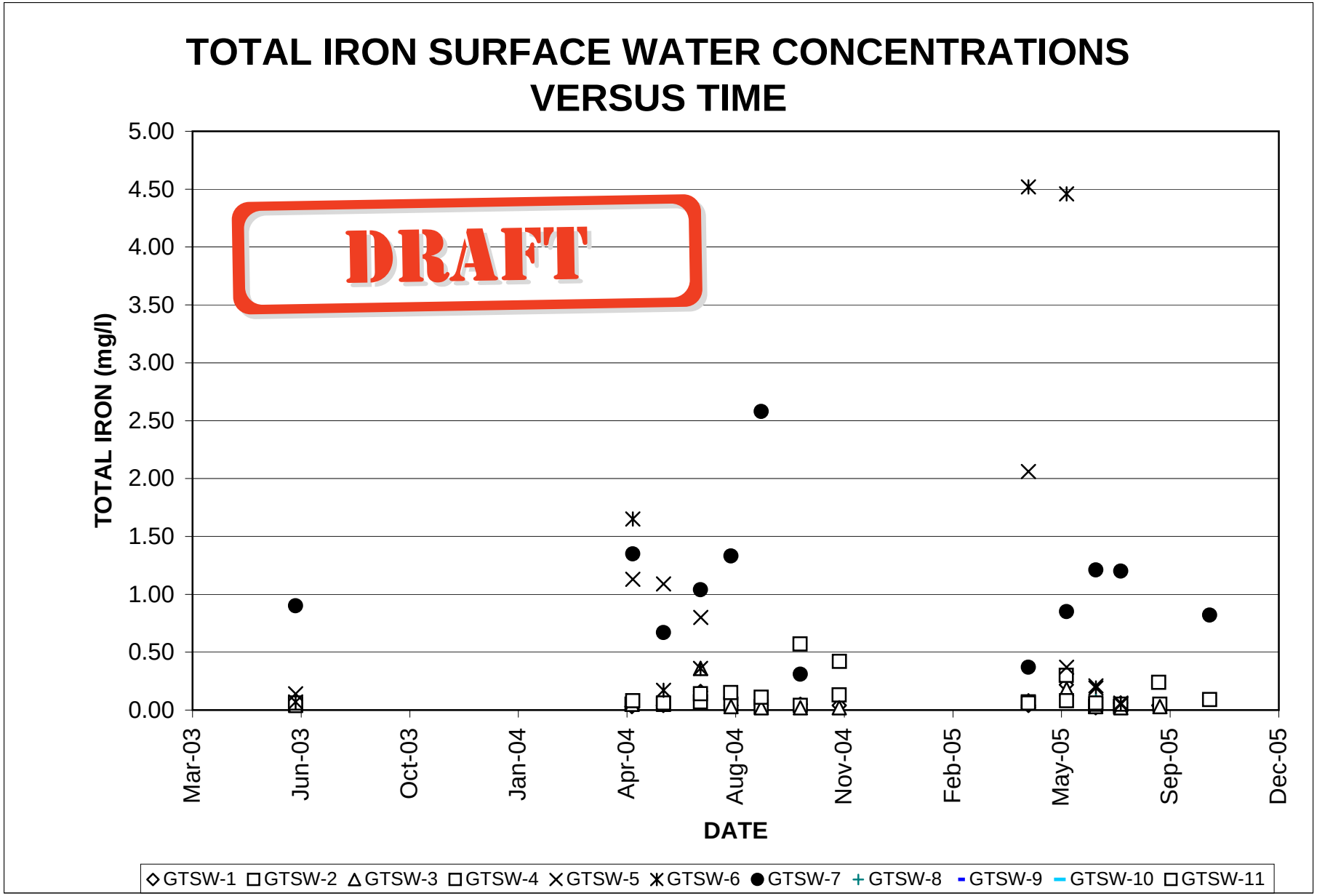
CONCENTRATIONS LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-14



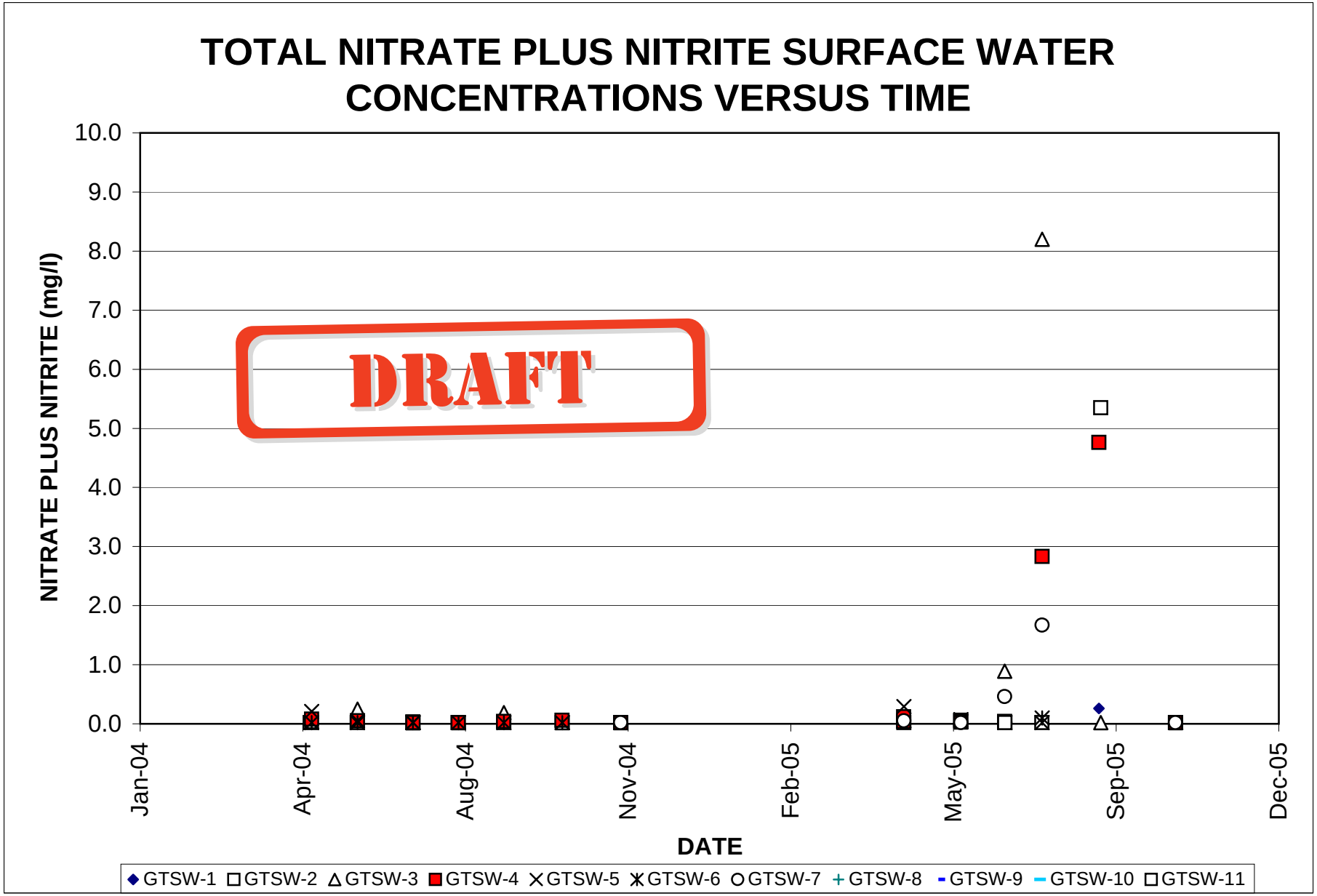
Concentrations less than detection plotted at the detection limit

FIGURE 4-15



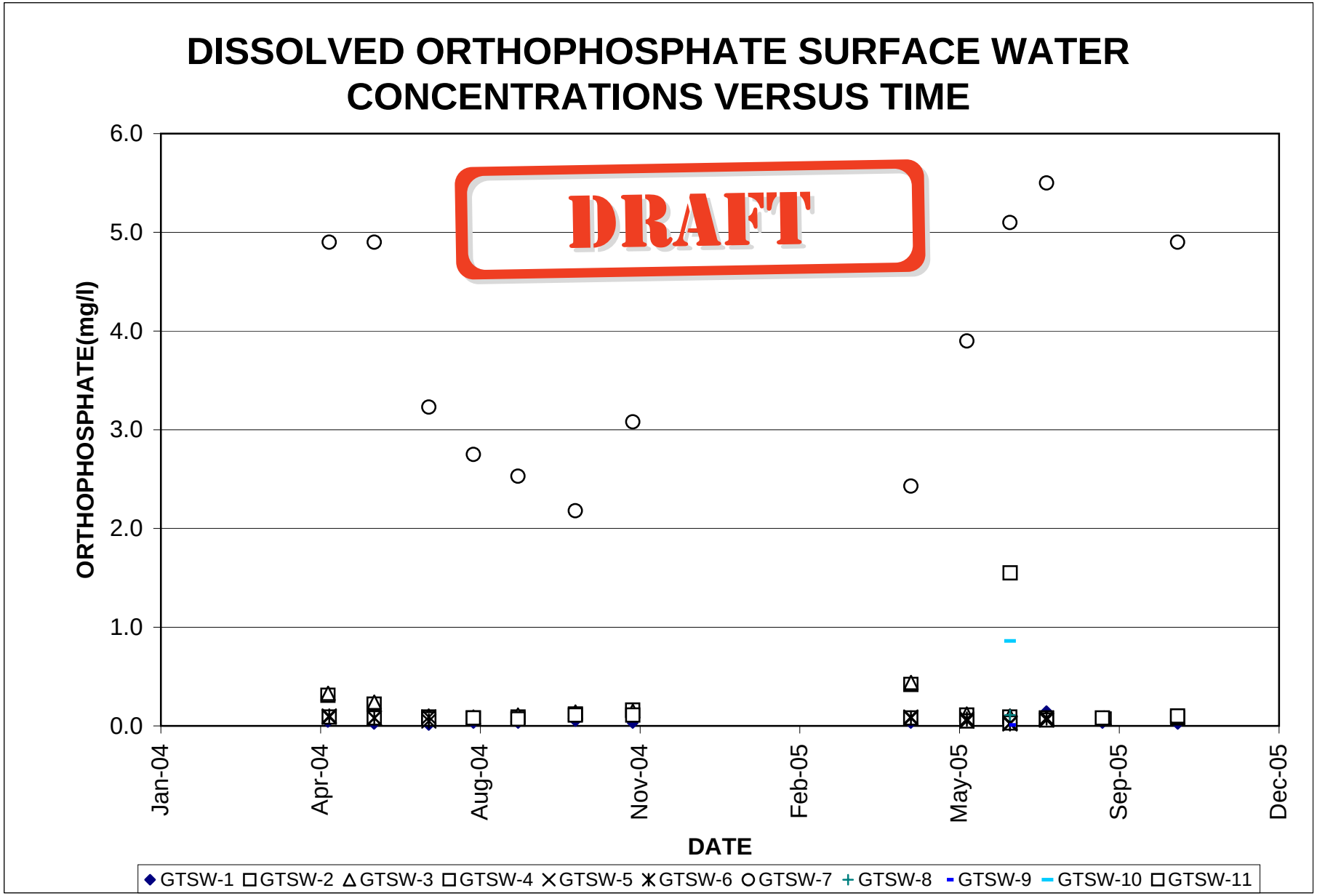
Concentrations less than detection plotted at the detection limit

FIGURE 4-16



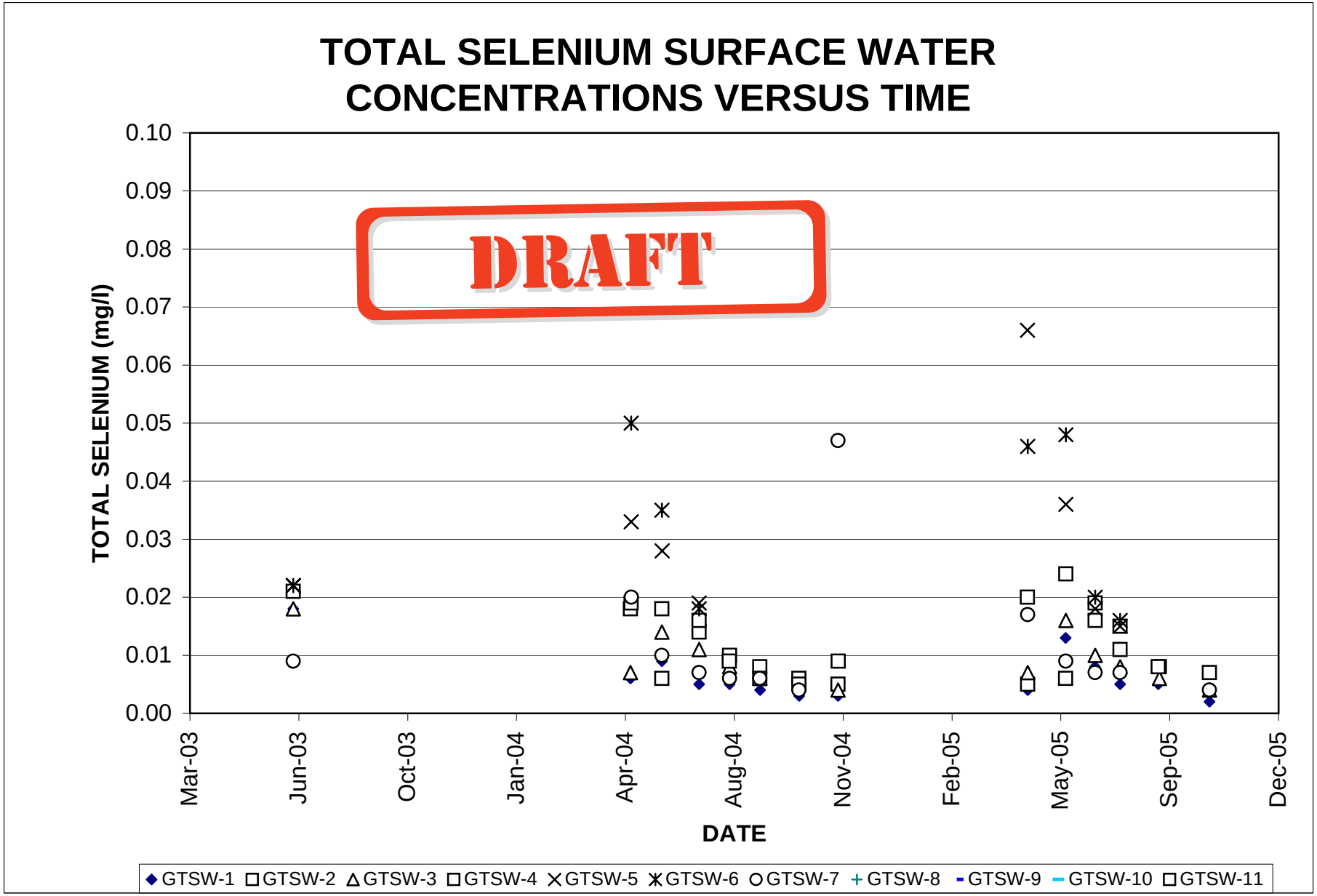
Concentrations less than detection plotted at the detection limit

FIGURE 4-17



Concentrations less than detection plotted at the detection limit

FIGURE 4-18

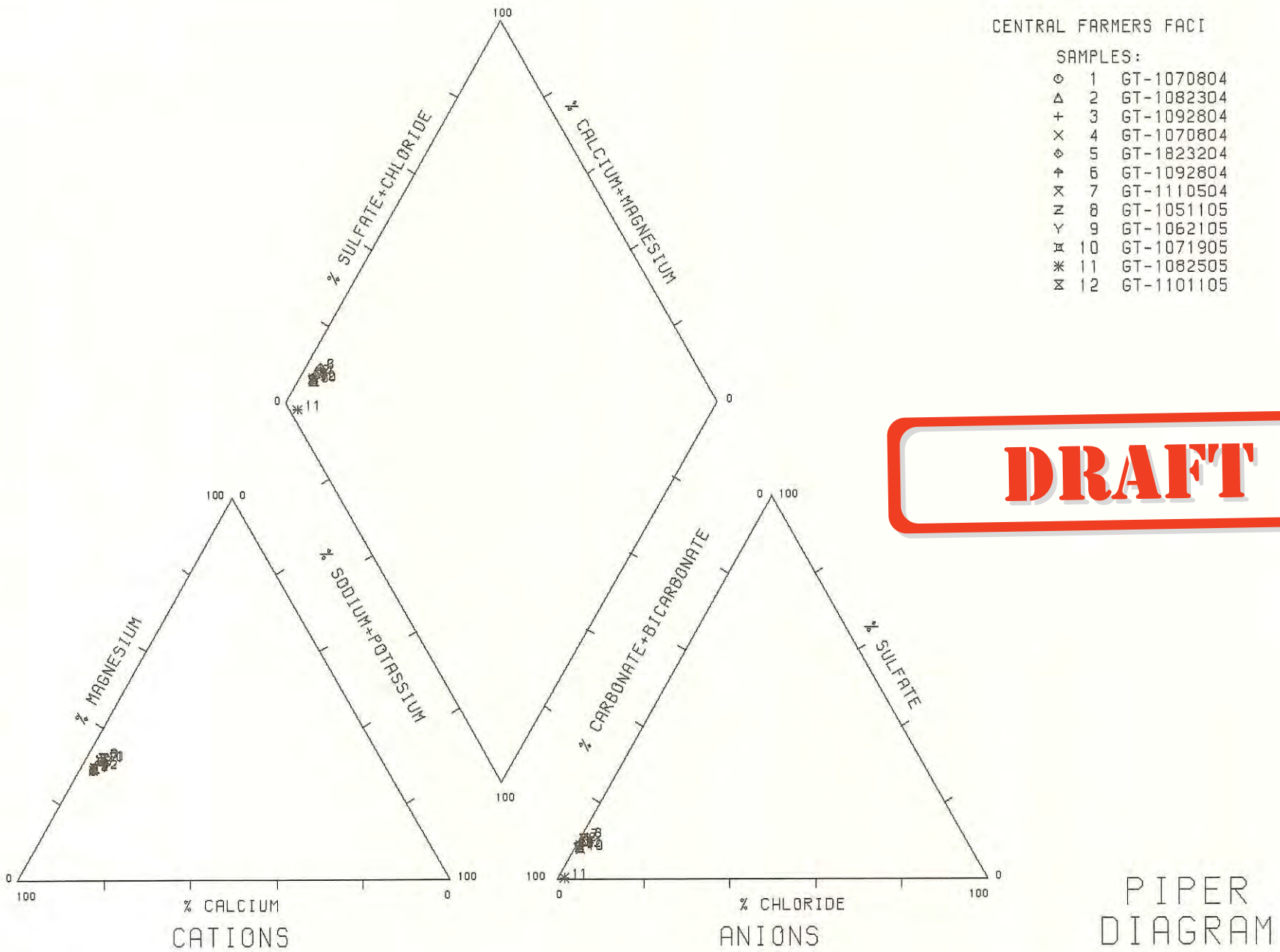


Concentrations less than detection plotted at the detection limit

FIGURE 4-19

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:48:44.56

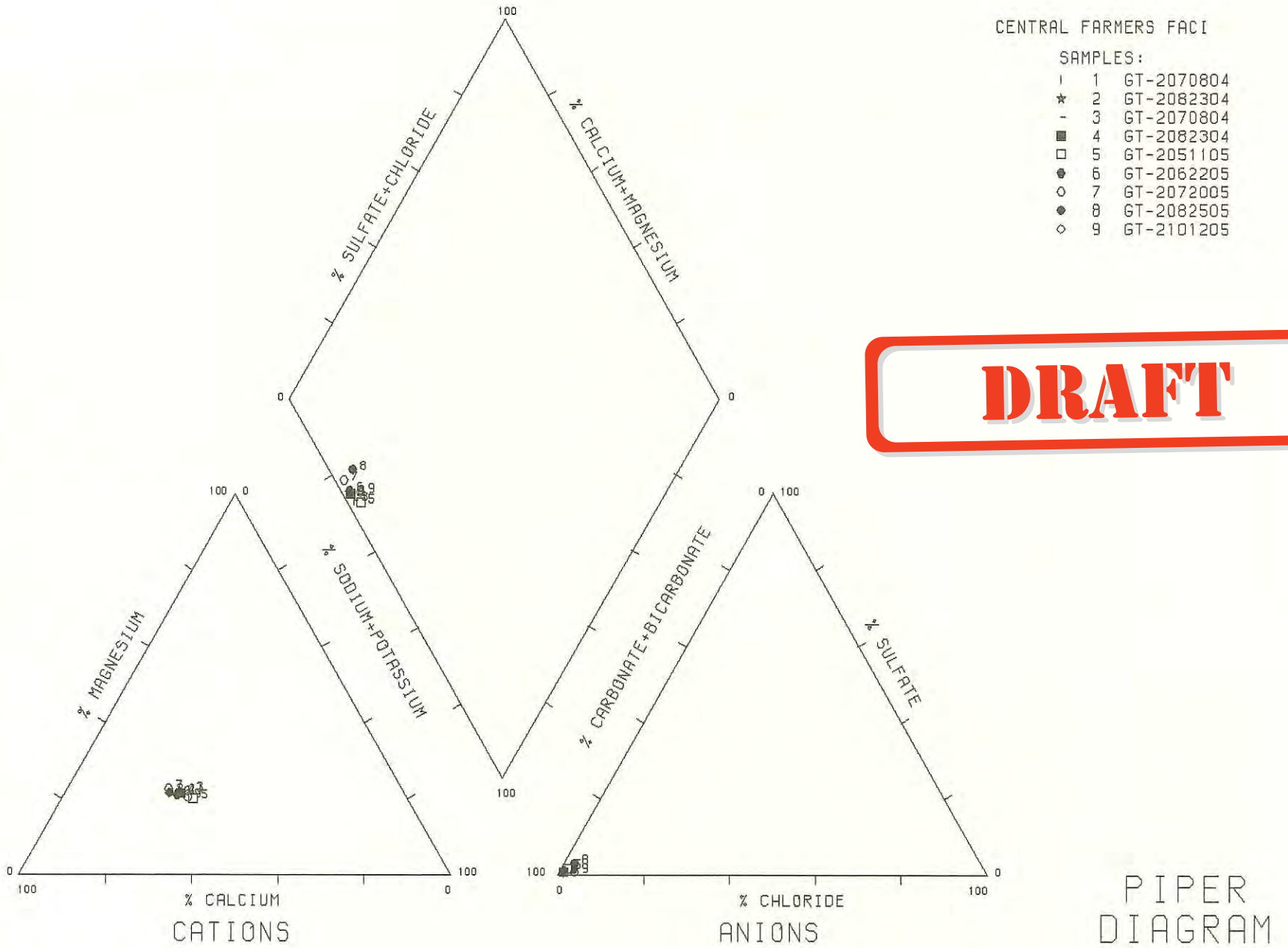


DRAFT

FIGURE 4-20

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:49:25.53

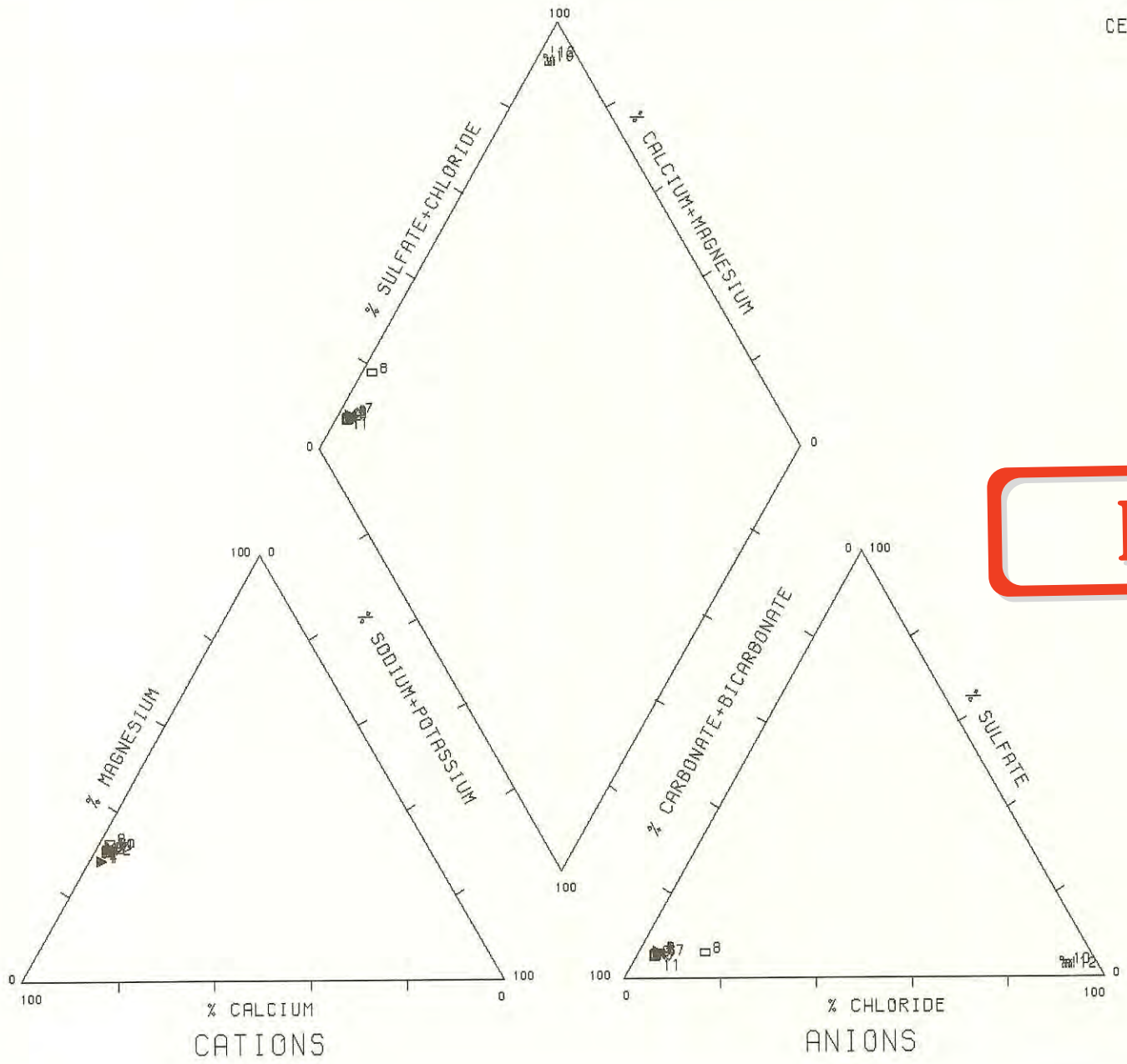


DRAFT

FIGURE 4-21

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:49:57.83



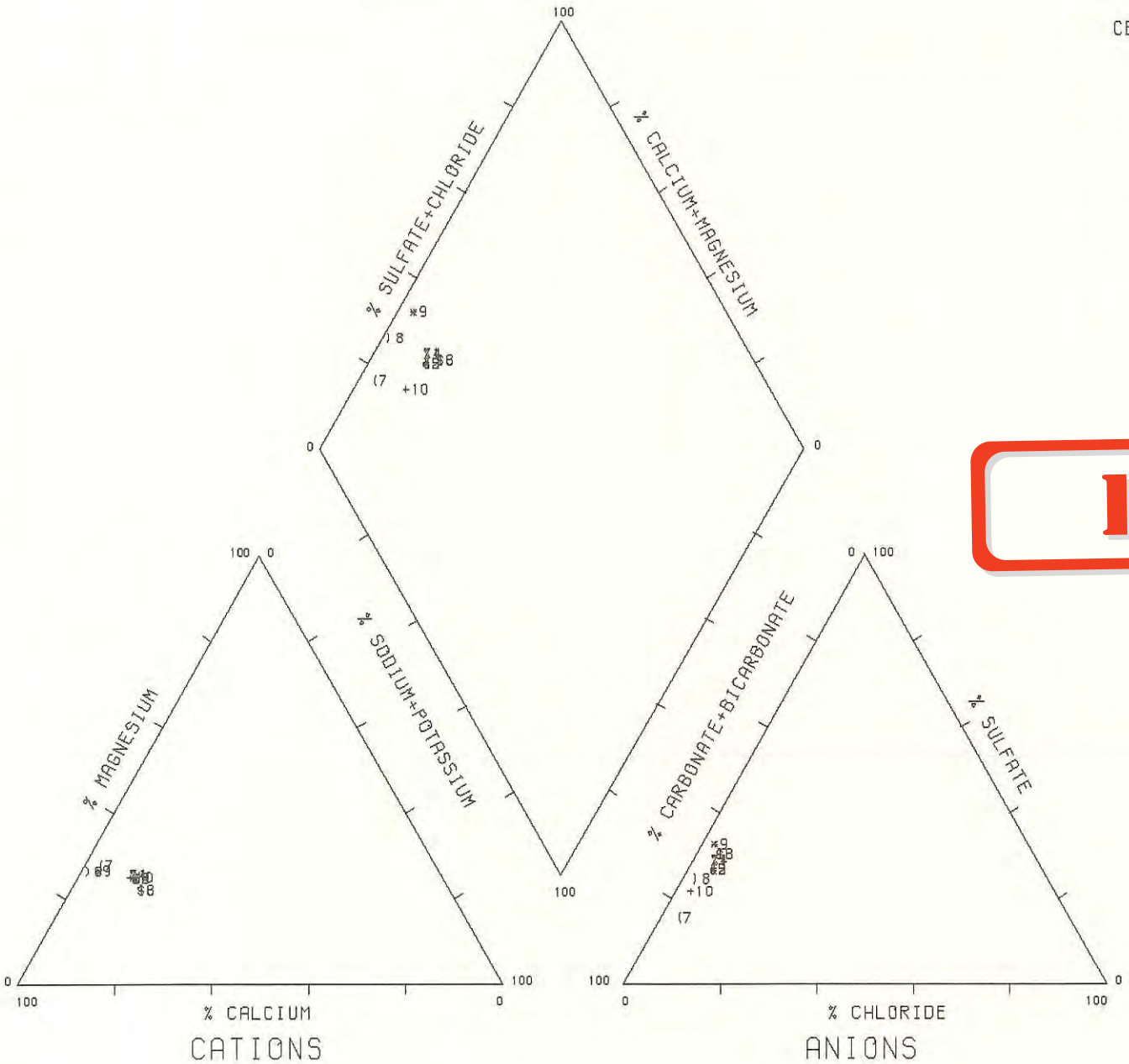
DRAFT

PIPER DIAGRAM

FIGURE 4-22

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:50:41.88



CENTRAL FARMERS FACI

SAMPLES:

"	1	GT-4070904
#	2	GT-4082404
$	3	GT-4092904
%	4	GT-4070904
&	5	GT-4082404
'	6	GT-4092904
(	7	GT-4051105
)	8	GT-4062205
*	9	GT-4072005
+	10	GT-4082505

DRAFT

PIPER DIAGRAM

FIGURE 4-23

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:58:31.33

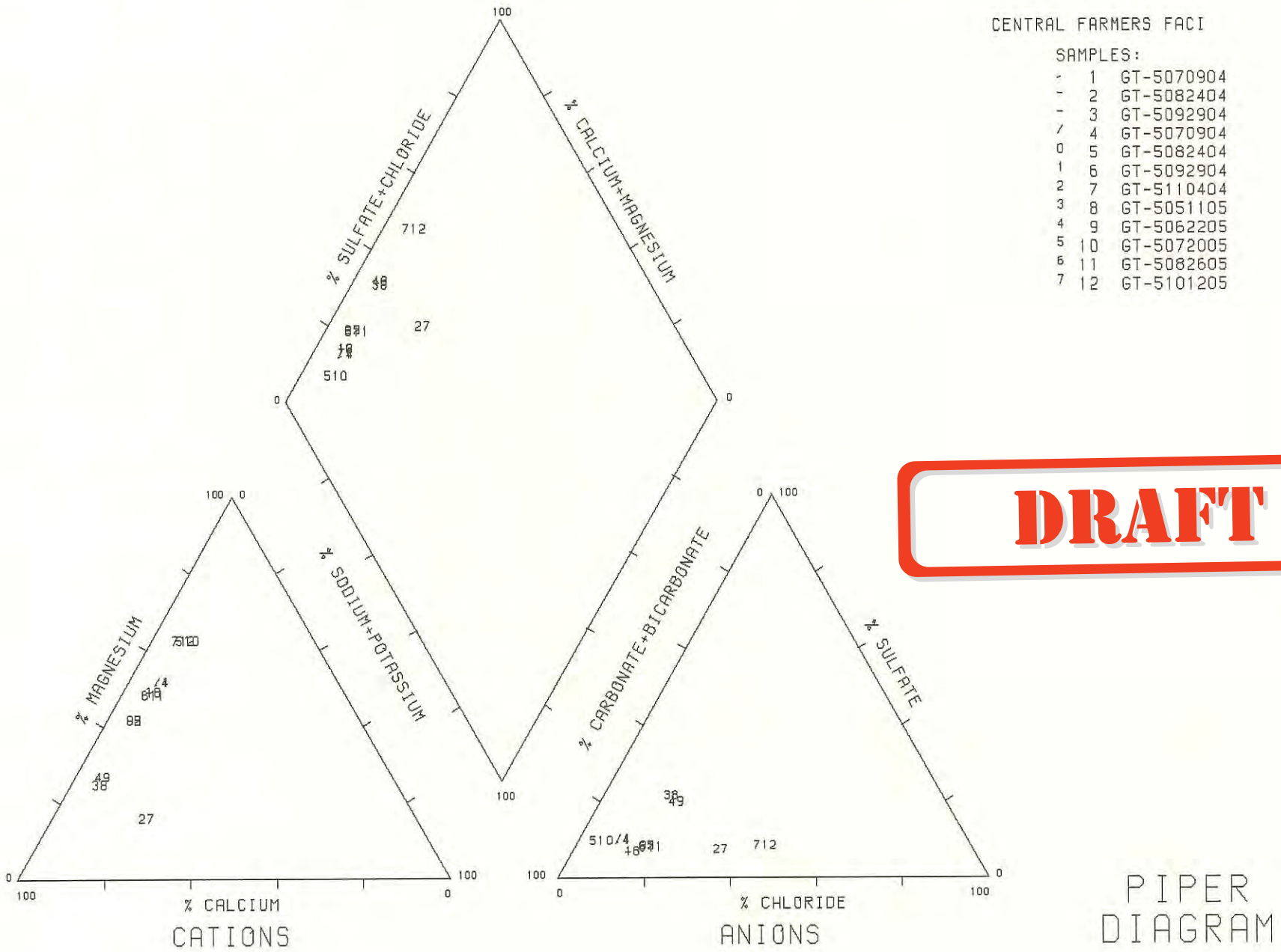
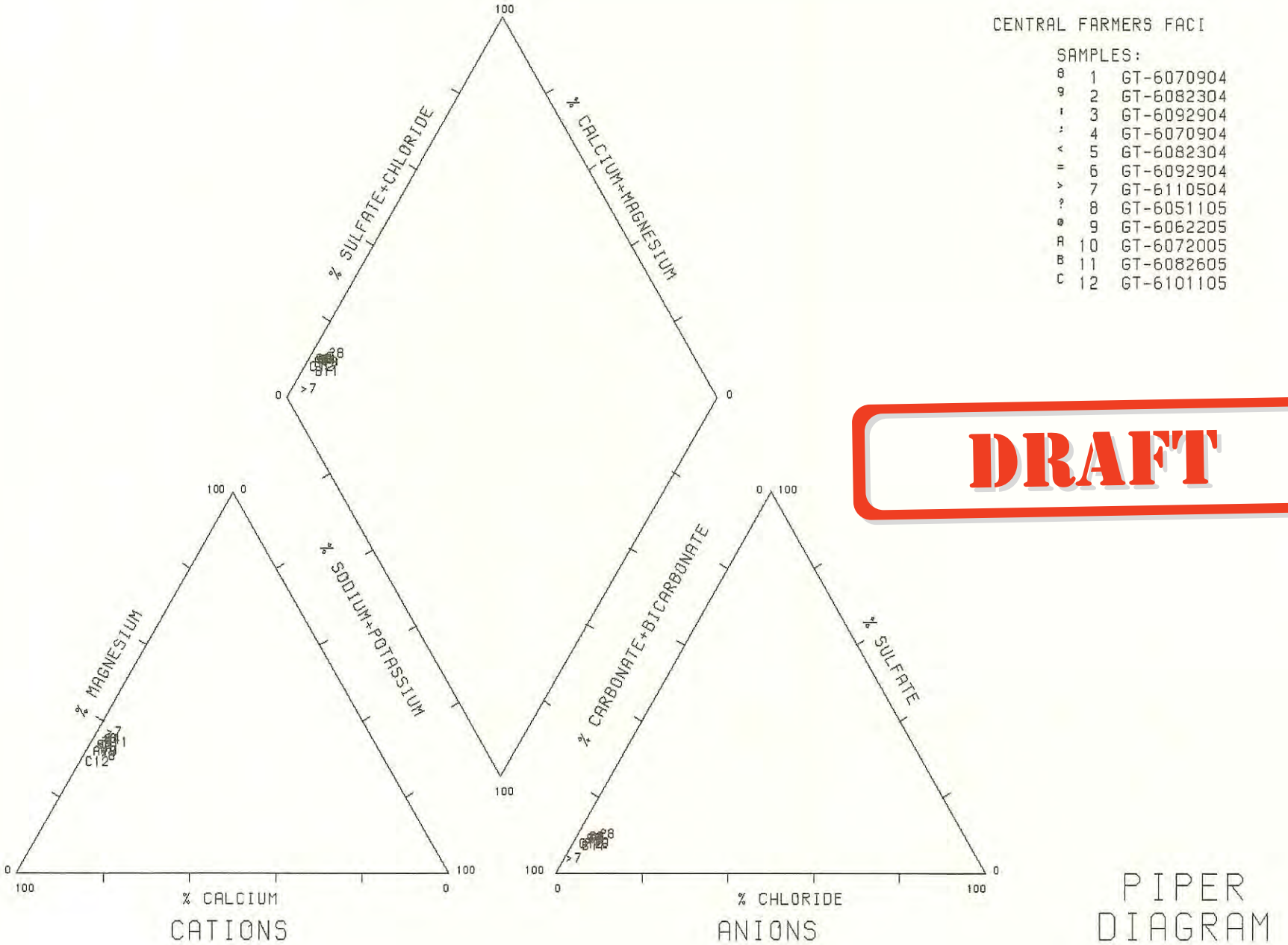


FIGURE 4-24

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 12:59:08.13

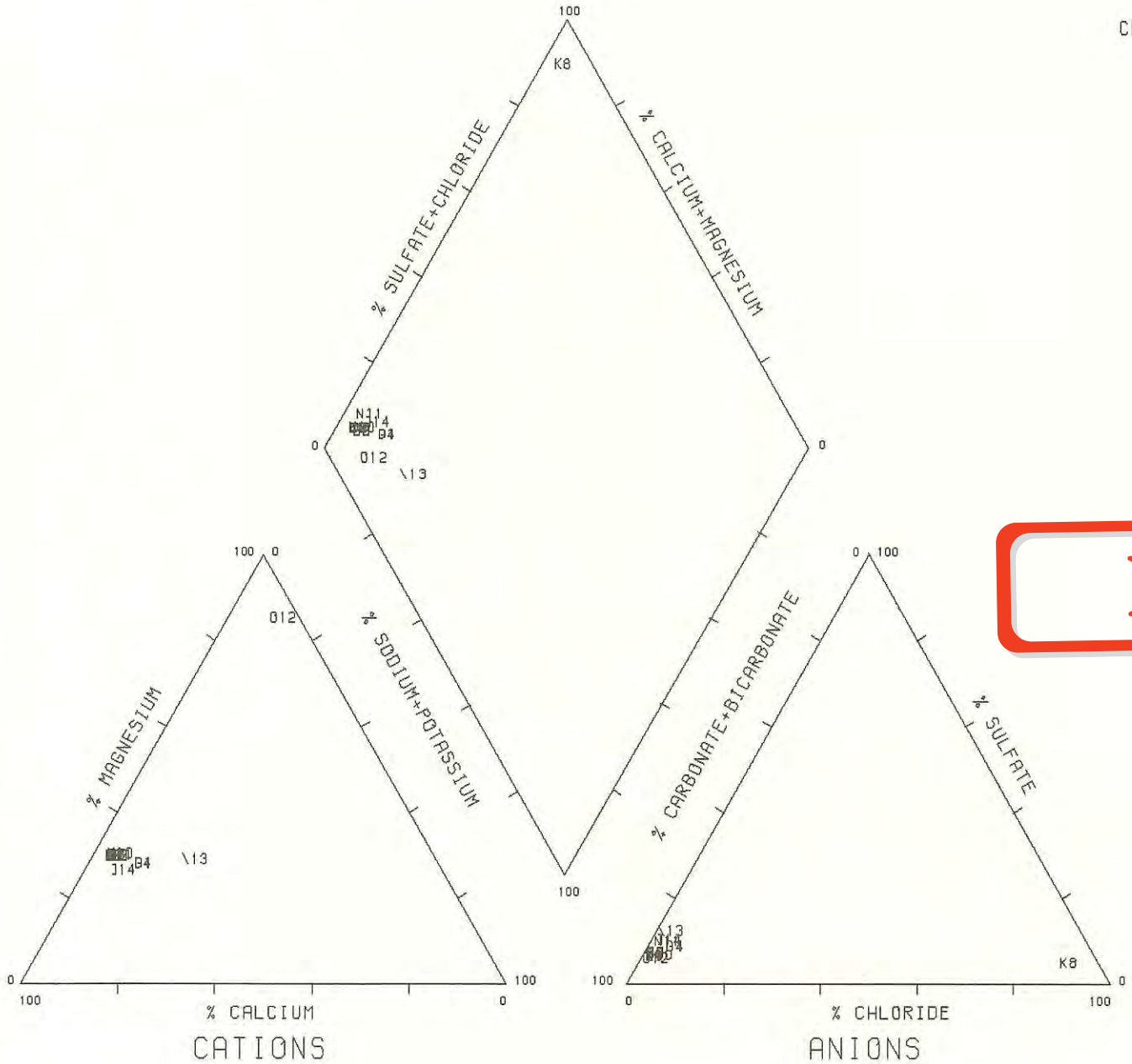


DRAFT

FIGURE 4-25

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 13:00:58.42



CENTRAL FARMERS FACI

SAMPLES:

D	1	GT-7070904
E	2	GT-7082304
F	3	GT-7092804
G	4	GT-7070904
H	5	GT-7082304
I	6	GT-7092804
J	7	GT-7110404
K	8	GT-7051105
L	9	GT-7062105
M	10	GT-7071905
N	11	GT-7082505
O	12	GT-7101105
\	13	DEEP070904
]	14	DEEP051105

DRAFT

PIPER DIAGRAM

FIGURE 4-26

GEORGETOWN CANYON MONITORING WELL GROUND WATER 2004 TO 2005

FRI 12-23-19:5 13:02:25.42

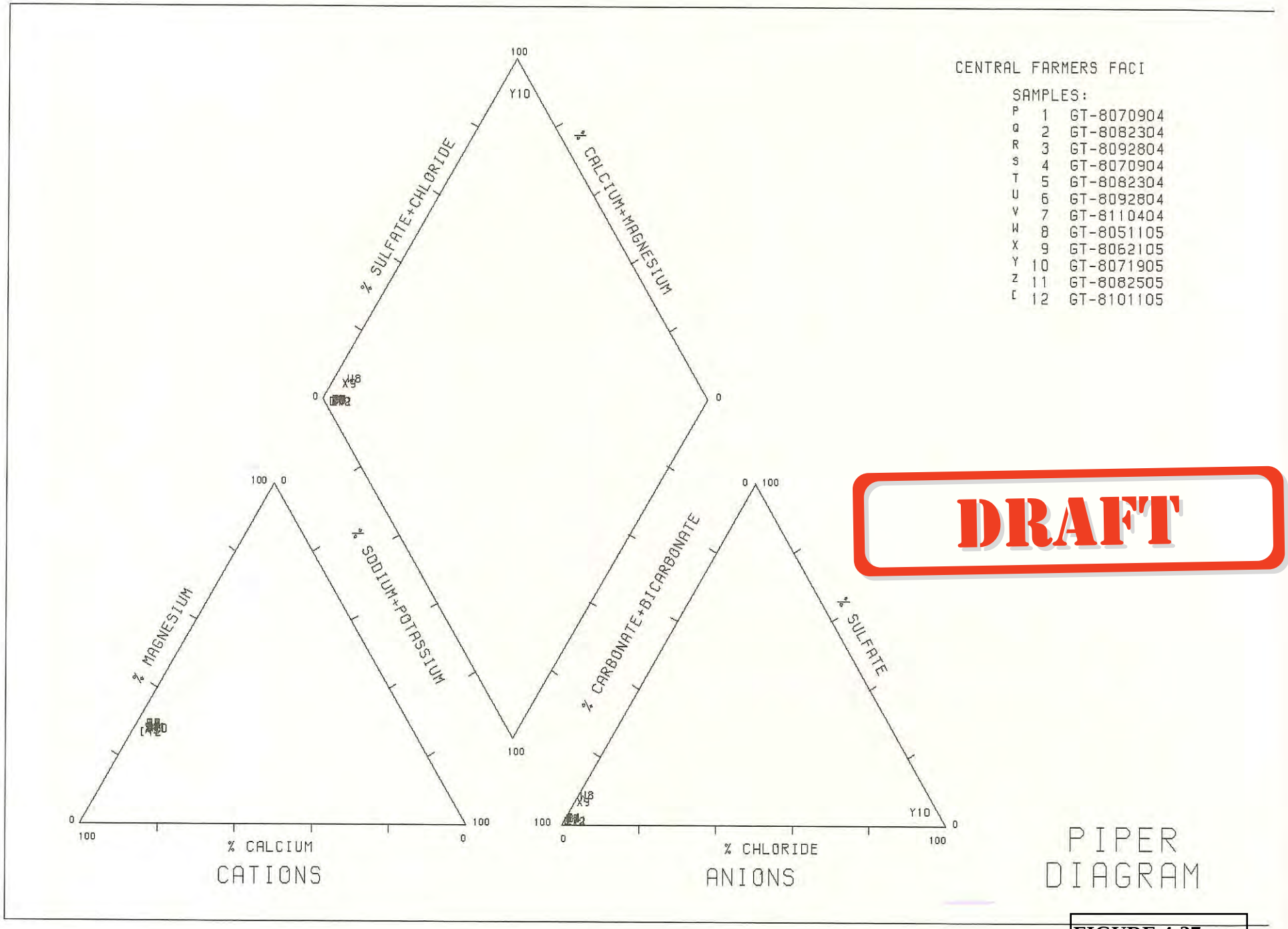


FIGURE 4-27

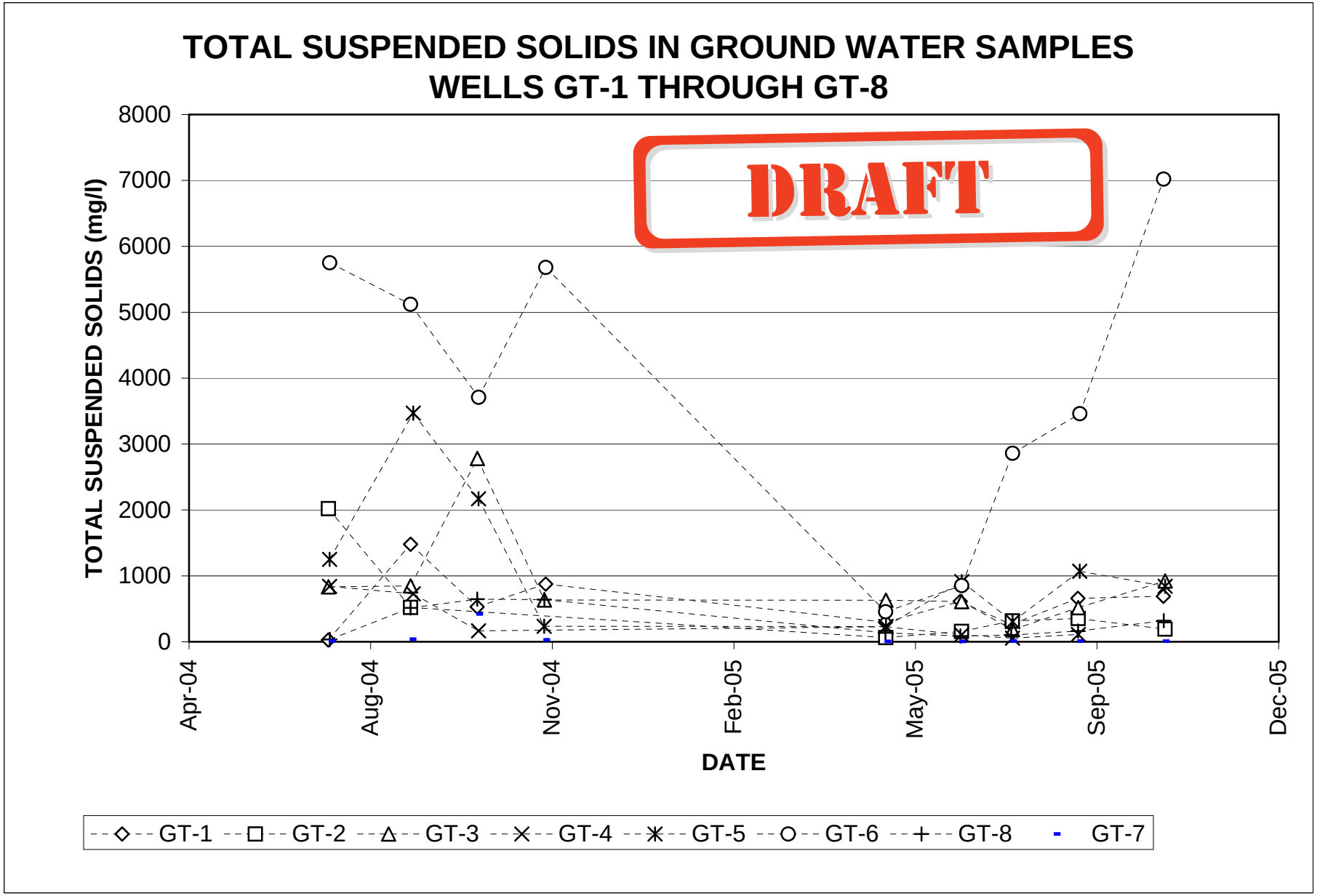
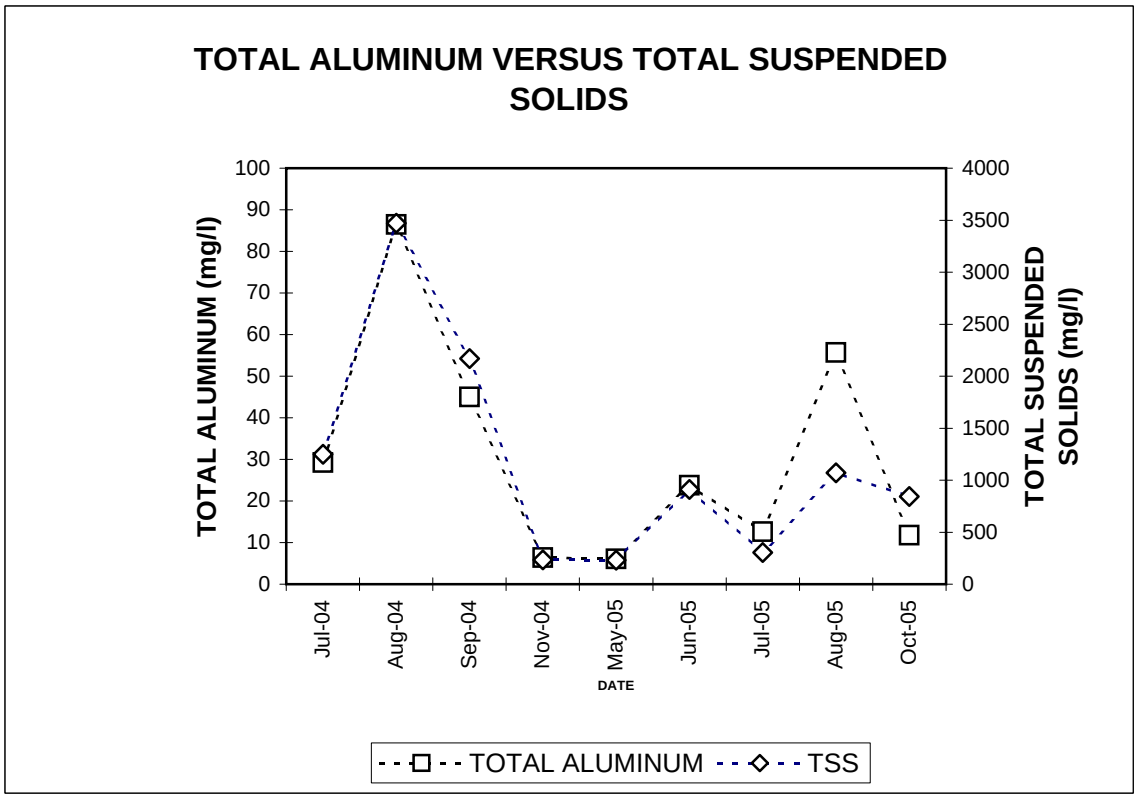
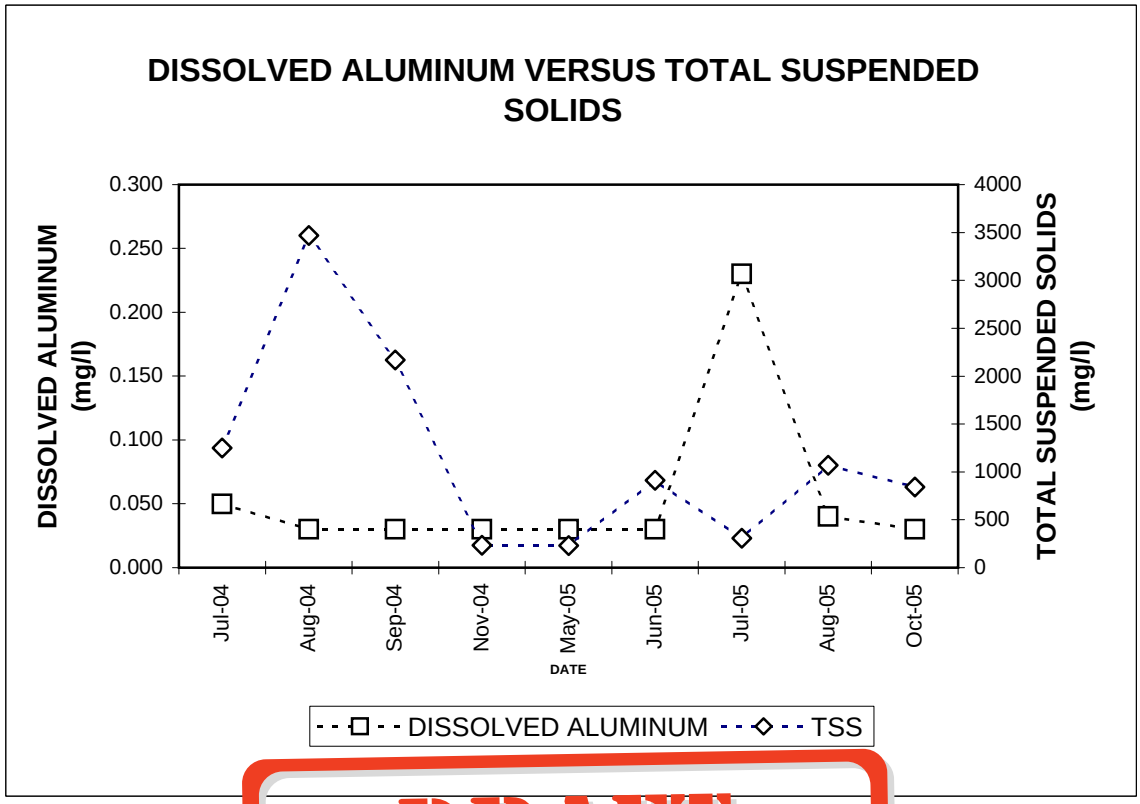

TOTAL SUSPENDED SOLIDS IN GROUND WATER SAMPLES
WELLS GT-1 THROUGH GT-8
DRAFT
TOTAL SUSPENDED SOLIDS (mg/l)
8000
7000
6000
5000
4000
3000
2000
1000
0
Apr-04
Aug-04
Nov-04
Feb-05
May-05
Sep-05
Dec-05
DATE
GT-1
GT-2
GT-3
GT-4
GT-5
GT-6
GT-8
GT-7

FIGURE 4-28

WELL GT-5



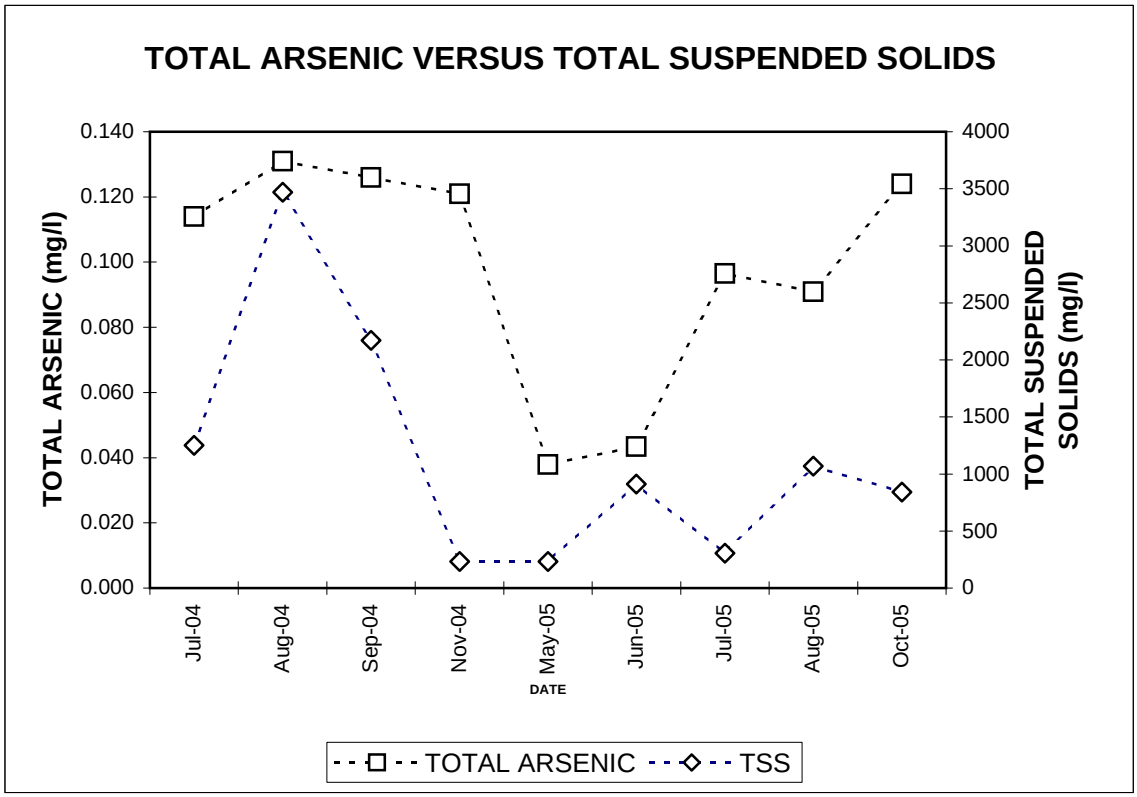


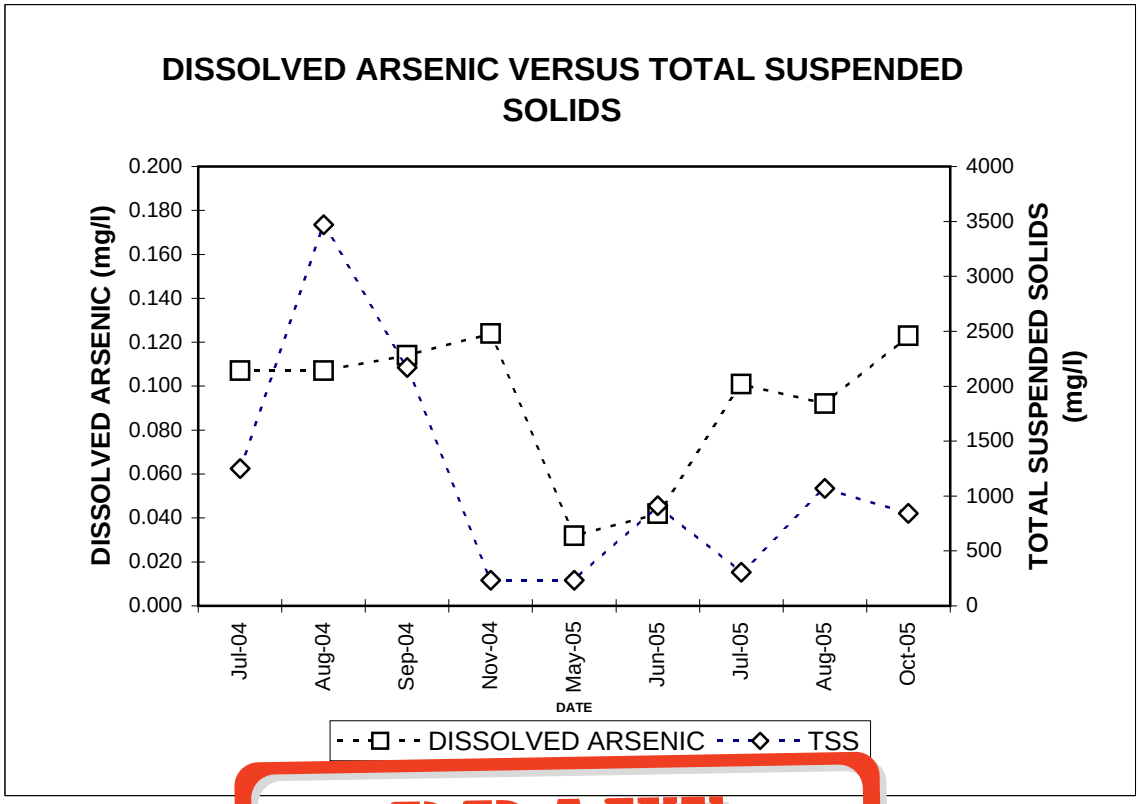
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28A

WELL GT-5



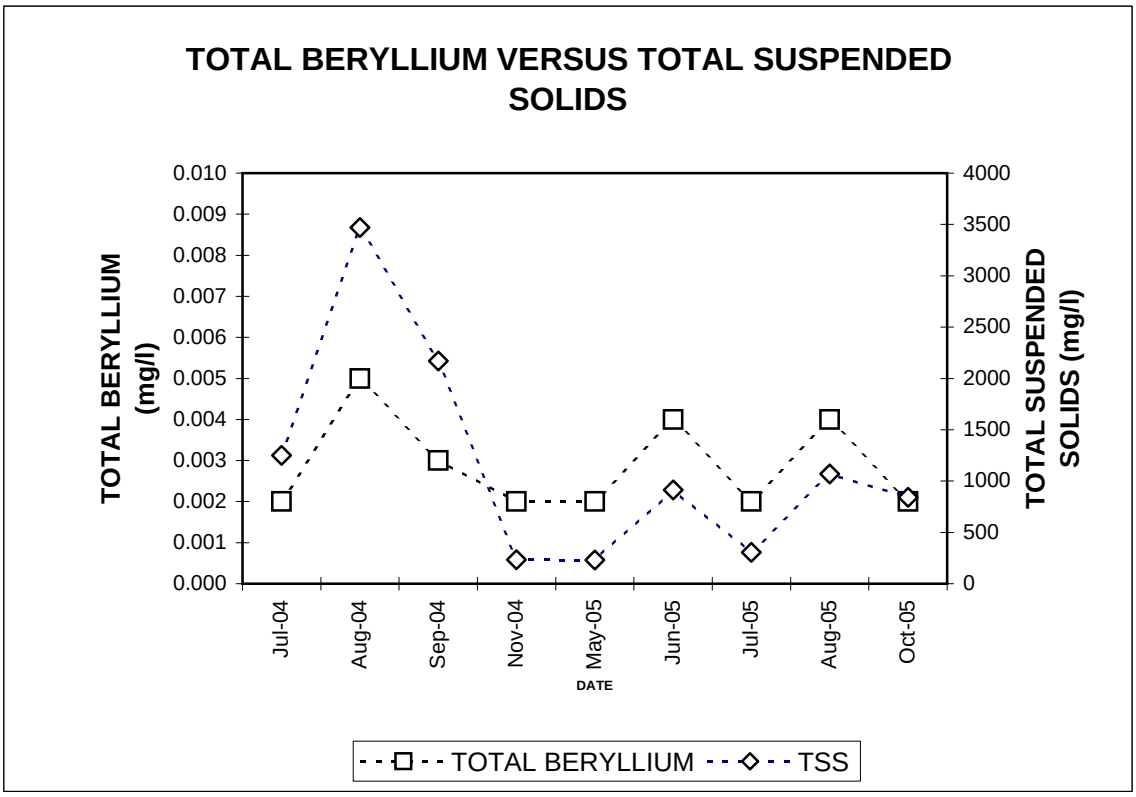


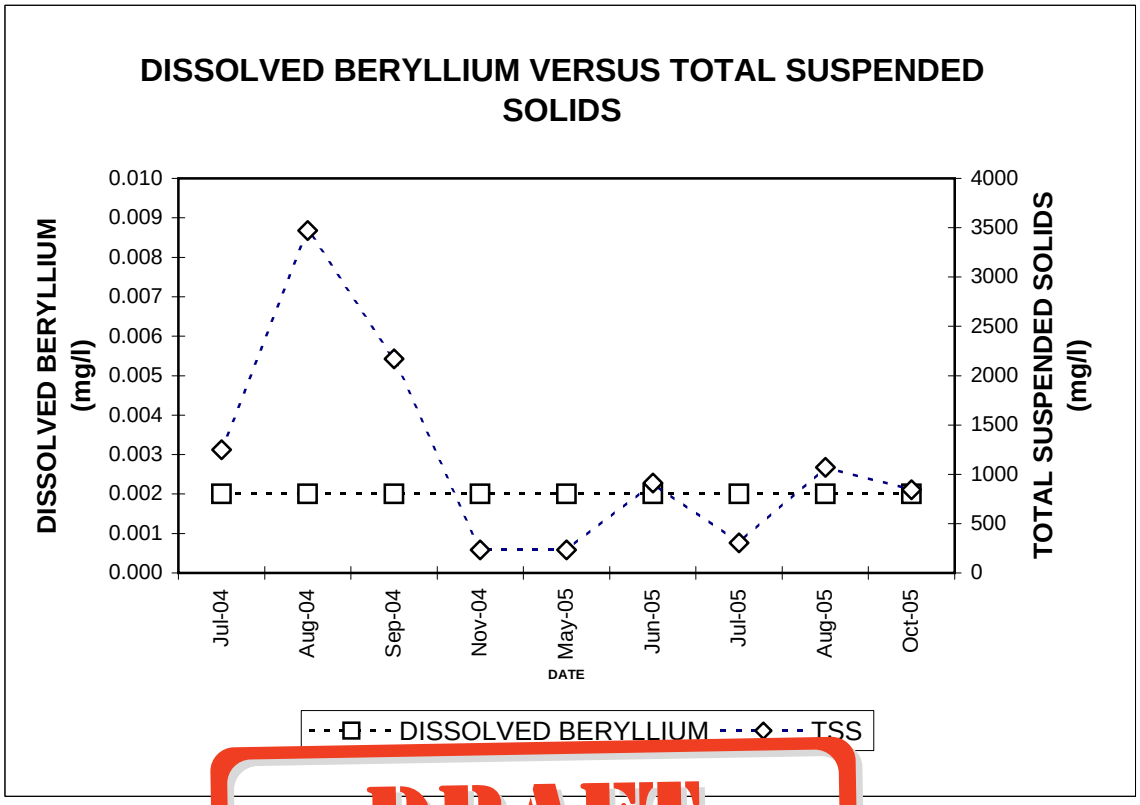
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28B

WELL GT-5



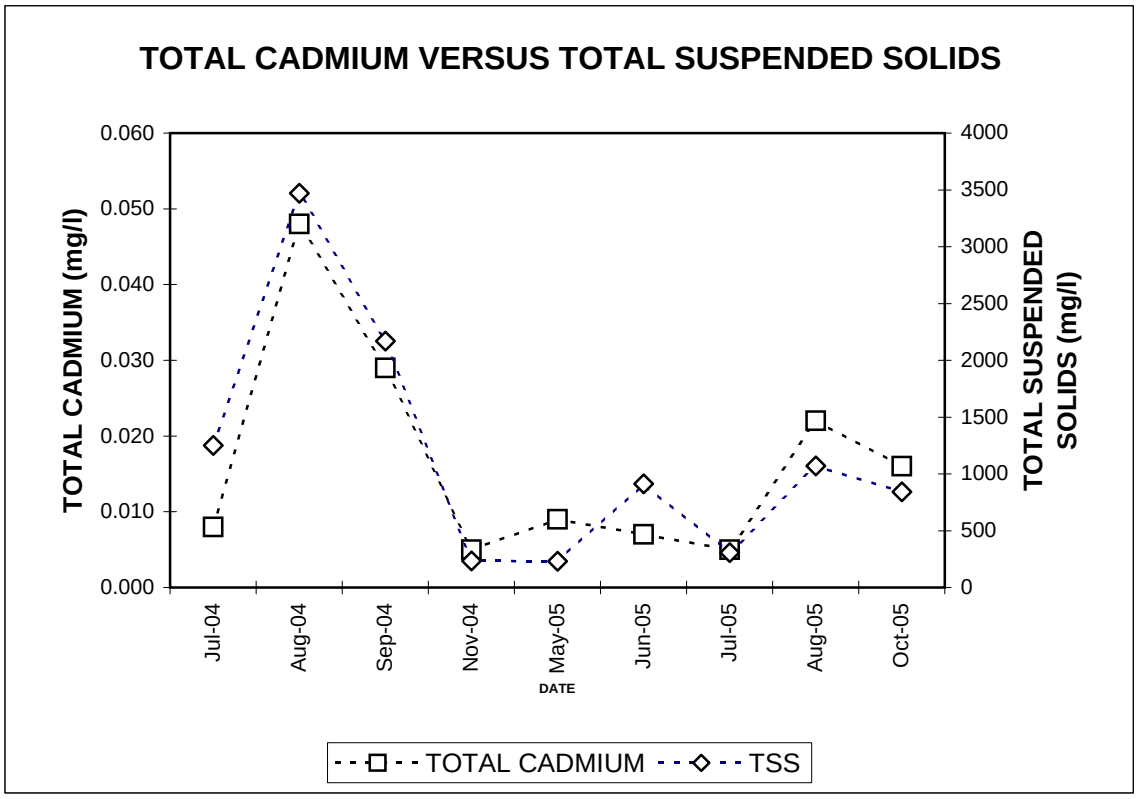


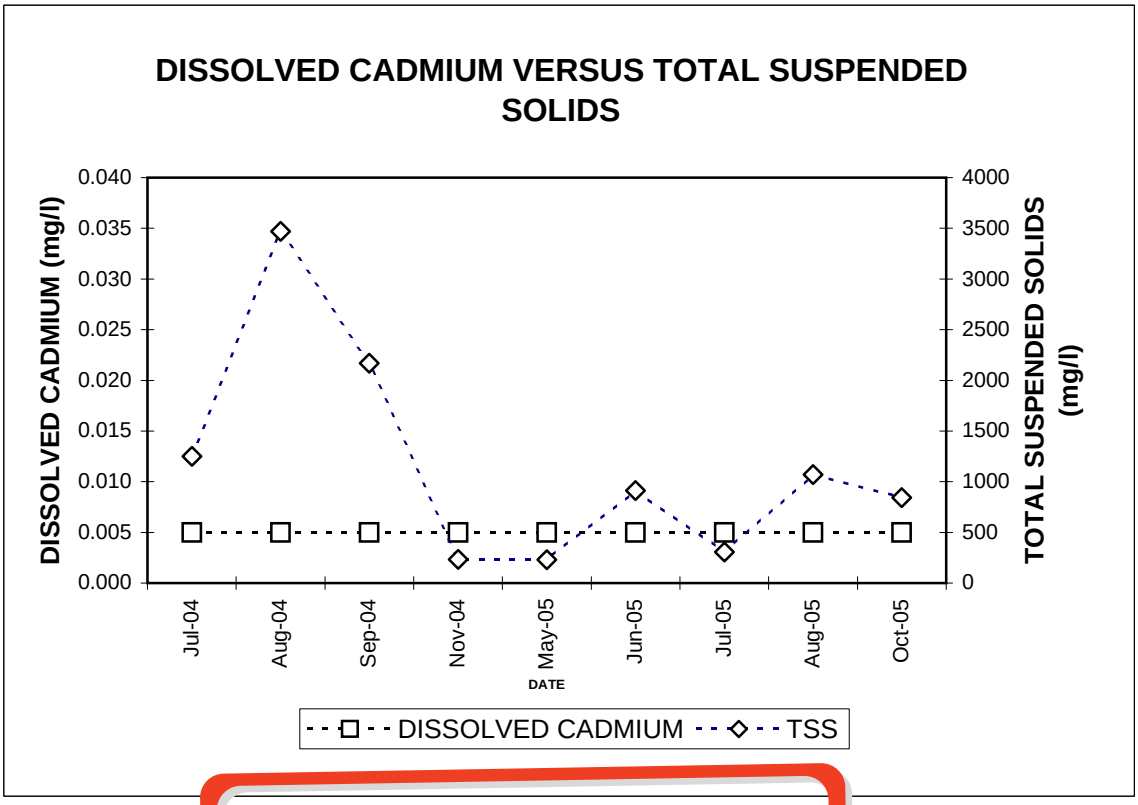
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28C

WELL GT-5



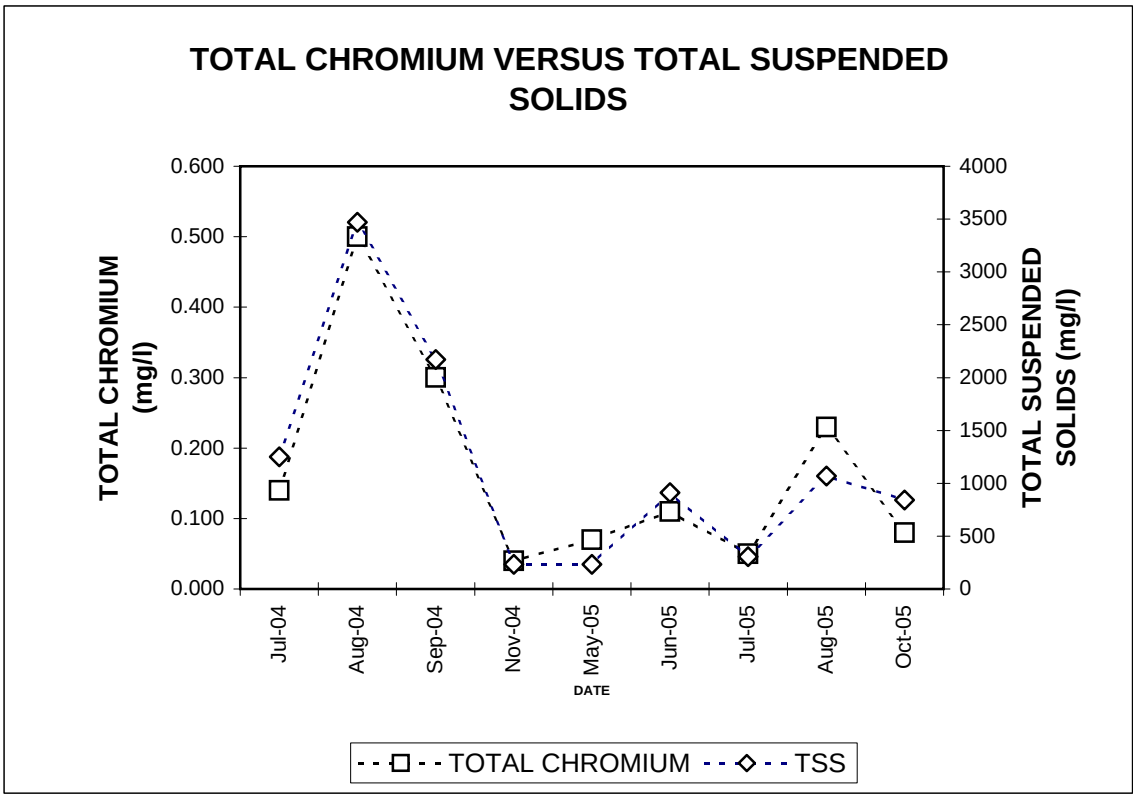


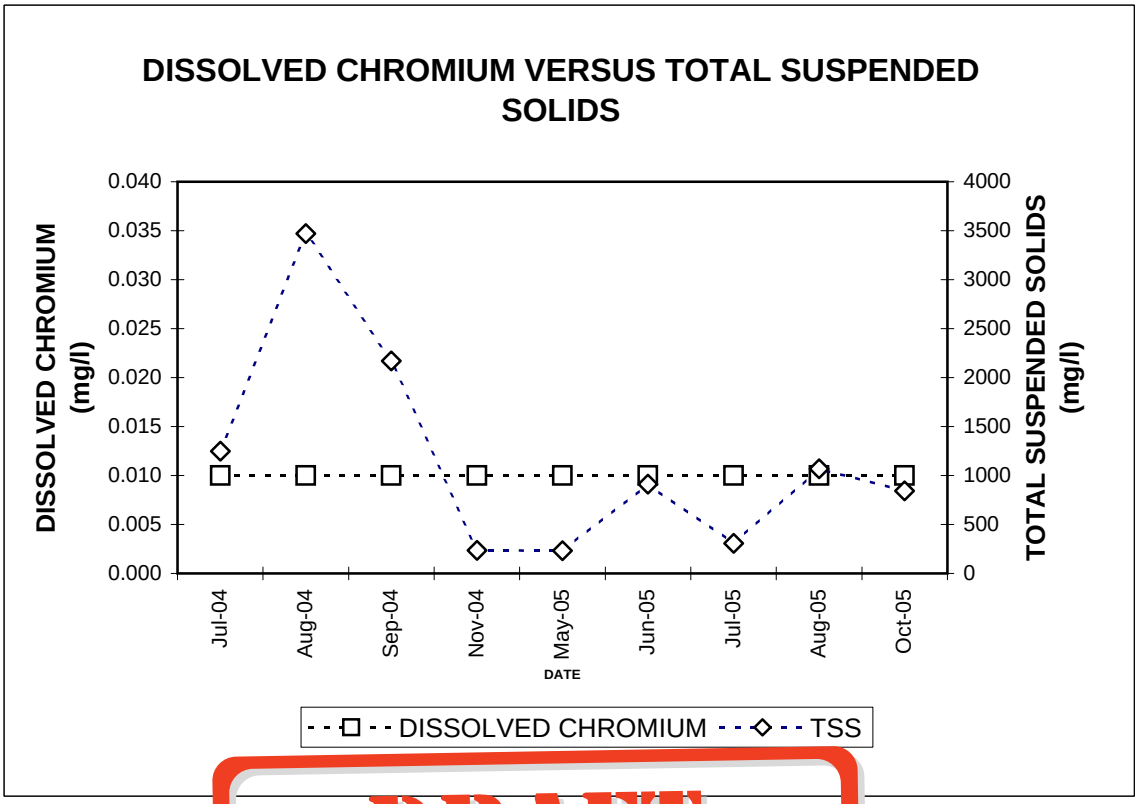
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28D

WELL GT-5



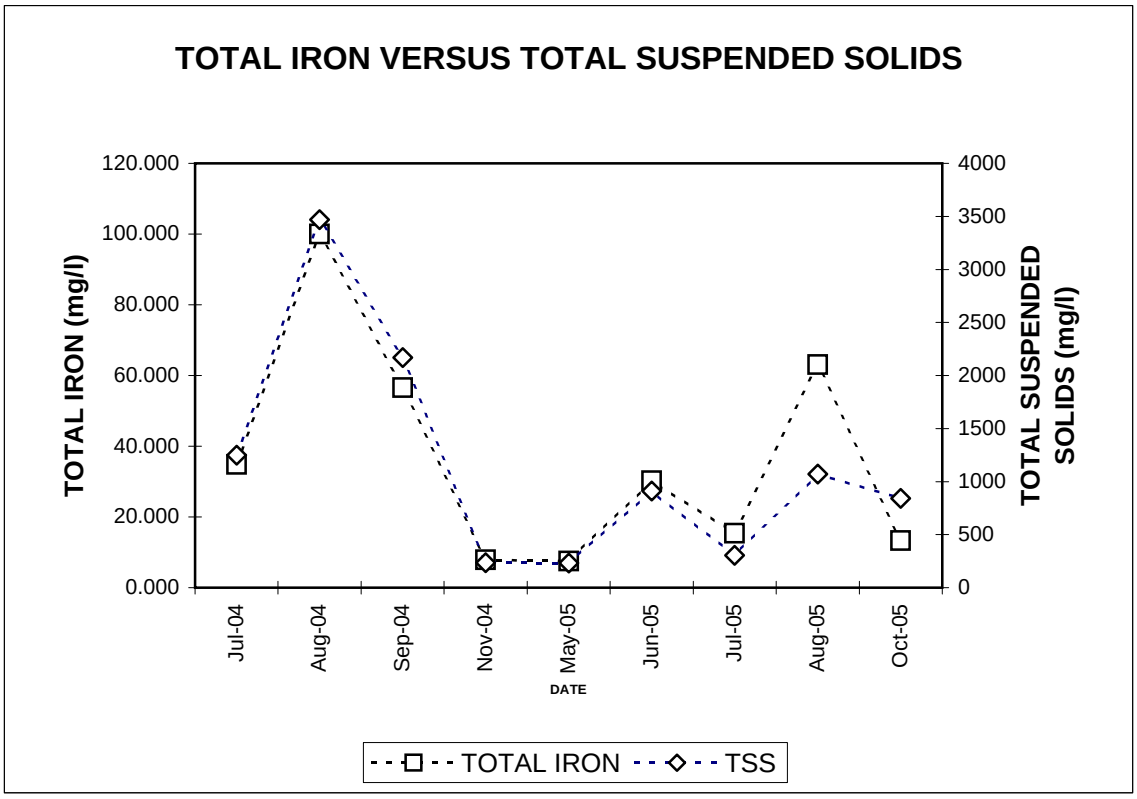


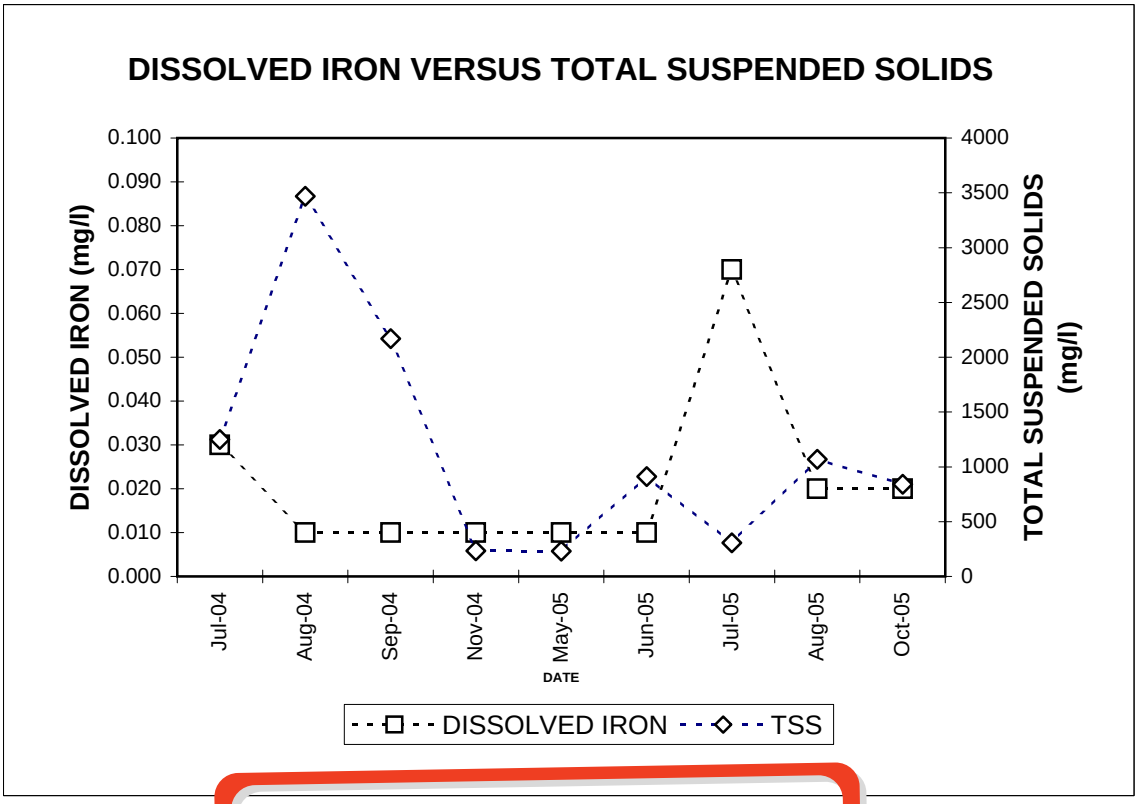
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28E

WELL GT-5



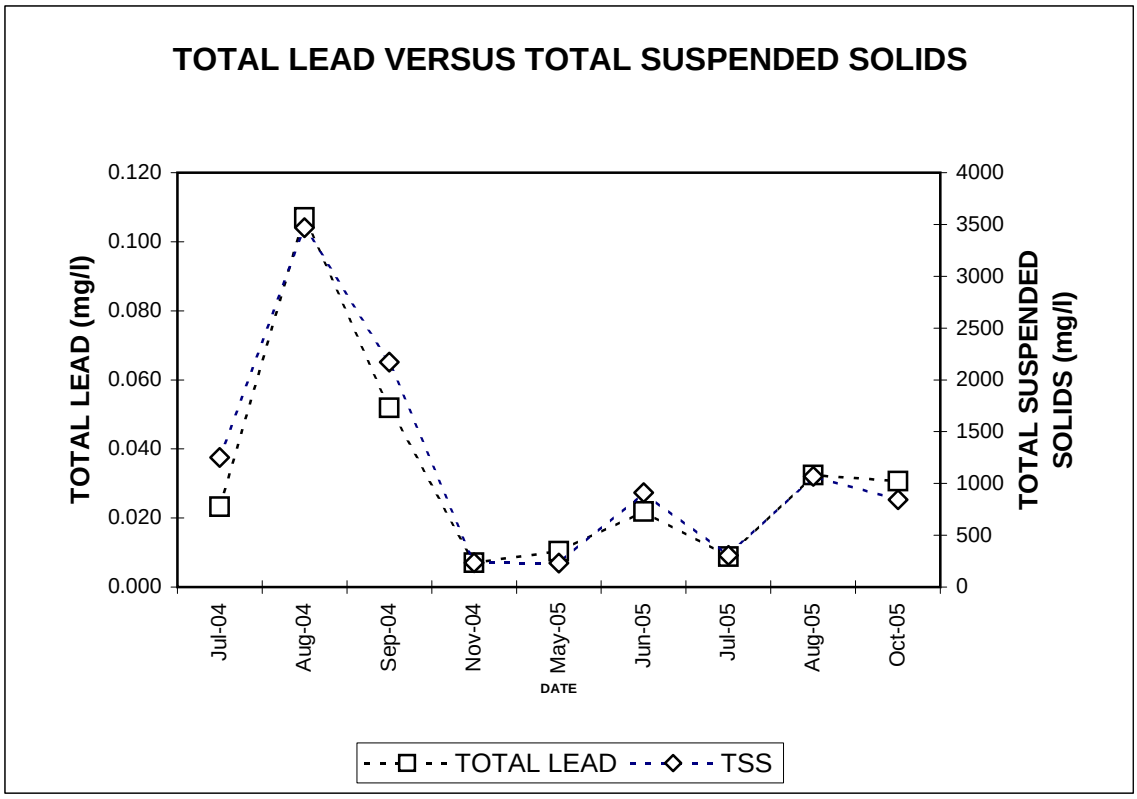


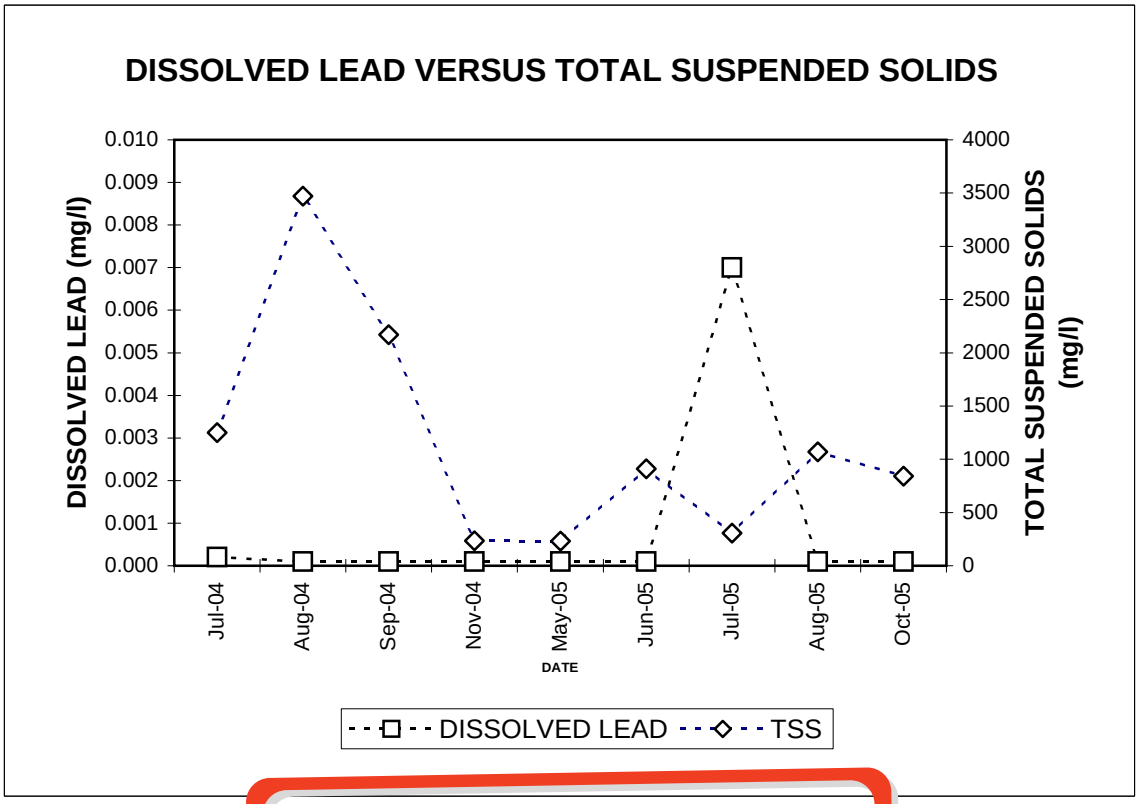
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28F

WELL GT-5



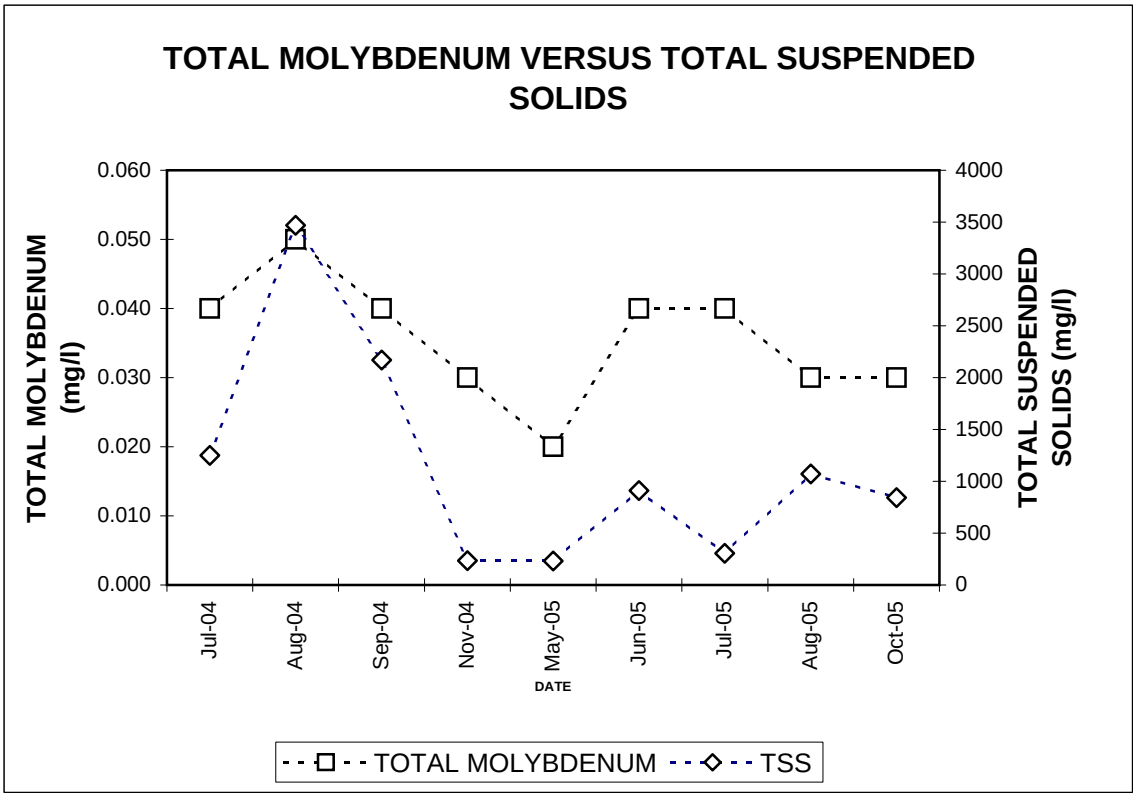


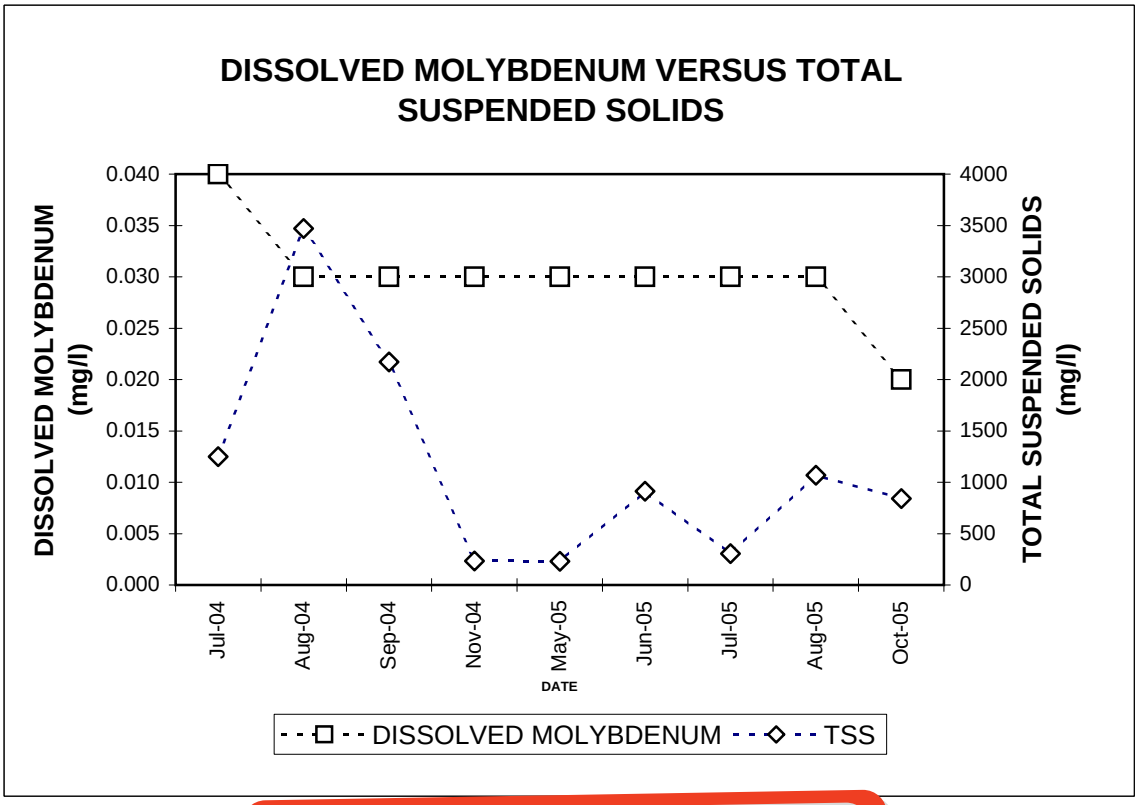
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28G

WELL GT-5



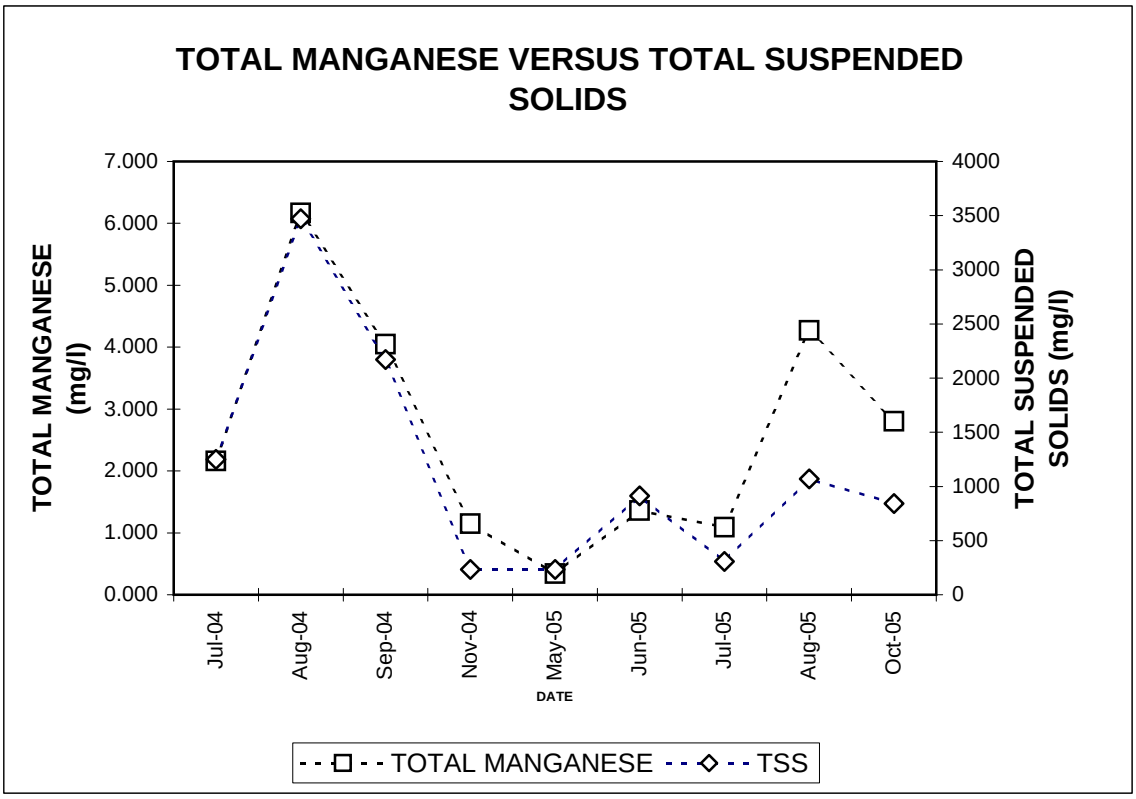


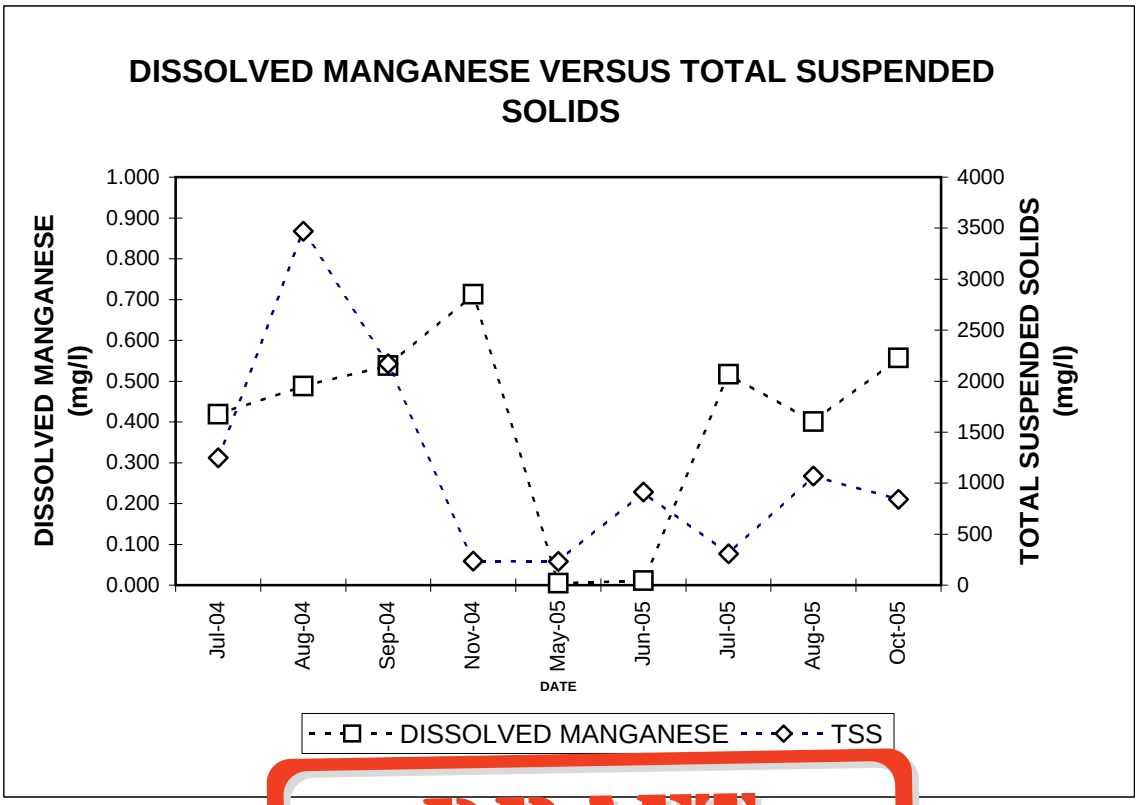
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28H

WELL GT-5



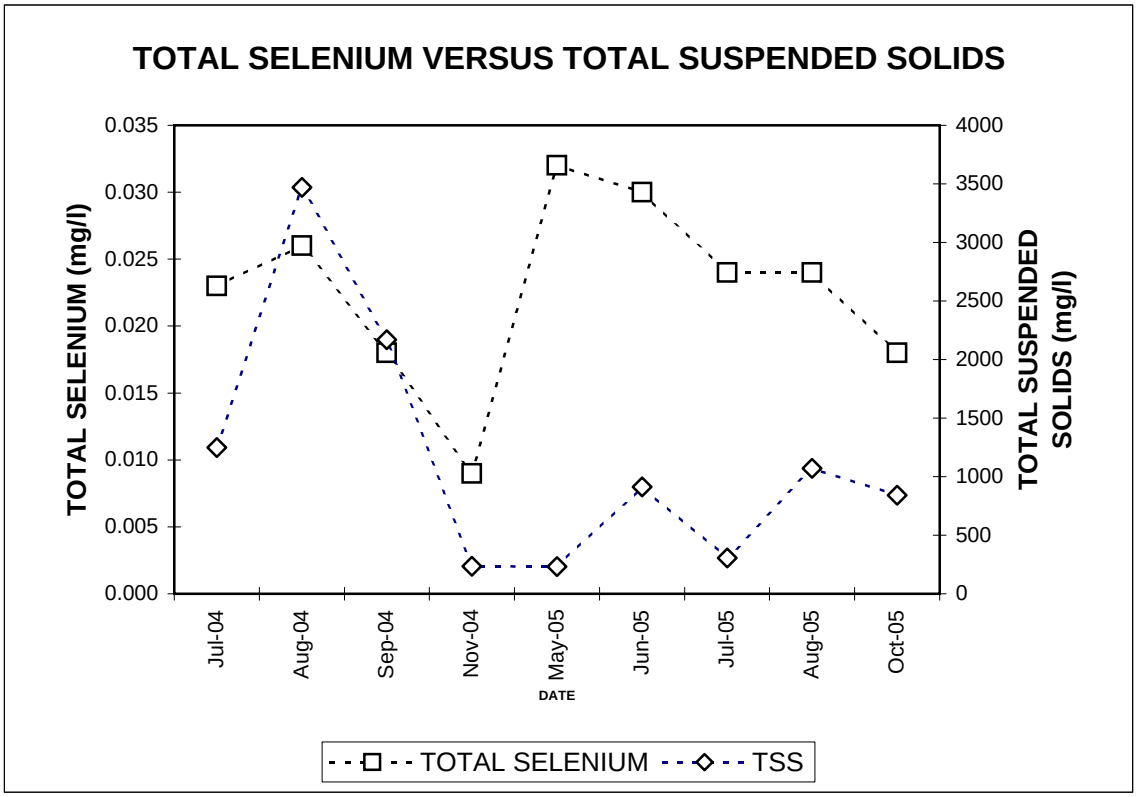


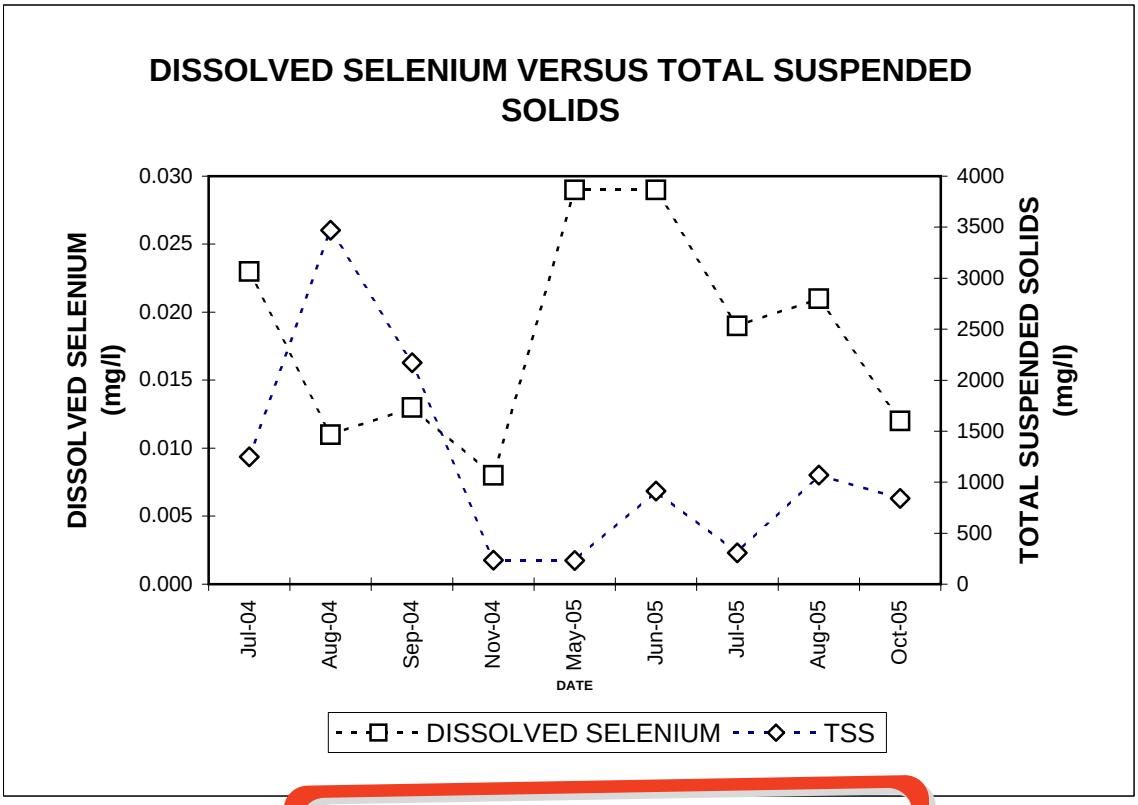
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28I

WELL GT-5



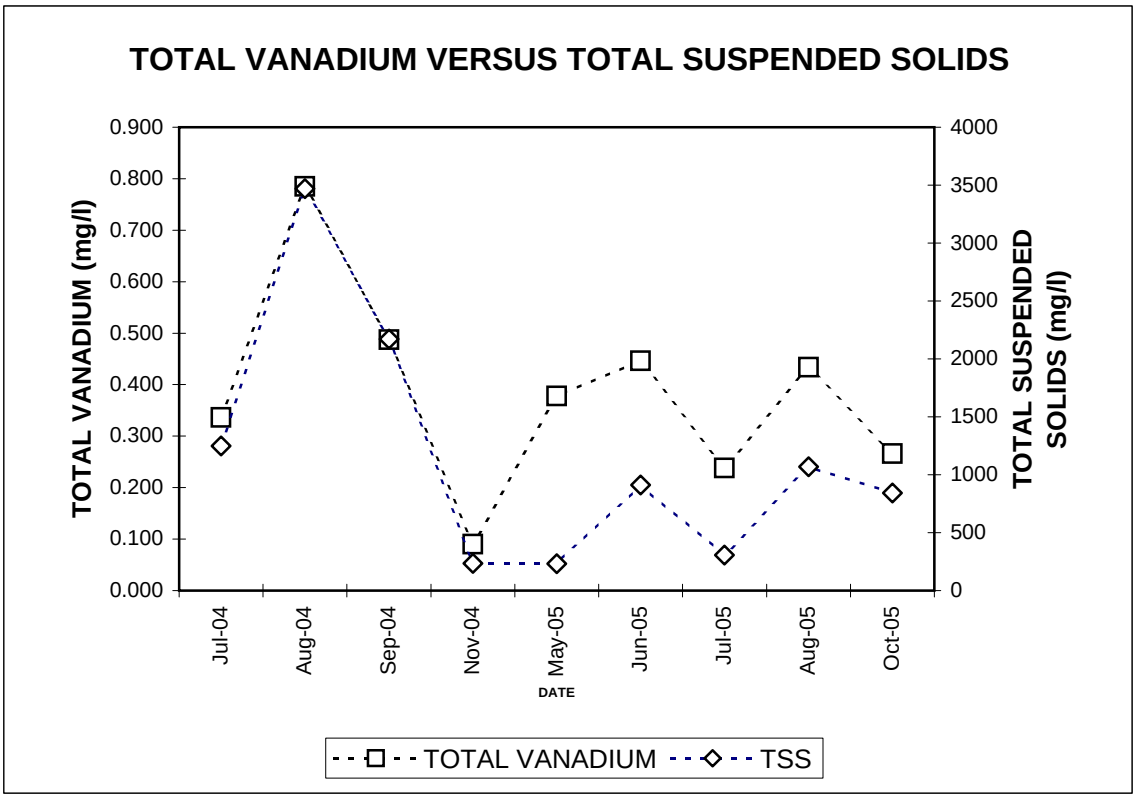


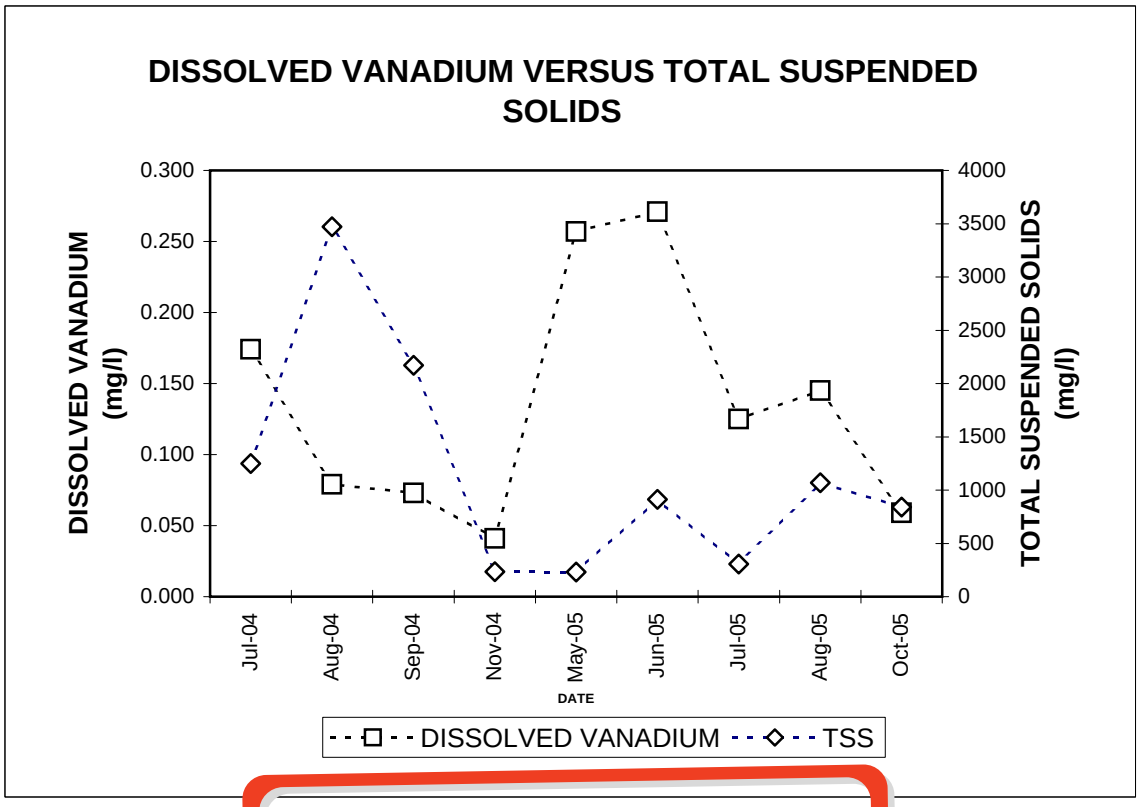
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28J

WELL GT-5



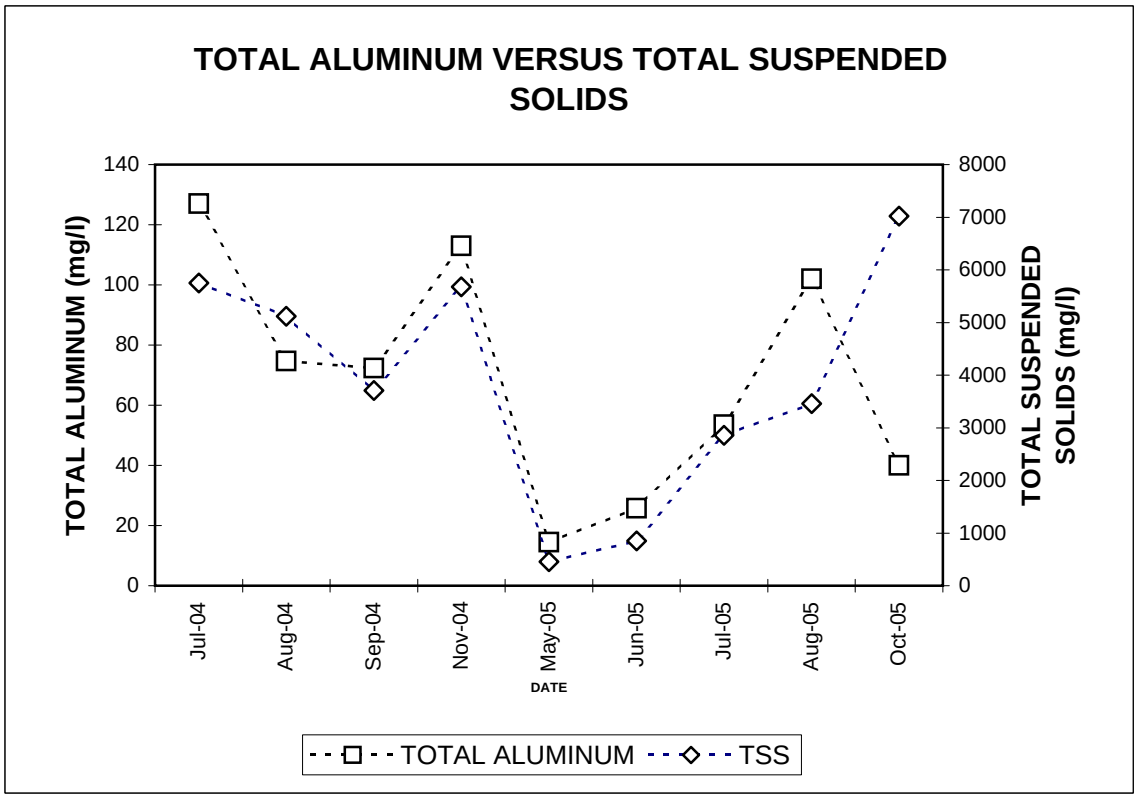


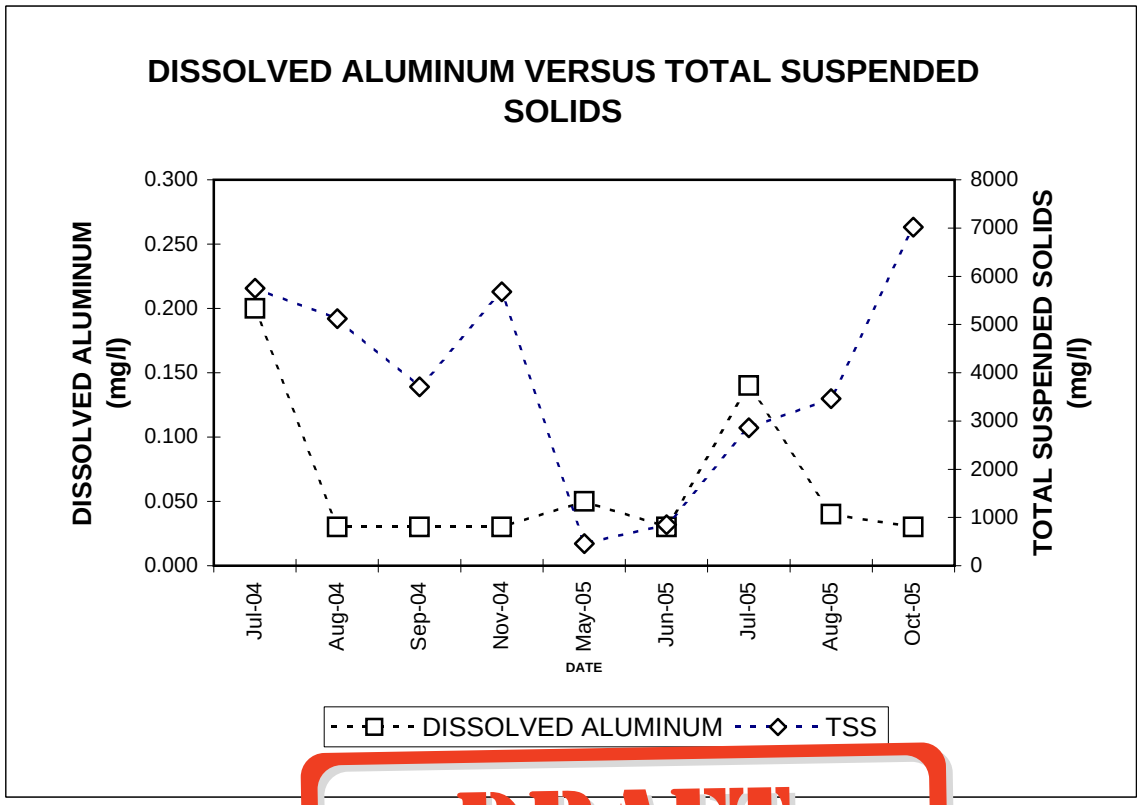
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28K

MONITOR WELL GT-6



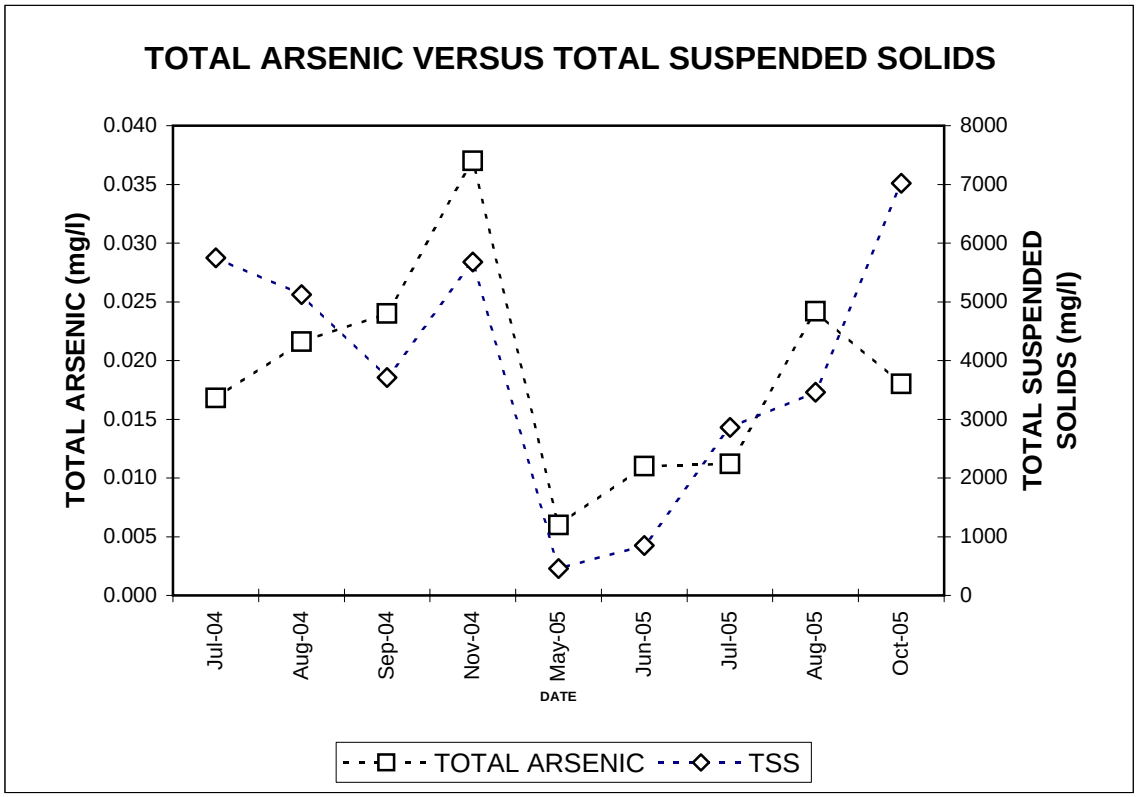


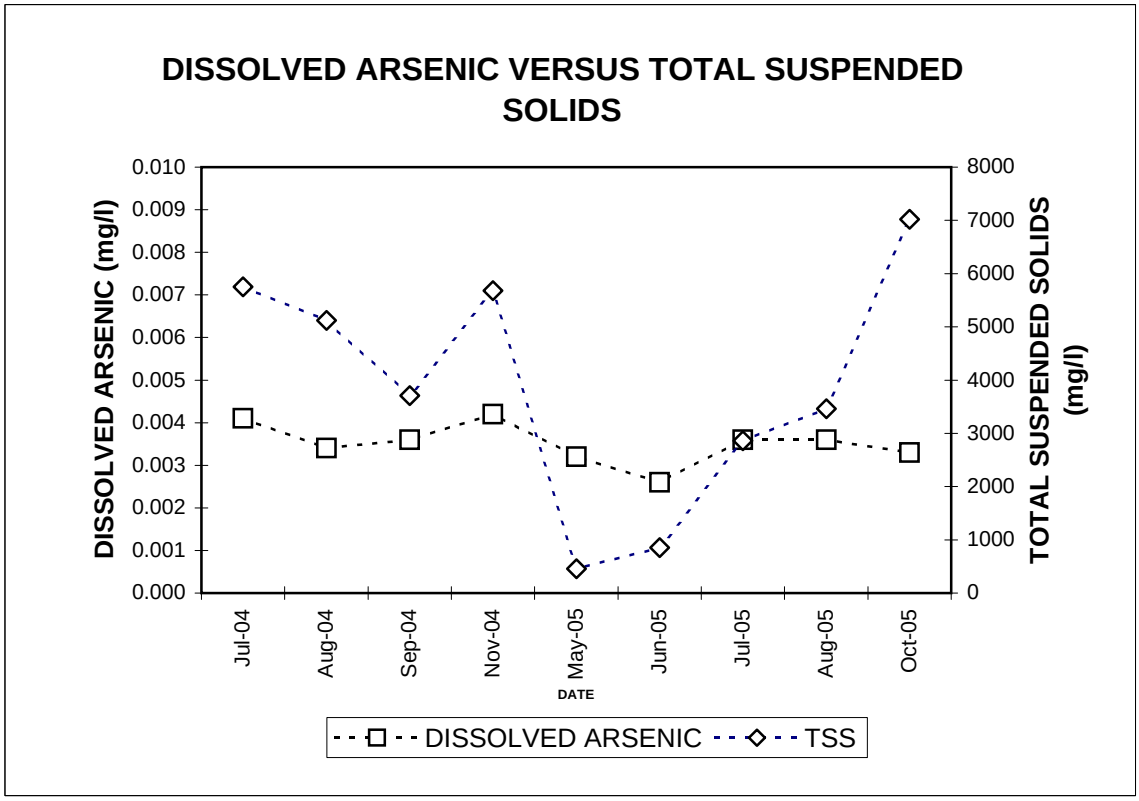
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28L

MONITOR WELL GT-6



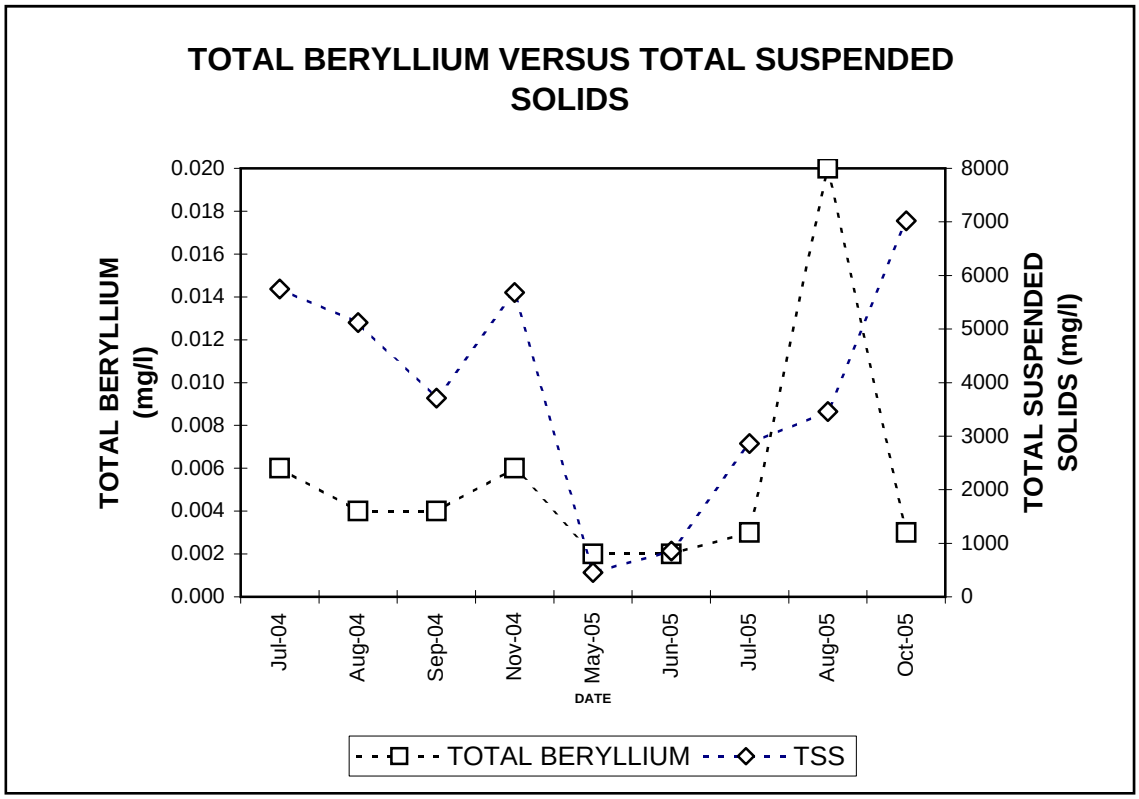


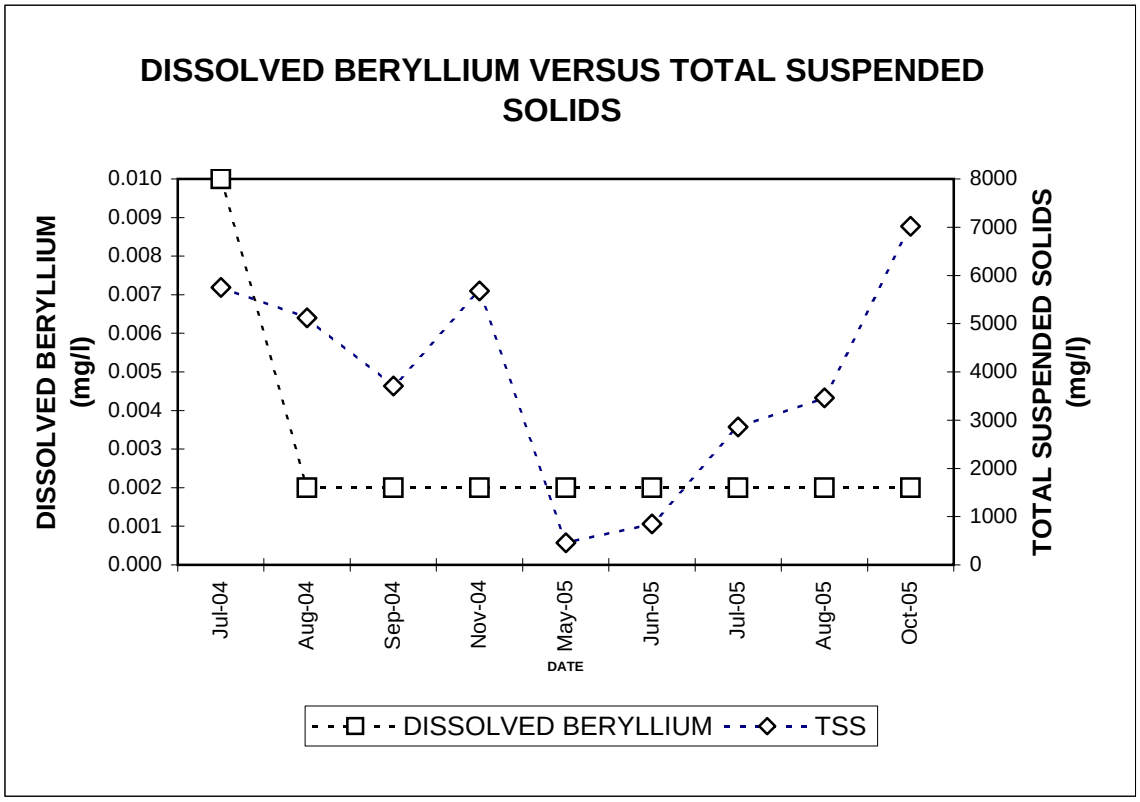
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28M

MONITOR WELL GT-6



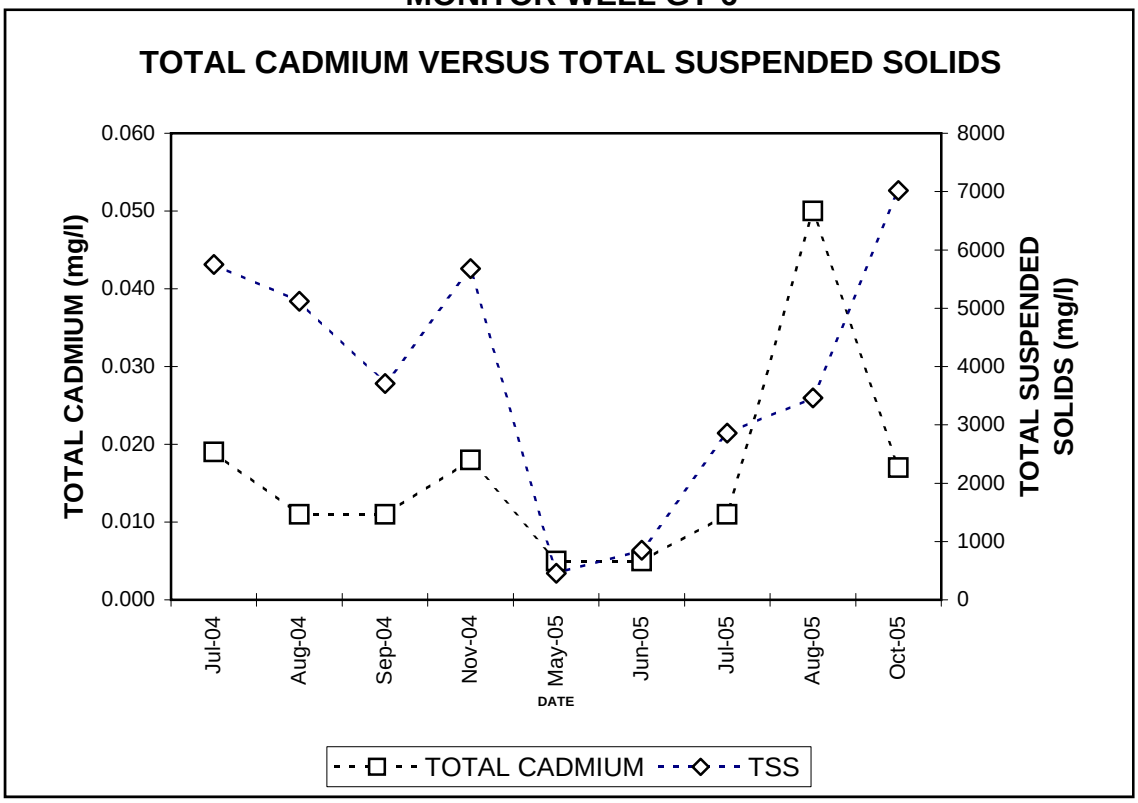


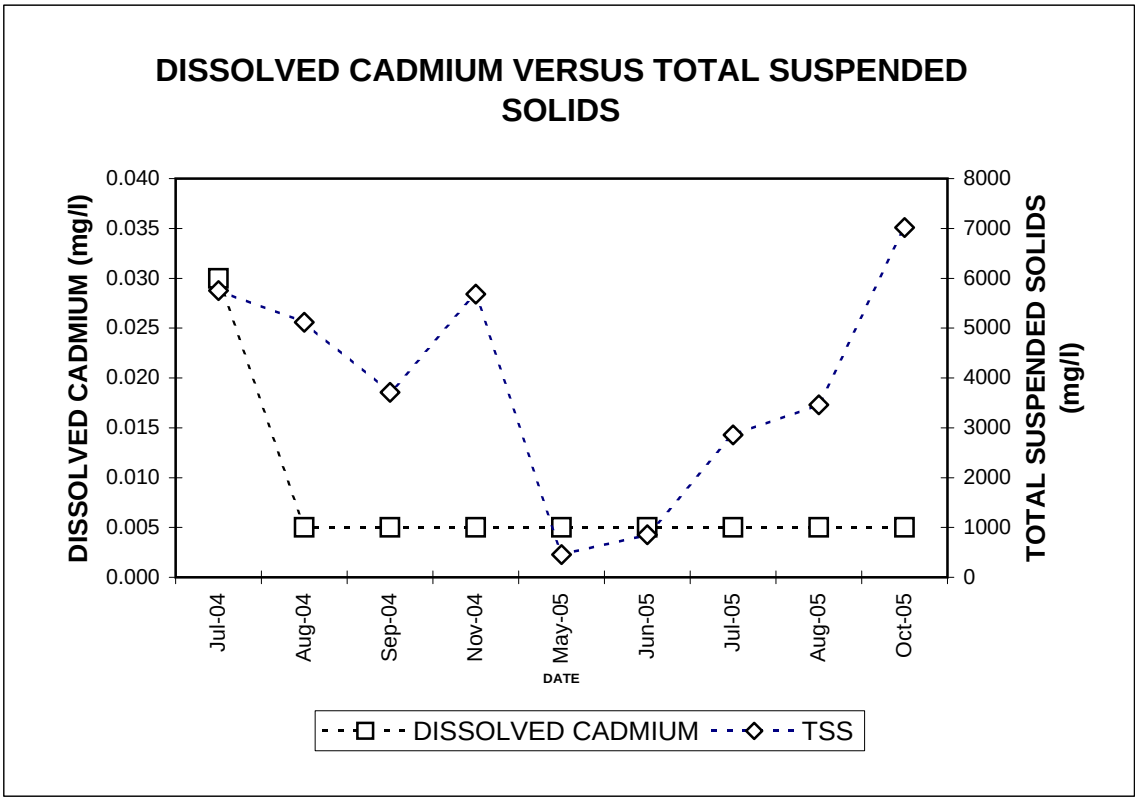
VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

DRAFT

FIGURE 4-28N

MONITOR WELL GT-6



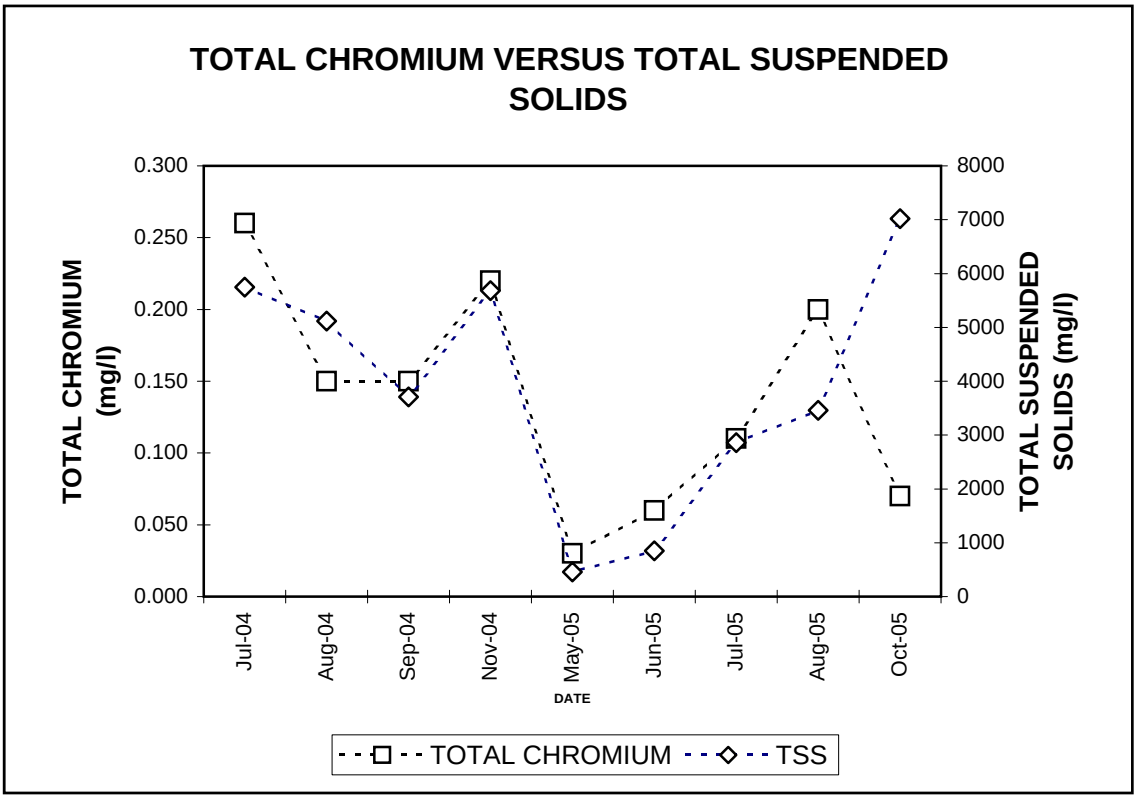


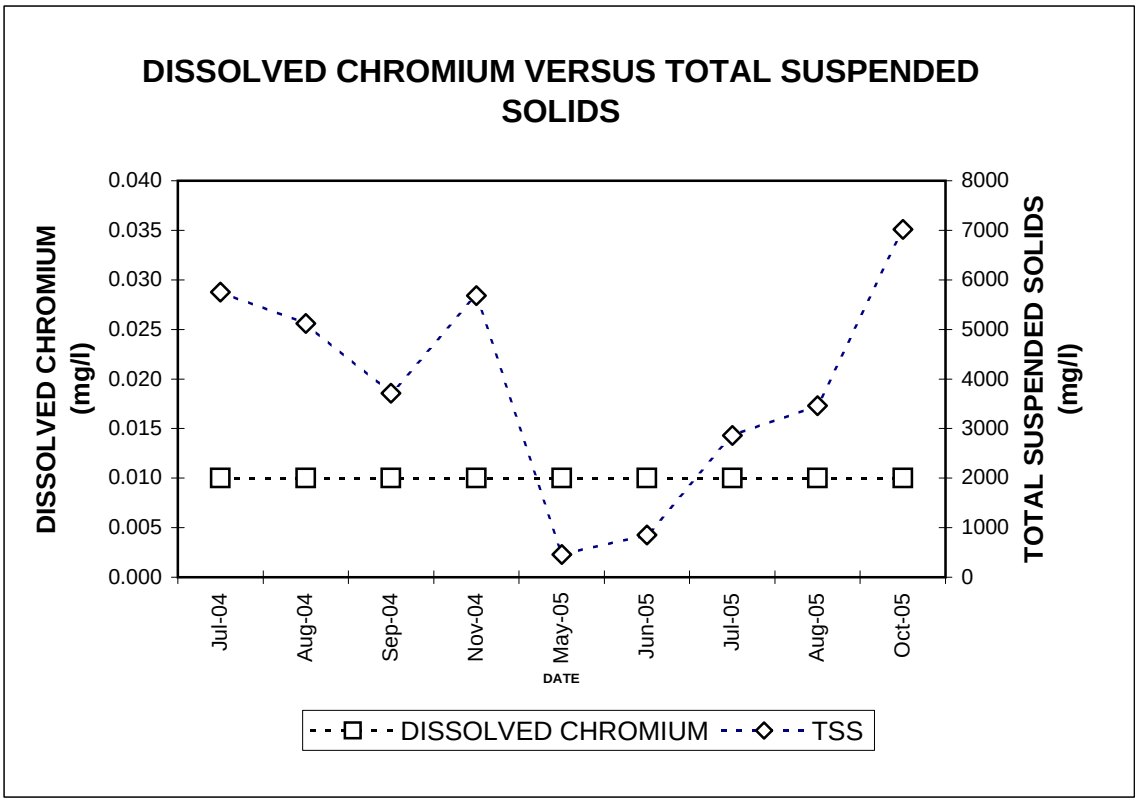
DRAFT

VALUES LESS THAN DET CTION PLO D
AT THE DETECTION LIMI

FIGURE 4-28O

MONITOR WELL GT-6



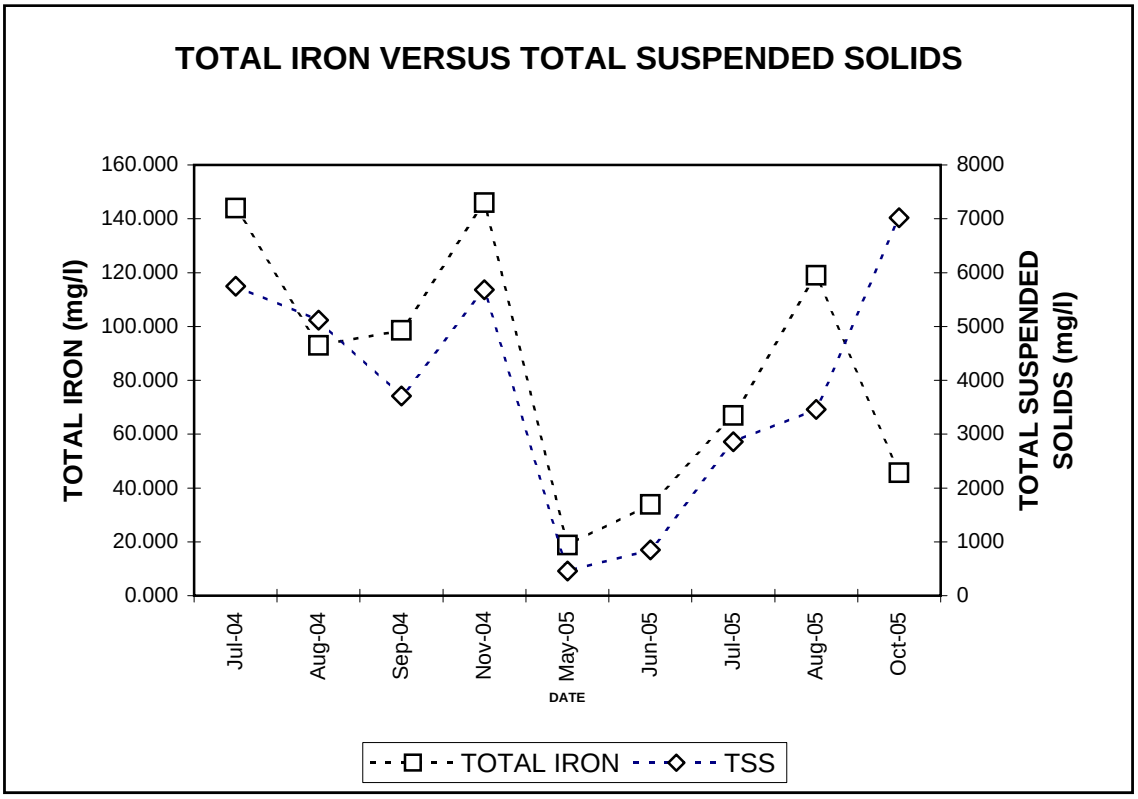


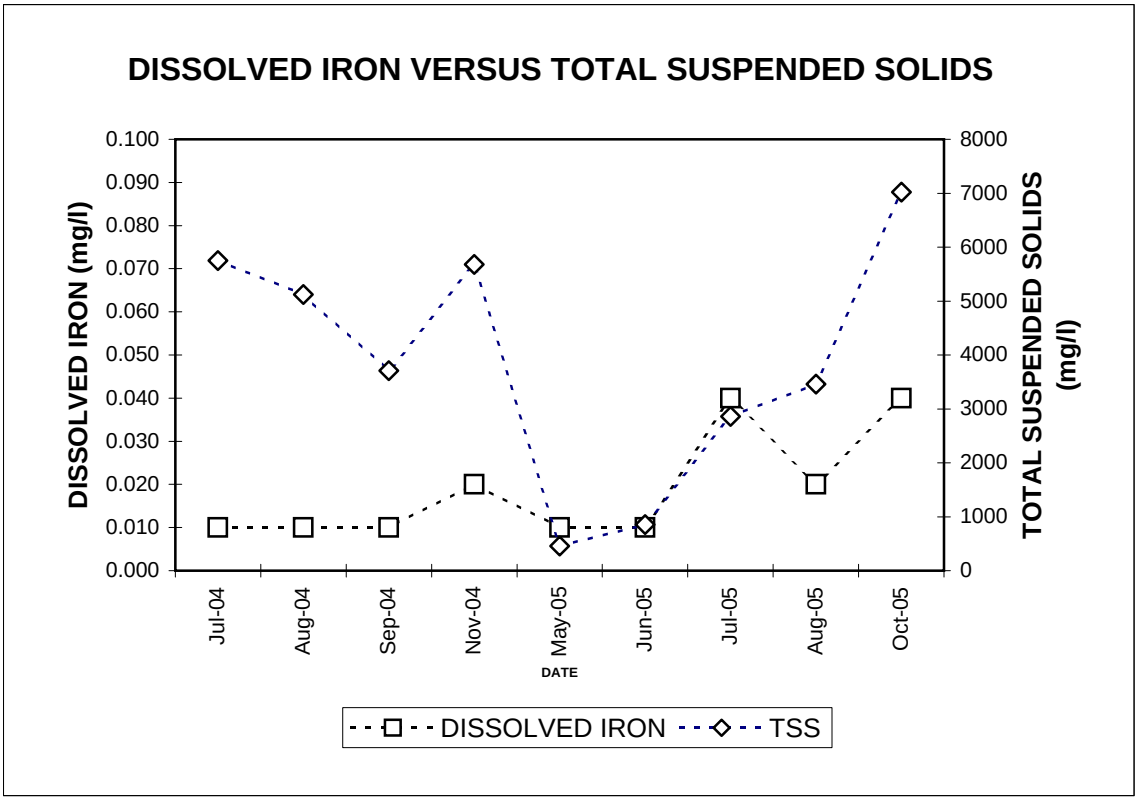
DRAFT

VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

FIGURE 4-28P

MONITOR WELL GT-6



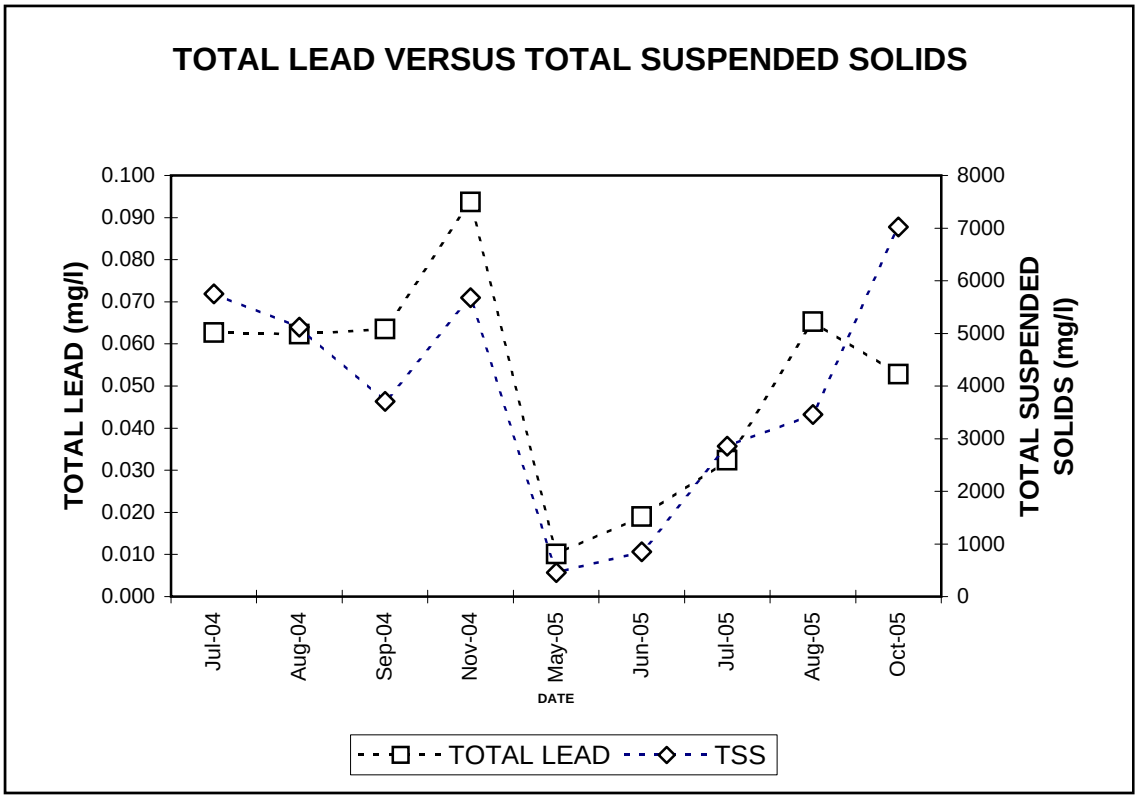


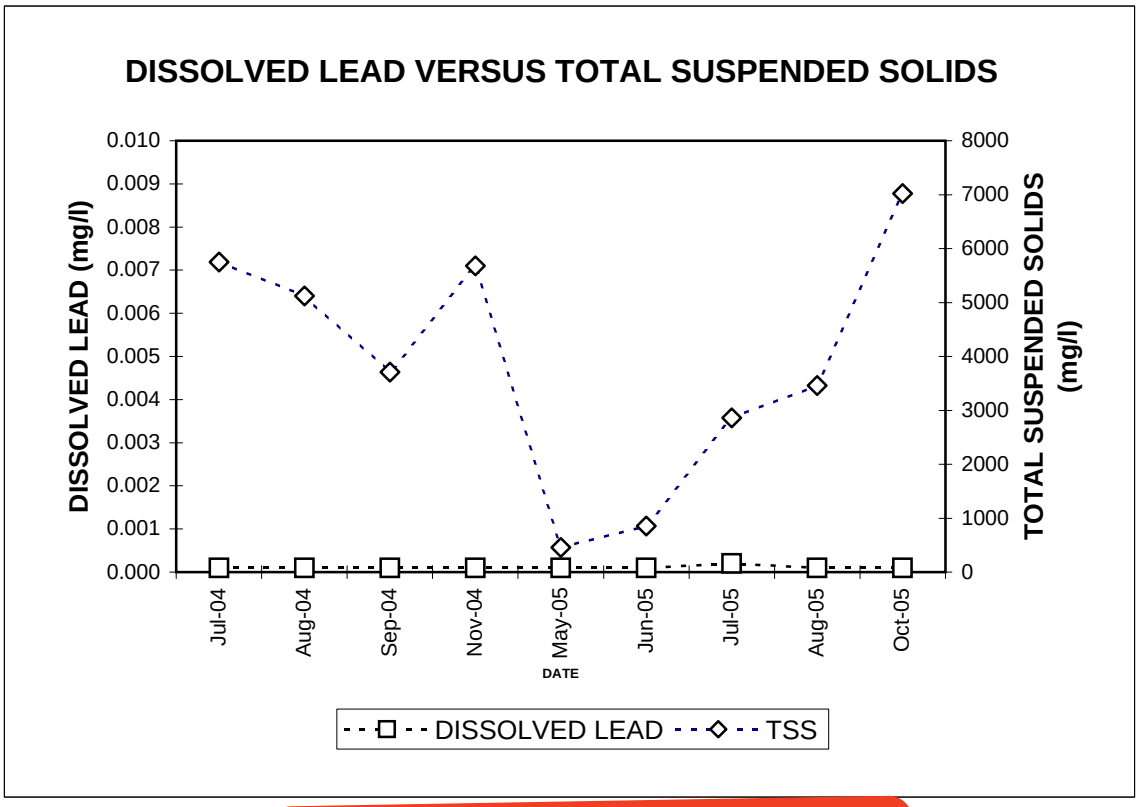
VALUES LESS THAN DETECTION PLOTTED AT THE DETECTION LIMIT

DRAFT

FIGURE 4-28Q

MONITOR WELL GT-6



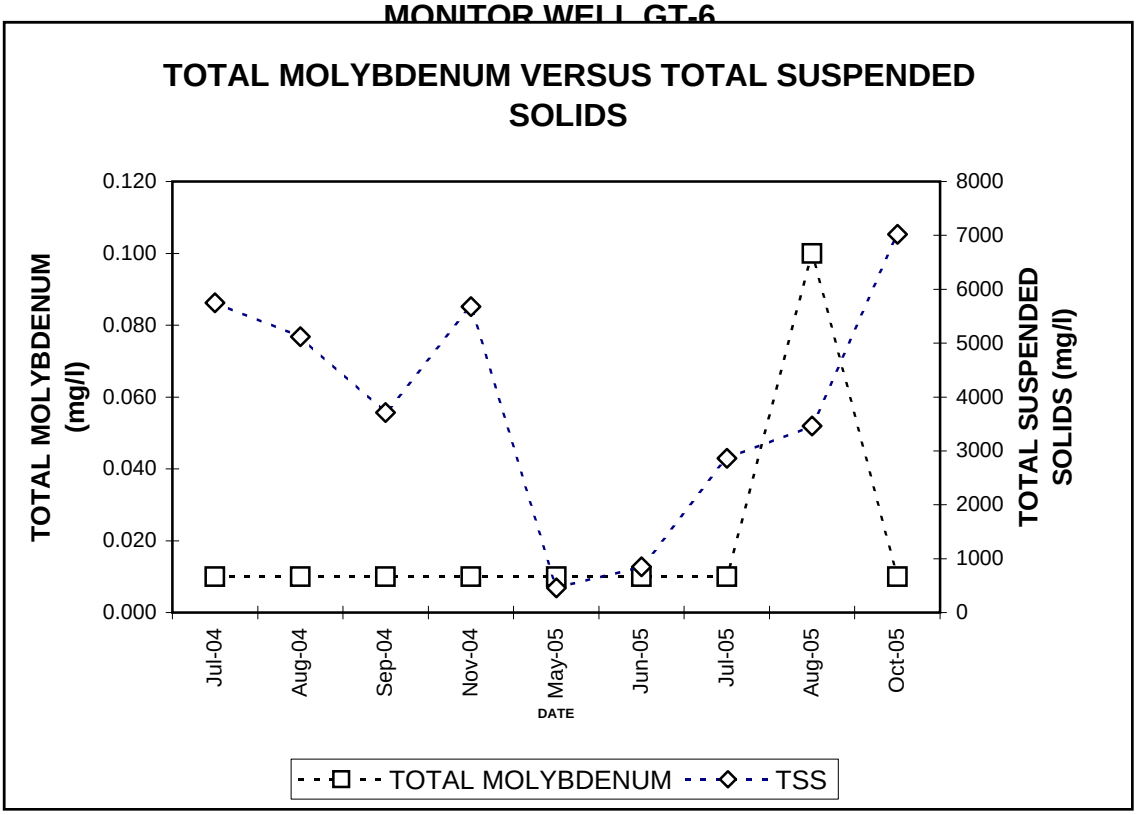


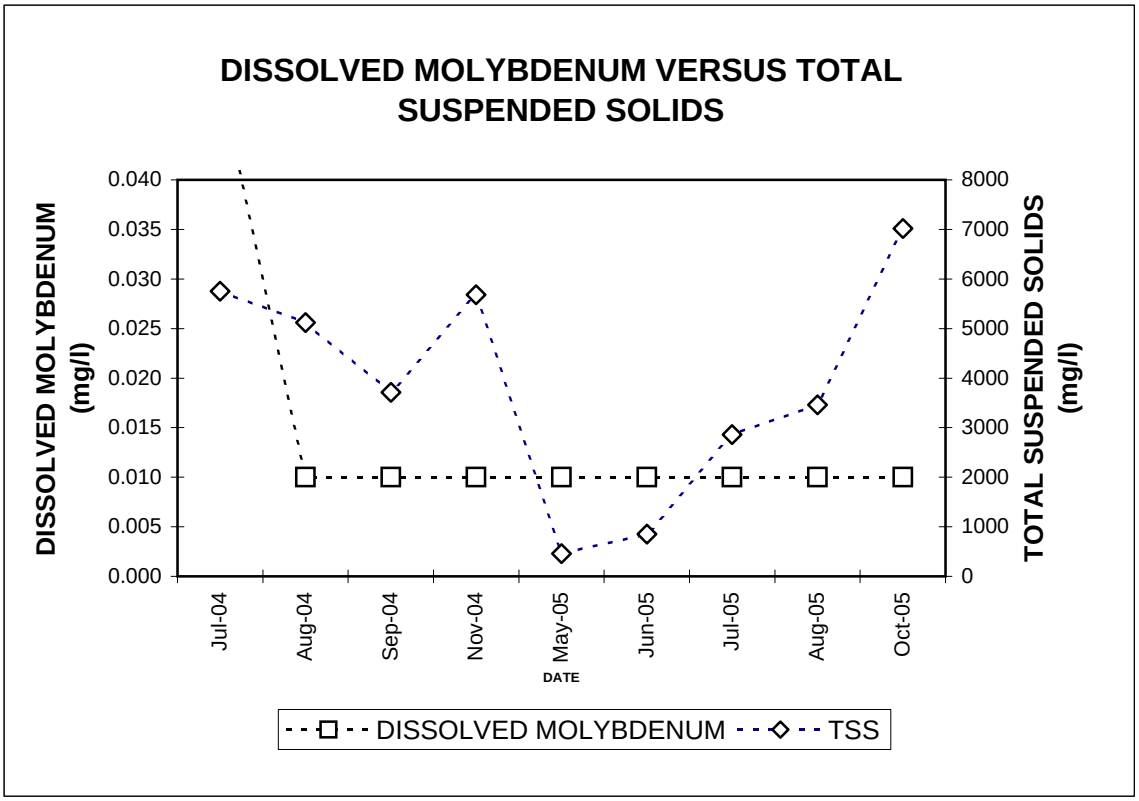
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28R

MONITOR WELL GT-6



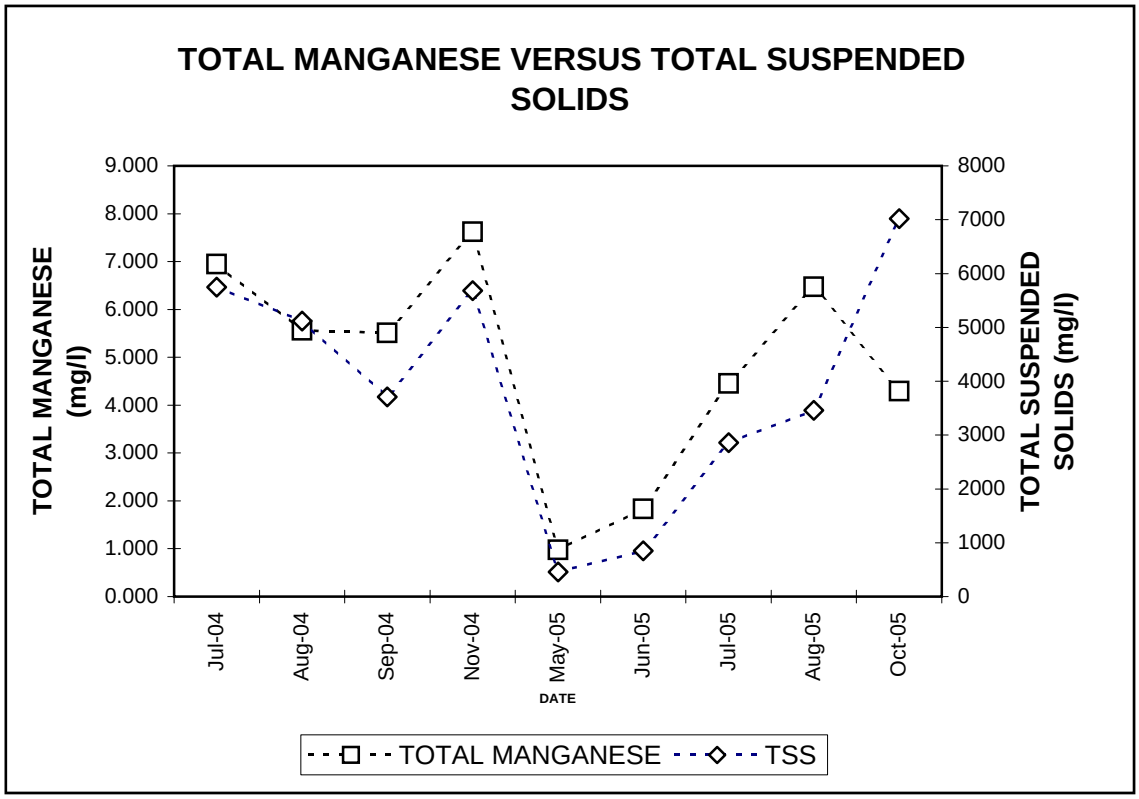


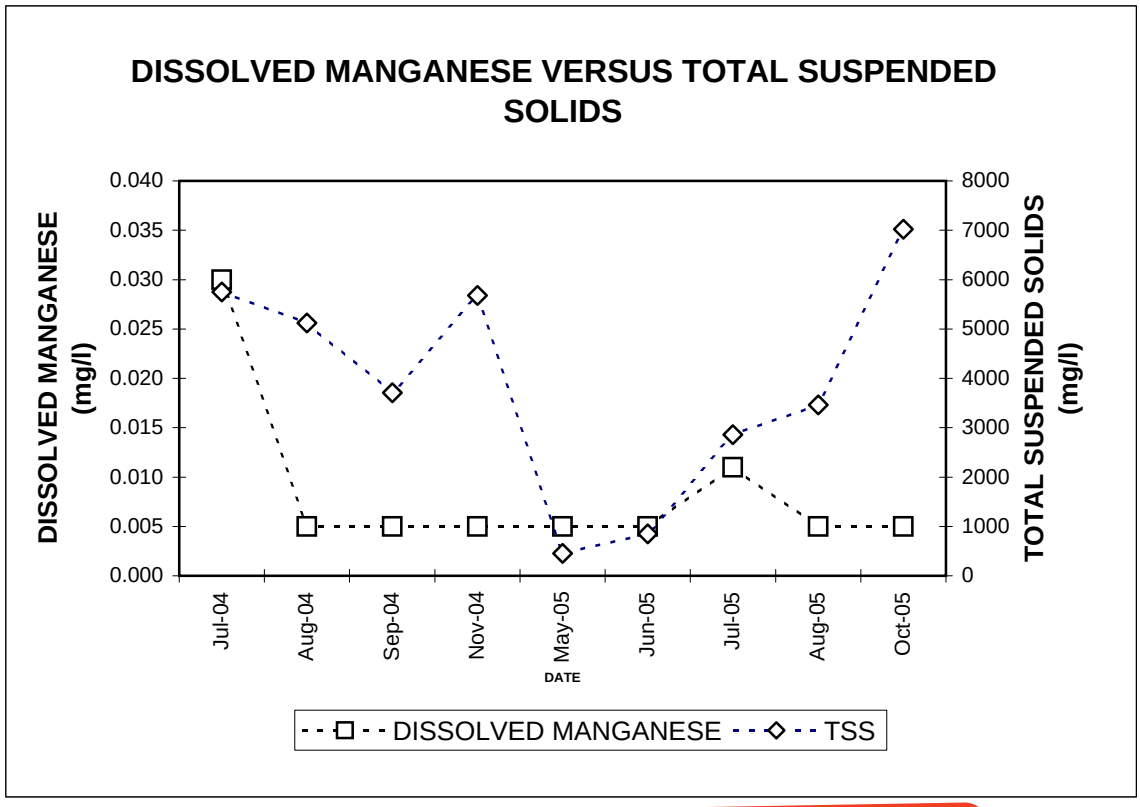
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28S

MONITOR WELL GT-6



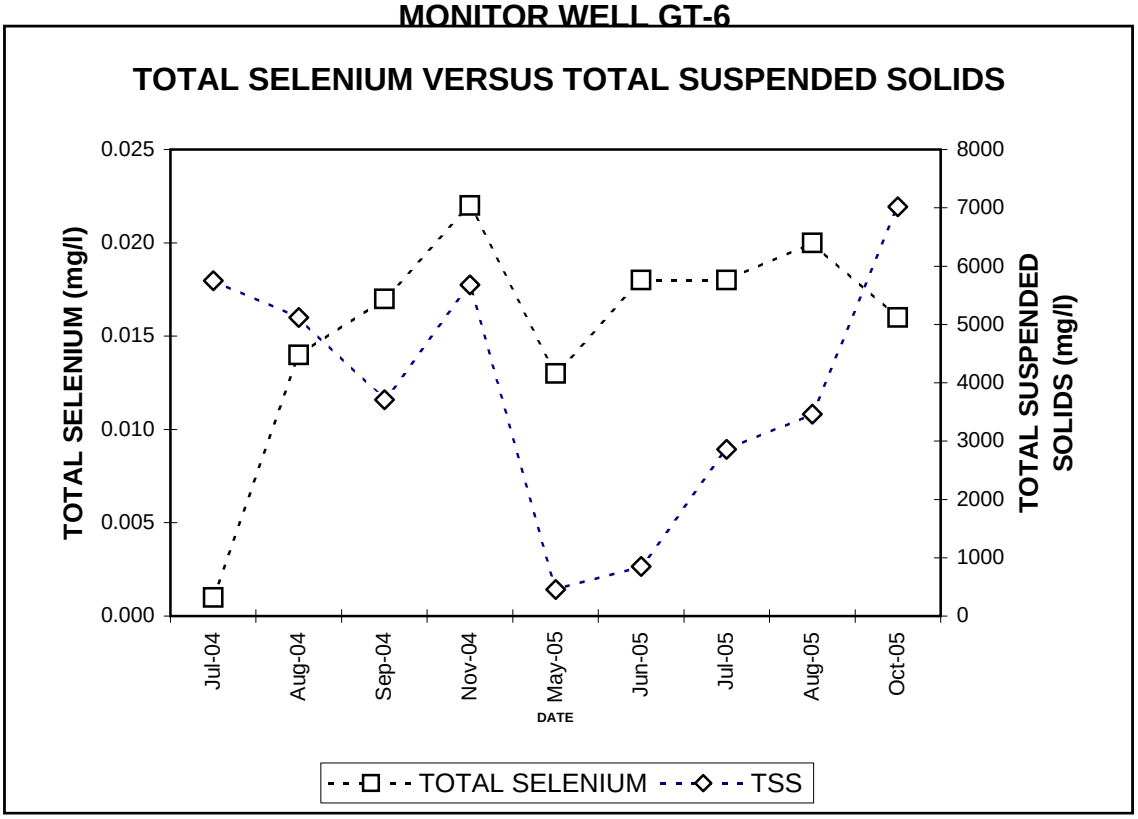


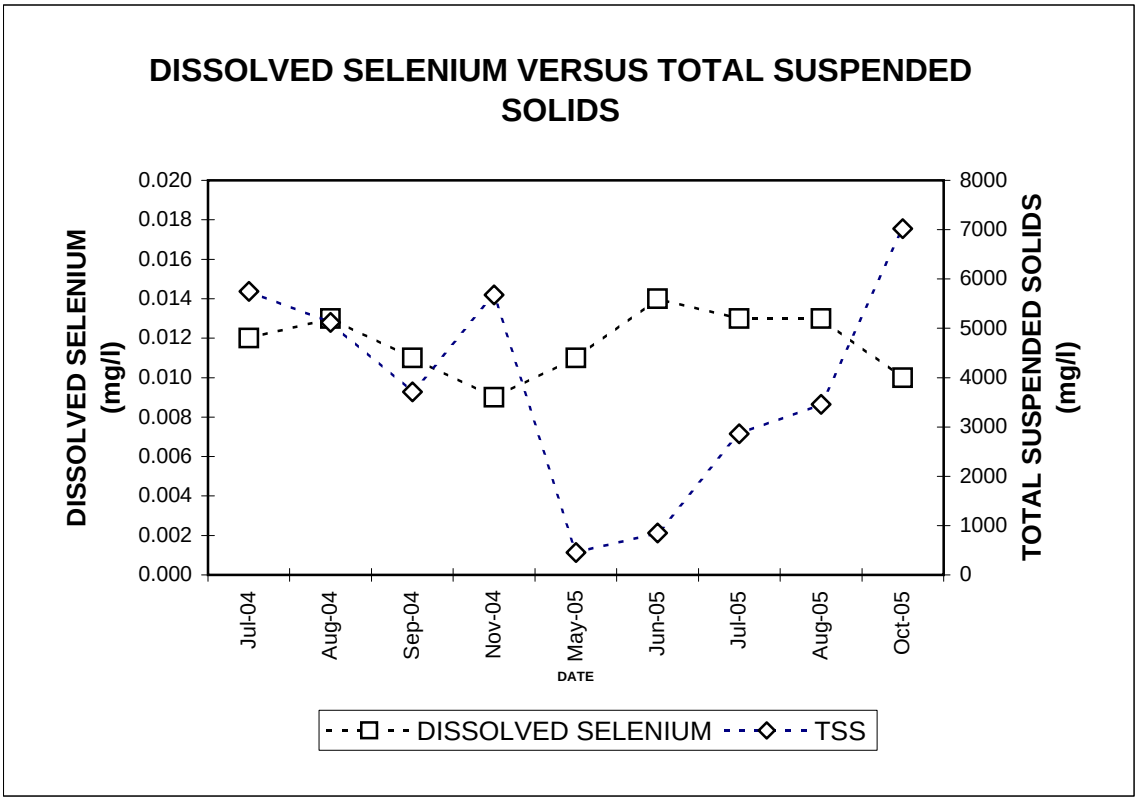
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28T

MONITOR WELL GT-6



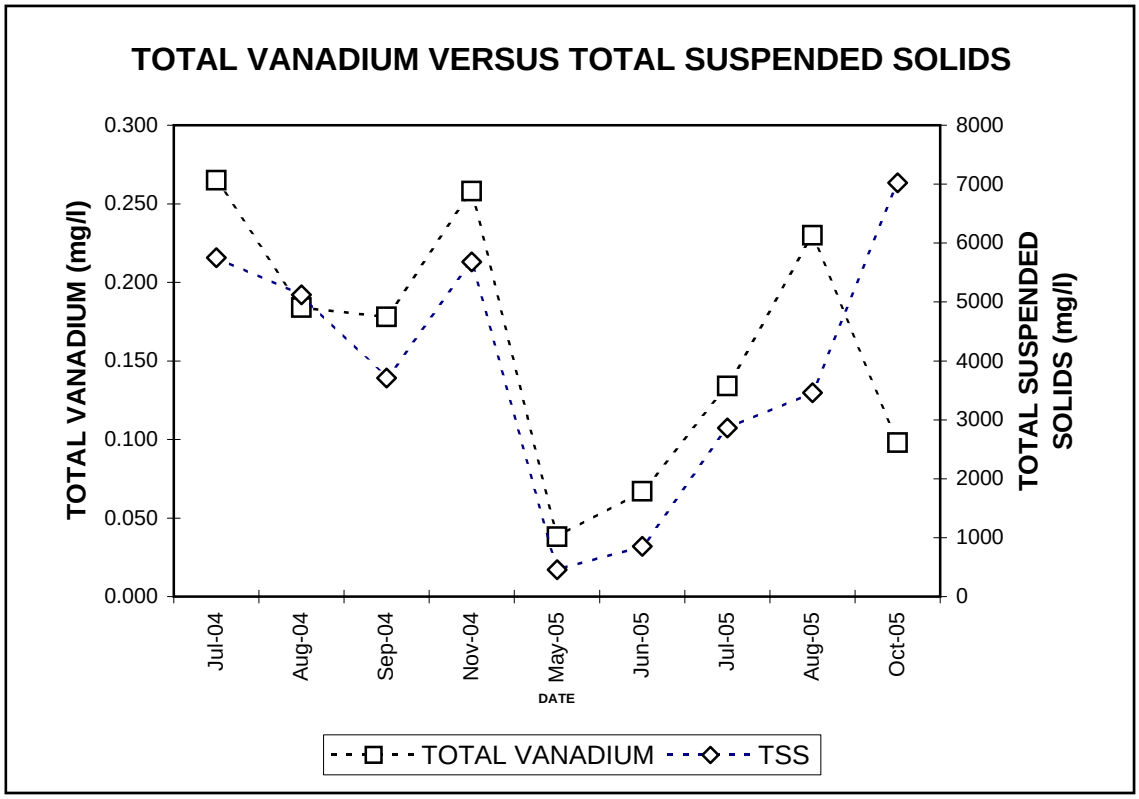


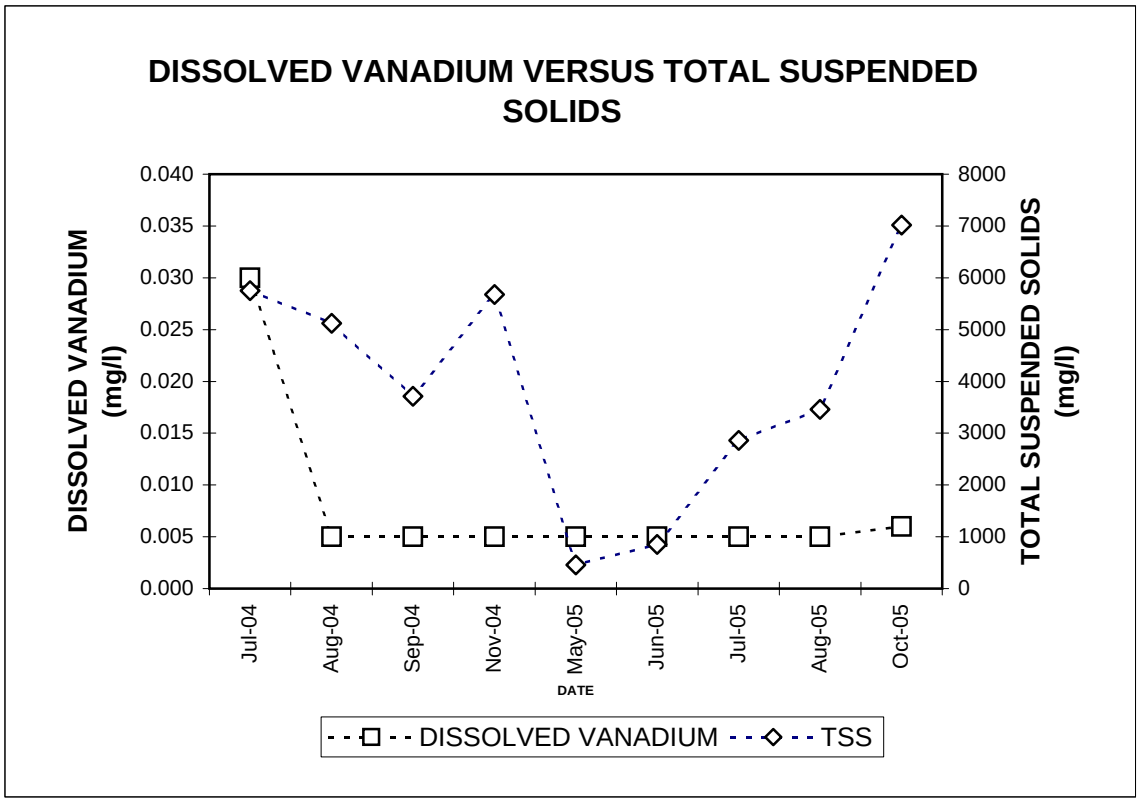
DRAFT

VALUES LESS THAN DETECTION PLOTTED
AT THE DETECTION LIMIT

FIGURE 4-28U

MONITOR WELL GT-6

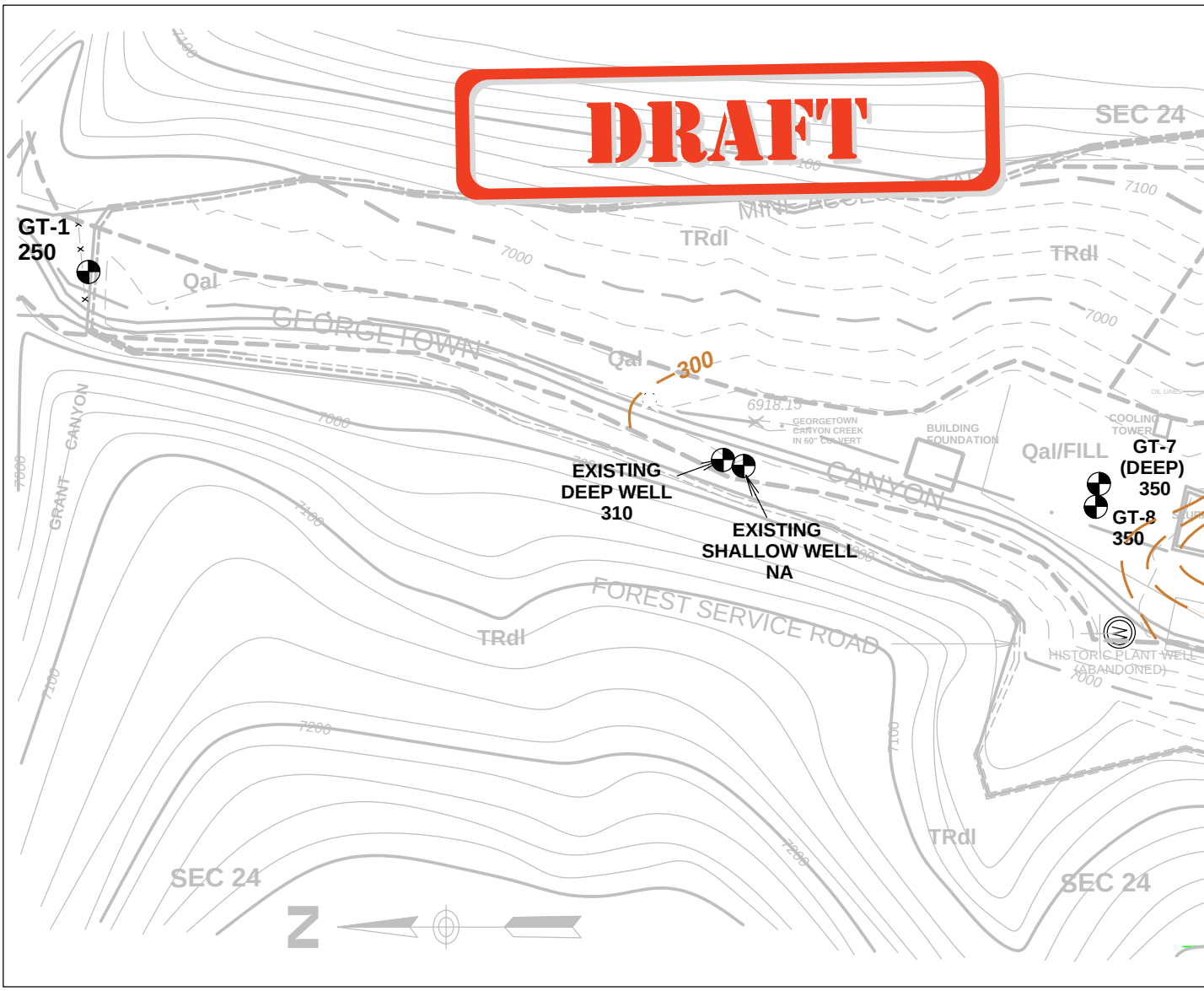




VALUES LESS THAN DETECTION LOTTED AT THE DETECTION LIMIT

DRAFT

FIGURE 4-28V



KEY

GT-1
250

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

500

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

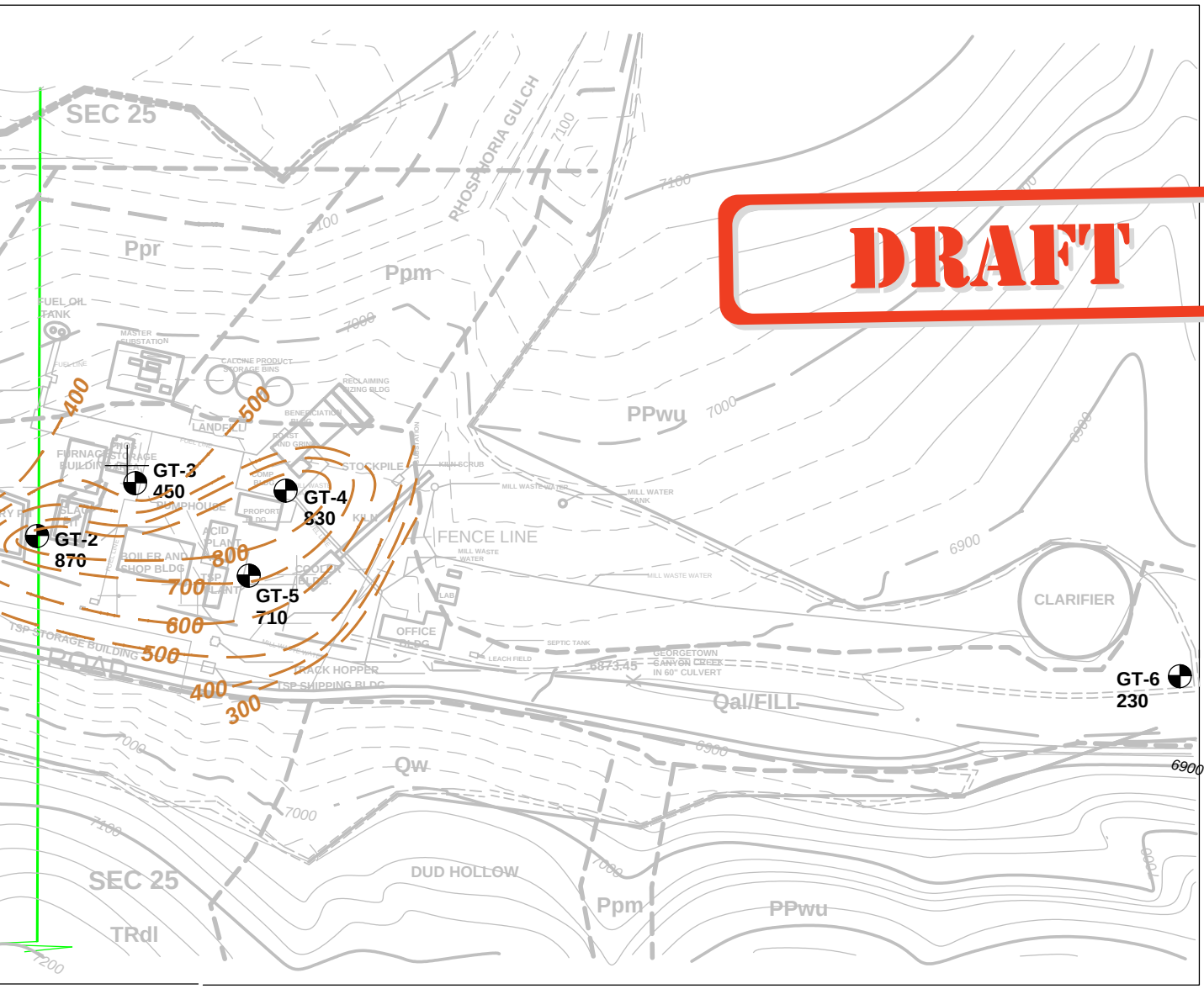
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

UM

ASH

WOODY FM.

FM.

IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF TOTAL DISSOLVED SOLIDS SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-29	

KEY

GT-1
0.02

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

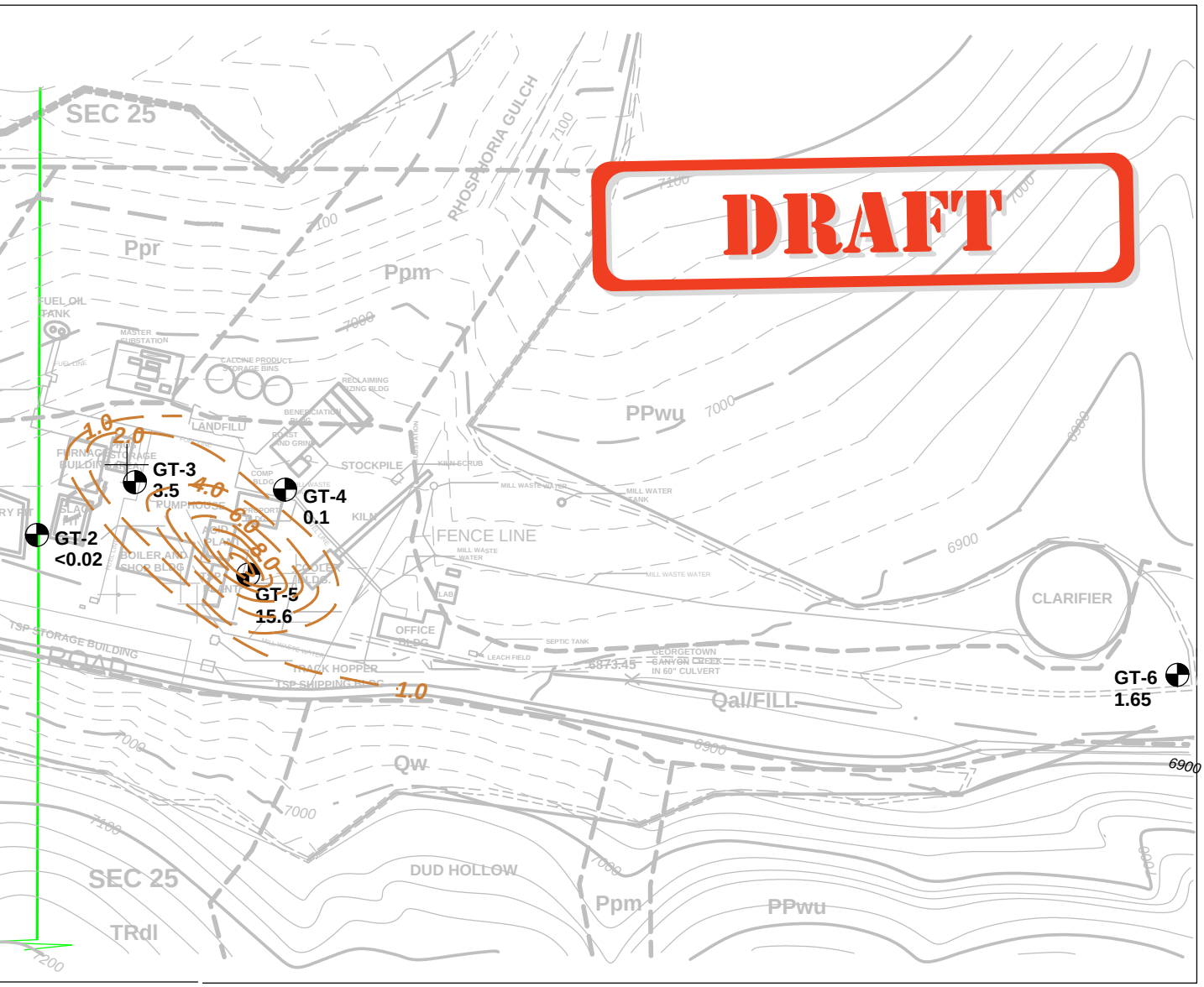
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF NITRATE-NITRITE SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-30	

KEY

GT-1
0.04

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

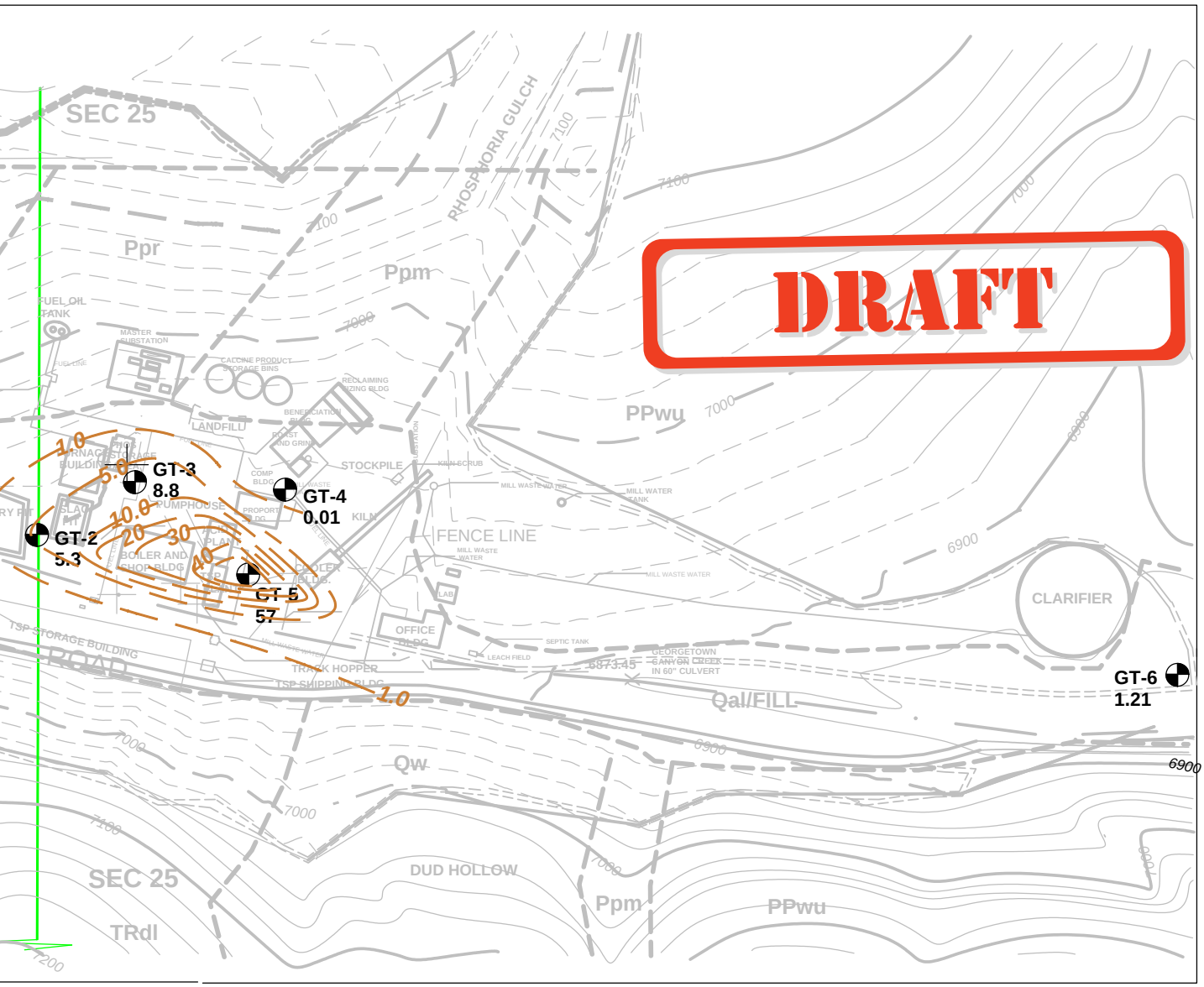
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

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CONTOUR INTERVAL = 20 FEET

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	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF ORTHOPHOSPHATE SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-31	

KEY

GT-1
<0.0005

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (MG/L)

0.01

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV
UPPER WELLS FM.

REFERENCES:

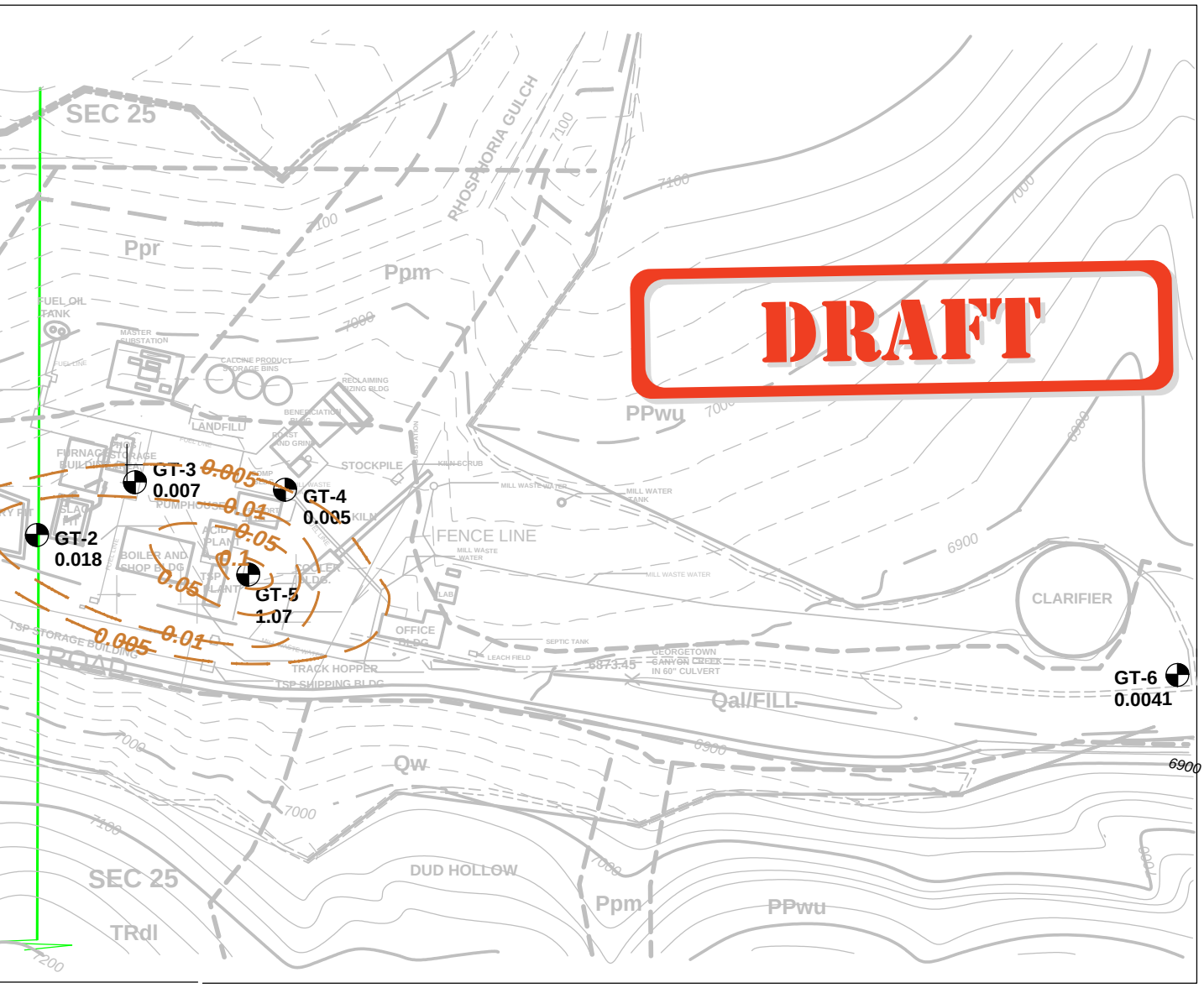
U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

2 1

T 10 S R 44 E



MAP SCALE

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CONTOUR INTERVAL = 20 FEET

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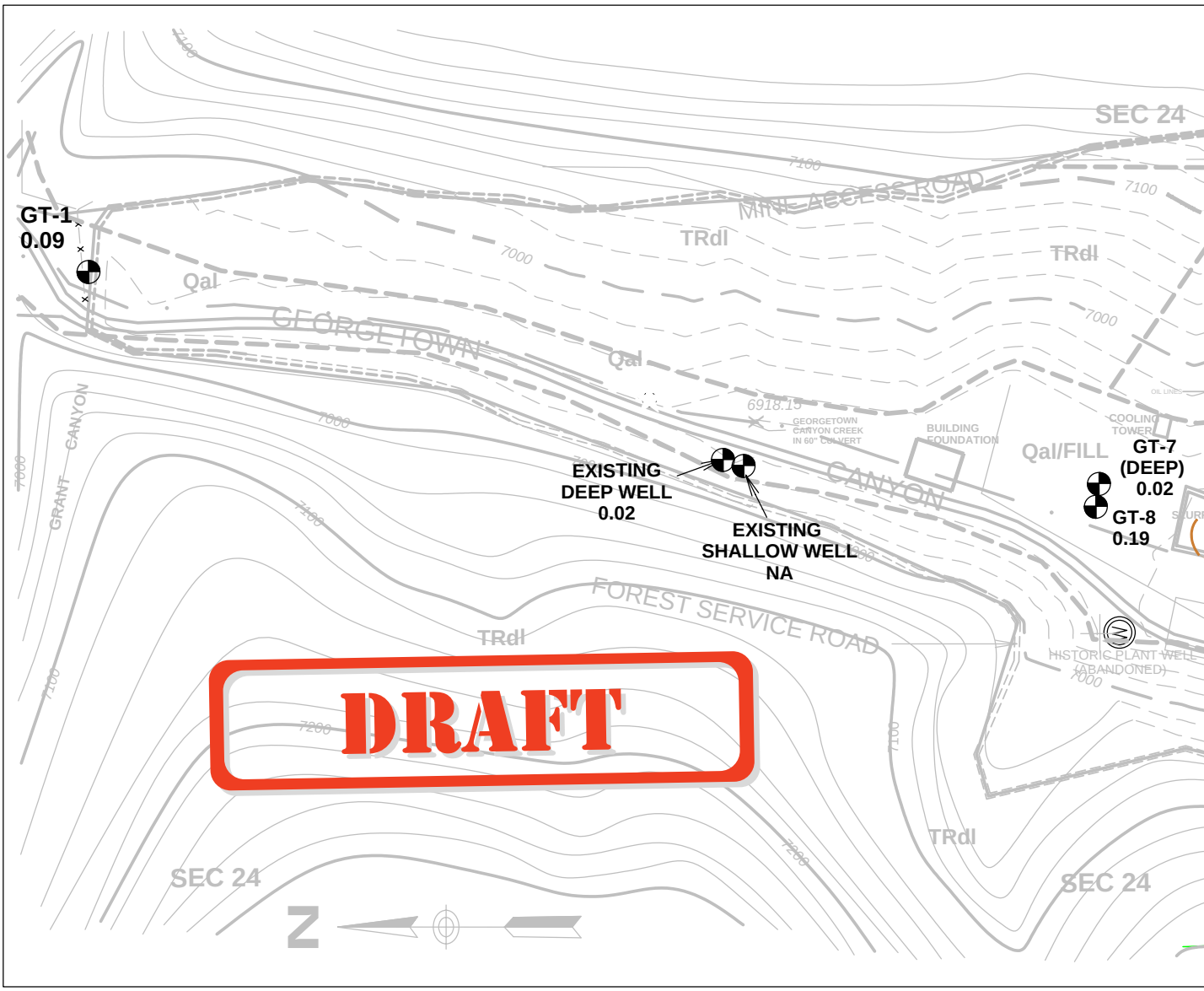
	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF ARSENIC SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-32	

2 1



KEY

GT-1
0.09

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

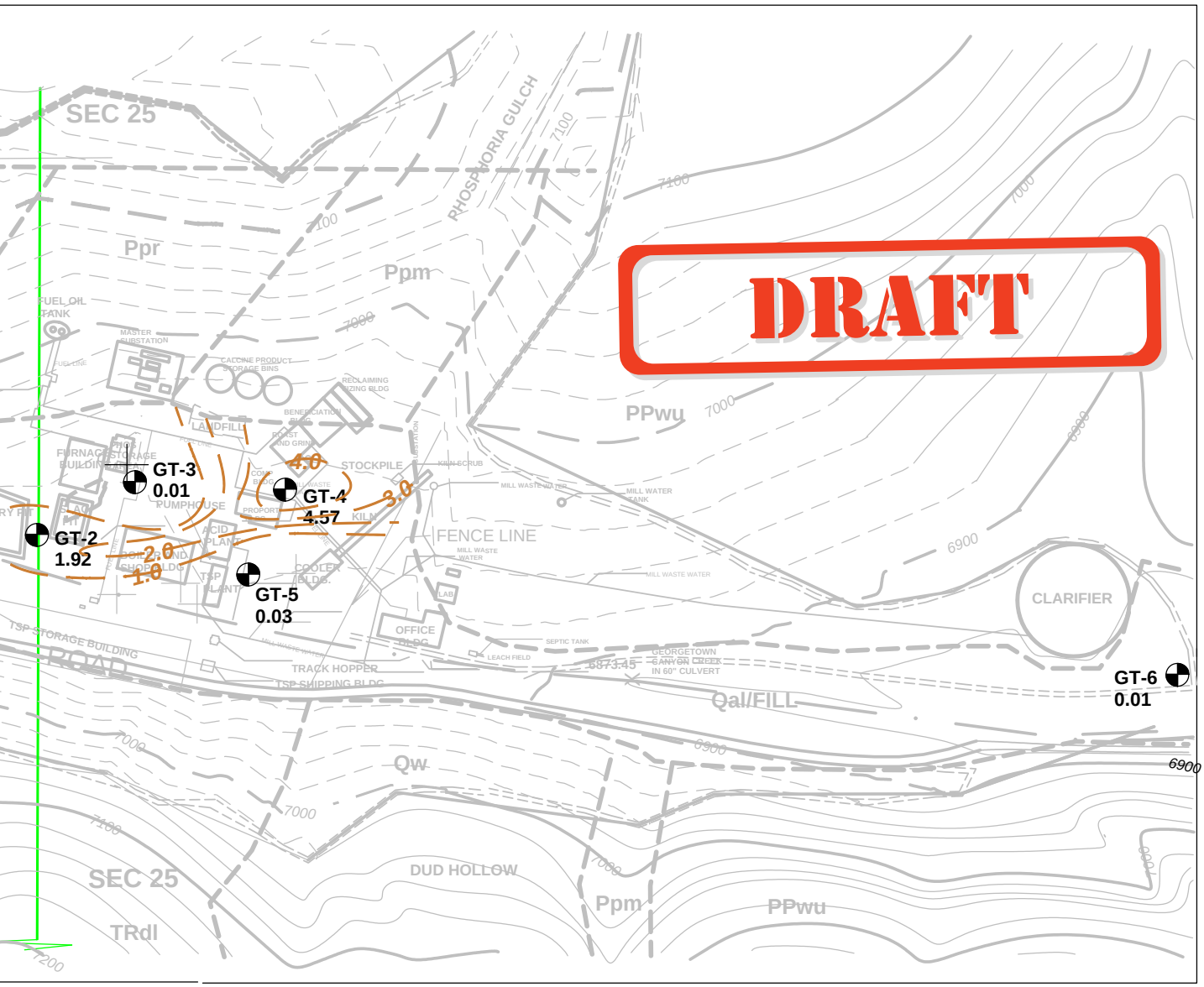
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

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CONTOUR INTERVAL = 20 FEET

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	FINAL SITE INVESTIGATION REPORT			
	TITLE: CONCENTRATIONS OF IRON SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-33	

KEY

GT-1
0.013

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

0.2

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

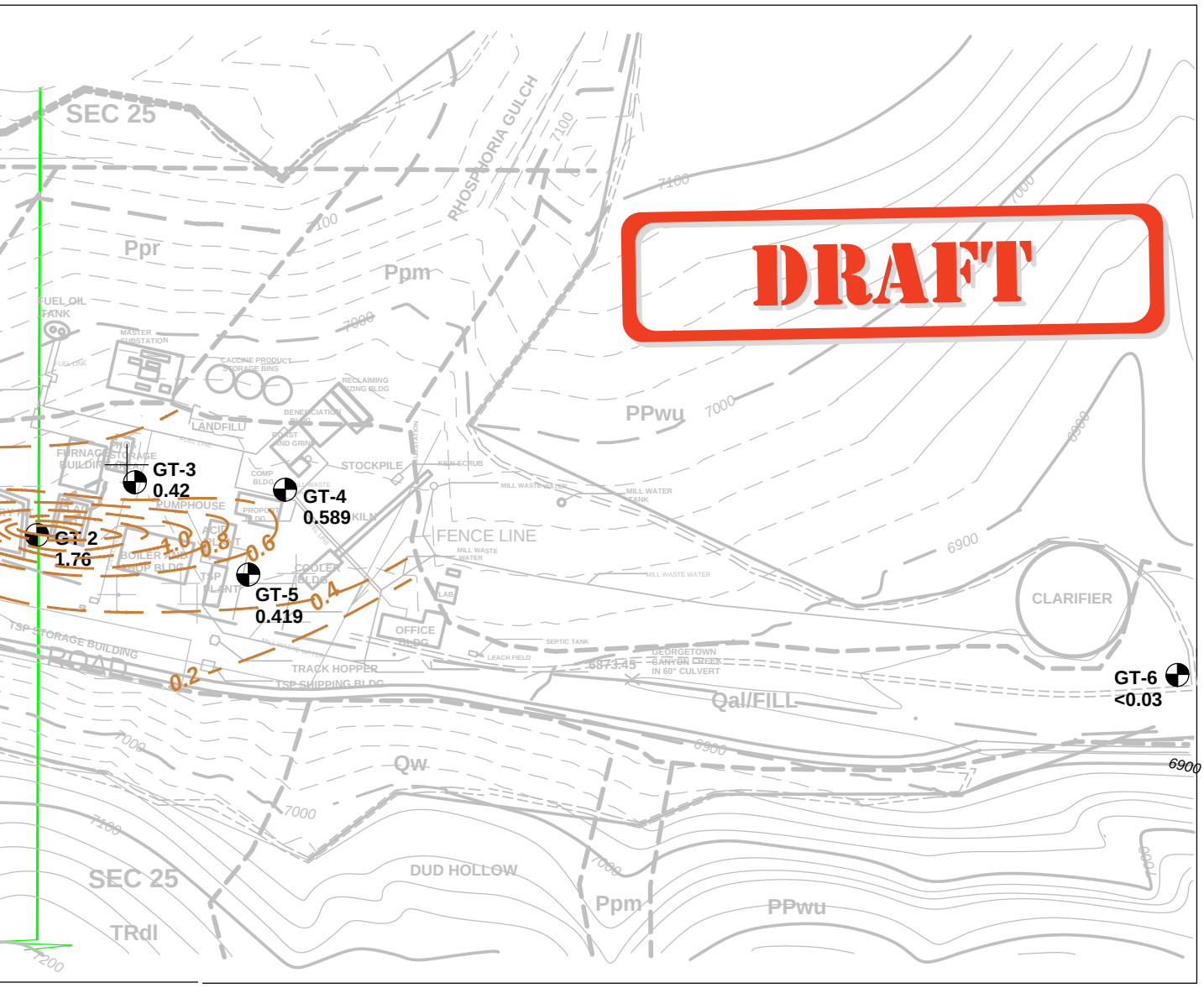
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

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CONTOUR INTERVAL = 20 FEET

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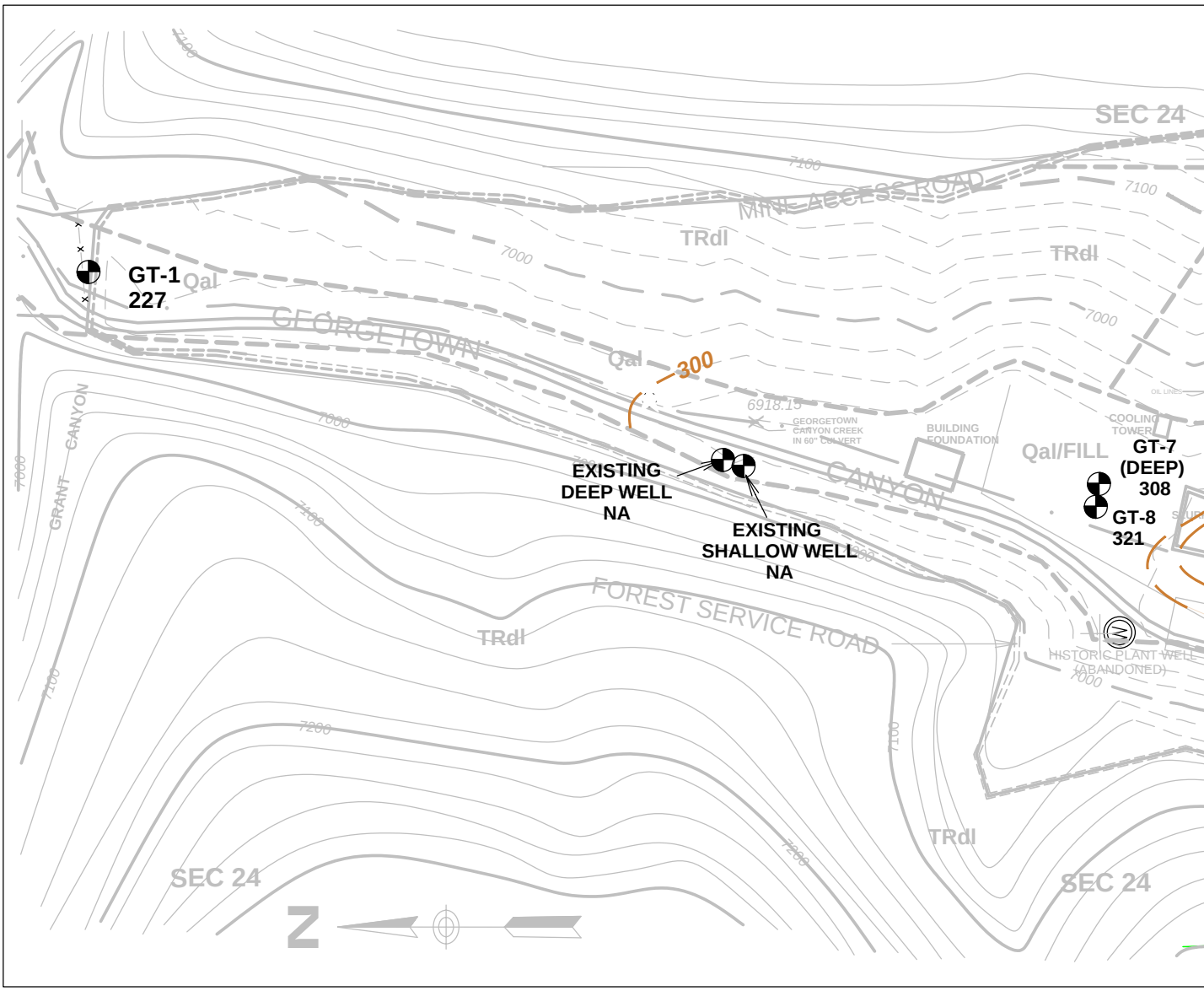
	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF MANGANESE SHALLOW AQUIFER JULY 2004 SAMPLING CENTRAL FARMERS FERTILIZER FACILITY			
11/22/04	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-34	



KEY

GT-1
227

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

500

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

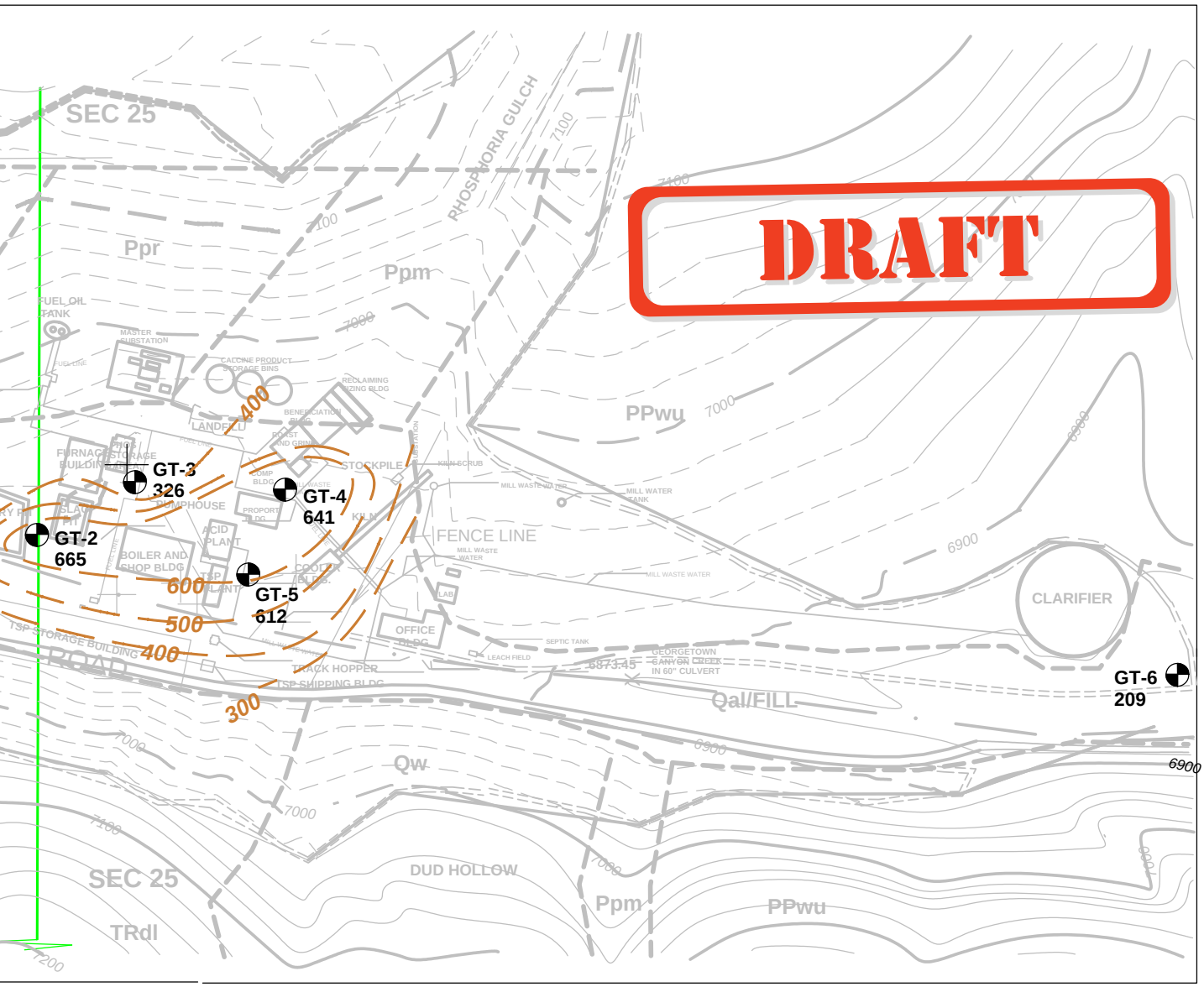
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

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CONTOUR INTERVAL = 20 FEET

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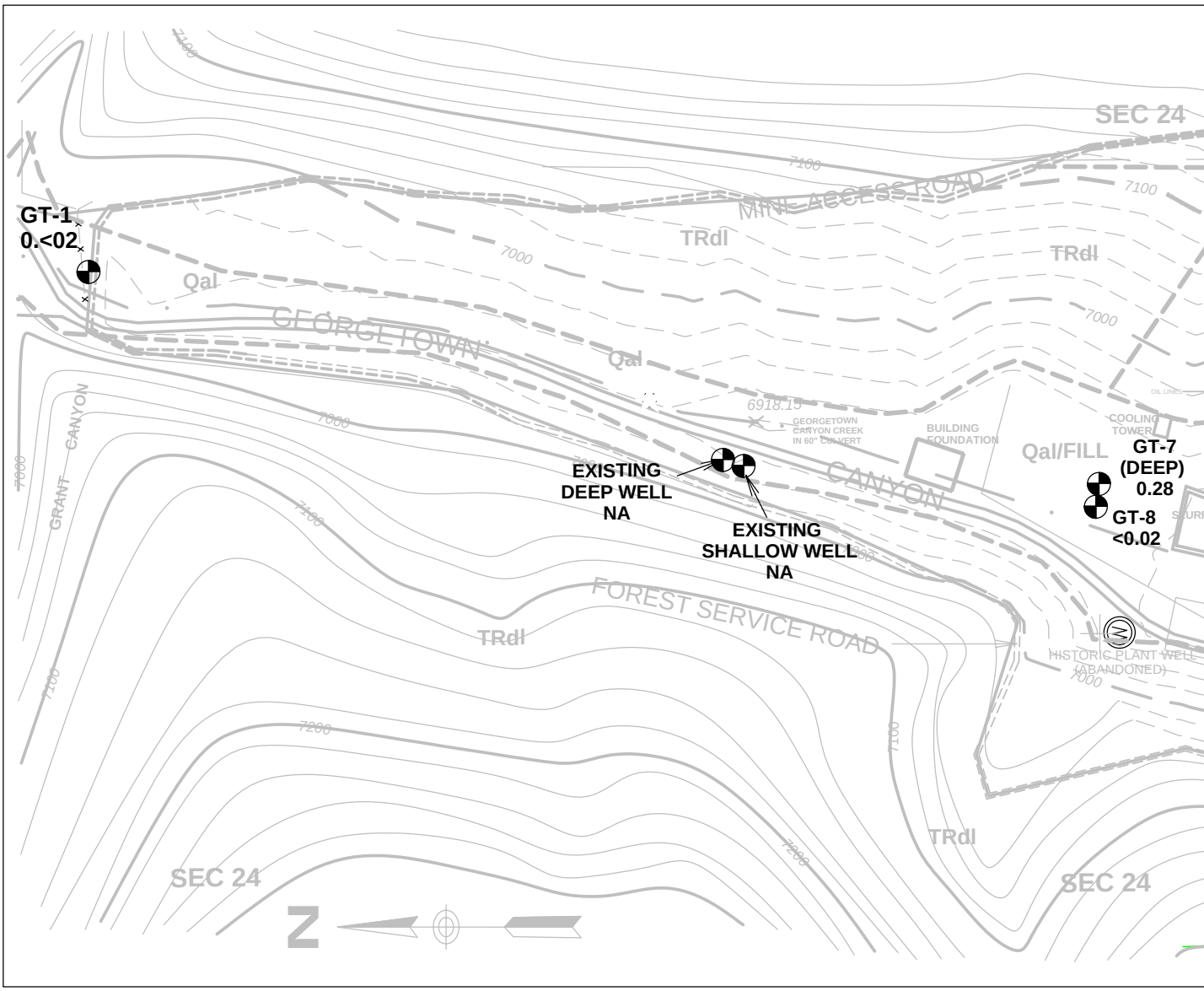
	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF TOTAL DISSOLVED SOLIDS SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
1/15/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-35	



KEY

GT-1
0.<02

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

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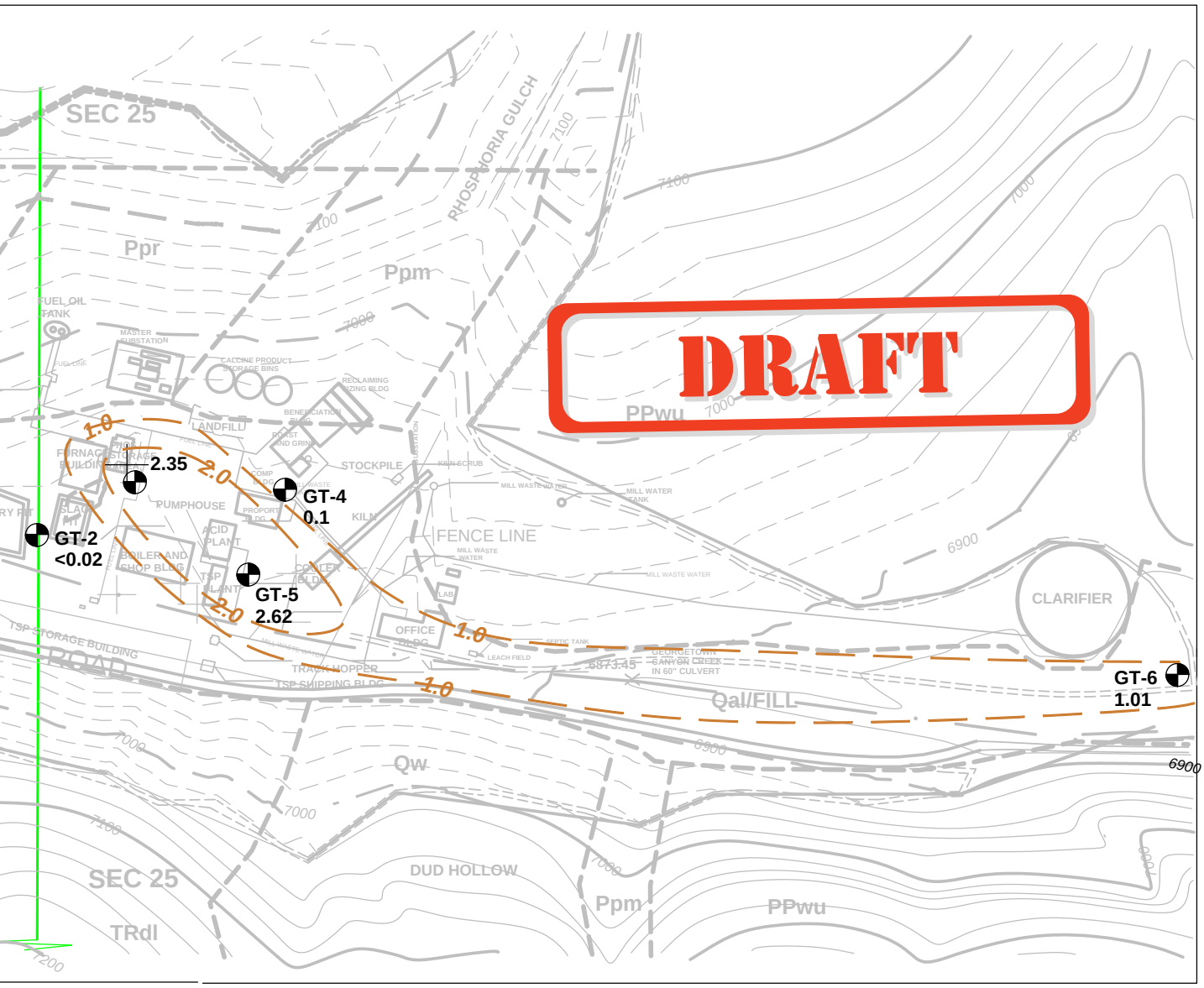

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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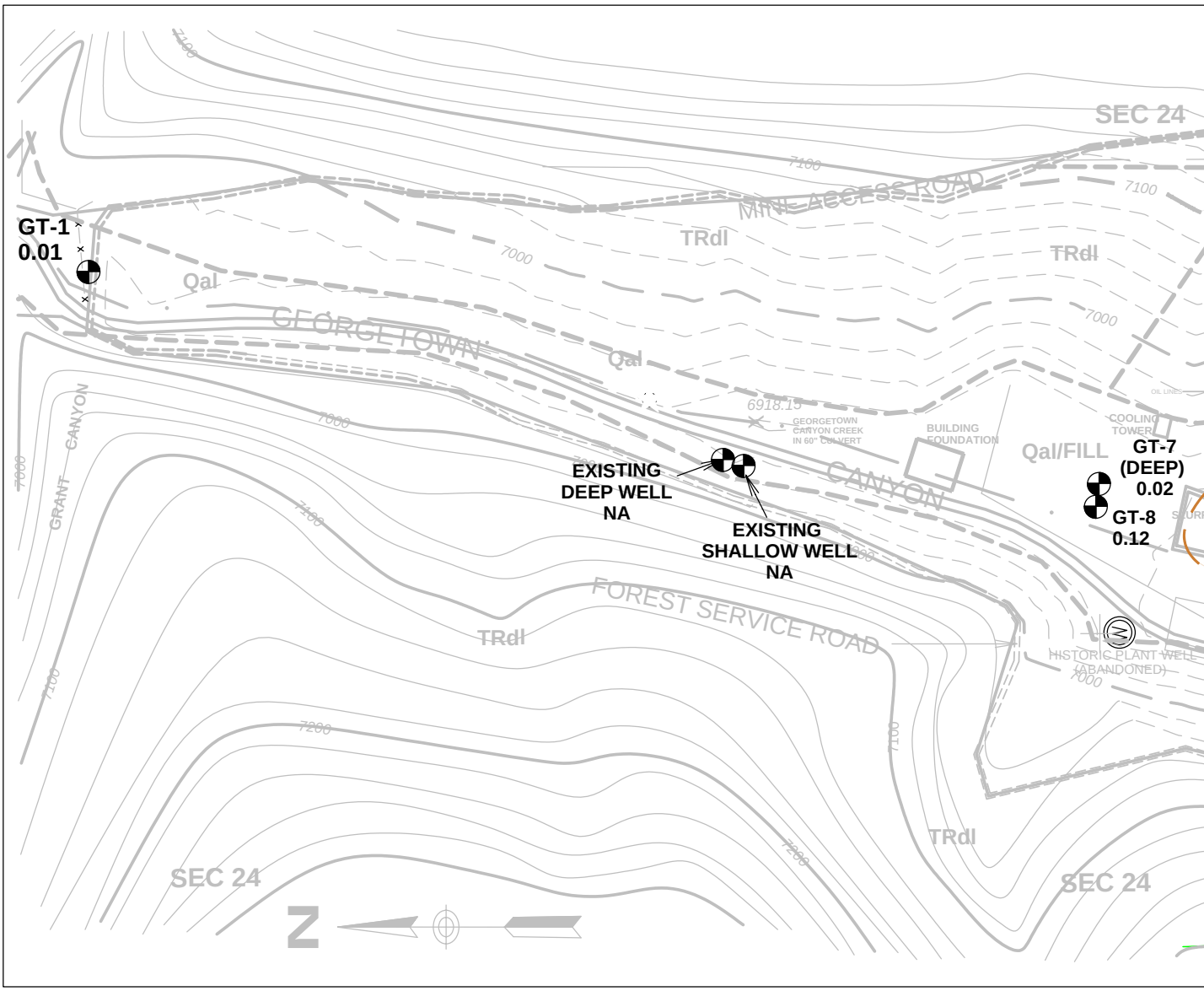
	FINAL SITE INVESTIGATION REPORT				
	TITLE CONCENTRATIONS OF NITRATE-NITRITE SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY				
12/30/05	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 4-36	

2 1



KEY

GT-1
0.01

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

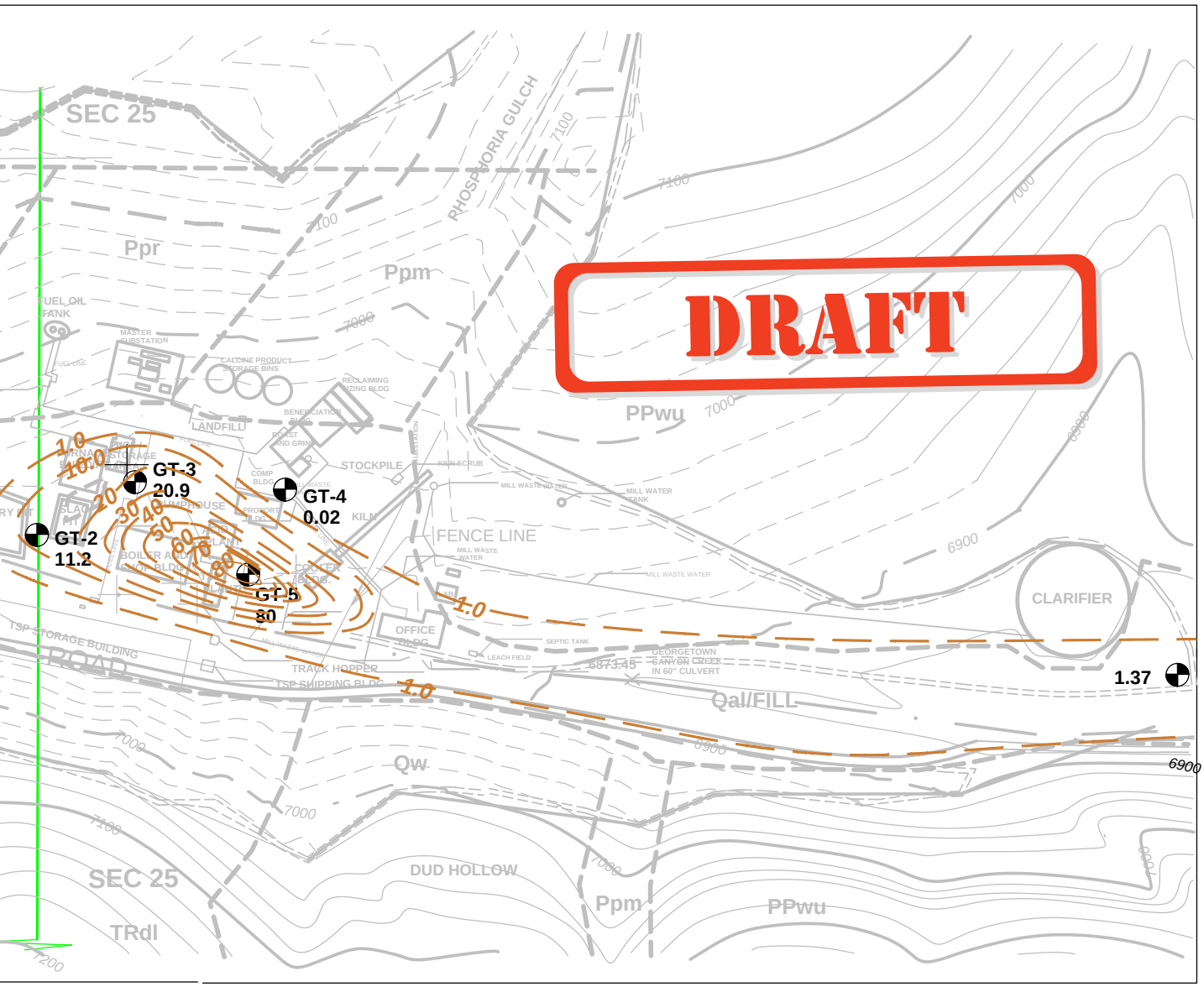
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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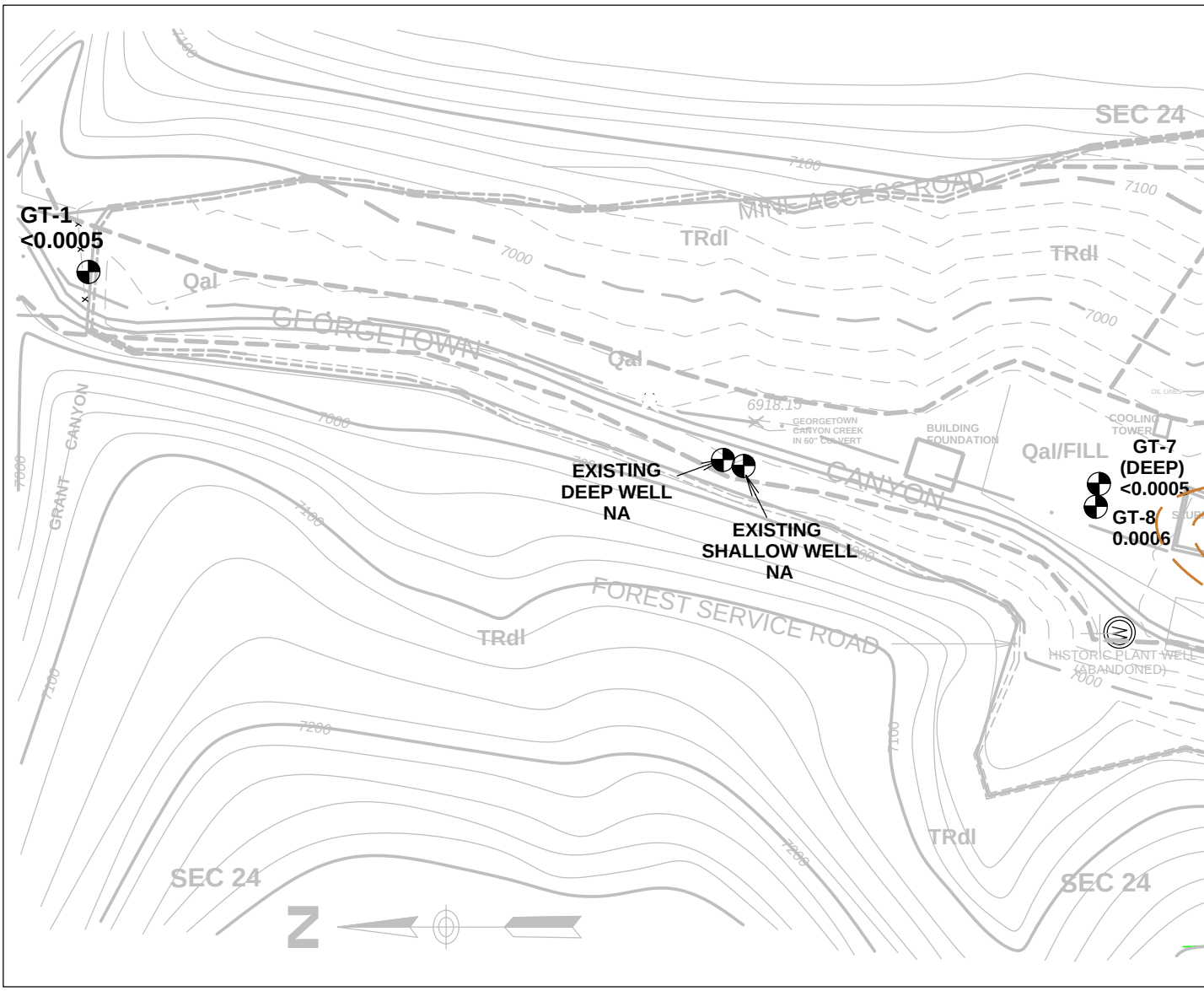
	FINAL SITE INVESTIGATION REPORT				
	TITLE CONCENTRATIONS OF ORTHOPHOSPHATE SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY				
12/30/05	SIZE B	CAGE CODE	DWG NO		REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.		SHEET FIGURE 4-37	



KEY

GT-1
<0.0005

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (MG/L)

0.01

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

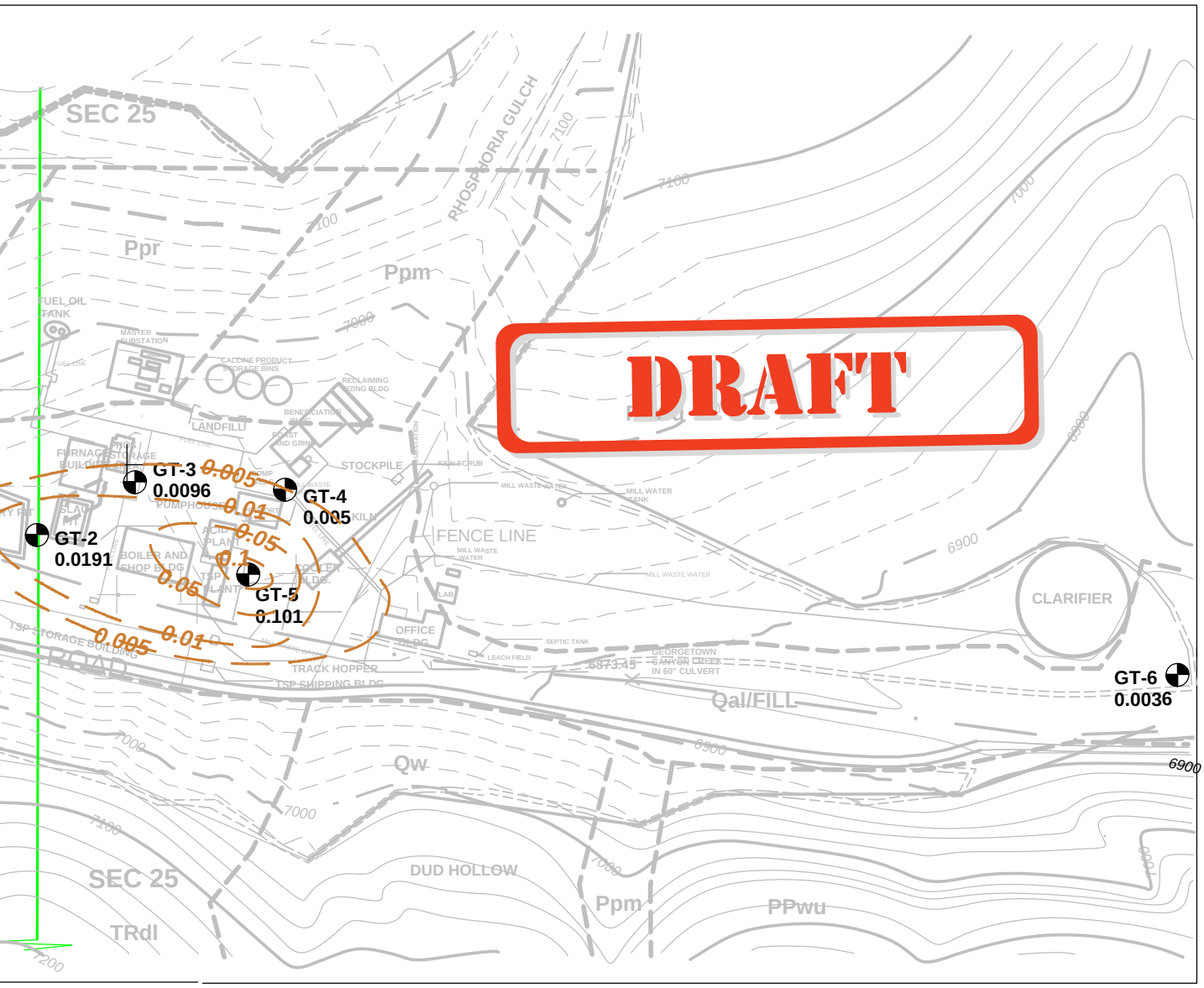
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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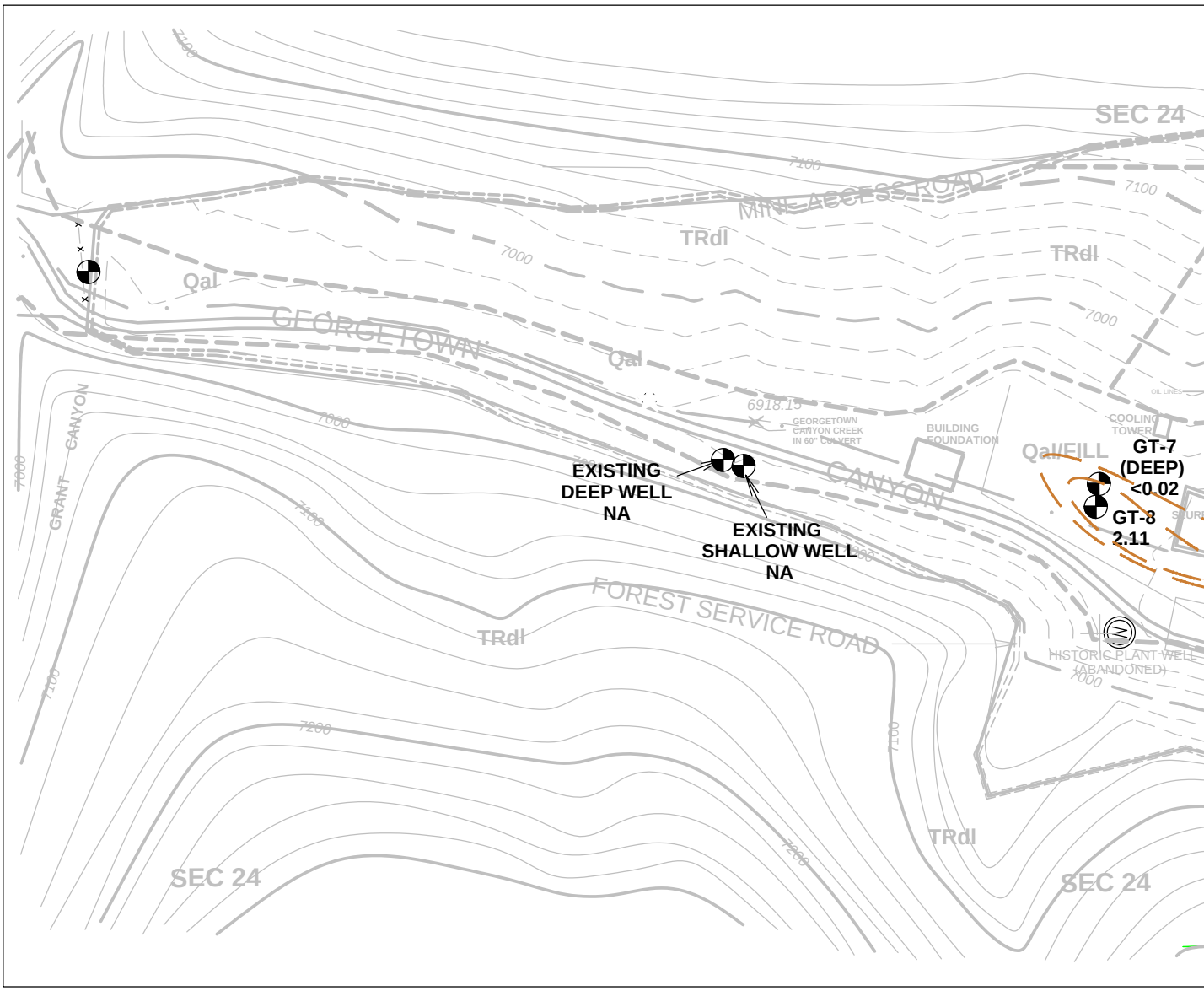
VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE	CONCENTRATIONS OF ARSENIC SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY		
12/30/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET	FIGURE 4-38



KEY

GT-1 <0.02

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

1.0

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

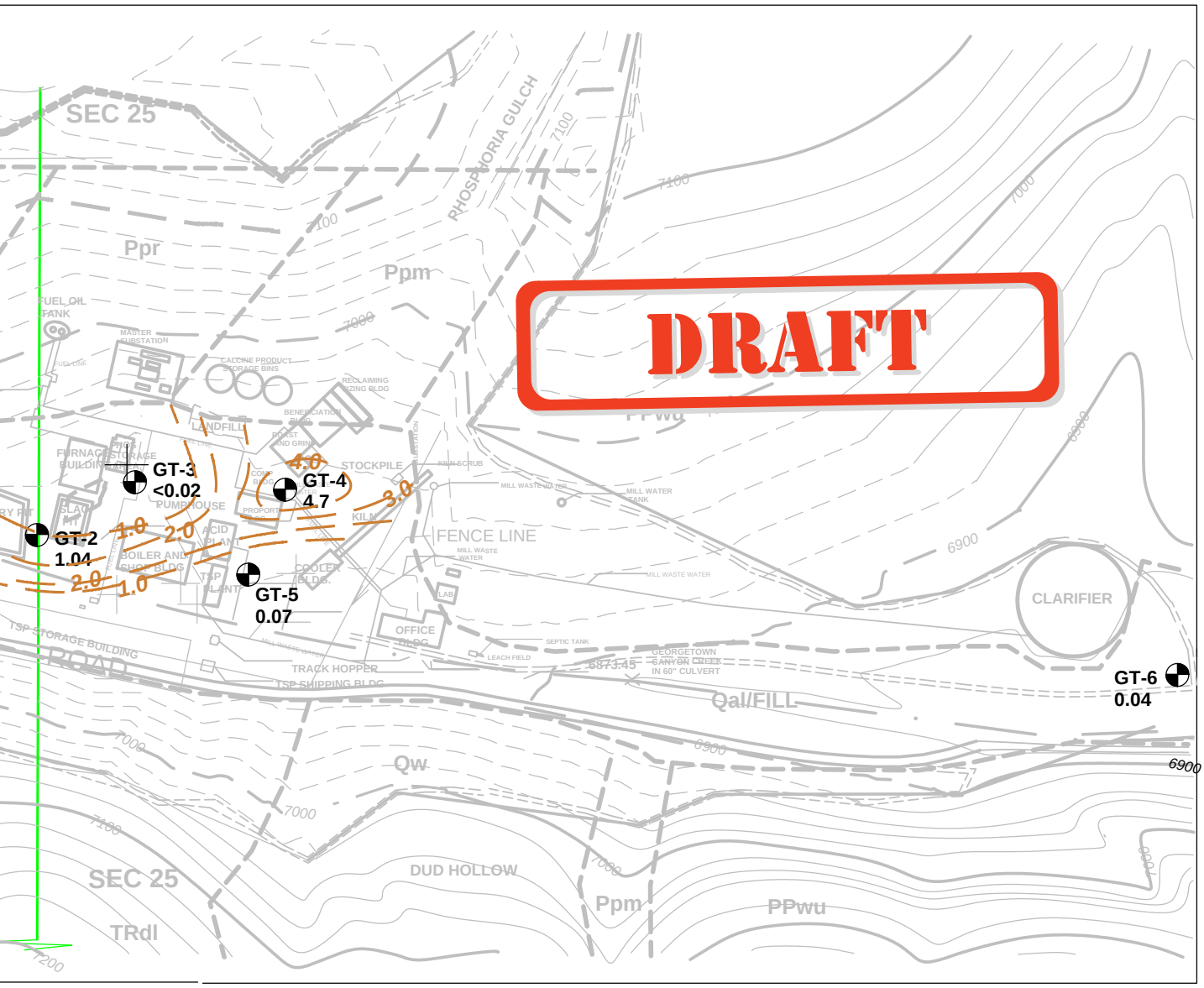
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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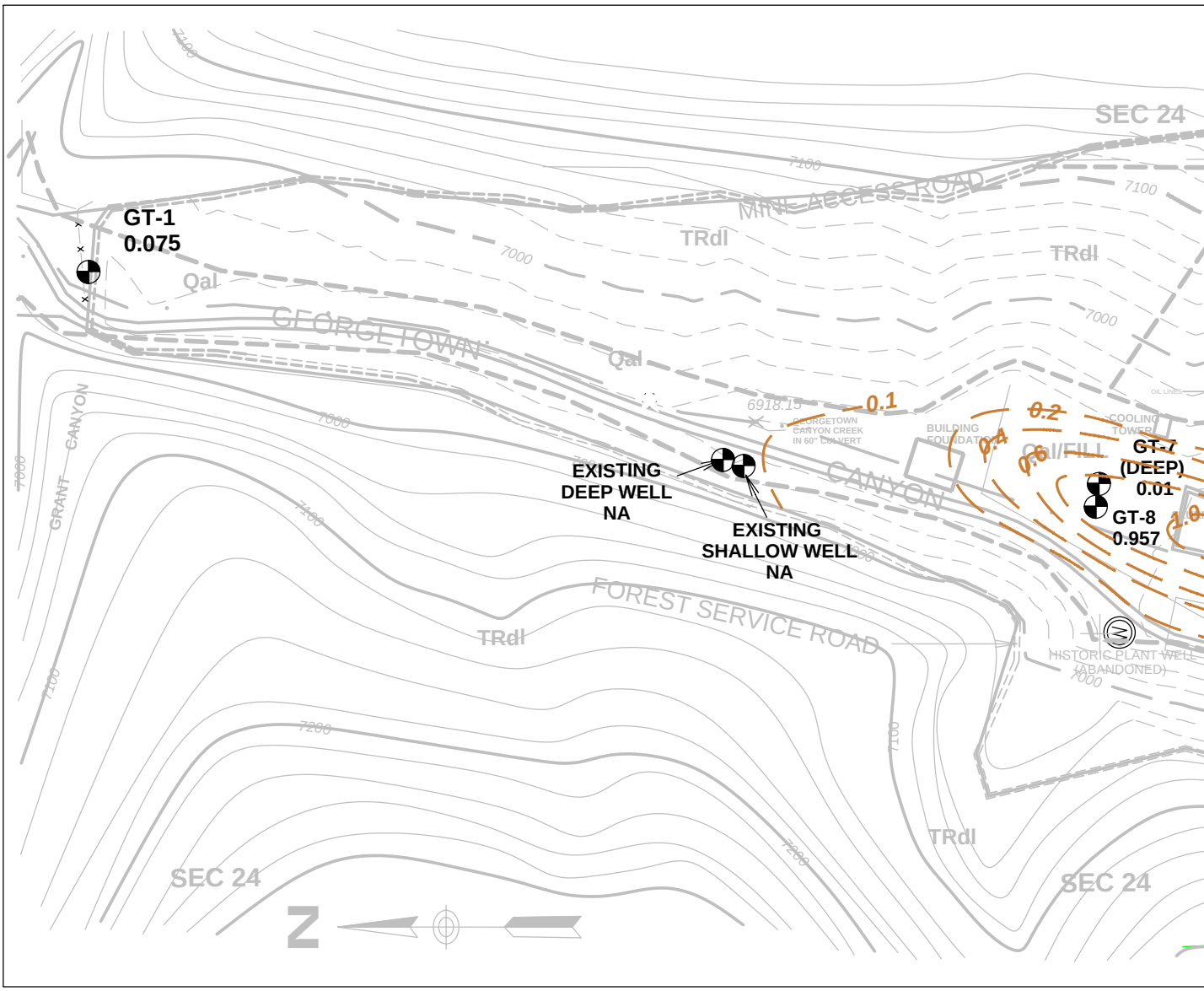
VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF IRON SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/30/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-39	



KEY

GT-1
0.075

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

0.2

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

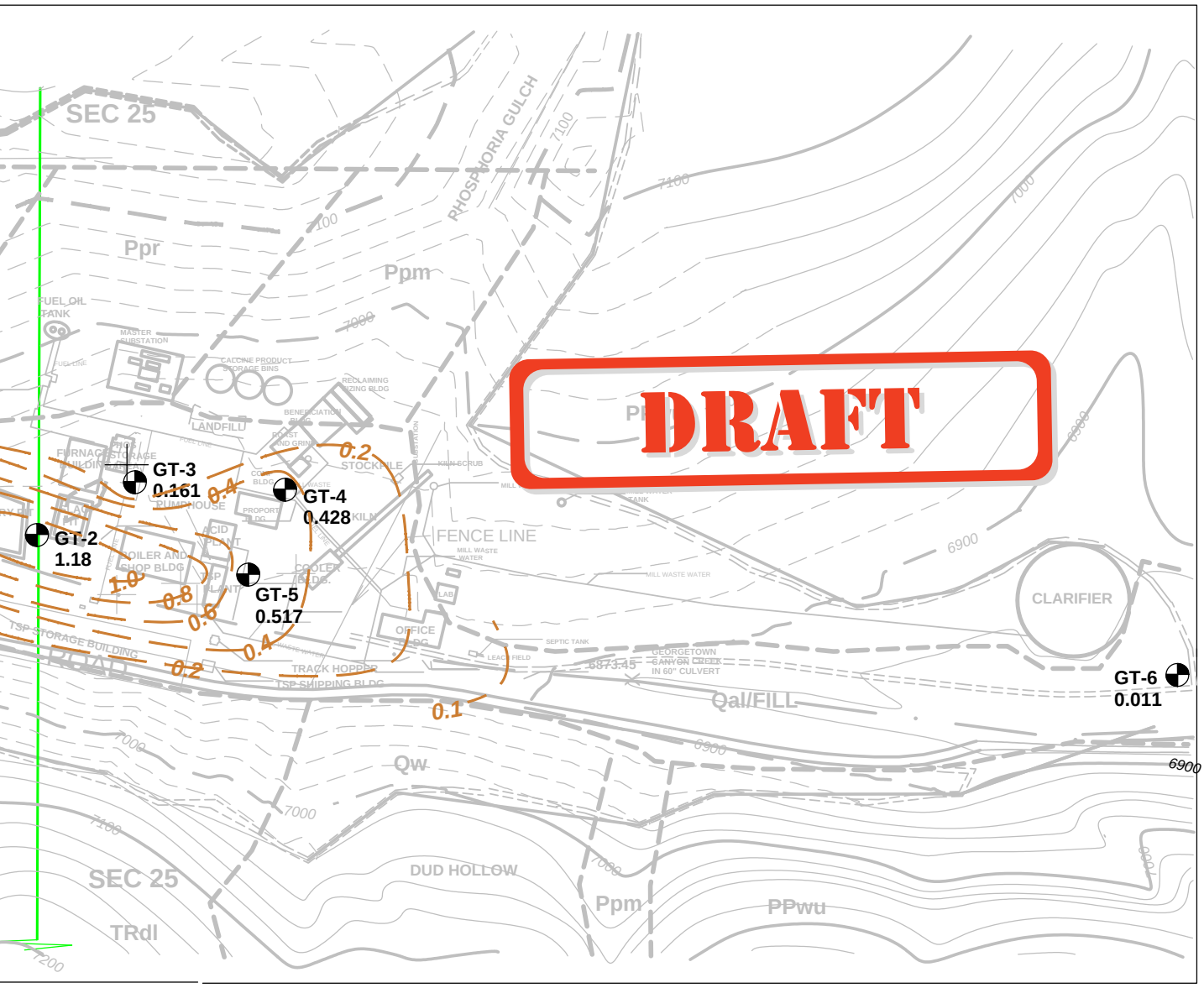
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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WOODY FM.

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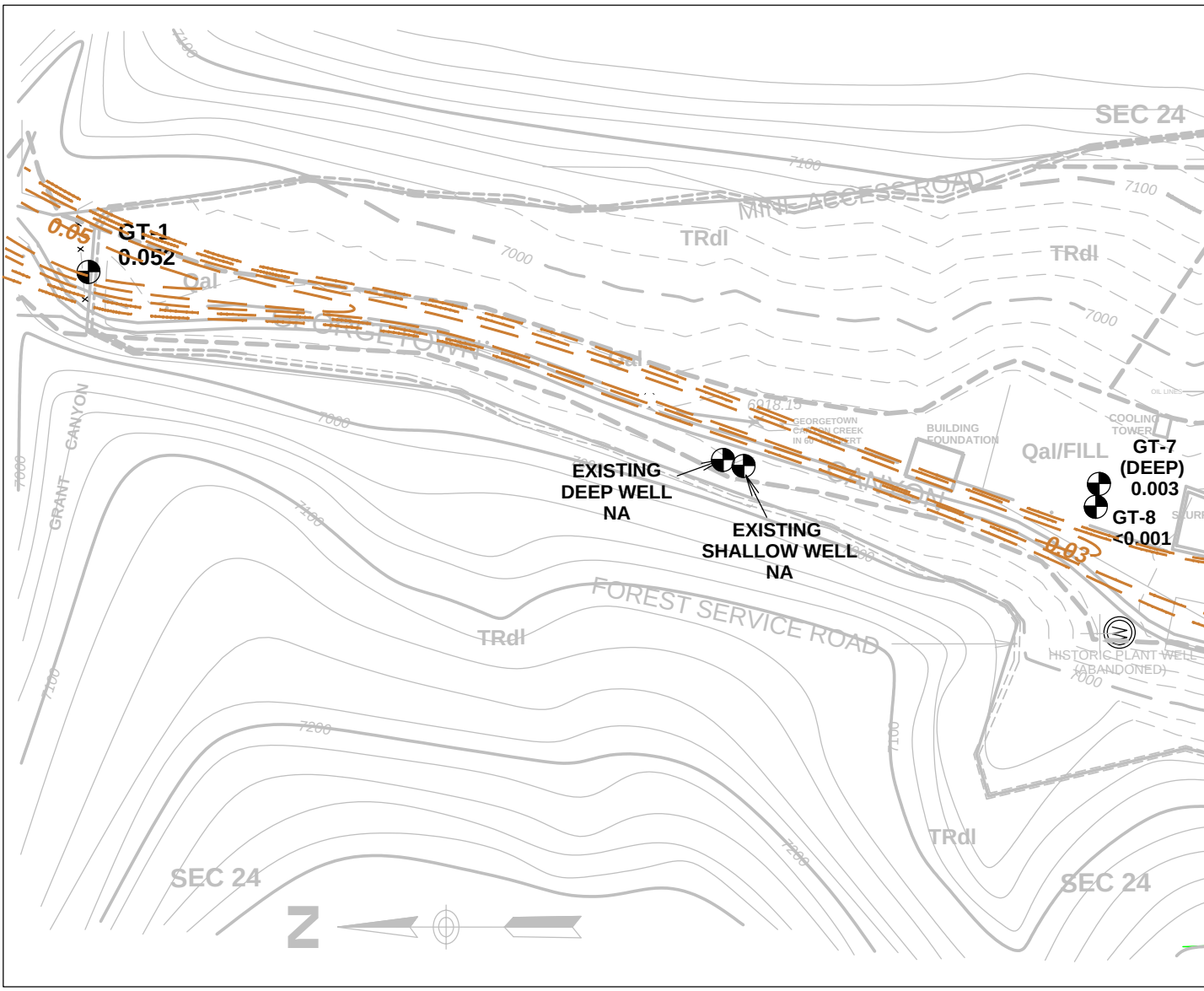
IA FM.

VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF MANGANESE SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/30/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN, P.G.	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-40	



KEY

GT-1
0.052

MONITORING WELL AND DISSOLVED GROUND WATER CONCENTRATION IN MILLIGRAMS PER LITER (mg/l)

0.05

CONCENTRATION CONTOUR AND VALUE

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIU

Qw - QUATERNARY HILL WA

TRdl - TRIASSIC LOWER DIN

Ppr - PERMIAN REX CHERT F

Ppm - PERMIAN PHOSPHORI

PPwu - PERMIAN-PENNSYLV UPPER WELLS FM.

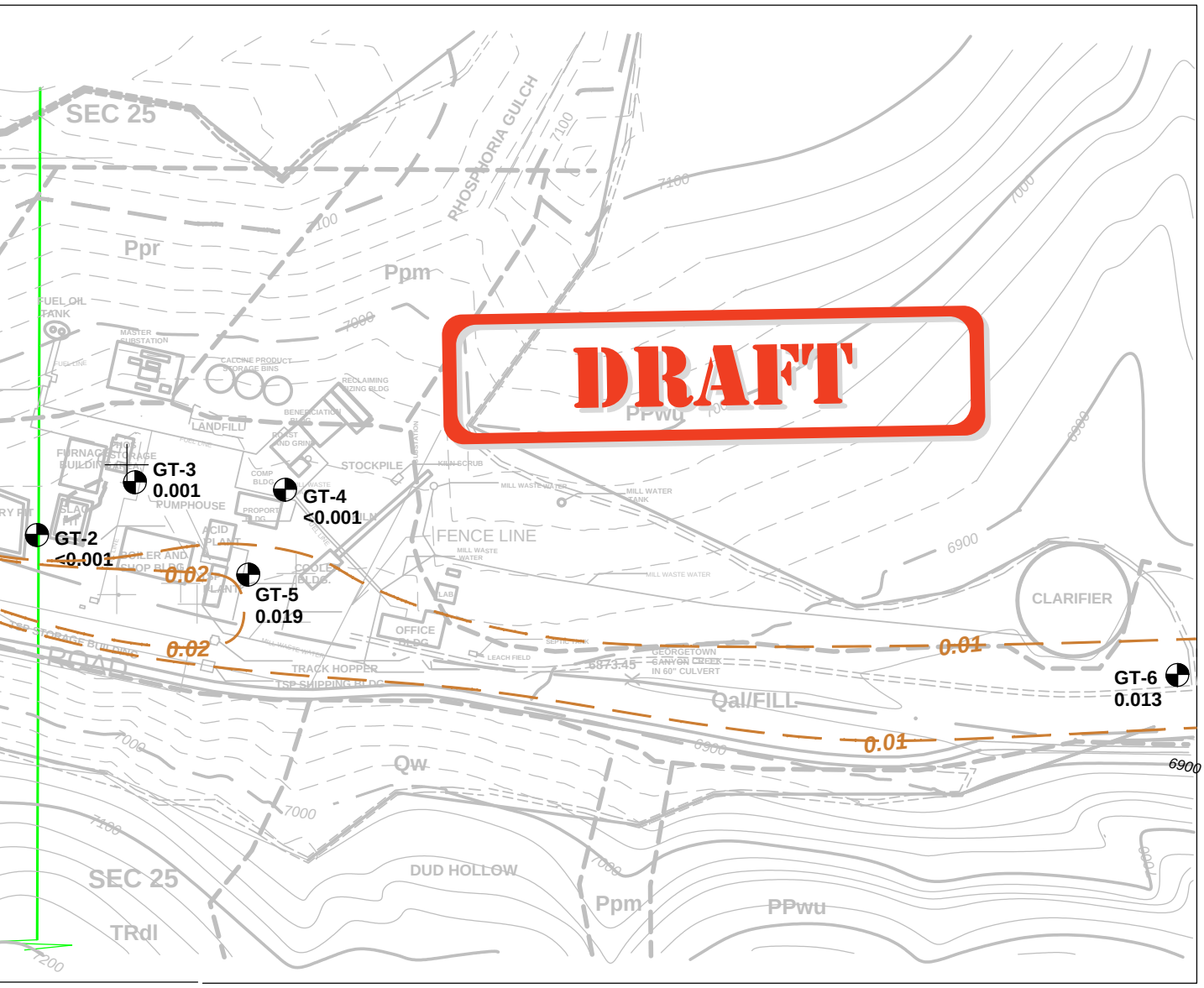
REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

T 10 S R 44 E



MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

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WOODY FM.

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VANIAN

	FINAL SITE INVESTIGATION REPORT			
	TITLE CONCENTRATIONS OF SELENIUM SHALLOW AQUIFER JULY 20, 2005 CENTRAL FARMERS FERTILIZER FACILITY			
12/30/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN, P.G.	SCALE	NU-WEST MINING AND NU-WEST INDUSTRIES, INC.	SHEET FIGURE 4-41	

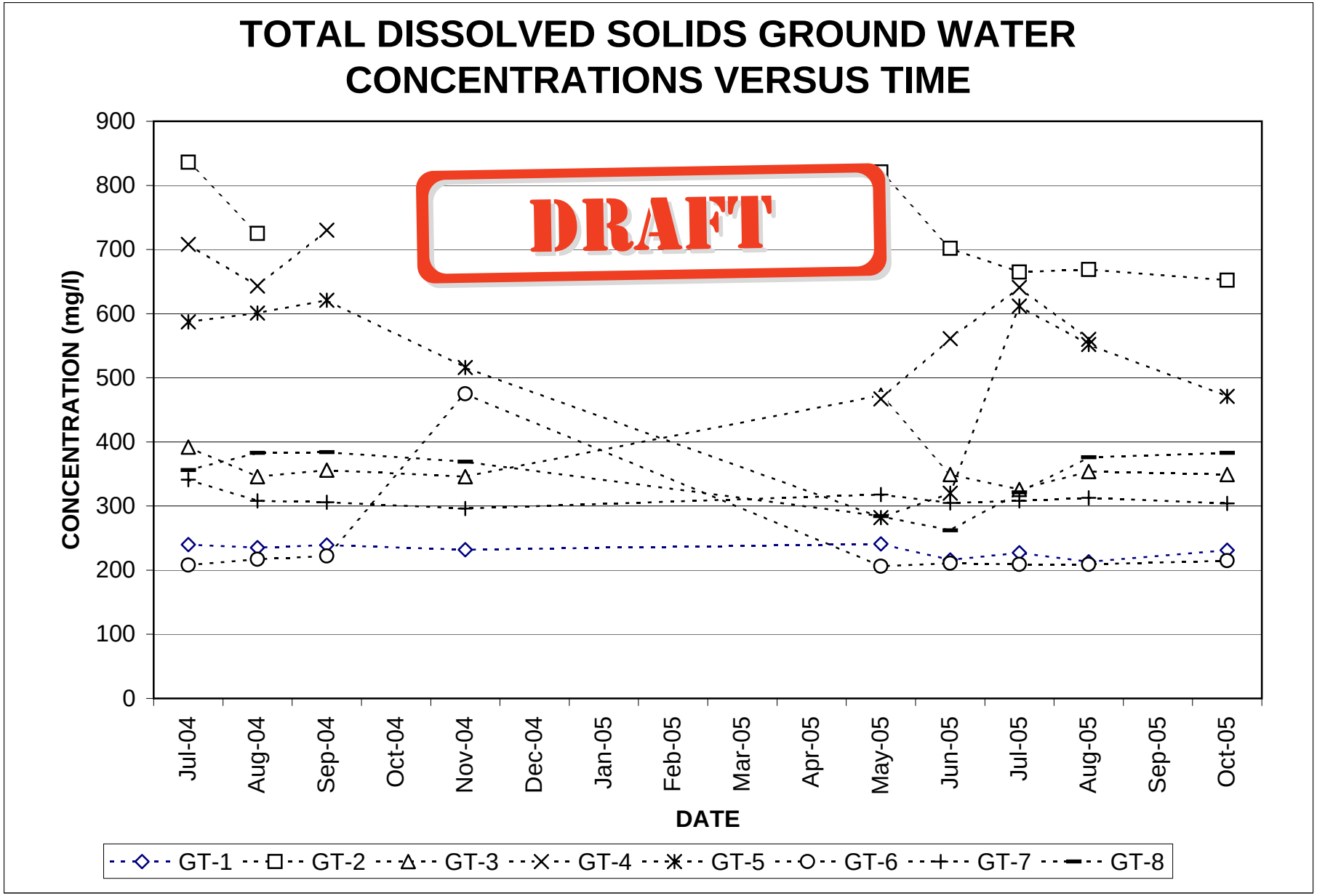
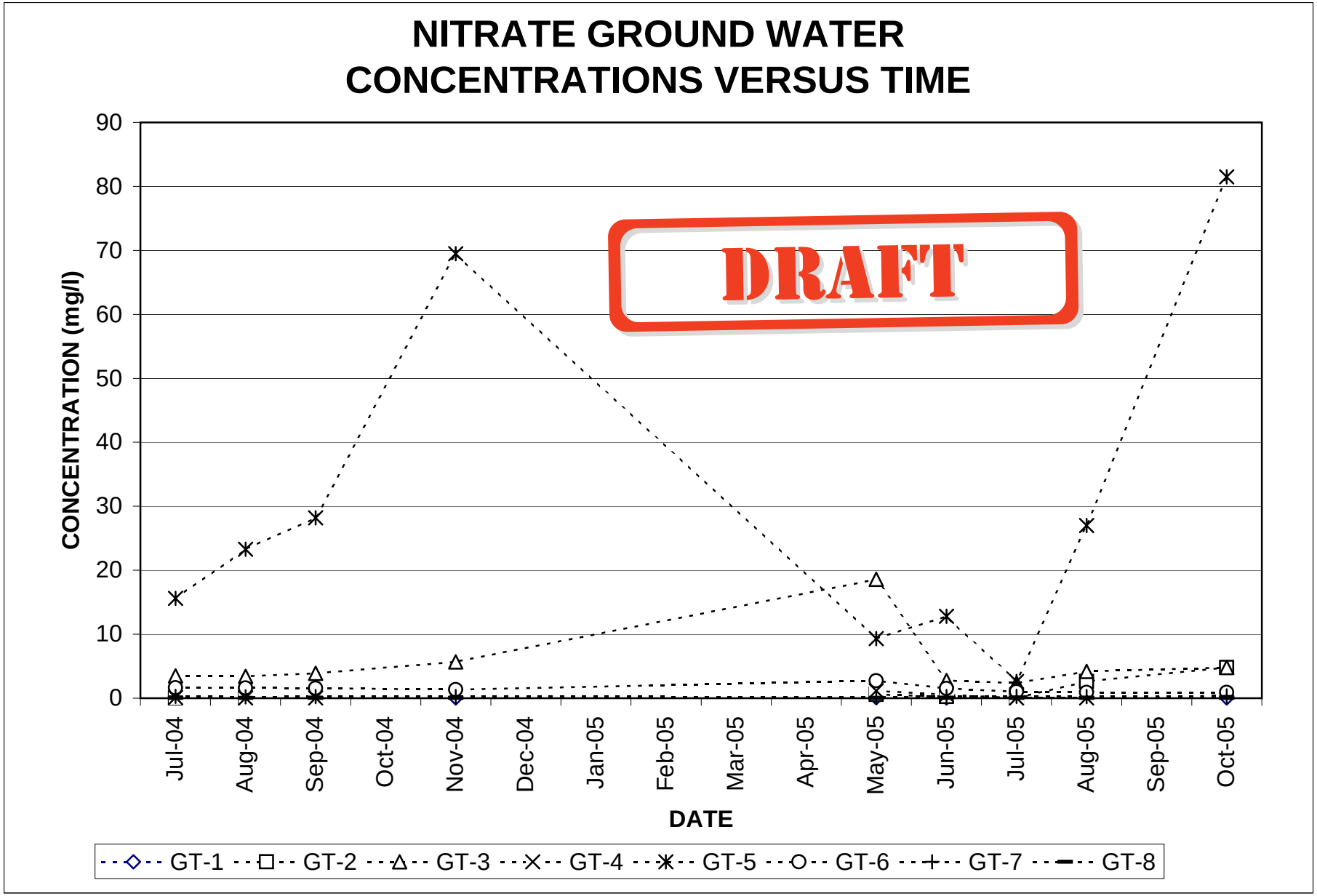

TOTAL DISSOLVED SOLIDS GROUND WATER CONCENTRATIONS VERSUS TIME
DRAFT
CONCENTRATION (mg/l)
900
800
700
600
500
400
300
200
100
0
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
DATE
GT-1
GT-2
GT-3
GT-4
GT-5
GT-6
GT-7
GT-8

FIGURE 4-42



Values less than detection plotted at the detection limit

FIGURE 4-43

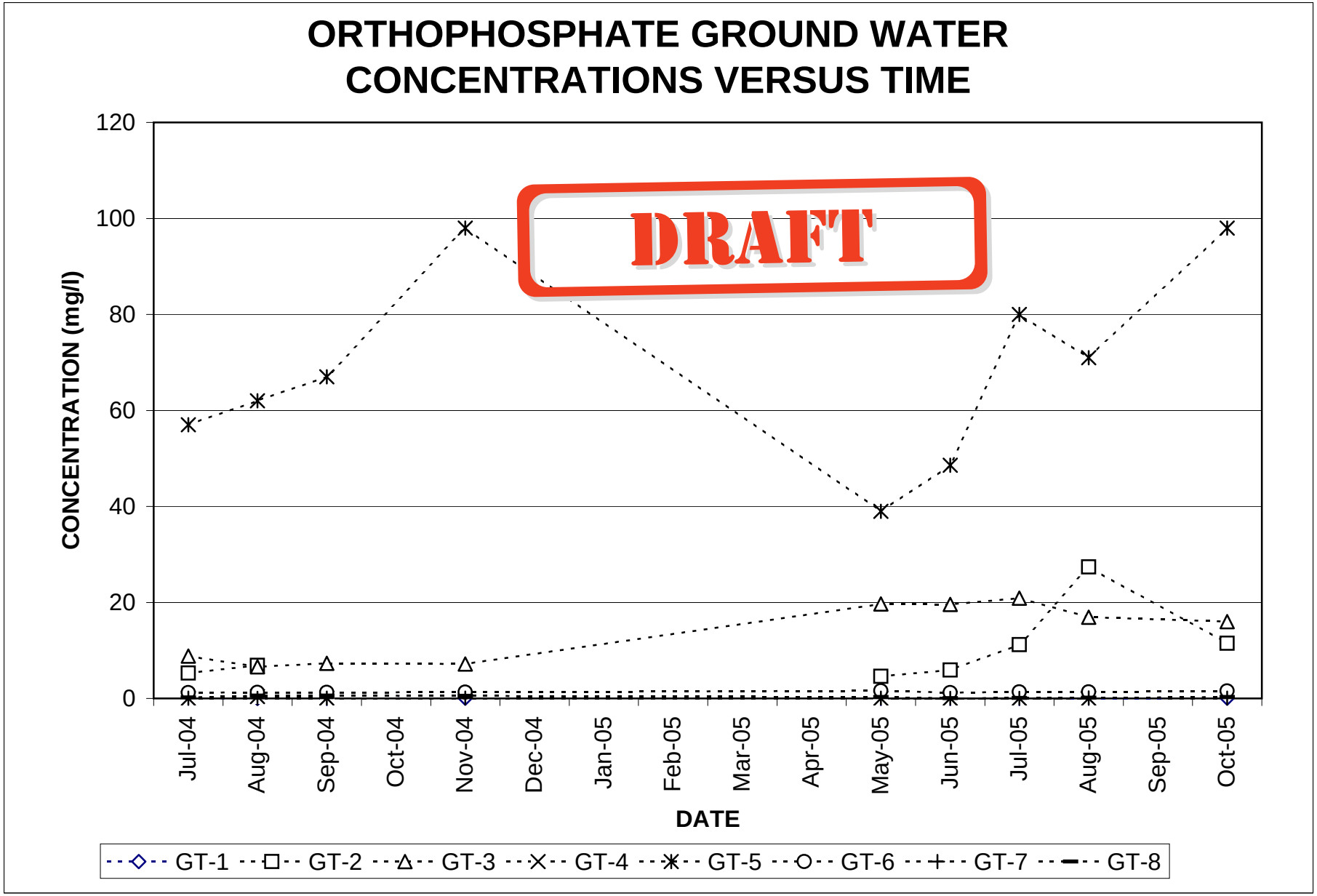
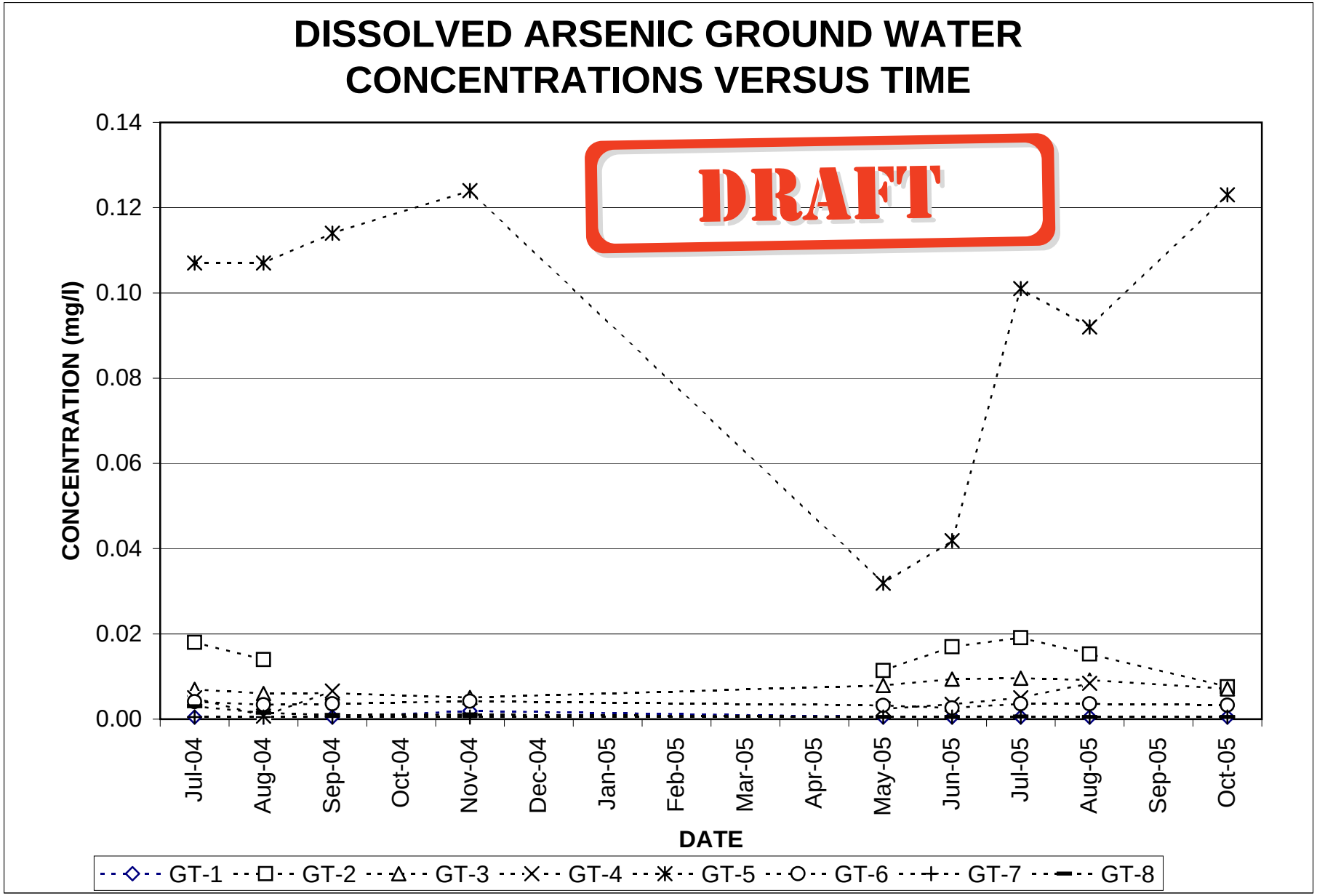
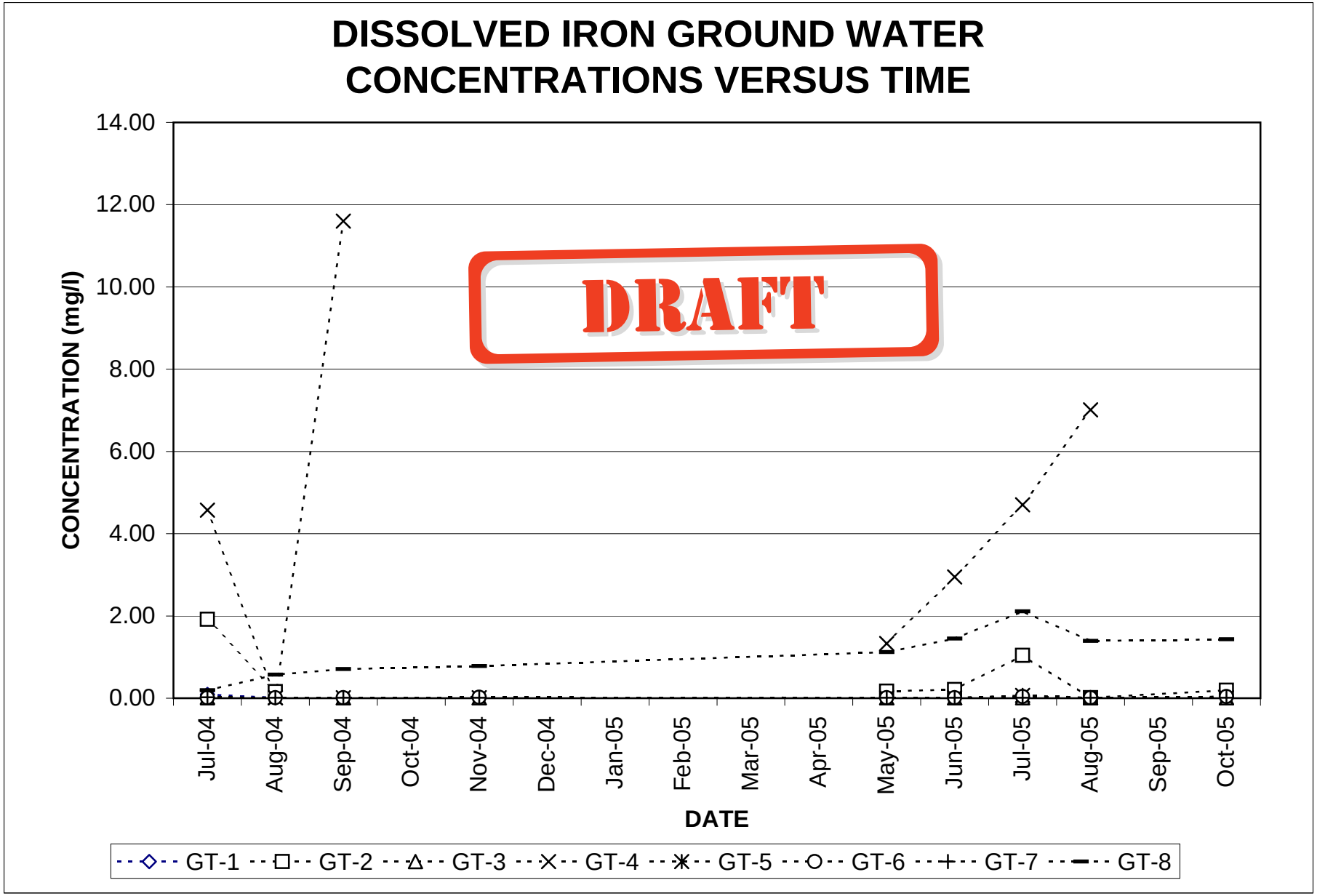

ORTHOPHOSPHATE GROUND WATER CONCENTRATIONS VERSUS TIME
DRAFT
CONCENTRATION (mg/l)
120
100
80
60
40
20
0
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
DATE
GT-1
GT-2
GT-3
GT-4
GT-5
GT-6
GT-7
GT-8

FIGURE 4-44



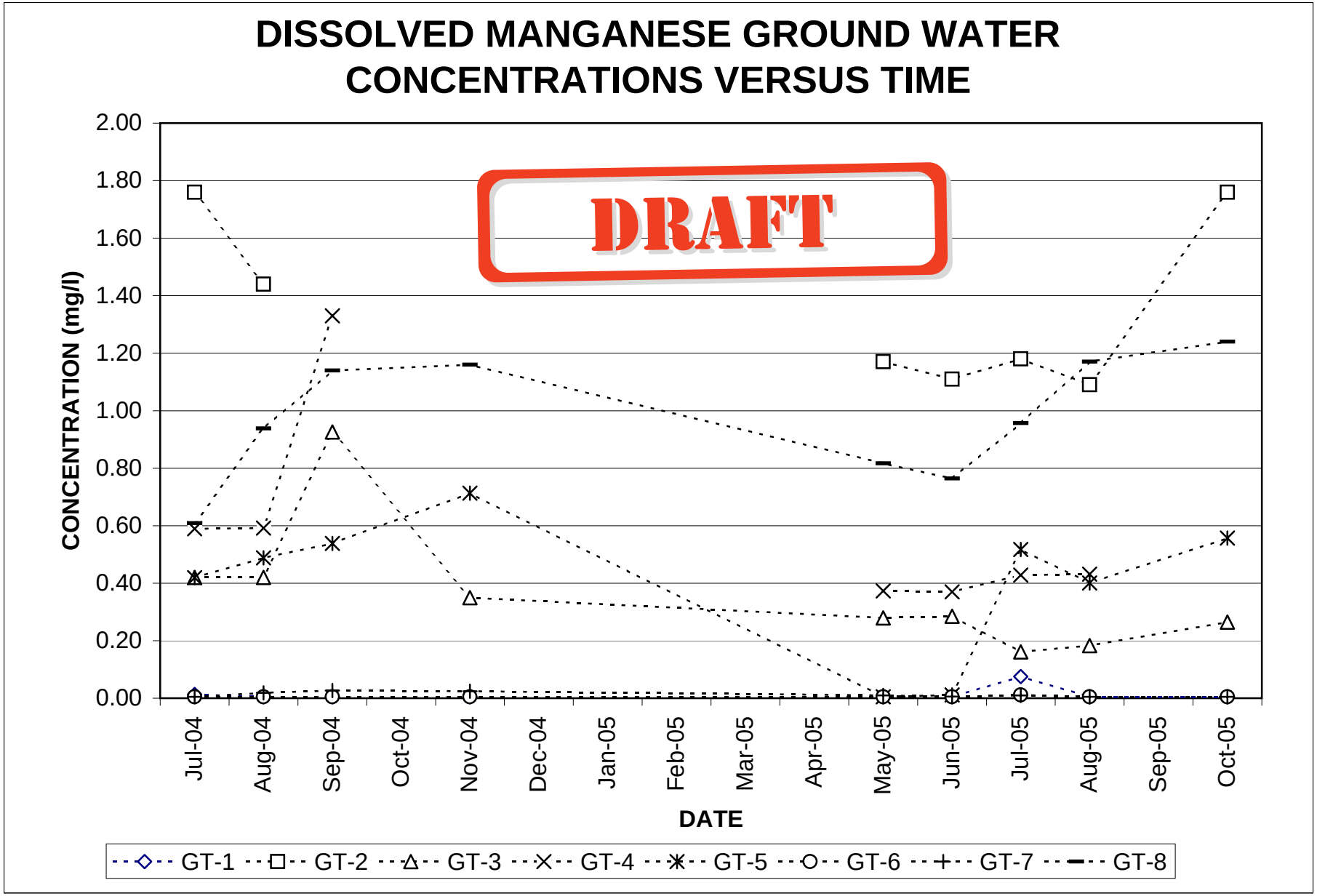
Values less than detection are plotted at the detection limit

FIGURE 4-45



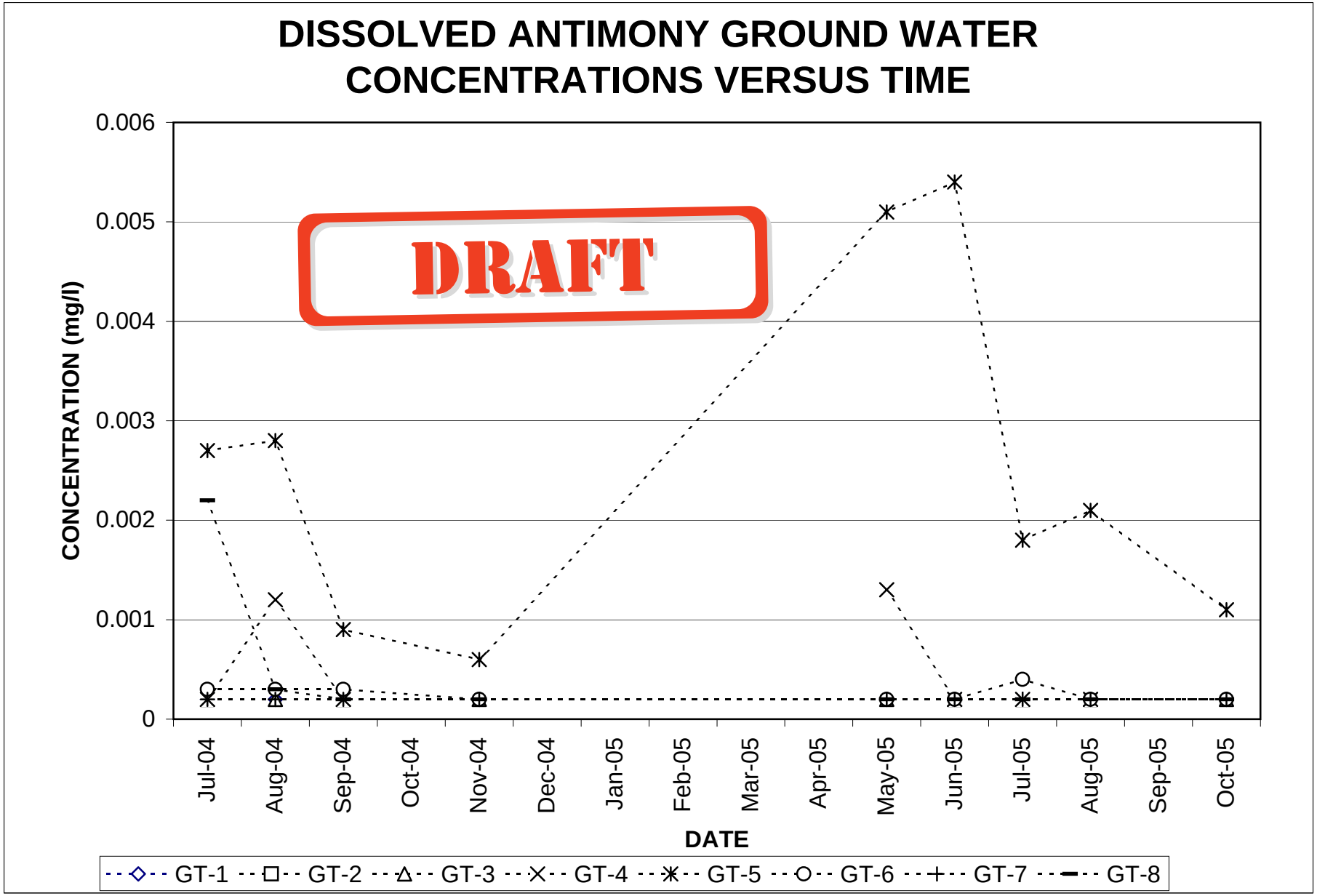
Values less than detection plotted at the detection limit

FIGURE 4-46



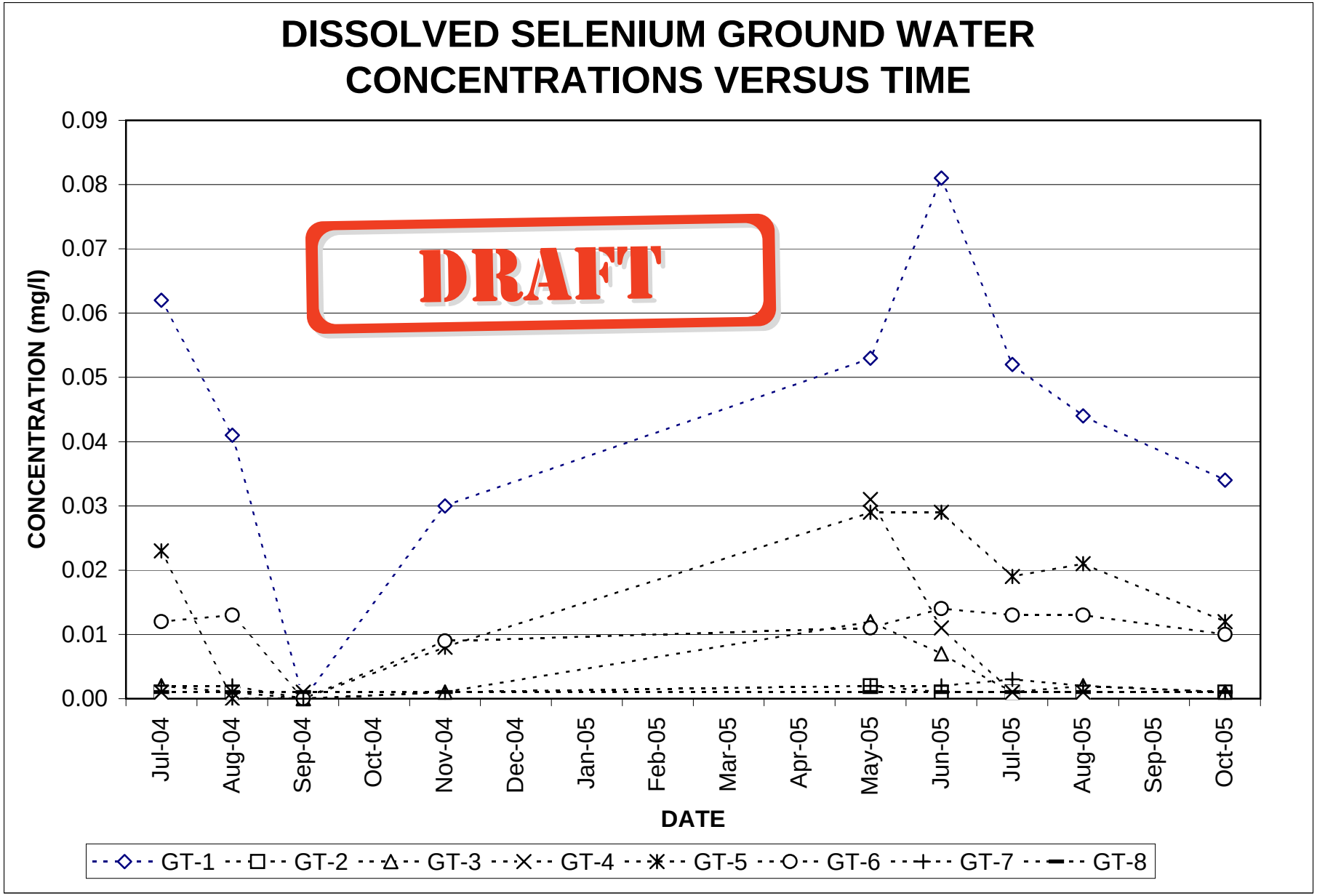
Values less than detection are plotted at the detection limit

FIGURE 4-47



Values less than detection are plotted at the method detection limit

FIGURE 4-48



Concentrations less than detection plotted at the detection limit

FIGURE 4-49

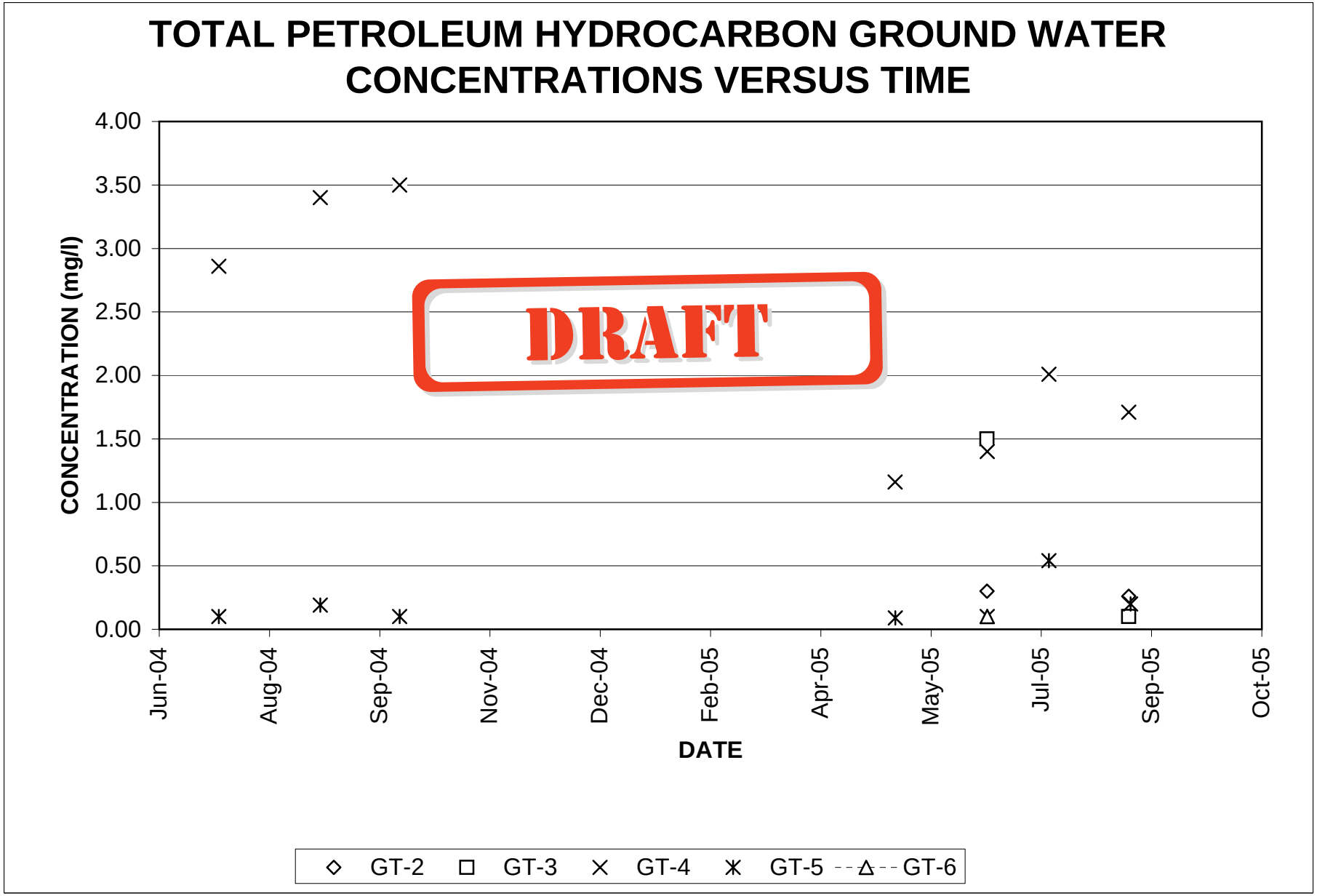

TOTAL PETROLEUM HYDROCARBON GROUND WATER CONCENTRATIONS VERSUS TIME
CONCENTRATION (mg/l)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
DRAFT
Jun-04
Aug-04
Sep-04
Nov-04
Dec-04
Feb-05
Apr-05
May-05
Jul-05
Sep-05
Oct-05
DATE
GT-2
GT-3
GT-4
GT-5
GT-6

FIGURE 4-50

DRAFT – APPENDICES
FIELD INVESTIGATIONS AND RESULTS
DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO

January 27, 2006

Prepared by:
Global Environmental Technologies, LLC
Salt Lake City, Utah

APPENDIX A
FIELD INVESTIGATIONS AND RESULTS
DRAFT FINAL SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO

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APPENDIX A – FIELD GROUND WATER SAMPLING FORMS

APPENDIX A – FIELD SURFACE WATER SAMPLING FORMS

APPENDIX A – WELL COMPLETION LOGS

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APPENDIX C – LABORATORY ANALYTICAL DATA SHEETS (on disk)

DRAFT – APPENDICES
FIELD INVESTIGATIONS AND RESULTS
DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO

January 27, 2006

Prepared by:
Global Environmental Technologies, LLC
Salt Lake City, Utah

A.1.0 INTRODUCTION

Field investigations at the former Central Farmers Fertilizer Facility in Georgetown Canyon, Idaho were conducted from April 2004 through October 2005 as part of a Site Investigation. The objectives of these investigations were to: 1) characterize the site hydrogeology; 2) evaluate the extent of ground water contamination beneath the former Central Farmers Fertilizer plant; 3) perform a sampling program to characterize water quality; and 4) evaluate phosphorous ore and soils that could impact ground water quality or the sediments in Georgetown Creek. The scope of work for the investigations described herein included:

- Drilling and sampling of twenty two soil borings;
- Physical testing in the laboratory of selected soil samples from the soil boring program in 2004 and from test pits for borrow materials in 2005;
- Collection of on-site surface soils, ore and sediment samples;
- Drilling and completion of seven shallow alluvial wells and one deep bedrock monitor well;
- Water level measurement in new and existing wells and measurement of pH, conductivity, and temperature following completion and development;
- Aquifer testing using the newly installed wells;
- Surface water quality sampling from Georgetown Creek, Phosphoria Gulch, the sediment pond and clarifier and flow measurements in Georgetown Creek at three locations, and;
- Collection of ground water samples from newly installed monitor wells and two sampling events from a preexisting deep well.

A.2.0 SOIL BORINGS

A.2.1 Introduction

Seventeen borings were drilled and sampled between the dates of July 12 to July 14, 2004 as part of the vadose zone investigation. An additional five borings were drilled on October 12, 2005 near the former shop area. Figure A.2.1 shows the locations of the borings. Boreholes were located in former plant areas and were drilled to auger refusal, or near the estimated high water table elevation to characterize the thickness, physical characteristics, distribution, and variability of the native soils and fill materials. Relatively undisturbed soil samples were collected to evaluate the physical characteristics of materials in the vadose zone.

A.2.2 Soil Borings

Layne Christensen Drilling of West Valley City, Utah drilled all borings during 2004. Borings were drilled with a CME 75 drill rig using 7-1/4-inch OD (3.5 inch ID) hollow-stem augers with a center plug to reduce the probability of sampling slough materials. Samples were collected approximately every one to five feet through the augers starting at ground level or at the one foot depth using a Dames & Moore (D&M) "U" type sampler (for geotechnical samples), or a split spoon sampler for chemical samples. The D&M sampler was driven to a depth approximately 18 inches below the auger bit with a 140 pound pin hammer falling 30 inches, while the split spoon was driven approximately 24 inches using the same drive mechanism.

During 2005, five soil borings were drilled at the north end of the former shop building by Andrew Well Drilling of Idaho Falls, Idaho. Borings were drilled with a Mobile B-61 drill rig using 7-1/4-inch OD (3.5 inch ID) hollow-stem augers with a center plug. Samples were obtained using a split spoon sampler.

The drill rig augers, rods, center plug and downhole sampling equipment were decontaminated with a high-pressure steam cleaner prior to the set up of the drill rig at each boring location, and prior to demobilization from the site. All parts of each of the samplers used were washed in Alconox detergent solution and triple rinsed with water prior to each use. Each boring was backfilled with bentonite hole plug to the ground surface. Boring logs are provided on Figures A.2.2 through A.2.22. It should be noted that boring numbers GTB-18 and GTB-19 were omitted from the drilling program. Descriptions of individual borings are provided below:

- Boring GTB-1 was drilled to a depth of 5.0 feet below grade. Materials encountered included dark grayish black fine to coarse gravel to auger refusal at 5.0 feet.

- Boring GTB-2 was drilled approximately to 1.0 feet before spontaneous ignition occurred from the presence of elemental phosphorous. The boring and surrounding area was covered with soil and bentonite.

- Boring GTB-3 was drilled to 31 feet below grade. Materials encountered included light to medium gray silty gravel over silty clay, clayey gravel, and sandy fine to coarse gravel and boulders.

- Boring GTB-4 was drilled to 27 feet below grade. Materials encountered included dark brown silty gravel over dark gray silty and fine to coarse sandy clay and gray to brown clayey gravels.

- Boring GTB-5 was drilled to auger refusal at 14 feet below grade. Materials encountered included brown silty and clayey gravel over silt, clayey gravel, and boulders at 14.0 feet.

- Boring GTB-6 was drilled to 22 feet below grade. Materials encountered included brown silty gravel over gray to tan to yellowish brown clayey gravel to 22.0 feet.

- Boring GTB-7 was drilled to 28.5 feet below grade. Materials encountered included dark brown silty gravel over clayey gravel and sandy clay and silty gravel. This boring indicated a strong fuel odor between 14 and 28 feet in depth.

- Boring GTB-8 was drilled to 27 feet below grade. Materials encountered included dark brown silty, shaley gravel over silty clay, and light grayish brown clayey gravel.

- Boring GTB-9 was drilled to auger refusal at 15 feet below grade. Materials encountered included dark brown silty gravel and wood over coarse rounded gravel, and boulders at 15.0 feet.

- Boring GTB-10 was drilled to auger refusal at 10.5 feet below grade. Materials encountered included dark brown coarse gravel and silty clay over coarse sandy gravel, and boulders at 10.5 feet.

- Boring GTB-11 was drilled to auger refusal at 12.0 feet below grade. Materials encountered included concrete, dark brown silt and coarse gravel over coarse sandy gravel (Wells), and boulders.

- Boring GTB-12 was drilled to 16 feet below grade. Materials encountered included light gray slag and sandy gravel over dark brown silty clay to 16.0 feet.

- Boring GTB-13 was drilled to 20.0 feet below grade. Materials encountered included light gray slag over silty gravel over orange yellow to medium brown clayey coarse gravel.

- Boring GTB-14 was drilled to auger refusal at 25.0 feet below grade. Materials encountered included dark brown silt and gravel over coarse clayey gravel, silty clay and orange-brown sandy gravel and boulders to 25.0 feet.

- Boring GTB-15 was drilled to auger refusal at 26.5 feet below grade. Materials encountered included medium brown silty gravel and sand over coarse sandy gravel.

- Boring GTB-16 was drilled to 22.5 feet below grade. Materials encountered included slag, medium brown silt and coarse gravel over coarse sandy gravel and cobbles to 22.5 feet.

- Boring GTB-17 was an added boring and was drilled to 15.0 feet below grade. Materials encountered included dark brown silty gravel over coarse clayey gravel. This boring was added to the boring program to assess the horizontal extent of soil contamination identified in boring GTB-7.

- Boring GTB-20 was drilled to refusal at 21 feet below grade beneath the concrete pad foundation of the shop about 18 feet south of the north edge of the pad. Materials encountered included dark brown silty gravel over clayey gravel, silty clay and silty gravel. This boring had no notable petroleum odor to total depth.

- Boring GTB-21 was drilled to 23.5 feet below grade beneath the concrete pad foundation of the shop about 20 feet south of the north edge of the pad. Materials encountered included dark brown silty gravel over silty clay and silty gravel. This

boring did not indicate any notable petroleum hydrocarbon odor.

- Boring GTB-22 was drilled to 24.5 feet below grade, approximately 38 feet north of the shop foundation. Materials encountered included dark brown silty gravel over clayey gravel clay. This boring indicated a strong fuel odor near the bottom of the boring.

- Boring GTB-23 was drilled to 24.5 feet below grade at a location of about 14 feet northwest of the shop corner. Materials encountered included dark brown silty gravel over clayey gravel and clay. This boring indicated a strong fuel odor between 12 feet and total depth.

- Boring GTB-24 was drilled to 24.5 feet below grade. Materials encountered included dark brown silty gravel over silty clay and clayey gravel. This boring indicated a strong fuel odor between 10 and 17 feet in depth.

A.2.3 Soil Sample Collection

Relatively undisturbed samples were collected approximately every two to five feet in each boring with a D&M "U" type sampler or a split spoon sampler (SPT). A thin wall sampler that was proposed as part of the program could not be used as the result of the coarse materials encountered at most drilling locations and the unpredictability of silt or clayey materials. Samples were logged on a Dames & Moore standardized boring log using the Unified Soil Classification System (USCS), shown on Figure A.2.23. Copies of drafted boring logs are provided on Figures A.2.2 through A.2.22, and indicate the depths from which geotechnical and chemical samples were obtained. Samples were placed in a plastic bag, sealed in a ring container and a label describing the boring ID, sample depth, date, and location was placed on the lid of the ring container. Samples collected for chemical analysis were placed in 500 ml sample jars provided by ACZ labs.

At the end of each day, collected samples from the vadose zone investigation were placed in an ice chest with ice to keep the samples cold. A chain-of-custody record was completed, signed, dated and placed in the ice chest with the samples. The ice chest was sealed and a custody seal was placed across the lid with sampler's initials and the

date. The ice chest was stored in a locked vehicle each night. Samples were shipped to ACZ labs next day delivery under chain-of-custody.

A.2.4 Physical Testing of Soils

A laboratory testing program was conducted on fifteen selected vadose zone samples, to evaluate grain size distribution, vadose moisture conditions and the potential rate of movement of moisture in the vadose zone. During 2005, additional soils were collected to evaluate possible borrow sites for cover materials. Tests conducted on each sample were performed by IGES of Salt lake City, Utah and are summarized on Table A.2.1. The following paragraphs describe the tests and summarize the results. Test results from IGES are provided in the Geotechnical Results section of Appendix A.

A.2.4.1 Grain Size Analysis

Grain size analysis is a quantitative determination of a material's particle size distribution and is used in the classification of materials. The test provides data pertaining to a material's characteristics such as: relative proportions of gravel, sand, silt, and clay-sized particles; uniformity and average grain size; maximum and minimum size of particles. The grain size distribution of a material can be used to predict a number of physical characteristics including permeability and compressibility.

Grain size analysis was performed on nine samples and used to determine the classification of the samples. Results are presented in Table A.2.2.

A.2.4.2 Bulk Density Test

The bulk density test is the measurement of the ratio of the total weight of a material to its total volume. Bulk density measurements are used to calculate a material's porosity. Ten samples were tested for bulk density with results ranging from 96.3 to 125.2

pounds per cubic foot. Test results are presented in the Geotechnical Results section and in Table A.2.2.

A.2.4.3 Moisture Content Test

The moisture content test determines the amount of free water or fluid in a given amount of material. Moisture content measurements are also used to calculate the porosity of a material. Eleven samples were tested for moisture content with results ranging from 6.4% to 27.3% moisture. Test results are presented in the Geotechnical Results section and in Table A.2.2.

A.2.4.4 Falling Head Permeability Test

Permeability is a measure of the ability of a material to transmit water. Laboratory permeability testing consists of applying a hydraulic head of water to one end of a sample and measuring the flow through the sample. Falling head tests were performed on selected samples. The falling head test allows for more accurate measurements of small quantities of water and is more suitable for materials with a permeability of less than 10^{-6} cm/s.

Seven samples were tested using the constant head test method with results ranging from 3.1×10^{-3} cm/s to 1.7×10^{-7} cm/sec. Test results are presented in Geotechnical Results section in Appendix A and in Table A.2.2.

A.2.4.5 Specific Gravity Test

Specific gravity is the ratio of the mass of a unit volume of a material at a stated temperature to the mass in air of the same volume of gas-free distilled water at a stated temperature. The specific gravity of a soil is used in almost every equation expressing the phase relationship of air, water, and solids in a given volume of material. Specific

gravity tests were performed for five samples collected with results ranging from 2.75 to 2.83. Test results are presented in Appendix A Geotechnical Results and Table A.2.2.

A.2.4.6 Capillary Moisture Test

This test determines the capillary-moisture properties of fine-textured soils as indicated by the moisture content/moisture tension relationship determined by a pressure-membrane apparatus using tensions between 1 and 15 atmospheres. Four samples were tested for capillary moisture. Test results are presented in Appendix A Geotechnical Results and in Table A.2.2.

A.2.4.7 Unsaturated Hydraulic Conductivity

Unsaturated hydraulic conductivity using steady state techniques is measured by applying a constant hydraulic head difference across the sample contained in a soil core and measuring the resulting steady state flux of water. The flow rate and tensiometer matrix potentials (pressure head) are recorded. Unsaturated hydraulic conductivity tests were performed on three samples. Test results are presented Appendix A Geotechnical Results and summarized in Table A.2.2.

A.2.4.8 Compaction Testing

In October 2005, three bulk soil samples were collected to evaluate geotechnical properties. These soils were selected for their use as potential cover or borrow materials. Compaction testing was performed on all three samples to assess the maximum densities that could be achieved by earthmoving equipment at the optimum moisture content of the soils. Test results using ASTM method D698 are presented Appendix A Geotechnical Results and summarized in Table A.2.2.

A.3.0 PHOSPHATE ORE, SURFACE SOIL AND SEDIMENT SAMPLING

A.3.1 Introduction

Surface soils and phosphate ore were sampled from eleven sites on September 13, 2004 (three ore sites, eight surface soil sites) and sediments were sampled on May 26, 2004 from three locations in Georgetown Creek. Samples were obtained to evaluate the chemical background character of the site soils and stream sediments, to identify areas of soil and creek sediment impacts from the historic Central Farmers Fertilizer Facility and to develop project remediation goals based on risk and background. Sampled soil areas are shown on Figure A.3.1 and included:

- GTSO-1 through GTSO-4 obtained from areas around the site represented by soils eroded from underlying formations for background assessment;
- GTSO-5 through GTSO-7 from the areas of the removed fuel oil tank and shop area;
- GTSO-8 from the master substation area;
- GTORE-1 through GTORE-3 in the areas of the ore storage area;
- At three composited sampling locations from sediments within the creek (GTSED-1 through GTSED-3); and;
- One composited sample obtained from the clarifier.

A.3.2 Soil Sample Collection

Sampling points were located using the map contained in the Sampling and Analysis Plan (GET, 2004). Four background soil samples (0 to 12 inches deep) were collected from locations shown on Figure A.3.1. Background samples were analyzed for total metals, phosphorous, and pH. Samples GTSO-5 through GTSO-7 were obtained from the acid plant, TSP building and the shop areas, and one sample, GTSO-8 was taken from native soils in the plant area near the former transformer substation. Samples were obtained from the upper 12 inches, composited and homogenized in a

decontaminated stainless steel mixing bowl using a stainless steel spoon, and placed in laboratory prepared sampling jars. Samples were transported to the analytical laboratory under full chain-of-custody and control. Soil samples collected were analyzed for total metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc, and other parameters. Sample from GTSO-5 through GTSO-8 and GTSED-2 were also analyzed for organics.

A.3.3 Ore Sample Collection

Three ore samples, designated GTORE-1 through GTORE-3, were obtained from the phosphate ore stockpile in Phosphoria Gulch using the same methods detailed above. Ore samples were collected from the upper 12-inch layer of ore, homogenized at each location using decontaminated mixing equipment, and placed in laboratory prepared sampling jars. Sampled were shipped on ice under chain of custody and analyzed for total metals, phosphorous, pH, radium and total uranium

A.3.4 Sediment Sampling

Sediment sampling consisted of collecting three sediment samples from Georgetown Creek, obtained at locations shown on Figure A.3.1. Sediment samples were obtained using a pre-cleaned sampling utensil and clean PVC container for compositing each sample. When each sample was thoroughly composited, a representative sample was transferred to a laboratory prepared sampling jar. All free liquid was drained from the sediment samples prior to closing the jar.

The first sample (GTSED-1) was composited from three close creek bottom locations, collected upstream of the site near the GTSW-1 surface water sampling location. The second sample (GTSED-2) was composited from three close locations on the creek bottom collected immediately downstream of the plant site where Georgetown Creek exits the CMP near surface water site GTSW-2. A third sample (GTSED-3) was

composited from three locations, collected from below the clarifier unit in the creek near surface water sample site GTSW-3. Sample GTSED-MAY04 was collected as a blind duplicate sample of GTSED-1. Sediment samples were obtained from a composited sample from the clarifier (GTSED-4), taken at one location on the east side of the clarifier. Sediment samples were placed into laboratory prepared sampling jars, shipped under chain of custody on ice, and analyzed for total metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc. The sample collected at GTSED-2 was also analyzed for organics.

A.3.5 Phosphorous Storage Tanks

Assessing the potential for elemental phosphorus to exist in the storage tanks was part of the SI. Former employees of the Central Farmers facility were questioned about the status of the tanks when the facility ceased operation. The response was that the company removed as much product as possible from every part of the plant to generate cash. The former employees thought that the storage tanks were emptied at the end of the operation and one of the former employees remembered partially opening the tanks to the atmosphere and partially filling them with soil/ore at the end of operations.

Two storage tanks were identified during the SI to be located south of the former furnace building and to the east of monitor well GT-3. These tanks were used during the plant operation to store elemental phosphorus after it was produced in the electric-arc furnace and before it was used to produce phosphoric acid for fertilizer production. The size of these tanks is not known, but according to former employees of the site the tanks are fairly small and would hold a "day or two worth of production". These storage tanks are contained within a concrete impoundment with concrete under and around the tanks. There is no concrete placed above the tanks. Investigation of the tanks by Nu-West revealed that the tanks were open to the atmosphere, possibly for quite some time based on the rusted condition observed on the pipe flange at the ground surface.

In order to confirm that the tanks did not contain significant amounts of elemental phosphorus, a plan was devised to probe the tanks. It has been observed at other times that elemental phosphorus will stick to metal when it comes into contact with the metal in the presence of air. A piece of 1-inch diameter rebar was used as the probe. The rebar was pushed to the bottom of each tank and moved in a stirring motion to cover as large of an area as possible. The rebar was then removed and inspected. This procedure was repeated 3 to 5 times in each tank. It was observed that each tank was partially filled with soil or a soil/ore mixture, and no elemental phosphorous was present. There is some moisture in each tank, but it did not appear to be any free water in the tanks.

A.4.0 MONITOR WELL INSTALLATION

A.4.1 Introduction

Eight monitor wells (GT-1 through GT-8) were drilled and completed at the Central Farmers fertilizer facility between the dates of May 24 and July 3, 2004. Locations of the monitor wells are shown on Figure A.4.1. Construction details for all wells are summarized in Table A.4.1. The objective of the monitor well installation program was to define the geologic characteristics and evaluate potential impacts from the former plant facility on the aquifer system beneath and downgradient to the south of the facility. A further objective of the monitor well installation program was to obtain aquifer data beneath and south of the facility including water level elevations, hydraulic gradients, and hydraulic conductivity.

A.4.2 Monitor Well Drilling

All wells were drilled and completed by Layne Christensen Drilling Services of Salt Lake City, Utah under the observation of a GET LLC professional geologist registered in the State of Idaho (PG No. 721). Samples of drill cuttings were collected continuously and logged every five feet during drilling. Wells were drilled using an Ingersoll Rand T-4 drilling rig, air-rotary methods and a 9-7/8-inch diameter drill bit. Water used during drilling was obtained from a potable city water source in Georgetown, Idaho. The 9-7/8-inch bit was used to advance temporary casing through the alluvium using ODEX drilling methods. All casing was removed during well completion. Cement grout was added to the annulus between the surface casing and the boring during well completion to seal the annular space between casing and alluvium in accordance with Idaho State Regulation 42-238(4) for water well drillers.

Monitor wells were drilled and completed according to the following steps:

- Steam clean all down-hole drilling equipment and any contaminated drilling equipment prior to setting up at each well site;

- Drill 9-7/8-inch borings and advance 10-inch casing into alluvium or to bedrock (in deep well) or to a depth specified by the site hydrogeologist;
- Obtain representative 5-foot samples;
- Stop to obtain water levels in the boring or sample as necessary;
- Clean each boring of drill cuttings and other accumulated materials and fluids introduced into each borehole;
- Install 4-inch diameter, Schedule 40 PVC well screen and casing assemblies with stainless steel centralizers set at the top and bottom of the screened interval;
- Tremie gravel pack into annulus surrounding each screen to approximately two feet above screen section while bailing and surging each well;
- Tremie approximately a five-foot thick bentonite pellet seal on top of the consolidated sand pack;
- Tremie a grout seal into the annulus of each well until the grout level reached the ground surface;
- Install a surface completion at each location, and;
- Develop each well by either bailing with a decontaminated 3-inch bailer and Smeal 5-T pump rig, using a 185 cfm air compressor, pumping each well using a decontaminated stainless steel submersible pump, or a combination of these methods. Development was initiated after grout had set for at least 48 hours. Each well was considered to be developed when discharge water was relatively clear and free of sediment and the pH, temperature, and specific conductance had stabilized.

Details of well construction and development are discussed in Appendix A, Sections A.4.3 and A.4.4, respectively. The shallow wells were drilled to about 12 feet below the water table to ensure that the entire well screen was within the saturated zone. Well GT-5 was screened across the water at the time of completion to allow for sampling of organics at the request of IDEQ. Water was first encountered at depths of 12 to 60 feet below land surface. Water levels were noted to drop during the drilling program.

A.4.3 Well Construction

All wells were constructed using PVC casing materials. PVC materials consisted of 4-inch diameter Schedule 40 PVC well casing and 0.015 inch factory slotted well screen. Screen lengths were 10 feet in the shallow monitor wells GT-1, GT-2, GT-3, GT-4, GT-6 and GT-8 and 20 feet in well GT-5 and deep well GT-7. Stainless steel centralizers were attached at the bottom and top of the screen assembly. Flush-coupled PVC end caps were threaded to the bottom of the screen assemblies. No glues or adhesive compounds were used on either the screen or casing assemblies. All casing and screen assemblies were steam cleaned prior to installation into the wells.

Each well was sand packed using 16-40 Colorado silica sand. Sand pack was tremied into place using a 1-1/2-inch diameter tremie pipe. Sand pack was tremied from the bottom of the boring to about two feet above the top of the screened interval. The top of the sand was measured with a weighted tape to approximate the depth. An approximate 5-foot seal of bentonite pellets was installed on top of the sand pack using tremie methods. The remaining annular space was then grouted to the surface with a neat cement grout or bentonite grout using tremie methods. Well GT-7 casing collapsed during the first completion attempt. The well was drilled out and rebuilt, with no evidence of grout contamination. Well construction is shown on the well completion logs, and on the well logs, Figures A.4.2 through A.4.9. Typical well construction is illustrated on Figure A.4.10.

Steel surface casing was installed to a depth of 3 feet below ground surface at all wells. Steel casing installed at these locations is composed of mild steel with a minimum wall thickness of 0.250 inches and a diameter of 10 inches (GT-8 is 8 inches). All the surface completions were fitted with locking caps. A 3-foot square, 6-inch thick concrete pad that slopes away from the casing was poured around each well. Four steel posts were cemented into postholes spaced around the well at approximate 5-foot centers.

A.4.4 Well Development

A minimum of 20 casing volumes of water was produced from each well to remove excess drilling fluids and accumulated sediments. Development was accomplished using a decontaminated 3-inch bailer and Smeal 5-T rig, a 185 cfm air compressor equipped with oil filters, pumping from each well using a decontaminated stainless steel submersible pump, air pumping, or a combination of these methods. Discharge was measured using a stopwatch and a graduated 5-gallon bucket. Discharge was monitored periodically for turbidity, sediment content, pH, specific conductance, and temperature. Development was considered complete when turbidity and the presence of sediments were negligible; and pH, specific conductance, and temperature of subsequent measurements were within the following ranges:

- pH = ± 0.2 units
- temperature = ± 1.0 C
- specific conductance = ± 10 percent

Well development data are summarized in Tables A.4.2 through A.4.9. These data tables also contain field readings obtained during testing and sampling events.

A.4.5 Geologic Logs

Geologic logs were prepared for each well and are presented in Figures A.4.2 through A.4.9. The geologic logs are based on inspection of drill cuttings collected at 5-foot intervals and drilling characteristics of the geologic units encountered. Standard geological terminology was used to describe the cuttings.

A.4.6 Monitor Well Surveying

A survey of the elevations and locations of the newly installed monitor wells and borings was performed by Harper & Leavitt Engineers of Blackfoot, Idaho. Surveyed well

coordinates and elevations are presented in Table A.4.1.

A.4.7 Monitor Well Water Level Elevations

After well completion, depth to water was measured to the nearest 0.01 foot in each well using an electric water level meter. All measurements are taken from the top of the 4-inch PVC casing. Calculated water level elevations are listed in Tables A.4.2 through A.4.9. Ground water levels measured throughout the course of the SI are presented on Figures A.4.11 through A.4.20. Water levels generally peak in late April through June, then decline through the remainder of the year. Water level trends shown on these figures indicated decreases for all wells throughout the SI, and are described as follows:

- Well GT-1 ground water levels fell about 3.85 feet between June 2, 2004 and February 2, 2005. Water levels rose about 6.5 feet by June 2005 to a higher elevation than 2004 peak levels.

- Well GT-2 ground water levels fell about 8.3 feet between June 6, 2004 and August 23, 2004 and was dry through April 2005. Water levels then rose about 24.8 feet by June 2005 to a higher elevation than 2004 peak levels.

- Well GT-3 ground water levels fell about 14 feet between June 5, 2004 and February 2,. Water levels then rose about 26.2 feet by June 2005 to a higher elevation than 2004 peak levels.

- Well GT-4 ground water levels fell about 8 feet between June 6, 2004 and April 10, 2005. Water levels then rose about 12.9 feet by April 28, 2005 to a higher elevation than 2004 peak levels. A second smaller peak occurred on June 22, 2005.

- Well GT-5 ground water levels fell about 10.3 feet between June 2, 2004 and April 10, 2005 Water levels then rose about 22.3 feet by April 27, 2005 to a higher elevation than 2004 peak levels. A second smaller peak occurred on June 22, 2005.

- Well GT-6 ground water levels fell about 7 feet between June 18, 2004 and June 28, 2004 and remained near that level through April 10, 2005. Water levels then rose about 8.2 feet by June 2005 to 2004 peak levels. Water level declines occurred at a slower rate in 2005 in this well.

- Well GT-7 ground water levels fell about 11.4 feet between June 17, 2004 and February 2, 2005. Water levels then rose about 24.2 feet by June 2005 to an elevation approximately 12 feet higher than 2004 peak levels.

- Well GT-8 ground water levels fell about 7.3 feet between July 7, 2004 and February 2, 2005. Water levels then rose about 24.8 feet by June 2005 to a higher elevation than 2004 peak levels.

- Preexisting well GT-Shallow has an overall very small increasing trend since May 2002. Water levels show little change in this well which is likely screen across the alluvial and bedrock aquifers.;

- Preexisting well GT-Deep ground water levels are seasonal, with a range of about 22 feet of seasonal difference noted between February and June 2005. Overall, water levels indicate a rising trend since monitoring commenced in 2002.

A.5.0 SPECIFIC CAPACITY TESTS

A.5.1 Introduction

Short-term specific capacity tests (short-term pumping tests) were conducted in eight wells installed during the SI. Downgradient monitor well GT-6 was tested in May 2005 because it could not be tested in 2004 as the result of the rapid drop in water levels that occurred between June 18 and June 28, 2004 during development of the well. Slug testing was also performed on four of the wells, but considering the low water levels in the wells at the time that slug testing was completed, the results could potentially be biased. Constant discharge testing performed for the specific capacity tests following well development are believed to yield better information regarding the characteristics of the two site aquifers.

A.5.2 Field Methods

A specific capacity test was conducted on each well following development. The purpose of the short-term pumping tests was to estimate specific capacity of each well and, where key assumptions were met, to estimate transmissivity. Specific capacities and transmissivities were estimated for all eight monitor wells. Results of these tests are shown in Table A.5.1. Data obtained from the tests are presented in Tables A.5.2 through A.5.9. Measurements of pH and specific conductance were also performed on selected grab samples during most of the tests. Results of these field measurements are shown in Tables A.5.2 through A.5.9.

Each specific capacity test was conducted using a submersible pump capable of discharging up to about 18 gallons per minute (gpm). Produced water was discharged to location away from the well with an unrestricted discharge hose kept at ground level throughout testing. Water levels were measured by hand using an electric water level meter. Rate and volume of discharge were measured using a graduated 5-gallon bucket and stopwatch. The procedure used to conduct each specific capacity test was:

1. Install pump and discharge piping into developed well.
2. Measure static water level in the well.
3. Turn the pump on and open discharge valve.
4. Measure water levels and discharge rates periodically.
5. Turn off the pump and measure water levels during recovery until the water level had recovered to near static conditions.

Data collected during the tests are contained in the tables and plotted on Figures A.5.1 through A.5.8.

A.5.3 Data Reduction and Analysis

Lohman (1972) defined specific capacity as the discharge rate divided by drawdown at a given time. Estimates of specific capacity calculated at the end of pumping are provided in Table A.5.1. In addition to estimating specific capacity, performing these tests for a several hour period allows for the plotting of drawdown data over multiple log cycles for time, well beyond the time where casing storage effects could bias drawdown. Recording measurements of drawdown over 4 log cycles for time in some cases allows for the estimation of transmissivity and hydraulic conductivity from the drawdown curve of these short-term specific capacity (pumping) tests.

Key assumptions for estimating aquifer parameters from these tests include:

- The aquifer is confined;
- The aquifer has an apparent infinite areal extent;
- The aquifer is homogeneous and isotropic with uniform thickness over the area influenced by the test;
- The static potentiometric surface is horizontal over the area influenced by test;

- The aquifer is pumped at a constant discharge rate;
- The well is fully penetrating, and;
- Flow of ground water to the well is horizontal.

The screened interval or the available saturated portion of the well was used to represent aquifer thickness. Water levels measured during the short-term pumping tests were used, where key assumptions were met, to estimate transmissivity using the methods described by Cooper and Jacob (1946). Transmissivities estimated using the Cooper and Jacob method are summarized in Table A.5.1. Pumping rates and drawdown curves are plotted Figures A.5.1 through A.5.8. Straight lines projected through the semi-log plots of drawdown versus time are visual estimates of best-fit linear regression lines used to estimate transmissivity by the Cooper and Jacob method.

A.6.0 GROUND WATER SAMPLING AND ANALYSIS

A.6.1 Introduction

Nine rounds of ground water samples were collected from the Central Farmers Fertilizer Facility project monitor wells and analyzed for general chemistry, total and dissolved metals, anions, and cations. Two round of samples were collected from the preexisting deep well GT-Deep, once in 2004 and once in 2005. Samples were collected for PCBs and total petroleum hydrocarbons analysis from wells GT-2, GT-3, GT-4 and GT-5 within the fenced area of the site. Locations of the sampled wells are shown on Figure A.4.1. Ground water sampling included:

- Collecting nine rounds of ground water samples from the new shallow and deep monitoring wells (GT-1 through GT-8) at the site (except from wells GT-2 and GT-4 when dry), and the existing deep well (GT-DEEP);
- Collecting blind duplicate and blank samples for quality assurance and quality control;
- Shipping samples on ice to an analytical laboratory under full chain of custody and control;
- Performing water level elevation measurements in Central Farmers Fertilizer Facility monitor wells, and;
- Reducing and evaluating sampling data results.

A.6.2 Ground Water Sampling Methods

Sampling activities from each monitor well sampling event were recorded on a field ground water sampling form. These sampling forms from each sampling event are contained behind the figures in the Field Ground Water Sampling Forms in Appendix A. Prior to sampling the wells, each wellhead was examined for its general condition and signs of tampering upon arrival at the monitoring well. The depths to water were

measured to the nearest 0.01 foot and recorded on the field form, and are listed in Table A.6.1.

Well purging was initially performed during the July 2004 sampling round (Round 1) using a non-dedicated all stainless steel sampling pump using a low-flow purge method. Flow rates were measured concurrent with drawdown in each well when field samples were collected to assess stabilization of purged ground water. Once pumping commenced and ground water discharged to the ground surface, the flow rate was adjusted such that the pumping level was maintained to within about 0.3 feet of the static level. Discharge was measured in a calibrated container and recorded on the field form. Field measurements were made using pH and conductivity meters. A ground water sample was obtained from each well when field parameters stabilized during purging.

As a result of the very low transmissivity noted in most of the wells, combined with the falling water levels in the wells observed following high water season, the low-flow sampling method proposed in the April 2004 Sampling and Analysis Plan (GET, 2004) could not be implemented. Therefore, for the remainder of the sampling rounds, wells were purged and sampled using decontaminated 3-inch by 8-foot long bailers on a winch operated by a Smeal 5T Rig. Samples obtained for organics were bailed using a disposable Teflon bailer following purging with the bailer. Equilibration was achieved when the extraction of three calculated casing volumes was completed. A sample was then obtained following the removal of at least three casing volumes, or the well was evacuated to dryness and then allowed to recover. Equilibration is generally considered to have been met if three successive measurements were obtained that fell within the following criteria:

- pH within ± 0.3 units;
- Temperature to within ± 1 degree C;
- Specific Conductance within ± 10 percent;

Results of the field parameters obtained during purging of the wells are presented in Table A.6.1 and represented on Figures A.6.1 through A.6.70. Following completion of well purging, the samples were then collected in laboratory prepared bottles with appropriate preservatives.

The pH meters were calibrated against two standard pH solutions, 7.0 and 10.0. The meter readings were adjusted, and the probe rinsed thoroughly with distilled water. The probe was then immersed in the water sample, and the pH and temperature were recorded to nearest hundredth for pH, and to 0.1 degree centigrade.

Specific conductivity meters were standardized by immersing a decontaminated specific conductivity probe into a standard conductivity solution and adjusting the reading. After the meter reading was adjusted to the buffer solution value the probe was rinsed with distilled water. The probe was then immersed in the well water sample, and the specific conductivity was read and recorded on the sampling form. The specific conductivity reading is automatically temperature-compensated to 25 degrees C by the meter.

Decontamination of sampling equipment including sampling pipe, pumps and wire, and bailers included a rigorous program of cleaning with a non-phosphate detergent, followed by a 3000 psi spray of potable water, followed by a triple rinse of distilled water. Sampling equipment was decontaminated prior to and after each use.

A.6.3 Sample Collection

Ground water samples were labeled according to the monitoring well designation with date and time of sample collection. The sample designation, date, and time that the sample was collected, and initials of the sampler were recorded in the field log and on the chain of custody form.

When the bailer sampling method was used, the decontaminated bailer was lowered down the well casing to the bottom of the well. After the bailer filled with water, it was raised to the surface. The water in the bailer was transferred to the sample containers so that air entrainment in the sample was minimized. Bottles for organic analysis were filled to the top to minimize aeration. Samples collected for dissolved metals analysis and ion balance were filtered in the field using a 0.45-micron disposable filter and then transferred to the appropriate sample bottles.

A.6.4 Sample Container/Preservation/Handling

The sample containers were preserved as required for each analytical method. Chain of custody forms were completed and stored with the samples. Each cooler was packed in ice, labeled and sealed with adhesive tape. To detect tampering of the water samples during transportation to the analytical laboratory, frangible custody seals were placed and taped over the opening between the body of the cooler and the cooler lid and signed by the collecting personnel.

A.6.5 QA/QC Samples

QA/QC samples included field duplicates and blanks. Blind duplicate samples included GWJUL04 (GT-2), AUG04 (GT-3) SEP04 (GT-8), MAY 05 (GT-2), GWJUN05 (GT-8), GWJUL05 (GT-2). The duplicate sample IDs were documented on the ground water sampling forms at the time of well sampling with a fictitious sampling time. Duplicates were collected by alternately filling the original and duplicate sample containers. The duplicate samples were preserved, handled, and transported in an identical manner as the actual water samples. Trip blanks were included in each cooler submitted to the laboratory with samples for organics analyses with the exception of the October 2005 round because the lab did not send blanks with the sample bottles. Trip blanks were included to detect contamination that may be introduced from sample containers and during transportation. The trip blanks consisted of a sample bottle filled with reagent-

grade water at the laboratory that accompanied the empty sample bottles to the site and the filled sample bottles back to the lab. The trip blanks were subsequently analyzed with the samples. The trip blank sample containers remained sealed until analyzed.

A.7.0 SURFACE WATER SAMPLING AND ANALYSIS

A.7.1 Introduction

Field surface water sampling for the SI was initiated during the last week of April 2004 and completed on October 11, 2005. Surface water sampling included collection of surface water samples from three locations in Georgetown Creek, above and below the ore storage area in Phosphoria Gulch, and from the clarifier. During 2005, one surface water sampling round (Round 11) included collection of surface water samples from water flowing across the site to characterize water quality. Surface water sample events included:

- 04/27/04 – Surface Water Round 1
- 05/26/04 – Surface Water Round 2
- 06/29/04 – Surface Water Round 3
- 07/27/04 – Surface Water Round 4
- 08/24/04 – Surface Water Round 5
- 09/29/04 – Surface Water Round 6
- 11/04/04 – Surface Water Round 7
- 04/27/05 – Surface Water Round 8
- 06/01/05 – Surface Water Round 9
- 06/28/05 – Surface Water Round 10
- 07/21/05 – Surface Water Round 11
- 08/26/05 – Surface Water Round 12
- 10/11/05 – Surface Water Round 13

Samples were analyzed for general chemistry and total metals. Dissolved anions and cations were collected for common ion metals. Surface waters were also analyzed for dissolved metals from Rounds 6 and 7 and all sample rounds in 2005. Samples were obtained at site GTSW-2 in Georgetown Creek for PCBs, semivolatile organics and total petroleum hydrocarbons during Rounds 1, 2, 7 and 8. Locations of the surface water

sample sites are shown on Figure A.7.1. Surface water sites GTSW-5 and GTSW-6 went dry and therefore were not available for sampling during Rounds 4 through 7 in 2004 and Rounds 12 and 13 in 2005.

A.7.2 Surface Water Sampling Methods

Information obtained from the surface water sampling activities included general water quality parameters, metals, anions, cations, pH, specific conductivity, and temperature.

During each sampling event, field measurements of pH, specific conductivity, and temperature were obtained. Results of field measurements are summarized in Table A.7.1, and represented on Figures A.7.2 through A.7.8.

The pH meters were calibrated against two standard pH solutions, 7.0 and 10.0. The meter readings were adjusted, and the probe rinsed thoroughly with distilled water. The probe was then immersed in the surface water sample, and the pH and temperature were recorded to nearest hundredth for pH, and to 0.1 degree centigrade. Results of field measurements are contained in Table A.7.1.

Specific conductivity meters were standardized by immersing a decontaminated specific conductivity probe into a standard conductivity solution and adjusting the reading. After the meter reading was adjusted to the buffer solution value the probe was rinsed with distilled water. The probe was then immersed in the surface water sample, and the conductivity recorded. The specific conductivity reading is automatically temperature-compensated to 25 degrees C by the meter. Results of field measurements are contained in Table A.7.1.

A.7.3 Sample Collection

Surface water samples were labeled according to the sample location and date and

time of sample collection. The sample designation, date, and time that the sample was collected, and initials of the sampler were recorded on the field sampling form, and on the chain of custody form. These forms are contained behind the figures in Appendix A. The samples were collected in a chemically inert container with appropriate preservatives. Meters were field calibrated prior to each use.

A complete set of sample containers were prepared prior to sampling each surface water site. The containers were labeled with the date, sample location, project name, collectors' name, time of collection, and parameters to be analyzed. The sample bottles were filled in order of volatility so that the containers for volatile organics were filled first and samples that were not pH-sensitive or subject to loss through volatilization were collected last. All grab surface water samples were collected using new disposable plastic cups or an empty distilled water bottle. The sample containers were preserved as required for analytical method. Chain of custody forms were completed and stored with the samples. Each cooler was labeled and sealed with tape. To detect tampering of the water samples during transportation to the analytical laboratory, frangible custody seals were placed over the crack between the body of the cooler and the cooler lid and signed by the collecting personnel.

A.7.4 QA/QC Samples

Blind duplicate samples were collected, including SWAPR04 (GTSW-3), SW-MAY04 (GTSW-1), GTSWJUN04 (GTSW-7), GTSWAPR05 (GTSW-7), GTSWJUN05 (GTSW-6) and GTSW2JUN05 (GTSW-8). The duplicate sample IDs were documented on the surface water sampling forms at the time of sampling with an assumed time of sampling. All duplicates were collected by alternately filling the original and duplicate sample containers. The duplicate samples were preserved, handled, and transported in an identical manner as the actual water samples.

A.7.5 Flow Rate Measurements

Flow rates were measured during surface water sampling Rounds 1 through 6 and 8 through 13 at each sampling location at sites GTSW-1, GTSW-2, and GTSW-3 along Georgetown Creek, shown on Figure A.7.1 with the exception of Round 4 when the Pygmy Meter vane was broken. Flow measurements could not be made along the ephemeral stream flowing out of Phosphoria Gulch in the spring of 2004 as the result of the shallow flow that would not accommodate the Pygmy Meter. Flow in Phosphoria Gulch was greater in 2005, but the level was still too shallow to accommodate the meter. Flow rate measurements were made using a Pygmy Meter, wading rod, tape measure and stopwatch to obtain the necessary readings.

Three locations were selected for stream flow measurement prior to the SI. These same locations, GTSW-1 through GTSW-3 were used during each round of measurements. Initially a cloth tape was laid out across the stream section perpendicular to flow. Both ends of the measuring tape were secured, and measurements commenced with the Pygmy meter along 0.5 or 1.0 foot intervals. The first measurement was made at the first point where there was adequate depth. Water depth was determined from calibrations on the wading rod. At each measurement location, the pygmy meter was placed on the corresponding steam depth mark to ensure that the meter was at the proper location. The meter was then placed in the stream and the number of revolutions of the vane was counted for sixty seconds. This was repeated at each measurement location across the creek.

Flow rate and stream width measurements are presented in Table A.7.2. This table shows the calculations resulting in the estimated total flow rate for each site. The data used to calculate the flow rates were recorded on field forms and entered into a spreadsheet. The stream flow equation used was:

$$V=(rev/time)(0.9604)+0.0312:$$

Where:

V = velocity

Rev = counted vane revolutions

Time = seconds (60)

Dividing the revolutions by the time in seconds measured this equation results in velocity in feet per second. Multiplying by the cross-sectional area of the segment measured gives cubic feet per second. The sum of the measured volumetric flows added together resulted in the total flow of the stream at each measured location, shown on Figure A.7.2.

8.0 REFERENCES

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APPENDIX A TABLES

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS

TABLE A.2.1
SUMMARY OF GEOTECHNICAL TESTING
CENTRAL FARMERS FERTILIZER PLANT
GEORGETOWN CANYON, IDAHO

Boring	Depth	Soil Type	Grain Size - ASTM D422-63	Bulk Density - ASTM 2937-83	Specific Gravity - ASTM 854	Compaction - ASTM D698	Moisture Content - ASTM D2216-80	Falling Head Permeability - EM - 1110-2-1906	Unsaturated Hydraulic Conductivity	Capillary Moisture - ASTM 3152
GT-1	none obtained									
GT-2	none obtained									
GT-3	12	GC	X	X	X		X	X	X	X
	17	CL-ML	X	X	X		X	X	X	X
GT-4	10	GC					X			
	20	GC	X	X	X		X	X		
GT-5	none obtained									
GT-6	none obtained									
GT-7	27	GM	X	X	x		X	X	X	X
GT-8	18.5	CL-ML	X				X			
GT-9	none obtained									
GT-10	10	GP	X	X	X		X			x
GT-11	8.5	GP					X	X		
GT-12	12.5	CL-ML					X	X		
GT-13	13	GC	X				X			
	17	GC					X			
GT-14	8.5	CL-ML	X	X			X			
	18	GP					X			
GT-15	10	GM					X			
	25	GP	X	X			X	X		
GT-16	none obtained									
GT-17	none obtained									
CVM-1	Surface grab	GM	X	X		X	X	X		
CVM-2	Surface grab	GM	X	X		X	X	X		
CVM-3	Surface grab	ML	X	X		X	X	X		

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TABLE A.2.2
SUMMARY OF SOILS GEOTECHNICAL TESTING

Boring	Sample Depth (ft)	Soil Type (USCS)	Grain Size - ASTM D422-63 (percent passing)	Bulk Density - ASTM 2937-83 (dry pcf)	Compaction - ASTM D698	Specific Gravity - ASTM 854	Moisture Content - ASTM D2216-80 (percent)	Falling Head Permeability - EM - 1110-2-1906 (cm sec^{-1})	Unsaturated Hydraulic Conductivity (cm sec^{-1})	Capillary Moisture - ASTM 3152 (percent)
GTB-3	12	GC	89.8 passing No. 4; 67.7 passing No. 40; 48.8 passing No. 200	115.9		2.749	14.3	1.70E-07	4.02E-07	12.4
	17	CL-ML	100 passing No. 4; 86.5 passing No. 40; 64.2 passing No. 200	104.3		2.745	22.8	2.30E-07	9.39E-08	21.7
GTB-4	10	GC					13.5			
	20	GC	35.2 passing No. 4; 25.2 passing No. 40; 16.5 passing No. 200	122.2		2.83	9.4	4.70E-04		
GTB-7	27	GM	62.3 passing No. 4; 32.4 passing No. 40; 19.7 passing No. 200	114.1		2.725	16.4	5.30E-06	1.09E-06	15.7
GTB-8	18.5	CL-ML	73.2 passing No. 4; 58.6 passing No. 40; 41.8 passing No. 200				18.6			
GTB-10	10	GP	37.1 passing No. 4; 23.8 passing No. 40; 15.2 passing No. 200	125.2		2.762	6.8			10.3
GTB-11	8.5	GP					13	2.20E-05		
GTB-12	12.5	CL-ML					19.4	1.70E-07		
GTB-13	13	GC	67.9 passing No. 4; 37.6 passing No. 40; 30.8 passing No. 200				11.3			
	17	GC					7.7			
GTB-14	8.5	CL-ML	100 passing No. 4; 94.5 passing No. 40; 84.6 passing No. 200	96.3			27.3			
	18	GP					12.5			
GTB-15	10	GM					8.7			

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TABLE A.2.2
SUMMARY OF SOILS GEOTECHNICAL TESTING

Boring	Sample Depth (ft)	Soil Type (USCS)	Grain Size - ASTM D422-63 (percent passing)	Bulk Density - ASTM 2937-83 (dry pcf)	Compaction - ASTM D698	Specific Gravity - ASTM 854	Moisture Content - ASTM D2216-80 (percent)	Falling Head Permeability - EM - 1110-2-1906 (cm sec^{-1})	Unsaturated Hydraulic Conductivity (cm sec^{-1})	Capillary Moisture - ASTM 3152 (percent)
	25	GP	32 passing No. 4; 19.6 passing No. 40; 11.6 passing No. 200	124.7			6.4	3.10E-03		
CVM-1	Surface	GM	80 passing No. 4; 65.3 passing No. 40; 44.1 passing No. 200	113.4	115 pcf @ 15.2%		14.8	4.50E-06		
CVM-2	Surface	GM	58.1 passing No. 4; 35.4 passing No. 40; 24.9 passing No. 200	116.7	121.8 pcf @ 10.5 %		8.6	2.70E-06		
CVM-3	Surface	GM	98.9 passing No. 4; 92.4 passing No. 40; 76.2 passing No. 200	86.9	90.1pcf @ 25 %		20.2	3.70E-05		

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TABLE A.4.1
MONITOR WELL CONSTRUCTION INFORMATION

Well	Date Completed	Elevation Meas. Pt. (ft)	Northing Coordinate (ft)	Easting Coordinate (ft)	Boring Depth (ft)	Well Diameter (in)	Screened Interval (ft)	Casing Interval (ft)	Sand Pack (ft)	Bentonite Seal (ft)	Grout Seal (ft)
GT-1	05/27/04	6963.24	17817.64	14808.84	25.6	4-inch PVC	11 to 21	-2.5 TO 11	8.5 to TD	3 to 8.5	0 to 3
GT-2	06/03/04	6918.3	15464.701	14200.912	45	4-inch PVC	32 to 42	-2.5 TO 32	29.1 TO TD	24.1to 29.1	0 to 24.1
GT-3	06/04/04	6916.8	15263.737	14307.431	45	4-inch PVC	34.5 to 44.5	-2.5 TO 34.5	30.8 TO TD	26.2 to 30.8	0 to 26.2
GT-4	06/06/04	6915.97	14957.54	14293.382	43.5	4-inch PVC	31.5 to 41.5	-2.5 TO 31.5	28.3 TO TD	23.3 to 28.3	0 to 23.3
GT-5	06/08/04	6912.1	15032.019	14118.991	37.5	4-inch PVC	17.5 to 37.5	-2.5 TO 17.5	14.5 TO TD	9.4 to 14.5	0 to 9.4
GT-6	06/10/04	6858.28	13123.317	13900.19	68	4-inch PVC	57.5 to 67.5	-2.5 to 57.5	54 TO TD	49.2 to 54.0	0 to 49.2
GT-7	06/28/04	6923.95	15752.218	14287.623	161	4-inch PVC	140 to 160	-2.5 to 140	136.5 to TD	132.0 to 136.5	0 to 132.0
GT-8	07/01/04	6923.23	15754.885	14275.259	43	4-inch PVC	30.0 to 40.0	-2.5 to 30.0	26.8 to TD	23.2 to 26.8	0 to 23.2

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TABLE A.4.2
MONITORING WELL GT-1
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Measuring Pt Elev (ft amsl)	Water Level Elev. (ft amsl)	pH (units)	Specific Cond (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/02/04	17:50	10.28	6963.245	6952.97	7.59	380	6.5	338	muddy
			6963.245		8.45	361	6.4	312	muddy
			6963.245		7.9	371	5.3	318	turbid
06/03/04	12:40	10.38	6963.245	6952.87	7.17	373	5.7		turbid
			6963.245		7.5	368	5.5		turbid
06/03/04	15:45		6963.245		7.31	366	7		turbid
			6963.245		7.84	366	7		turbid
06/05/04	21:20		6963.245		7.4	371	7		clearing
06/06/04	9:45		6963.245		7.42	378	6.9		clearing
06/06/04	9:50		6963.245		7.49	332	6.7		clearing
06/06/04	9:55		6963.245		7.53	311	6.2		clearing
06/06/04	17:45		6963.245		7.84	384	8.3	330	Specific capacity test END
06/18/04	8:39	11.01	6963.245	6952.24					
07/08/04	16:03	12.61	6963.245	6950.64	7.61	425	7.4		1st sample round
07/16/04	8:25	12.86	6963.245	6950.39					
08/23/04	14:45	13.59	6963.245	6949.66	7.74	441	6.4		2nd Sampling Round
09/28/04	14:45	13.74	6963.245	6949.51	7.69	414	7.2		3rd Sampling Round
11/05/04	9:15	13.92	6963.245	6949.33	7.47	446	5.2		4th Sampling Round
02/02/05		14.13	6963.245	6949.12					

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TABLE A.4.3
MONITORING WELL GT-2
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/03/04	14:30	34.71	6883.59					
06/06/04	14:06	34.12	6884.18					Development
06/07/04	11:27			7.85	785	10.5		Development
06/07/04				7.61	832	9.5	712	Development
06/09/04	15:19			6.79	955	14.7		Development - cloudy
06/09/04	15:30			6.96	935	14.9		Development - cloudy
06/09/04	16:10			6.56	1153	15.6		Development - cloudy
06/09/04	16:49			6.67	1034	15		Development - cloudy
06/18/04	9:35	34.44	6883.86					Development - cloudy
07/08/04	14:10	35.96	6882.34	7.07	1363	10		1st Sampling Round
07/16/04	11:25	36.62	6881.68					
08/23/04	14:45	42.45	6875.85	7.27	1101	7.6		2nd Sampling Round
09/28/04	15:10	dry	6873.80					3rd Sampling Round
11/05/04	16:00	dry	6873.80					4th Sampling Round
02/02/05		dry	6873.80					
04/10/05		dry	6873.80					
04/27/05		30.64	6887.66					
05/11/05		22.81	6895.49	6.99	1379	9.5		5th Sampling Round
06/01/05		19.72	6898.58					
06/22/05		23.8	6894.50	7.11	1162	8.2		2005 Sampling
06/28/05		25.01	6893.29					
07/06/05		26.99	6891.31					
07/19/05		30.47	6887.83	7.19	1170	10.1		2005 Sampling
08/25/05		37.98	6880.32	7.07	1053	8.7		2005 Sampling
10/11/05		43.17	6875.13	7.11	1128	6.5		2005 Sampling

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TABLE A.4.4
MONITORING WELL GT-3
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/05/04	10:55	33.22	6883.58					Development
06/07/04	8:36	33.39	6883.41					Development
06/07/04	11:43			7.02	549	9.1		Development
06/07/04	20:46			6.7	703	9.7		Development
06/18/04	9:22	34.33	6882.47					
07/08/04	18:15	36.34	6880.46	7.03	758	7.4		1st Sampling Round
07/16/04	11:25	37.55	6879.25					
08/23/04	18:30	42.94	6873.86	7.28	664	6.8		2nd Sampling Round
09/28/04	17:45	45.08	6871.72	7.17	654	6.9		3rd Sampling Round
11/04/04	16:10	44.35	6872.45	7.2	691	5.6		4th Sampling Round
02/02/05		47.21	6869.59					
04/10/05		44.75	6872.05					
04/27/05		27.71	6889.09					
05/11/05		23.11	6893.69	6.6	936	7.3		5th Sampling Round
06/01/05		21.04	6895.76					
06/22/05		23.99	6892.81	7.67	655	7.7		2005 Sampling
06/28/05		25.19	6891.61					
07/06/05		27	6889.80					
07/20/05		30.68	6886.12	6.92	617	7.5		2005 Sampling
08/25/05		39.04	6877.76	6.97	676	6.8		2005 Sampling
10/11/05		43.68	6873.12	6.94	664	6.2		2005 Sampling

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TABLE A.4.5
MONITORING WELL GT-4
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/06/04	11:10	35.77	6880.20					
06/17/04	18:10	37.28	6878.69	6.91	649	10.3	521	Development
06/18/04	7:55	37.41	6878.56					
06/19/04	14:42			6.69	498	8.7	403	Development
07/09/04	8:45	38.84	6877.13	7.06	941	7		1st Sampling Round
07/16/04	14:38	39.4	6876.57					
08/24/04	10:25	42.03	6873.94	7.16	938	8.3		2nd Sampling Round
09/29/04	10:00	43.29	6872.68	6.93	1117	7.2		3rd Sampling Round
11/04/04	13:10	dry	6871.97					4th Sampling Round
02/02/05		43.86	6872.11					
04/10/05		dry	6871.97					
04/27/05		31.15	6884.82					
05/11/05		32.89	6883.08	7.15	790	8.1		5th Sampling Round
06/01/05		36.56	6879.41					
06/22/05		36.07	6879.90	7.3	822	8.1		2005 Sampling
06/28/05		36.98	6878.99					
07/06/05		37.82	6878.15					
07/20/05		38.78	6877.19	7.19	988	8		2005 Sampling
08/25/05		42.44	6873.53	7.2	826	7.7		2005 Sampling
10/11/05		dry	6871.97					

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TABLE A.4.6
MONITORING WELL GT-5
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/16/04	8:11	26.77	6885.33	6.71	690	8.2	559	Development
06/16/04	8:54			6.86	643	7.2	523	Development
06/16/04	9:00			6.85	633	6.7	514	Development
06/18/04	7:56	27.41	6884.69					
06/19/04	14:02			6.81	647	15.3	514	Development
07/09/04	9:30	30.69	6881.41	7.15	1442	7		1st Sampling Round
07/16/04	13:26	31.5	6880.60					
08/24/04	11:30	33.8	6878.30	7.04	1696	8.4		2nd Sampling Round
09/29/04	9:00	35.28	6876.82	6.99	1751	6.1		3rd Sampling Round
11/05/04	13:15	37.06	6875.04	6.9	1687	6.8		4th Sampling Round
02/02/05		36.56	6875.54					
04/10/05		38.31	6873.79					
04/27/05		15.98	6896.12					
05/11/05		17.73	6894.37	6.66	579	5.7		5th Sampling Round
06/01/05		25.42	6886.68					
06/22/05		26.64	6885.46	6.35	643	6.5		2005 Sampling
06/28/05		27.81	6884.29					
07/06/05		28.98	6883.12					
07/19/05		31.1	6881.00	6.84	1362	8.3		2005 Sampling
08/25/05		35.12	6876.98	7.2	826	7.7		2005 Sampling
10/11/05		36.62	6875.48	6.9	1528	6.4		2005 Sampling

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TABLE A.4.7
MONITORING WELL GT-6
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/18/04	9:15	58.61	6799.67					
06/20/04	11:15	58.61	6799.67					
06/20/04	12:10			6.89	274	5.8	219	turbid
06/20/04	13:47			6.94	318	6.2	254	turbid
06/21/04	14:38	58.76	6799.52	6.93	193	7	158	turbid
06/22/04	9:52	58.81	6799.47					
06/28/04	17:05	65.61	6792.67	6.95	392	7.8	273	sandy
06/29/04	10:22	65.95	6792.33					
06/30/04	7:05	66.1	6792.18					
07/07/04	13:39	66.51	6791.77					
07/09/04	11:05	66.54	6791.74	7.5	388	6.9		1st Sampling Round
07/16/04	11:08	66.55	6791.73					
08/23/04	15:15	66.68	6791.60	7.51	410	6.5		2nd Sampling Round
09/29/04	11:15	66.61	6791.67	7.88	405	6.4		3rd Sampling Round
11/05/04	9:45	66.91	6791.37	7.88	406	6.4		4th Sampling Round
02/02/05		66.82	6791.46					
04/10/05		66.51	6791.77					
04/27/05		59.23	6799.05					
05/11/05		58.34	6799.94	7.7	382	8.9		5th Sampling Round
06/01/05		58.42	6799.86					
06/22/05		58.63	6799.65	7.53	372	6.5		2005 Sampling
06/28/05		59.27	6799.01					
07/06/05		59.88	6798.40					
07/20/05		62.42	6795.86	7.56	373	9.8		2005 Sampling
08/26/05		66.64	6791.64	7.72	374	6		2005 Sampling
10/11/05		67.18	6791.10	7.54	388	6.4		2005 Sampling

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TABLE A.4.8
MONITORING WELL GT-7
WATER LEVELS AND FIELD WATER QUALITY DATA

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
06/16/04	13:03			6.68	480		385	open hole @ 41 ft bg
06/16/04	16:15			6.91	492			open hole @ 61ft bg
06/16/04	16:57			6.84	470		389	open hole @ 73.5 ft bg
06/17/04	16:40	42.43	6878.79	7.11	491		398	open hole @ 148 ft bg
06/18/04	7:12	42.39	6878.83					
06/28/04	19:15	44.98	6878.97					
06/30/04	9:07	45.09	6878.86	7.09	391	7.9	276	clear
06/30/04	11:11			7.04	362	7.9	256	clear
06/30/04	11:27			7.8	368	8	273	clear
06/30/04	11:42			7.91		8.1		clear
06/30/04	13:05	45.16	6878.79					
07/07/04	8:15	45.78	6878.17					
07/09/04	11:30	45.9	6878.05	7.26	609	10.2		1st Sampling Round
07/16/04	8:40	46.84	6877.11					
08/23/04	16:30	50.98	6872.97	7.55	572	6.3		2nd Sampling Round
09/28/04	16:00	53.18	6870.77	7.56	532	7.3		3rd Sampling Round
11/04/04	14:10	54.94	6869.01	7.53	559	5.6		4th Sampling Round
02/02/05		56.54	6867.41					
04/10/05		54.87	6869.08					
04/27/05		44.29	6879.66					
05/11/05		36.06	6887.89	7.52	536	5.8		5th Sampling Round
06/01/05		32.33	6891.62					
06/22/05		35.75	6888.20	7.5	287	8		2005 Sampling
06/28/05		37.02	6886.93					
07/06/05		39.76	6884.19					
07/19/05		41.77	6882.18	7.5	526	8.5		2005 Sampling
08/25/05		48.38	6875.57	7.44	524	6.9		2005 Sampling
10/11/05		52.01	6871.94	7.58	553	6.3		2005 Sampling

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TABLE A.4.9
MONITORING WELL GT-8
WATER LEVELS AND FIELD WATER QUALITY

Date (mm/dd/yy)	Time (h:m)	Depth to Water (ft)	Water Level Elev. (ft amsl)	pH (units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	TDS (mg/l)	Comment
07/07/04	10:54	24.04	6899.20					
07/07/04	19:53			7.13	618		442	Development
07/08/04	14:24			7	611	10.9	427	Development
07/08/04	14:37			7.84		9.3	440	Development
07/08/04	20:55			7.4	621	8.2	446	Development
07/15/04	15:14	25.06	6898.18					
07/15/04	12:20	24.16	6899.08	7.17	640	11.6		1st Sampling Round
07/15/04	15:26	25.06	6898.18					
07/16/04	8:40	25.14	6898.10					
08/23/04	17:30	28.79	6894.45	7.39	680	6.5		2nd Sampling Round
09/28/04	17:00	30.01	6893.23	7.46	661	7.1		3rd Sampling Round
11/04/04	15:30	30	6893.24	7.34	697	6		4th Sampling Round
02/02/05		31.38	6891.86					
04/10/05		28.93	6894.31					
04/27/05		19.55	6903.69					
05/11/05		12.98	6910.26	7.45	484	5.8		5th Sampling Round
06/01/05		13.62	6909.62					
06/22/05		14.69	6908.55	7.44	235	8.9		2005 Sampling
07/06/05		16.22	6907.02					
07/19/05		18.87	6904.37	7.4	552	8.4		2005 Sampling
08/25/05		24.35	6898.89	7.34	645	7		2005 Sampling
10/11/05		26.85	6896.39	7.46	711	5.5		2005 Sampling

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TABLE A.5.1
RESULTS OF SPECIFIC CAPACITY TESTING -e

Well	Pumping Rate (gpm)	Assumed Gradient -a (ft/ft)	Assumed Porosity -b (percent)	Aquifer Thickness -c (ft)	Specific Capacity -d (gpm/ft)	Delta s	Estimated Transmissivity (ft2/day)	Estimated Hydraulic Conductivity (ft/day)	Estimated Flow Velocity (ft/day)
GT-1	13	0.03	0.45	10	4.52	0.24	1912	191.18	12.75
GT-2	0.75	0.015	0.45	10	0.13	4.25	6	0.62	0.02
GT-3	4.4	0.015	0.45	10	0.96	1.8	86	8.63	0.29
GT-4	0.9	0.015	0.45	10	0.25	2.2	14	1.44	0.05
GT-5	0.55	0.015	0.45	10	0.07	4.13	5	0.47	0.02
GT-6	5.2	0.06	0.45	10	1.25	0.45	408	40.78	5.44
GT-7	16.6	0.004	0.45	20	1.64	0.29	2020	101.01	0.90
GT-8	4.2	0.027	0.45	10	0.92	1.52	98	9.75	0.59

Footnotes:
a - Calculated from June 18, 2004 water level map
b - conservative assumed porosity value; actual values may vary by location
c - Values based on screened alluvial or total bedrock thickness
d - Calculated at the end of pumping except GT-6 at 73 minutes.
e - See Appendix A for test data and plots used to calculate aquifer parameters

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TABLE A.5.2
MONITOR WELL GT-1 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
6/6/2004	13:12:40			11.53							Static
6/6/2004	13:18:00			11.53			13				pump on
6/6/2004	13:19:14	0:01:14	1.23	14.01	2.48	23.5	13				cloudy water
6/6/2004	13:21:04	0:03:04	3.07	14.14	2.61	23.5	13				cloudy water
6/6/2004	13:25:00	0:07:00	7	14.21	2.68	23.5	13				clearing up
6/6/2004	13:34:22	0:16:22	16.37	14.27	2.74	23.5	13				clear
6/6/2004	13:45:00	0:27:00	27	14.33	2.8	23.5	13				crystal clear
6/6/2004	14:36:30	1:18:30	78.5	14.44	2.91	23.5	13.5				crystal clear
6/6/2004	17:46:00	4:28:00	268	14.54	3.01	23.5	13.5				crystal clear
6/6/2004	17:50:00	4:32:00	272	14.55	3.02	23.5	13.5				pump off
6/6/2004	17:50:41	4:32:41		11.64	0.11	23.5	0				Recovery
6/6/2004	17:51:47	4:33:47		11.62	0.09	23.5	0				Recovery
6/6/2004	19:43:00	6:25:00		11.53	0	23.5	0				Recovery

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TABLE A.5.3
MONITOR WELL GT-2 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
6/9/2004	15:10:00			34.57							Static
6/9/2004	15:15:00			34.57		44.5	0.75				Pump on
6/9/2004	15:16:11	0:01:11	1.18	35.00	0.43	44.5	0.75				cloudy
6/9/2004	15:16:38	0:01:38	1.23	35.03	0.46	44.5	0.75				cloudy
6/9/2004	15:17:09	0:02:09	2.15	35.10	0.53	44.5	0.75				cloudy
6/9/2004	15:19:31	0:04:31	4.52	35.32	0.75	44.5	0.75				cloudy
6/9/2004	15:25:20	0:10:20	10.33	35.80	1.23	44.5	0.75				cloudy
6/9/2004	15:27:52	0:12:52	12.87	36.00	1.43	44.5	0.75	6.96	935	14.9	clearing
6/9/2004	15:31:20	0:16:20	16.33	36.32	1.75	44.5	0.75				Clear
6/9/2004	16:08:00	0:53:00	53.00	37.14	2.57	44.5	0.6 up rate	6.56	1153	15.6	Clear
6/9/2004	16:37:00	1:22:00	82.00	39.06	4.49	44.5	0.75				Clear
6/9/2004	16:49:30	1:34:30	94.50	39.38	4.81	44.5	0.75	6.67	1034	15.0	Clear
6/9/2004	17:46:00	2:31:00	151.00	40.43	5.86	44.5	0.75	6.70	947	13.2	Clear
6/9/2004	17:50:00	2:35:00	155.00	40.48	5.91	44.5					Pump off
6/9/2004	17:50:27	2:35:27		40.10	5.53	44.5					RECOVERY
6/9/2004	17:50:46	2:35:46		39.75	5.18	44.5					RECOVERY
6/9/2004	17:51:35	2:36:35		39.30	4.73	44.5					RECOVERY
6/9/2004	17:52:07	2:37:07		39.00	4.43	44.5					RECOVERY
6/9/2004	17:52:48	2:37:48		38.70	4.13	44.5					RECOVERY
6/9/2004	17:57:16	2:42:16		37.40	2.83	44.5					RECOVERY
6/9/2004	18:15:00	3:00:00		35.91	1.34	44.5					RECOVERY
6/9/2004	18:29:15	3:14:15		35.64	1.07	44.5					RECOVERY
6/9/2004	18:35:40	3:20:40		35.56	0.99	44.5					End test - trip pump

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TABLE A.5.4
GT-3 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
6/10/2004	7:20:00			34.79							static
6/10/2004	7:22:00			34.79		47	4.4				start pump
6/10/2004	7:22:25	0:00:25	0.42	35.69	0.9	47	4.4				cloudy
6/10/2004	7:22:51	0:00:51	0.85	35.95	1.16	47	4.4				cloudy
6/10/2004	7:23:18	0:01:18	1.3	36.12	1.33	47	4.4				cloudy
6/10/2004	7:23:57	0:01:57	1.95	36.3	1.51	47	4.4				cloudy
6/10/2004	7:26:50	0:04:50	4.83	36.78	1.99	47	4.4				clearing
6/10/2004	7:31:20	0:09:20	9.33	37.16	2.37	47	4.4	6.61	443	6.1	clearing
6/10/2004	7:36:05	0:14:05	14.08	37.39	2.6	47	4.4				clearing
6/10/2004	7:56:45	0:34:45	34.75	37.97	3.18	47	4.4				clearing
6/10/2004	8:12:50	0:50:50	50.83	38.21	3.42	47	4.4	6.57	426	7	clearing
6/10/2004	8:43:34	1:21:34	81.57	38.58	3.79	47	4.4				clearing
6/10/2004	9:45:20	2:23:20	143.33	39.17	4.38	47	4.4	6.67	404	5.8	clearing
6/10/2004	10:10:00	2:48:00	168	39.36	4.57	47	4.4	6.65	427	7.4	Pump Off
6/10/2004	10:12:00	2:50:00		39.37	4.58	47					Recovery
6/10/2004	10:12:18	2:50:18		38.7	3.91	47					Recovery
6/10/2004	10:12:56	2:50:56		38.3	3.51	47					Recovery
6/10/2004	10:13:22	2:51:22		38	3.21	47					Recovery
6/10/2004	10:14:23	2:52:23		37.75	2.96	47					Recovery
6/10/2004	10:15:27	2:53:27		37.32	2.53	47					Recovery
6/10/2004	10:17:42	2:55:42		36.97	2.18	47					Recovery
6/10/2004	10:27:41	3:05:41		37.53	2.74	47					Recovery
6/10/2004	10:51:00	3:29:00		35.76	0.97	47					Recovery

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TABLE A.5.5
MONITOR WELL GT-4 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
6/23/2004	12:25:00			38.71							static
6/23/2004	12:28:00			38.71		44	1.9				pump on
6/23/2004	12:38:09	0:10:09		42.00	3.29	44	1.9				below top pump reduce
6/23/2004	12:42:00	0:03:51		41.68	2.97	44	1.9				slightly cloudy
6/23/2004	12:53:40	0:11:40		41.78	3.07	44	0.9				clear-slight film
6/23/2004	13:27:00	0:33:20		41.94	3.23	44	0.9	6.86	531	17.1	
6/23/2004	13:37:00	0:10:00		42.00	3.29	44	0.9	6.99	544	14.7	strong smell
6/23/2004	13:41:00	0:04:00		42.00	3.29	44	0.9	7.04	570	14.4	
6/23/2004	13:43:00	0:02:00		42.00	3.29	44	0.9				pump off
6/23/2004	13:52:00	0:09:00		41.90	3.19	44					
						44					
6/24/2004	7:25:00			38.81		44					static
6/24/2004	7:28:00	0:03:00	3	38.81		44					pump on
6/24/2004	7:28:12	0:03:12	3.2	39.01	0.20	44	0.9				cloudy
6/24/2004	7:28:32	0:03:32	3.53	39.21	0.40	44	0.9				cloudy
6/24/2004	7:29:19	0:04:19	4.32	39.45	0.64	44	0.9				cloudy
6/24/2004	7:30:28	0:05:28	5.47	39.60	0.79	44	0.9				cloudy
6/24/2004	7:33:46	0:08:46	8.77	39.95	1.14	44	0.9				cloudy
6/24/2004	7:36:10	0:11:10	11.16	40.15	1.34	44	0.9				cloudy
6/24/2004	7:39:16	0:14:16	14.27	40.35	1.54	44	0.9				clearing yellow color
6/24/2004	7:49:10	0:24:10	24.16	40.77	1.96	44	0.9				clearing yellow color
6/24/2004	7:57:23	0:32:23	32.38	41.00	2.19	44	0.9				clear- smells like fuel
6/24/2004	7:59:49	0:34:49	34.82	41.08	2.27	44	0.9	7	1075	10.9	clear- smells like fuel
6/24/2004	8:05:46	0:40:46	40.77	41.27	2.46	44		7	886	11.2	clear- smells like fuel
6/24/2004	8:40:10	1:15:10	75.16	42.18	3.37	44		7.07	890	12.3	clear- smells like fuel
6/24/2004	9:02:40	1:37:40	97.67	42.39	3.58	44		7.05	968	12.9	clear- smells like fuel
6/24/2004	9:05:00	1:40:00	100	42.45	3.64	44					pump off
6/24/2004	9:05:50	1:40:50		42.58	3.77	44					Recovery
6/24/2004	9:06:05	1:41:05		42.50	3.69	44					Recovery
6/24/2004	9:06:44	1:41:44		42.10	3.29	44					Recovery
6/24/2004	9:08:21	1:43:21		42.25	3.44	44					Recovery
6/24/2004	9:11:52	1:46:52		42.00	3.19	44					Recovery
6/24/2004	9:21:24	1:56:24		41.60	2.79	44					Recovery
6/24/2004	9:54:30	2:29:30		40.75	1.94	44					Recovery
6/24/2004	11:07:00	3:42:00		39.97	1.16	44					Recovery
6/24/2004	12:25:00	5:00:00		39.57	0.76	44					end test

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TABLE A.5.6
MONITORING WELL GT-5 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
6/20/2004	14:42:00			28.58		40					Static
6/20/2004	15:07:00	0		28.58		40					air on
6/20/2004	15:11:23	0:04:23	4.38	30.98	2.40	40	0.55				initial slug recover
6/20/2004	15:14:51	0:07:51	7.85	31.37	2.79	40	0.55				turbid
6/20/2004	15:17:37	0:10:37	10.62	31.75	3.17	40	0.55				slightly turbid
6/20/2004	15:24:57	0:17:57	17.95	32.60	4.02	40	0.55				slightly turbid
6/20/2004	15:27:27	0:20:27	20.45	32.84	4.26	40	0.55				slightly cloudy
6/20/2004	15:32:39	0:25:39	25.65	33.28	4.70	40		6.96	595	14.3	slightly cloudy
6/20/2004	15:37:25	0:30:25	30.42	33.61	5.03	40	0.55	7.12	606	14.1	slightly cloudy
6/20/2004	15:46:40	0:39:40	39.67	34.10	5.52	40	0.45	7.33	626	14.4	slightly cloudy
6/20/2004	15:58:25	0:51:25	51.42	34.50	5.92	40	0.45	7.40	651	15.4	slightly cloudy
6/20/2004	16:11:00	1:04:00	64	34.81	6.23	40	0.4	7.33	626	14.4	slightly cloudy
6/20/2004	16:14:00	1:07:00	67	34.82	6.24	40	0.4				Pump off
6/20/2004	16:14:31	1:07:31		34.80		40					Recovery
6/20/2004	16:15:23	1:08:23		34.75		40					Recovery
6/20/2004	16:17:03	1:10:03		34.50		40					Recovery
6/20/2004	16:22:19	1:15:19		33.91		40					Recovery
6/20/2004	16:30:26	1:23:26		33.23		40					Recovery
6/20/2004	17:14:27	2:07:27		31.17		40					Recovery
6/20/2004	17:25:00	2:18:00		30.90		40					Recovery
6/20/2004	17:37:00	2:30:00		30.61		40					Recovery
6/20/2004	18:31:00	3:24:00		29.85		40					Recovery
6/20/2004	21:08:00	6:01:00		29.02		40					Recovery

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TABLE A.5.7
WELL GT-6 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
5/10/2005	16:15:00			58.48							static
5/10/2005	16:46:00			58.48		67	5.2				pump on
5/10/2005	16:46:22	0:00:22	0.38	58.92	0.44	67	5.2				turbid, no sand
5/10/2005	16:46:39	0:00:39	0.65	58.98	0.50	67	5.2				turbid, no sand
5/10/2005	16:47:02	0:01:02	1.03	59.00	0.52	67	5.2				turbid, no sand
5/10/2005	16:47:54	0:01:54	1.90	59.10	0.62	67	5.2				cloudy
5/10/2005	16:51:18	0:05:18	5.30	59.16	0.68	67	5.2	7.51	379	6.3	clearing
5/10/2005	16:55:50	0:09:50	9.83	59.22	0.74	67	5.2				clearing
5/10/2005	17:02:53	0:16:53	16.88	59.28	0.8	67	5.2				clear
5/10/2005	17:15:00	0:29:00	29.00	59.48	1	67	5.2	7.69	380	6.4	clear
5/10/2005	17:29:00	0:43:00	43.00	59.90	1.42	67	5.2				cloudy
5/10/2005	17:59:00	1:13:00	73	62.64	4.16	67	5.2				muddy
5/10/2005	18:11:00	1:25:00	85	63.37	4.89	67	3.7	7.71	380	6.5	clearing, losing rate
5/10/2005	18:21:00	1:35:00	95	65.42	6.94	67					Pump off
5/10/2005	18:21:40	1:35:40		63.15	4.67	67					Recovery
5/10/2005	18:22:01	1:36:01		61.05	2.57	67					Recovery
5/10/2005	18:22:48	1:36:48		60.40	1.92	67					Recovery
5/10/2005	18:23:25	1:37:25		60.18	1.70	67					Recovery
5/10/2005	18:24:50	1:38:50		59.41	0.93	67					Recovery
5/10/2005	18:25:44	1:39:44		59.16	0.68	67					Recovery
5/10/2005	18:28:12	1:42:12		58.90	0.42	67					Recovery
5/10/2005	18:30:26	1:44:26		58.80	0.32	67					Recovery
5/10/2005	18:51:00	2:05:00		58.60	0.12	67					Recovery

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TABLE A.5.8
MONITORING WELL GT-7 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Cond. (uS)	Temp (degrees C)	Comment
7/7/2004	11:05:00			46.51		162.5					Static
7/7/2004	11:08:00		0	46.51		162.5	12				pump on
7/7/2004	11:10:47	0:02:47	2.78	52.09	5.58	162.5	12				
7/7/2004	11:12:03	0:04:03	4.05	52.98	6.47	162.5	12				clear
7/7/2004	11:12:46	0:04:46	4.77	53.21	6.7	162.5	12				clear
7/7/2004	11:14:52	0:06:52	6.87	53.3	6.79	162.5	12				clear
7/7/2004	11:22:00	0:14:00	14	53.31	6.8	162.5	12				abort test
7/7/2004	11:25:00	0:00:00	0	46.61	0	162.5	16.6				pump on
7/7/2004	11:26:05	0:01:05	1.08	55.02	8.41	162.5	16.6				clear
7/7/2004	11:26:34	0:01:34	1.57	55.83	9.22	162.5	16.6				clear
7/7/2004	11:26:51	0:01:51	1.85	56.1	9.49	162.5	16.6				clear
7/7/2004	11:28:59	0:03:59	3.98	56.3	9.69	162.5	16.6	7.15	570	7.4	clear
7/7/2004	11:52:30	0:27:30	27.5	56.42	9.81	162.5	16.6	7.53	570	9.0	clear
7/7/2004	12:08:00	0:43:00	43	56.42	9.81	162.5	16.6				clear
7/7/2004	12:17:00	0:52:00	52	56.43	9.82	162.5	16.6				clear
7/7/2004	12:32:40	1:07:40	67.67	56.52	9.91	162.5	16.6				clear
7/7/2004	13:14:00	1:49:00	109	56.55	9.94	162.5	16.6	7.43	560	10.7	clear
7/7/2004	14:00:00	2:35:00	155	56.58	9.97	162.5	16.6	7.71	563	10.0	clear
7/7/2004	14:31:00	3:06:00	186	56.62	10.01	162.5	16.6	7.63	561	10.5	clear
7/7/2004	14:33:00	3:08:00	188	56.62	10.01	162.5					pump off
7/7/2004	14:33:15	3:08:15		51.5	4.89	162.5					Recovery
7/7/2004	14:33:31	3:08:31		47.8	1.19	162.5					Recovery
7/7/2004	14:33:59	3:08:59		46.9	0.29	162.5					Recovery
7/7/2004	14:34:18	3:09:18		46.61	0	162.5					Recovery
7/7/2004	14:35:00	3:10:00		46.58	-0.03	162.5					Recovery

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TABLE A.5.9
MONITORING WELL GT-8 SPECIFIC CAPACITY TEST

Date (mm:dd:yy	Time (h:m:s)	Elapsed Time Minutes	Minutes	DTW (ft)	Drawdown (ft)	Total Depth (ft)	Flow Rate (gpm)	pH (units)	Spec. Con (uS)	Temp (degrees C)	Comment
7/14/2004	7:10:00			25.64		42.5					Static
7/14/2004	7:14:00			25.64		42.5					pump on
7/14/2004	7:14:30	0:00:30	0.5	26.7	1.06	42.5	4.25				
7/14/2004	7:14:58	0:00:58	0.97	26.8	1.16	42.5	4.25				
7/14/2004	7:15:40	0:01:40	1.67	27	1.36	42.5	4.25				
7/14/2004	7:21:32	0:07:32	7.53	27.68	2.04	42.5	4.25	7.07	648	8.1	
7/14/2004	7:29:47	0:15:47	15.78	28.14	2.5	42.5	4.25				
7/14/2004	9:07:05	1:53:05	113.08	29.47	3.83	42.5	4.25	7.03	652	8.8	
7/14/2004	10:10:00	2:56:00	176	29.72	4.08	42.5	4.25	6.75	652	8.7	
7/14/2004	10:54:00	3:40:00	220	29.88	4.24	42.5	4.2	7.36	641	9.4	
7/14/2004	12:47:00	5:33:00	333	30.17	4.53	42.5	4	7.49	640	9.3	
7/14/2004	12:50:00	5:36:00	336	30.2	4.56	42.5					pump off
7/14/2004	12:50:10	5:36:10		29.67	4.03	42.5					recovery
7/14/2004	12:50:25	5:36:25		29.4	3.76	42.5					recovery
7/14/2004	12:50:36	5:36:36		29.3	3.66	42.5					recovery
7/14/2004	12:51:22	5:37:22		29	3.36	42.5					recovery
7/14/2004	12:52:55	5:38:55		28.66	3.02	42.5					recovery
7/14/2004	12:57:55	5:43:55		28.1	2.46	42.5					recovery
7/14/2004	13:05:05	5:51:05		27.65	2.01	42.5					recovery
7/14/2004	13:27:50	6:13:50		27.15	1.51	42.5					recovery

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-1	7/8/2004	16:03:00		12.61				
GT-1	7/8/2004		4			7.36	8.6	428
GT-1	7/8/2004		9			7.47	8	424
GT-1	7/8/2004		14			7.54	7.5	424
GT-1	7/8/2004		19			7.55	7.3	424
GT-1	7/8/2004		24		24	7.61	7.4	425
GT-2	7/8/2004	NA		35.96				
GT-2	7/8/2004		2.5			7	11.2	1308
GT-2	7/8/2004		[illegible]				9.4	1283
GT-2	7/8/2004		11			7.12	8.1	1273
GT-2	7/8/2004		13.5		13.5	7.07	10	1363
GT-3	7/8/2004	18:1[illegible]00		[illegible]				
GT-3	7/8/2004		5			6.94	8.9	739
GT-3	7/8/2004		10			7.01	7.3	737
GT-3	7/8/2004		15			7.03	7.3	749
GT-3	7/8/2004		17.5			7.06	7.1	752
GT-3	7/8/2004		20		20	7.03	7.4	758
GT-4	7/9/2004	8:45:00		38.84				
GT-4	7/9/2004		2.5			6.52	7.4	1081
GT-4	7/9/2004		6			6.94	7	1041
GT-4	7/9/2004		11.5			7	6.9	969
GT-4	7/9/2004		14			7.05	7	965
GT-4	7/9/2004		16		16	7.06	7	941
GT-5	7/9/2004	9:30:00		30.69				
GT-5	7/9/2004		2.5			6.89	7.5	1235
GT-5	7/9/2004		7			6.92	7.1	1306
GT-5	7/9/2004		11			6.92	6.8	1278
GT-5	7/9/2004		15.5			6.94	6.8	1312
GT-5	7/9/2004		18			7.03	7	1383
GT-5	7/9/2004		19		19	7.15	7	1442
GT-6	7/9/2004	11:05:00		66.54				
GT-6	7/9/2004		1			7.25	7.1	383
GT-6	7/9/2004		2.5			7.34	6.1	381
GT-6	7/9/2004		3			7.38	5.9	377
GT-6	7/9/2004		5		5	7.5	6.9	388
GT-7	7/9/2004	11:30:00		45.9				
GT-7	7/9/2004		7.7			7.17	9.8	591
GT-7	7/9/2004		9.8			7.24	9.5	604
GT-7	7/9/2004		11.8			7.26	9.8	611
GT-7	7/9/2004		14.5		14.5	7.26	10.2	609
GT-8	7/9/2004	12:20:00		24.16				
GT-8	7/9/2004		1.8			7.02	11.4	661
GT-8	7/9/2004		3.3			7.15	11.5	640
GT-8	7/9/2004		4.2			7.19	11.6	639
GT-8	7/9/2004		4.5		4.5	7.17	11.6	640

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
North Well	7/9/2004	13:20:00		24.16				
North Well	7/9/2004		2.5			7.3	533	661
North Well	7/9/2004		8.5			7.43	514	640
North Well	7/9/2004		12.5			7.45	521	639
North Well	7/9/2004		14.5			7.44	522	640
North Well	7/9/2004		16		16	7.43	520	640
GT-1	8/23/2004	14:45:00		13.59				
GT-1	8/23/2004		9			7.52	7.7	440
GT-1	8/23/2004		12			7.87	6.7	440
GT-1	8/23/2004		15			7.81	6.5	440
GT-1	8/23/2004		18		18	7.74	6.4	441
GT-2	8/23/2004	18:00:00		42.45				
GT-2	8/23/2004		1			7.13	8.1	946
GT-2	8/23/2004		2			7.9	7.5	995
GT-2	8/23/2004		3			[illegible]	[illegible]	1059
GT-2	8/23/2004		6		6	7.27	7.6	1101
GT-3	8/23/2004	18:30:00		42.9[illegible]				
GT-3	8/23/2004		2.5			[illegible]35	7.2	[illegible]70
GT-3	8/23/2004		5			7.32	7	[illegible]64
GT-3	8/23/2004		7		[illegible]	7.26	6.8	664
GT-4	8/23/2004	10:25:00		42.03				
GT-4	8/23/2004		0.8			7.7	9.2	1200
GT-4	8/23/2004		2.6			7.23	7.6	1172
GT-4	8/23/2004		3.3			7.18	7.6	997
GT-4	8/23/2004		3.8			7.18	7.9	949
GT-4	8/23/2004		4.1		4.1	7.16	8.3	938
GT-5	8/23/2004	11:30:00		33.8				
GT-5	8/23/2004		2.5			7.08	8.8	1771
GT-5	8/23/2004		5.8			7.07	8.6	1621
GT-5	8/23/2004		7.8			7.05	8.4	1585
GT-5	8/23/2004		9			7.04	8.3	1675
GT-5	8/23/2004		10.4		10.4	7.06	8.4	1696
GT-6	8/23/2004	15:15:00		66.68				
GT-6	8/23/2004		0.5			7.86	7.6	416
GT-6	8/23/2004		2.7			7.71	7.1	415
GT-6	8/23/2004		4.1			7.59	6	405
GT-6	8/23/2004		5.1		5.1	7.51	6.5	410
GT-7	8/23/2004	16:30:00		50.98				
GT-7	8/23/2004		30			7.65	7	758
GT-7	8/23/2004		90			7.77	6.5	598
GT-7	8/23/2004		100			7.62	6.4	571
GT-7	8/23/2004		210			7.56	6.4	571
GT-7	8/23/2004		220		220	7.55	6.3	572

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-8	8/23/2004	17:30:00		28.79				
GT-8	8/23/2004		9			7.47	7.2	683
GT-8	8/23/2004		15			7.39	6.6	675
GT-8	8/23/2004		21			7.35	6.5	676
GT-8	8/23/2004		24		24	7.39	6.5	680
GT-1	9/28/2004	14:45:00		13.74				
GT-1	9/28/2004		6			6.95	9.6	401
GT-1	9/28/2004		12			7.4	7.4	412
GT-1	9/28/2004		15			7.58	7.2	413
GT-1	9/28/2004		18		18	7.68	7.2	414
GT-3	9/28/2004	17:45:00		45.8				
GT-3	9/28/2004		0.8			7.11	7.6	664
GT-3	9/28/2004		2.4			7.21	7	650
GT-3	9/28/2004		3.9			7.2	6.9	648
GT-3	9/28/2004		4.9		4.9	7.17	6.9	654
GT-4	9/28/2004	10:00:00		43.29				
GT-4	9/28/2004		0.5			6.85	7.5	1112
GT-4	9/28/2004		0.75		0.75	6.93	7.2	1117
GT-5	9/28/2004	9:00:00		35.28				
GT-5	9/28/2004		2			[illegible]	[illegible]	1778
GT-5	9/28/2004		5			6.98	6.3	1781
GT-5	9/28/2004		[illegible]			7	6.1	1780
GT-5	9/28/2004		[illegible]		[illegible]	6.99	6.1	1751
GT-6	9/28/2004	11:15:00	[illegible]	66.61				
GT-6	9/28/2004		2.5			8.17	7.6	406
GT-6	9/28/2004		4			8.03	6.1	407
GT-6	9/28/2004		5		5	7.88	6.4	405
GT-7	9/28/2004	16:00:00		53.18				
GT-7	9/28/2004		45			7.75	7.8	559
GT-7	9/28/2004		90			7.56	7.6	530
GT-7	9/28/2004		135			7.6	7.2	525
GT-7	9/28/2004		180			7.53	7.4	536
GT-7	9/28/2004		216		216	7.56	7.3	532
GT-8	9/28/2004	17:00:00		30.01				
GT-8	9/28/2004		6			7.47	7.8	650
GT-8	9/28/2004		12			7.31	7.1	665
GT-8	9/28/2004		18			7.35	7.1	662
GT-8	9/28/2004		24		24	7.46	7.1	661
GT-1	11/6/2004	9:15:00		13.92				
GT-1	11/6/2004		7.5			7.6	5.1	
GT-1	11/6/2004		12.5			7.21	5.1	
GT-1	11/6/2004		17.5			7.39	5.4	
GT-1	11/6/2004		20		20	7.47	5.2	
GT-3	11/6/2004	16:10:00		44.35				
GT-3	11/6/2004		3			7.28	5.6	699
GT-3	11/6/2004		5			7.26	5.3	697
GT-3	11/6/2004		6		6	7.2	5.6	691
GT-5	11/6/2004	13:15:00		37.06				
GT-5	11/6/2004		4		4	6.9	6.8	1687

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-6	11/6/2004	9:45:00		66.91				
GT-6	11/6/2004		2.5			7.77	6.3	409
GT-6	11/6/2004		3.7			7.84	5.8	409
GT-6	11/6/2004		6.5		6.5	7.88	6.4	406
GT-7	11/6/2004	14:10:00		54.94				
GT-7	11/6/2004		50			7.3	6.3	584
GT-7	11/6/2004		100			7.55	5.8	560
GT-7	11/6/2004		150			7.51	5.8	557
GT-7	11/6/2004		200			7.56	5.7	560
GT-7	11/6/2004		220		220	7.53	5.6	559
GT-8	11/6/2004	15:30:00		30.08				
GT-8	11/6/2004		7.5			7.48	5.8	696
GT-8	11/6/2004		12.5			7.48	5.5	702
GT-8	11/6/2004		20		20	7.34	6	697
GT-1	05/11/05	13:05:00		9.02				
GT-1	05/11/05		5			8.18	11.00	421
GT-1	05/11/05		17			7.97	11.00	405
GT-1	05/11/05		25			7.36	11.20	402
GT-1	05/11/05		35			7.80	11.00	387
GT-1	05/11/05		38		38	7.82	9.20	391
GT-2	05/11/05	15:22:00		22.81				
GT-2	05/11/05		1			7.06	12.5	1045
GT-2	05/11/05		2			.04	10.2	1270
GT-2	05/11/05		3			.02	9.10	1220
GT-2	05/11/05		4		40	6.99	9.50	1379
GT-3	05/11/05	16:24:00		[illegible]				
GT-3	05/11/05		10			6.87	8.20	920
GT-3	05/11/05		20			6.82	7.80	926
GT-3	05/11/05		30			6.71	7.50	940
GT-3	05/11/05		40		40	6.60	7.30	936
GT-4	05/11/05	17:23:00		32.89				
GT-4	05/11/05		5			7.27	9.00	792
GT-4	05/11/05		10			7.13	8.20	807
GT-4	05/11/05		20		20	7.15	8.10	790
GT-5	05/11/05	18:06:00		17.73				
GT-5	05/11/05		10			6.68	7.10	588
GT-5	05/11/05		20			6.66	6.40	572
GT-5	05/11/05		30			6.66	6.10	576
GT-5	05/11/05		43		43	6.66	5.70	579
GT-6	05/11/05	13:52:00		58.34				
GT-6	05/11/05		10			7.60	11.00	379
GT-6	05/11/05		20			7.67	9.40	374
GT-6	05/11/05		30			7.76	9.00	381
GT-6	05/11/05		35		35	7.70	8.90	382
GT-7	05/11/05	11:30:00		36.06				
GT-7	05/11/05		60			7.28	6.70	572
GT-7	05/11/05		180			7.52	6.50	546
GT-7	05/11/05		320			7.49	6.00	548
GT-7	05/11/05		400		400	7.52	5.80	536

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-8	05/11/05	11:16:00		12.98				
GT-8	05/11/05		15			7.67	5.70	484
GT-8	05/11/05		30			7.48	6.20	474
GT-8	05/11/05		50			7.53	6.10	481
GT-8	05/11/05		53		53	7.45	5.80	484
North Well	05/11/05	12:39:00		46.41				
North Well	05/11/05		40			7.21	9.20	464
North Well	05/11/05		2160			7.54	10.50	488
North Well	05/11/05		5260			7.25	7.80	515
North Well	05/11/05		7900		7900	6.99	6.70	520
GT-1	06/21/05	10:45:00		9.74				
GT-1	06/21/05		5			7.72	9.13	392
GT-1	06/21/05		15			7.68	6.40	354
GT-1	06/21/05		25		25	7.76	6.60	208
GT-2	06/22/05	8:49:00		23.80				
GT-2	06/22/05		9			7.10	9.00	1049
GT-2	06/22/05		18			7.08	9.00	942
GT-2	06/22/05		27			7.11	8.20	638
GT-2	06/22/05		36					1162
GT-3	06/22/05	9:33:00		23.90				
GT-3	06/22/05					6.82	8.60	681
GT-3	06/22/05					6.86	7.40	670
GT-3	06/22/05					6.83		660
GT-3	06/22/05		42		42	7.67	7.70	936
GT-4	06/22/05	17:23:00		36.07				
GT-4	06/22/05		5			7.32	9.20	750
GT-4	06/22/05		10		10	7.30	8.10	882
GT-5	06/22/05	11:10:00		26.64				
GT-5	06/22/05		5			6.64	8.90	641
GT-5	06/22/05		10			6.61	7.00	648
GT-5	06/22/05		16			6.54	7.70	629
GT-5	06/22/05		22		22	6.35	6.50	643
GT-6	06/22/05	11:55:00		58.63				
GT-6	06/22/05		5			7.80	9.50	198
GT-6	06/22/05		10			7.60	6.80	363
GT-6	06/22/05		18			7.59	6.00	360
GT-6	06/22/05		21		21	7.53	6.50	372
GT-7	06/21/05	16:00:00		35.75				
GT-7	06/21/05		60			7.34	9.30	556
GT-7	06/21/05		120			7.38	9.20	431
GT-7	06/21/05		180			7.37	9.30	525
GT-7	06/21/05		240			7.37	9.10	526
GT-7	06/21/05		254		254	7.50	8.00	287
GT-8	06/21/05	17:20:00		13.62				
GT-8	06/21/05		18			7.36	8.90	441
GT-8	06/21/05		36			7.37	8.00	474
GT-8	06/21/05		53		53	7.44	8.90	235

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-1	07/19/05	15:35:00		12.12				
GT-1	07/19/05		10			7.17	12.30	384
GT-1	07/19/05		15			7.48	8.10	378
GT-1	07/19/05		20			7.58	7.40	389
GT-1	07/19/05		25		25	7.68	8.70	401
GT-2	07/20/05	8:30:00		30.47				
GT-2	07/20/05		10			6.84	11.30	1037
GT-2	07/20/05		20			7.20	9.20	1047
GT-2	07/20/05		30		30	7.19	10.10	1170
GT-3	07/20/05	9:30:00		30.68				
GT-3	07/20/05		10			7.11	9.00	597
GT-3	07/20/05		20			6.94	8.30	613
GT-3	07/20/05		30			6.90	8.40	622
GT-3	07/20/05		35		35	6.92	7.50	617
GT-4	07/20/05	10:10:00		38.78				
GT-4	07/20/05		2.5			7.36	11.00	739
GT-4	07/20/05		3.5			7.33	8.50	743
GT-4	07/20/05		5.5			7.28	8.50	784
GT-4	07/20/05		7.75			[illegible]	[illegible]	862
GT-4	07/20/05		[illegible]		10	7.19	8.00	988
GT-5	07/20/05	10:35:00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
GT-5	07/20/05		[illegible]			6.85	10.3[illegible]	1334
GT-5	07/20/05		[illegible]			6.84	9.3[illegible]	1355
GT-5	07/20/05		10			6.81	7.60	1354
GT-5	07/20/05		12			6.84	8.10	1350
GT-5	07/20/05		14			6.82	8.20	1375
GT-5	07/20/05		16		16	6.84	8.30	1362
GT-6	07/20/05	11:20:00		62.42				
GT-6	07/20/05		5			6.89	11.00	379
GT-6	07/20/05		7.5			7.28	9.40	374
GT-6	07/20/05		11.5			7.45	9.00	381
GT-6	07/20/05		13.5			7.45	9.00	381
GT-6	07/20/05		15		15	7.49	8.90	382
GT-7	07/19/05	16:20:00		41.77				
GT-7	07/19/05		72			7.59	11.50	504
GT-7	07/19/05		144			7.69	9.80	506
GT-7	07/19/05		216			7.68	9.10	516
GT-7	07/19/05		240		240	7.50	8.50	526
GT-8	07/19/05	17:25:00		18.87				
GT-8	07/19/05		10			7.65	10.30	538
GT-8	07/19/05		20			7.44	8.30	599
GT-8	07/19/05		30			7.39	7.80	594
GT-8	07/19/05		40			7.49	8.80	581
GT-8	07/19/05		46		46	7.40	8.40	552
GT-1	08/25/05	10:45:00		14.13				
GT-1	08/25/05		5			8.01	7.90	393
GT-1	08/25/05		10			7.92	7.40	393
GT-1	08/25/05		20		20	7.90	7.70	389

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-2	08/25/05	13:50:00		37.98				
GT-2	08/25/05		4			7.06	9.20	997
GT-2	08/25/05		8		8	7.07	8.70	1053
GT-3	08/25/05	14:40:00		39.04				
GT-3	08/25/05		5			6.95	9.00	677
GT-3	08/25/05		7.5			6.85	7.50	722
GT-3	08/25/05		12		12	6.97	6.80	676
GT-4	08/25/05	15:30:00		42.44				
GT-4	08/25/05		1			7.47	9.10	857
GT-4	08/25/05		3		3	7.20	7.70	826
GT-5	08/25/05	10:00:00		35.12				
GT-5	08/25/05		1			6.85	8.30	1333
GT-5	08/25/05		3			6.75	6.90	1336
GT-5	08/25/05		5		5	6.98	6.70	1326
GT-6	08/25/05	11:30:00		66.64				
GT-6	08/25/05		1			8.31	7.90	359
GT-6	08/25/05		3		3	7.72	6.00	374
GT-7	08/25/05	11:30:00		36.06				
GT-7	08/25/05		[illegible]			[illegible]	[illegible]	536
GT-7	08/25/05		[illegible]			7.38	6.6[illegible]	531
GT-7	08/25/05		35			7.47	7.2[illegible]	525
GT-7	08/25/05		30			7.56	7.2[illegible]	531
GT-7	08/25/05		25		225	7.44	6.[illegible]	524
GT-8	08/25/05	13:00:00		24.35				
GT-8	08/25/05		9			7.09	8.40	573
GT-8	08/25/05		18			7.31	7.30	636
GT-8	08/25/05		27			7.33	7.20	652
GT-8	08/25/05		36		36	7.34	7.00	645
GT-1	10/11/05	12:30:00		13.63				
GT-1	10/11/05		3			8.04	7.60	415
GT-1	10/11/05		9			7.97	6.70	424
GT-1	10/11/05		15		15	7.88	6.90	422
GT-2	10/11/05	9:45:00		43.17				
GT-2	10/11/05		1			6.55	6.70	887
GT-2	10/11/05		1.5			6.84	6.80	1099
GT-2	10/11/05		2		2	7.11	6.50	1128
GT-3	10/12/05	10:40:00		43.68				
GT-3	10/12/05		1.5			6.93	6.60	663
GT-3	10/12/05		4		4	6.94	6.20	664
GT-5	10/12/05	11:00:00		36.62				
GT-5	10/12/05		1			6.58	6.60	1507
GT-5	10/12/05		2.5			6.52	6.00	1532
GT-5	10/12/05		2.8		2.8	6.90	6.40	1528
GT-6	10/11/05	14:50:00		67.18				
GT-6	10/11/05		1			6.89	7.70	397
GT-6	10/11/05		3		3	7.54	6.40	388

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TABLE A.6.1
SUMMARY OF FIELD GROUND WATER QUALITY MEASUREMENTS

WELL ID	EVENT	TIME (h:m:s)	VOL REMOVED (gal)	DTW (feet)	VOL EVAC (total gal)	pH (units)	TEMP (degrees C)	COND (uS/cm)
GT-7	10/11/05	15:40:00		52.01				
GT-7	10/11/05		45			7.23	6.20	555
GT-7	10/11/05		90			7.55	6.00	558
GT-7	10/11/05		135			7.70	6.10	557
GT-7	10/11/05		180			7.63	5.90	557
GT-7	10/11/05		225		225	7.58	6.30	553
GT-8	10/11/05	15:40:00		26.85				
GT-8	10/11/05		9			7.76	6.70	670
GT-8	10/11/05		18			7.45	5.90	701
GT-8	10/11/05		27			7.32	5.90	705
GT-8	10/11/05		33		33	7.46	5.50	711

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TABLE A.7.1
FIELD SURFACE WATER QUALITY SUMMARY

Surface Water Station	Date (mmddyy)	Time (h:m)	pH (units)	Cond (uS/cm)	Temp (°C)	Comment
GTSW-1	04/27/04	13:30:00	7.8	378	7.6	clear - flow measuren
GTSW-1	05/26/04	10:45:00	8.42	373	6.1	clear-odorless
GTSW-1	06/29/04	15:40:00	8.13	382	11.6	clear-odorless
GTSW-1	07/27/04	14:50:00	8.37	392	13.7	clear
GTSW-1	08/24/04	15:00:00	7.66	395	8.3	clear-odorless
GTSW-1	09/29/04	13:05:00	8.22	405	7.9	clear
GTSW-1	11/04/04	9:00:00	7.5	467	2.8	clear
GTSW-1	04/27/05	11:15:00	8.22	359	4.4	clear
GTSW-1	06/01/05	10:30:00	8.28	339	6.8	clear
GTSW-1	06/28/05	10:10:00	8.09	381	8.11	clear-odorless
GTSW-1	07/21/05	8:50:00	7.12	388	8.7	clear
GTSW-1	08/26/05	10:15:00	7.94	370	7.7	clear
GTSW-1	10/11/05	12:45:00	7.77	398	5.9	
GTSW-2	04/27/04	14:46:00	8.22	390	8.7	clear
GTSW-2	05/26/04	12:45:00	8.47	379	5.3	clear-odorless
GTSW-2	06/29/04	16:30:00	7.29	401	9.6	clear-odorless
GTSW-2	07/27/04	15:10:00	8.44	376	12.1	clear
GTSW-2	08/24/04	14:20:00	7.92	410	9	clear-odorless
GTSW-2	09/29/04	12:30:00	8.51	408	9.2	clear
GTSW-2	11/04/04	9:30:00	8.11	410	3	clear
GTSW-2	04/27/05	12:30:00	8.35	368	5.6	clear
GTSW-2	06/01/05	11:30:00	8.66	350	6.8	turbid- overflow from s
GTSW-2	06/28/05	11:05:00	8.47	186	8.69	clear-odorless
GTSW-2	07/21/05	9:45:00	8.26	375	8.6	clear
GTSW-2	08/26/05	12:35:00	8.35	374	14.3	clear
GTSW-2	10/11/05	13:50:00	8.27	401	8	clear
GTSW-3	04/27/04	15:20:00	8.44	384	9.5	clear
GTSW-3	05/26/04	13:35:00	8.61	376	4.9	clear-odorless
GTSW-3	06/29/04	17:05:00	7.11	401	9.5	clear-odorless
GTSW-3	07/27/04	15:25:00	8.5	373	13.4	clear
GTSW-3	08/24/04	13:30:00	8.05	407	9.6	clear
GTSW-3	09/29/04	12:05:00	7.95	394	8.3	clear
GTSW-3	11/04/04	10:00:00	8.54	408	2.4	clear
GTSW-3	04/27/05	14:00:00	8.06	368	4.3	clear
GTSW-3	06/01/05	12:10:00	8.89	348	7.5	cloudy, turbid
GTSW-3	06/28/05	11:47:00	8.39	184	9.35	clear
GTSW-3	07/21/05	10:30:00	8.23	376	13.1	clear
GTSW-3	08/26/05	12:05:00	8.01	367	9	clear-odorless
GTSW-3	10/11/05	14:30:00	8.42	397	6.6	clear
GTSW-4	04/28/04	9:15:00	7.83	461	4	clear-sample obtainec
GTSW-4	05/26/04	14:55:00	8.13	442	5.2	clear-odorless
GTSW-4	06/29/04	18:05:00	7.2	481	9.8	
GTSW-4	07/27/04	14:20:00	8.16	1070	15.8	clear
GTSW-4	08/24/04	12:45:00	8.11	551	11.1	clear
GTSW-4	09/29/04	10:15:00	7.52	562	7.8	clear
GTSW-4	11/04/04	na				light tan-clear
GTSW-4	04/27/05	10:15:00	7.99	472	4.4	clear-odorless
GTSW-4	06/01/05	14:15:00	8.98	436	7.8	cloudy- turbid
GTSW-4	06/28/05	15:00:00	8.35	438	10.04	clear-odorless
GTSW-4	07/21/05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]-odorless

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TABLE A.7.1
FIELD SURFACE WATER QUALITY SUMMARY

GTSW-4	08/26/05	9:30:00	7.58	476	9	clear
GTSW-4	10/11/05	na	na	na	na	na
GTSW-5	04/28/04	9:30:00	7.88	450	5	clear
GTSW-5	05/26/04	15:30:00	8.66	420	6.9	clear-odorless
GTSW-5	06/29/04	18:30:00	7.18	456	7.2	clear-odorless
GTSW-5	07/27/04	dry				
GTSW-5	08/24/04	dry				
GTSW-5	09/29/04	dry				
GTSW-5	11/04/04	dry				
GTSW-5	04/27/05	10:25:00	7.95	456	4.3	brownish/silty
GTSW-5	06/01/05	14:30:00	9	422	8.45	turbid -picking up sed
GTSW-5	06/28/05	15:20:00	8.51	430	12.1	clear
GTSW-5	07/21/05	11:50:00	8.37	452	17.2	clear-odorless
GTSW-5	08/26/05	dry				
GTSW-5	10/11/05	dry				
GTSW-6	04/28/04	9:45:00	8.4	402	5.9	brownish-cloudy
GTSW-6	05/26/04	14:40:00	8.75	420	6.9	tubid-tan, odorless
GTSW-6	06/29/04	17:50:00	7.32	451	19.2	slightly cloudy
GTSW-6	07/27/04	dry				
GTSW-6	08/24/04	dry				
GTSW-6	09/29/04	dry				
GTSW-6	11/04/04	dry				
GTSW-6	04/27/05	13:15:00	8.44	163	4.7	turbid - brown
GTSW-6	06/01/05	13:45:00	8.85	402	10.06	chocolate brown- ove
GTSW-6	06/28/05	13:00:00	8.55	424	12.44	slightly turbid
GTSW-6	07/21/05	11:10:00	8.1	448	20.4	slightly cloudy
GTSW-6	08/26/05	dry				
GTSW-6	10/11/05	dry				
GTSW-7	04/28/04	10:00:00	7.57	254	8.6	SLIGHTLY CLOUDY
GTSW-7	05/26/04	14:30:00	8.13	267	8.5	clear-odorless
GTSW-7	06/29/04	17:35:00	7.73	249	18.1	clear
GTSW-7	07/27/04	15:45:00	9.21	228	24.1	light brown-moss on s
GTSW-7	08/24/04	13:15:00	7.78	261	17.1	slight greenish cast-cl
GTSW-7	09/29/04	10:45:00	8.89	248	11	clear-light brown colo
GTSW-7	11/04/04	10:20:00	8.79	259	1.3	very turbid-brown
GTSW-7	04/27/05	13:20:00	7.9	101	4.6	slight greenish cast
GTSW-7	06/01/05	13:15:00	8.54	224	14.09	slight greenish cast
GTSW-7	06/28/05	12:30:00	7.67	227	18.08	slight greenish cast-cl
GTSW-7	07/21/05	10:55:00	7.58	252	21.7	slightly cloudy, slight
GTSW-7	08/26/05	8:30:00	6.73	251	13.9	slightly turbid with mo
GTSW-7	10/11/05	10:45:00	6.95	263	5.6	turbid
GTSW-8	06/28/05	13:40:00	8.25	216	11.8	clear-odorless
GTSW-9	06/28/05	14:20:00	8.16	237	11.29	clear
GTSW-10	06/28/05	14:40:00	8.62	220	18.14	clear
GTSW-11	06/28/05	15:35:00	8.83	456	22.2	clear-odorless

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-1	***4/27/2004***	***0***								
GTSW-1	4/27/2004	0.5	0.5	0.3	0.6	11	60	0.21	0.15	0.03
GTSW-1	4/27/2004	1	0.5	0.4	0.6	11	60	0.21	0.2	0.04
GTSW-1	4/27/2004	1.5	0.5	0.45	0.6	184	60	2.98	0.225	0.67
GTSW-1	4/27/2004	2	0.5	0.55	0.6	142	60	2.3	0.275	0.63
GTSW-1	4/27/2004	2.5	0.5	0.65	0.6	222	60	3.58	0.325	1.17
GTSW-1	4/27/2004	3	0.5	0.65	0.6	218	60	3.52	0.325	1.14
GTSW-1	4/27/2004	3.5	0.5	0.6	0.6	128	60	2.08	0.3	0.62
GTSW-1	4/27/2004	4	0.5	0.5	0.6	126	60	2.05	0.25	0.51
GTSW-1	4/27/2004	4.5	0.5	0.5	0.6	109	60	1.78	0.25	0.44
GTSW-1	4/27/2004	5	0.6	0.35	0.6	8	60	0.16	0.21	0.03
GTSW-1	4/27/2004	5.7								5.30
GTSW-2	***4/27/2004***	***0***								
GTSW-2	4/27/2004	1	1	0.35	0.6	0	60	0.03	0.35	0.01
GTSW-2	4/27/2004	2	1	0.5	0.6	3	60	0.08	0.5	0.04
GTSW-2	4/27/2004	3	1	0.7	0.6	1	60	0.05	0.7	0.03
GTSW-2	4/27/2004	4	1	1.3	0.6	2	60	0.06	1.3	0.08
GTSW-2	4/27/2004	5	1	1.3	0.6	6	60	0.13	1.3	0.17
GTSW-2	4/27/2004	6	1	1.2	0.6	3	60	0.08	1.2	0.10
GTSW-2	4/27/2004	7	1	1.35	0.6	20	60	0.35	1.35	0.47
GTSW-2	4/27/2004	8	1	1.45	0.6	39	60	0.66	1.45	0.95
GTSW-2	4/27/2004	9	1	1.45	0.6	32	60	0.54	1.45	0.79
GTSW-2	4/27/2004	10	1	1.4	0.6	23	60	0.4	1.4	0.56
GTSW-2	4/27/2004	11	1	1.35	0.6	7	60	0.14	1.35	0.19
GTSW-2	4/27/2004	12	1	1.25	0.6	8	60	0.16	1.25	0.20
GTSW-2	4/27/2004	13	1	1.3	0.6	1	60	0.05	1.3	0.06
GTSW-2	4/27/2004	14	1	1.4	0.6	0	60	0.03	1.4	0.04
GTSW-2	4/27/2004	15	1	1	0.6	0	60	0.03	1	0.03
GTSW-2	4/27/2004	16	1	0.7	0.6	0	60	0.03	0.7	0.02
GTSW-2	4/27/2004	17	1	0.4	0.6	0	60	0.03	0.4	0.01
GTSW-2	4/27/2004	18								3.76

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	*4/27/2004*	*0*								
GTSW-3	4/27/2004	0.5	0.5	0.7	0.6	22	60	0.38	0.35	0.13
GTSW-3	4/27/2004	1	0.5	1.1	0.6	49	60	0.82	0.55	0.45
GTSW-3	4/27/2004	1.5	0.5	1.2	0.6	87	60	1.42	0.6	0.85
GTSW-3	4/27/2004	2	0.5	1.2	0.6	81	60	1.33	0.6	0.80
GTSW-3	4/27/2004	2.5	0.5	1.1	0.6	57	60	0.94	0.55	0.52
GTSW-3	4/27/2004	3	0.5	0.9	0.6	50	60	0.83	0.45	0.37
GTSW-3	4/27/2004	3.5	0.5	0.8	0.6	64	60	1.06	0.4	0.42
GTSW-3	4/27/2004	4	0.5	0.7	0.6	52	60	0.86	0.35	0.30
GTSW-3	4/27/2004	4.5	0.5	0.6	0.6	40	60	0.67	0.3	0.20
GTSW-3	4/27/2004	5	0.5	0.4	0.6	18	60	0.32	0.2	0.06
GTSW-3	4/27/2004	5.5								4.12
GTSW-1	***5/26/2004***	***0***								
GTSW-1	5/26/2004	0.5	0.5	0.2	0.6	78	60	1.28	0.1	0.13
GTSW-1	5/26/2004	1	0.5	0.4	0.6	294	60	4.74	0.2	0.95
GTSW-1	5/26/2004	1.5	0.5	0.4	0.6	178	60	2.88	0.2	0.58
GTSW-1	5/26/2004	2	0.5	0.6	0.6	248	60	4	0.3	1.20
GTSW-1	5/26/2004	2.5	0.5	0.4	0.6	179	60	2.9	0.2	0.58
GTSW-1	5/26/2004	3	0.5	0.6	0.6	294	60	4.74	0.3	1.42
GTSW-1	5/26/2004	3.5	0.5	0.4	0.6	144	60	2.34	0.2	0.47
GTSW-1	5/26/2004	4	0.5	0.5	0.6	168	60	2.72	0.25	0.68
GTSW-1	5/26/2004	4.5	0.5	0.6	0.6	110	60	1.79	0.3	0.54
GTSW-1	5/26/2004	5	0.4	0.4	0.6	33	60	0.56	0.16	0.09
GTSW-1	5/26/2004	5.3								6.63

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***5/26/2004***	***0***								
GTSW-2	5/26/2004	1	1	0.5	0.6	2	60	0.06	0.5	0.03
GTSW-2	5/26/2004	2	1	0.85	0.6	2	60	0.06	0.85	0.05
GTSW-2	5/26/2004	3	1	1	0.6	4	60	0.1	1	0.10
GTSW-2	5/26/2004	4	1	1	0.6	14	60	0.26	1	0.26
GTSW-2	5/26/2004	5	1	1.1	0.6	22	60	0.38	1.1	0.42
GTSW-2	5/26/2004	6	1	1.3	0.6	36	60	0.61	1.3	0.79
GTSW-2	5/26/2004	7	1	1.5	0.6	46	60	0.77	1.5	1.15
GTSW-2	5/26/2004	8	1	1.51	0.6	14	60	0.26	1.51	0.39
GTSW-2	5/26/2004	9	1	1.55	0.6	12	60	0.22	1.55	0.35
GTSW-2	5/26/2004	10	1	1.5	0.6	20	60	0.35	1.5	0.53
GTSW-2	5/26/2004	11	1	1.5	0.6	16	60	0.29	1.5	0.43
GTSW-2	5/26/2004	12	1	1.45	0.6	15	60	0.27	1.45	0.39
GTSW-2	5/26/2004	13	1	1.5	0.6	14	60	0.26	1.5	0.38
GTSW-2	5/26/2004	14	1	1.35	0.6	5	60	0.11	1.35	0.15
GTSW-2	5/26/2004	15	1	1	0.6	0	60	0.03	1	0.03
GTSW-2	5/26/2004	16	1	0.7	0.6	0	60	0.03	0.7	0.02
GTSW-2	5/26/2004	17	1	0.4	0.6	0	60	0.03	0.4	0.01
GTSW-2	5/26/2004	18								5.48
GTSW-3	***5/26/2004***	***0***								
GTSW-3	5/26/2004	0.5	0.5	0.6	0.6	63	60	1.04	0.3	0.31
GTSW-3	5/26/2004	1	0.5	0.7	0.6	131	60	2.13	0.35	0.74
GTSW-3	5/26/2004	1.5	0.5	0.95	0.6	127	60	2.06	0.475	0.98
GTSW-3	5/26/2004	2	0.5	0.8	0.6	156	60	2.53	0.4	1.01
GTSW-3	5/26/2004	2.5	0.5	0.9	0.6	58	60	0.96	0.45	0.43
GTSW-3	5/26/2004	3	0.5	1.05	0.6	108	60	1.76	0.525	0.92
GTSW-3	5/26/2004	3.5	0.5	1	0.6	81	60	1.33	0.5	0.66
GTSW-3	5/26/2004	4	0.5	0.8	0.6	49	60	0.82	0.4	0.33
GTSW-3	5/26/2004	4.5	0.5	0.75	0.6	25	60	0.43	0.375	0.16
GTSW-3	5/26/2004	5	0.4	0.5	0.6	6	60	0.13	0.2	0.03
GTSW-3	5/26/2004	5.3								5.58

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-1	***6/29/2004***	***0***								
GTSW-1	6/29/2004	0.5	0.5	0.2	0.6	101	60	1.65	0.1	0.16
GTSW-1	6/29/2004	1	0.5	0.35	0.6	194	60	3.14	0.175	0.55
GTSW-1	6/29/2004	1.5	0.5	0.35	0.6	143	60	2.32	0.175	0.41
GTSW-1	6/29/2004	2	0.5	0.5	0.6	108	60	1.76	0.25	0.44
GTSW-1	6/29/2004	2.5	0.5	0.55	0.6	83	60	1.36	0.275	0.37
GTSW-1	6/29/2004	3	0.5	0.6	0.6	144	60	2.34	0.3	0.70
GTSW-1	6/29/2004	3.5	0.5	0.7	0.6	165	60	2.67	0.35	0.94
GTSW-1	6/29/2004	4	0.5	0.5	0.6	132	60	2.14	0.25	0.54
GTSW-1	6/29/2004	4.5								4.11
GTSW-2	***6/29/2004***	***0***								
GTSW-2	6/29/2004	1	1	0.3	0.6	0	60	0.03	0.3	0.01
GTSW-2	6/29/2004	2	1	0.5	0.6	0	60	0.03	0.5	0.02
GTSW-2	6/29/2004	3	1	0.7	0.6	2	60	0.06	0.7	0.04
GTSW-2	6/29/2004	4	1	1.3	0.6	3	60	0.08	1.3	0.10
GTSW-2	6/29/2004	5	1	1.2	0.6	5	60	0.11	1.2	0.13
GTSW-2	6/29/2004	6	1	1.2	0.6	6	60	0.13	1.2	0.15
GTSW-2	6/29/2004	7	1	1.2	0.6	26	60	0.45	1.2	0.54
GTSW-2	6/29/2004	8	1	1.4	0.6	35	60	0.59	1.4	0.83
GTSW-2	6/29/2004	9	1	1.5	0.6	5	60	0.11	1.5	0.17
GTSW-2	6/29/2004	10	1	1.5	0.6	13	60	0.24	1.5	0.36
GTSW-2	6/29/2004	11	1	1.4	0.6	18	60	0.32	1.4	0.45
GTSW-2	6/29/2004	12	1	1.4	0.6	4	60	0.1	1.4	0.13
GTSW-2	6/29/2004	13	1	1.4	0.6	2	60	0.06	1.4	0.09
GTSW-2	6/29/2004	14	1	1.4	0.6	2	60	0.06	1.4	0.09
GTSW-2	6/29/2004	15	1	1.35	0.6	0	60	0.03	1.35	0.04
GTSW-2	6/29/2004	16	1	0.8	0.6	0	60	0.03	0.8	0.02
GTSW-2	6/29/2004	17	1	0.55	0.6	0	60	0.03	0.55	0.02
GTSW-2	6/29/2004	18	1	0.3	0.6	0	60	0.03	0.3	0.01
GTSW-2	6/29/2004	19								3.20

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	***6/29/2004***	***0***								
GTSW-3	6/29/2004	0.5	0.5	0.4	0.6	18	60	0.32	0.2	0.06
GTSW-3	6/29/2004	1	0.5	0.6	0.6	35	60	0.59	0.3	0.18
GTSW-3	6/29/2004	1.5	0.5	0.6	0.6	53	60	0.88	0.3	0.26
GTSW-3	6/29/2004	2	0.5	0.9	0.6	86	60	1.41	0.45	0.63
GTSW-3	6/29/2004	2.5	0.5	1	0.6	77	60	1.26	0.5	0.63
GTSW-3	6/29/2004	3	0.5	0.85	0.6	46	60	0.77	0.425	0.33
GTSW-3	6/29/2004	3.5	0.5	0.9	0.6	125	60	2.03	0.45	0.91
GTSW-3	6/29/2004	4	0.5	0.8	0.6	95	60	1.55	0.4	0.62
GTSW-3	6/29/2004	4.5	0.5	0.5	0.6	44	60	0.74	0.25	0.18
GTSW-3	6/29/2004	5	0.45	0.5	0.6	33	60	0.56	0.225	0.13
GTSW-3	6/29/2004	5.4								3.94
GTSW-3	***8/24/2004***	***0***								
GTSW-3	8/24/2004	0.5	0.5	0.35	0.6	27	60	0.46	0.175	0.08
GTSW-3	8/24/2004	1	0.5	0.5	0.6	47	60	0.78	0.25	0.20
GTSW-3	8/24/2004	1.5	0.5	0.7	0.6	43	60	0.72	0.35	0.25
GTSW-3	8/24/2004	2	0.5	0.5	0.6	38	60	0.64	0.25	0.16
GTSW-3	8/24/2004	2.5	0.5	0.3	0.6	30	60	0.51	0.15	0.08
GTSW-3	8/24/2004	3	0.5	0.45	0.6	67	60	1.1	0.225	0.25
GTSW-3	8/24/2004	3.5	0.5	0.6	0.6	54	60	0.9	0.3	0.27
GTSW-3	8/24/2004	4	0.5	0.3	0.6	48	60	0.8	0.15	0.12
GTSW-3	8/24/2004	4.5	0.5	0.3	0.6	45	60	0.75	0.15	0.11
GTSW-3	8/24/2004	5								1.52

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***8/24/2004***	***0***								
GTSW-2	8/24/2004	1	1	0.3	0.6	0	60	0.03	0.3	0.01
GTSW-2	8/24/2004	2	1	0.5	0.6	0	60	0.03	0.5	0.02
GTSW-2	8/24/2004	3	1	0.6	0.6	3	60	0.08	0.6	0.05
GTSW-2	8/24/2004	4	1	1	0.6	2	60	0.06	1	0.06
GTSW-2	8/24/2004	5	1	1.1	0.6	0	60	0.03	1.1	0.03
GTSW-2	8/24/2004	6	1	1.1	0.6	2	60	0.06	1.1	0.07
GTSW-2	8/24/2004	7	1	1	0.6	10	60	0.19	1	0.19
GTSW-2	8/24/2004	8	1	1.3	0.6	11	60	0.21	1.3	0.27
GTSW-2	8/24/2004	9	1	1.35	0.6	0	60	0.03	1.35	0.04
GTSW-2	8/24/2004	10	1	1.35	0.6	6	60	0.13	1.35	0.17
GTSW-2	8/24/2004	11	1	1.25	0.6	0	60	0.03	1.25	0.04
GTSW-2	8/24/2004	12	1	1.2	0.6	3	60	0.08	1.2	0.10
GTSW-2	8/24/2004	13	1	1.2	0.6	5	60	0.11	1.2	0.13
GTSW-2	8/24/2004	14	1	1.2	0.6	5	60	0.11	1.2	0.13
GTSW-2	8/24/2004	15	1	1.1	0.6	1	60	0.05	1.1	0.05
GTSW-2	8/24/2004	16	1	0.6	0.6	1	60	0.05	0.6	0.03
GTSW-2	8/24/2004	17	1	0.3	0.6	0	60	0.03	0.3	0.01
GTSW-2	8/24/2004	18								1.40
GTSW-1	***8/24/2004***	***0***								
GTSW-1	8/24/2004	0.5	0.5	0.3	0.6	64	60	1.06	0.15	0.16
GTSW-1	8/24/2004	1	0.5	0.35	0.6	47	60	0.78	0.175	0.14
GTSW-1	8/24/2004	1.5	0.5	0.35	0.6	80	60	1.31	0.175	0.23
GTSW-1	8/24/2004	2	0.5	0.4	0.6	45	60	0.75	0.2	0.15
GTSW-1	8/24/2004	2.5	0.5	0.45	0.6	70	60	1.15	0.225	0.26
GTSW-1	8/24/2004	3	0.5	0.45	0.6	32	60	0.54	0.225	0.12
GTSW-1	8/24/2004	3.5	0.5	0.3	0.6	39	60	0.66	0.15	0.10
GTSW-1	8/24/2004	4								1.16

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-1	***9/29/2004***	***0***								
GTSW-1	9/29/2004	0.5	0.5	0.2	0.6	30	60	0.51	0.1	0.05
GTSW-1	9/29/2004	1	0.5	0.2	0.6	10	60	0.19	0.1	0.02
GTSW-1	9/29/2004	1.5	0.5	0.3	0.6	39	60	0.66	0.15	0.10
GTSW-1	9/29/2004	2	0.5	0.25	0.6	47	60	0.78	0.125	0.10
GTSW-1	9/29/2004	2.5	0.5	0.2	0.6	64	60	1.06	0.1	0.11
GTSW-1	9/29/2004	3	0.5	0.3	0.6	92	60	1.5	0.15	0.23
GTSW-1	9/29/2004	3.5	0.5	0.3	0.6	117	60	1.9	0.15	0.29
GTSW-1	9/29/2004	4	0.5	0.35	0.6	36	60	0.61	0.175	0.11
GTSW-1	9/29/2004	4.4								0.99
GTSW-2	***9/29/2004***									
GTSW-2	9/29/2004	1	1	0.4	0.6	0	60	0.03	0.4	0.01
GTSW-2	9/29/2004	2	1	0.5	0.6	0	60	0.03	0.5	0.02
GTSW-2	9/29/2004	3	1	0.8	0.6	1	60	0.05	0.8	0.04
GTSW-2	9/29/2004	4	1	1.1	0.6	2	60	0.06	1.1	0.07
GTSW-2	9/29/2004	5	1	1.1	0.6	0	60	0.03	1.1	0.03
GTSW-2	9/29/2004	6	1	1.1	0.6	1	60	0.05	1.1	0.05
GTSW-2	9/29/2004	7	1	1.2	0.6	1	60	0.05	1.2	0.06
GTSW-2	9/29/2004	8	1	1.35	0.6	4	60	0.1	1.35	0.13
GTSW-2	9/29/2004	9	1	1.4	0.6	2	60	0.06	1.4	0.09
GTSW-2	9/29/2004	10	1	1.3	0.6	4	60	0.1	1.3	0.12
GTSW-2	9/29/2004	11	1	1.2	0.6	1	60	0.05	1.2	0.06
GTSW-2	9/29/2004	12	1	1.2	0.6	1	60	0.05	1.2	0.06
GTSW-2	9/29/2004	13	1	1.3	0.6	3	60	0.08	1.3	0.10
GTSW-2	9/29/2004	14	1	1.2	0.6	0	60	0.03	1.2	0.04
GTSW-2	9/29/2004	15	1	1	0.6	1	60	0.05	1	0.05
GTSW-2	9/29/2004	16	1	0.6	0.6	0	60	0.03	0.6	0.02
GTSW-2	9/29/2004	17	1	0.3	0.6	0	60	0.03	0.3	0.01
GTSW-2	9/29/2004	18								0.95

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	***9/29/2004***	***0***								
GTSW-3	9/29/2004	0.5	0.5	0.15	0.6	0	60	0.03	0.075	0.00
GTSW-3	9/29/2004	1	0.5	0.3	0.6	16	60	0.29	0.15	0.04
GTSW-3	9/29/2004	1.5	0.5	0.55	0.6	29	60	0.5	0.275	0.14
GTSW-3	9/29/2004	2	0.5	0.6	0.6	34	60	0.58	0.3	0.17
GTSW-3	9/29/2004	2.5	0.5	0.6	0.6	55	60	0.91	0.3	0.27
GTSW-3	9/29/2004	3	0.5	0.5	0.6	46	60	0.77	0.25	0.19
GTSW-3	9/29/2004	3.5	0.5	0.6	0.6	32	60	0.54	0.3	0.16
GTSW-3	9/29/2004	4	0.5	0.2	0.6	12	60	0.22	0.1	0.02
GTSW-3	9/29/2004	4.5	0.5	0.3	0.6	9	60	0.18	0.15	0.03
GTSW-3	9/29/2004	5								1.03
GTSW-1	***4/27/2005***	***0***								
GTSW-1	4/27/2005	0.5	0.5	0.5	0.6	42	60	0.70348	0.25	0.18
GTSW-1	4/27/2005	1	0.5	0.45	0.6	79	60	1.295726667	0.225	0.29
GTSW-1	4/27/2005	1.5	0.5	0.7	0.6	64	60	1.055626667	0.35	0.37
GTSW-1	4/27/2005	2	0.5	0.75	0.6	79	60	1.295726667	0.375	0.49
GTSW-1	4/27/2005	2.5	0.5	0.85	0.6	143	60	2.320153333	0.425	0.99
GTSW-1	4/27/2005	3	0.5	0.95	0.6	153	60	2.48022	0.475	1.18
GTSW-1	4/27/2005	3.5	0.5	0.9	0.6	228	60	3.68072	0.45	1.66
GTSW-1	4/27/2005	4	0.5	0.8	0.6	198	60	3.20052	0.4	1.28
GTSW-1	4/27/2005	4.5	0.5	0.75	0.6	117	60	1.90398	0.375	0.71
GTSW-1	4/27/2005	5.0	0.5	0.75	0.6	74	60	1.215693333	0.375	0.46
GTSW-1	4/27/2005	5.5	0.5	0.5	0.6	21	60	0.36734	0.25	0.09
										7.69

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STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***4/27/2005***	***0***								
GTSW-2	4/27/2005	1	1	0.4	0.6	1	60	0.047206667	0.4	0.02
GTSW-2	4/27/2005	2	1	0.7	0.6	1	60	0.047206667	0.7	0.03
GTSW-2	4/27/2005	3	1	1	0.6	0	60	0.0312	1	0.03
GTSW-2	4/27/2005	4	1	1.3	0.6	3	60	0.07922	1.3	0.10
GTSW-2	4/27/2005	5	1	1.2	0.6	11	60	0.207273333	1.2	0.25
GTSW-2	4/27/2005	6	1	1.2	0.6	24	60	0.41536	1.2	0.50
GTSW-2	4/27/2005	7	1	1.4	0.6	57	60	0.94358	1.4	1.32
GTSW-2	4/27/2005	8	1	1.45	0.6	67	60	1.103646667	1.45	1.60
GTSW-2	4/27/2005	9	1	1.5	0.6	52	60	0.863546667	1.5	1.30
GTSW-2	4/27/2005	10	1	1.5	0.6	48	60	0.79952	1.5	1.20
GTSW-2	4/27/2005	11	1	1.5	0.6	22	60	0.383346667	1.5	0.58
GTSW-2	4/27/2005	12	1	1.4	0.6	18	60	0.31932	1.4	0.45
GTSW-2	4/27/2005	13	1	1.4	0.6	16	60	0.287306667	1.4	0.40
GTSW-2	4/27/2005	14	1	1.4	0.6	7	60	0.143246667	1.4	0.20
GTSW-2	4/27/2005	15	1	1.25	0.6	3	60	0.07922	1.25	0.10
GTSW-2	4/27/2005	16	1	0.85	0.6	0	60	0.0312	0.85	0.03
GTSW-2	4/27/2005	17	1	0.55	0.6	0	60	0.0312	0.55	0.02
GTSW-2	4/27/2005	18	1	0.4	0.6	0	60	0.0312	0.4	0.01
										8.13

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	***4/27/2005***	***0***								
GTSW-3	4/27/2005	0.5	0.5	0.8	0.6	11	60	0.207273333	0.4	0.08
GTSW-3	4/27/2005	1	0.5	0.9	0.6	18	60	0.31932	0.45	0.14
GTSW-3	4/27/2005	1.5	0.5	1	0.6	35	60	0.591433333	0.5	0.30
GTSW-3	4/27/2005	2	0.5	1.1	0.6	84	60	1.37576	0.55	0.76
GTSW-3	4/27/2005	2.5	0.5	1.15	0.6	132	60	2.14408	0.575	1.23
GTSW-3	4/27/2005	3	0.5	1.1	0.6	150	60	2.4322	0.55	1.34
GTSW-3	4/27/2005	3.5	0.5	1.2	0.6	124	60	2.016026667	0.6	1.21
GTSW-3	4/27/2005	4	0.5	1	0.6	124	60	2.016026667	0.5	1.01
GTSW-3	4/27/2005	4.5	0.5	0.7	0.6	73	60	1.199686667	0.35	0.42
GTSW-3	4/27/2005	5.0	0.5	0.9	0.6	59	60	0.975593333	0.45	0.44
GTSW-3	4/27/2005	5.5	0.5	0.7	0.6	38	60	0.639453333	0.35	0.22
										7.15
GTSW-1	***6/1/2005***	***0***								
GTSW-1	6/1/2005	0.5	0.5	0.45	0.6	33	60	0.55942	0.225	0.13
GTSW-1	6/1/2005	1	0.5	0.6	0.6	127	60	2.064046667	0.3	0.62
GTSW-1	6/1/2005	1.5	0.5	0.7	0.6	292	60	4.705146667	0.35	1.65
GTSW-1	6/1/2005	2	0.5	0.85	0.6	284	60	4.577093333	0.425	1.95
GTSW-1	6/1/2005	2.5	0.5	0.9	0.6	306	60	4.92924	0.45	2.22
GTSW-1	6/1/2005	3	0.5	0.8	0.6	326	60	5.249373333	0.4	2.10
GTSW-1	6/1/2005	3.5	0.5	0.9	0.6	342	60	5.50548	0.45	2.48
GTSW-1	6/1/2005	4	0.5	0.8	0.6	298	60	4.801186667	0.4	1.92
GTSW-1	6/1/2005	4.5	0.5	0.9	0.6	112	60	1.823946667	0.45	0.82
GTSW-1	6/1/2005	5.0	0.5	1	0.6	194	60	3.136493333	0.5	1.57
GTSW-1	6/1/2005	5.5	0.5	1	0.6	290	60	4.673133333	0.5	2.34
GTSW-1	6/1/2005	6	0.5	1	0.6	294	60	4.73716	0.5	2.37
GTSW-1	6/1/2005	6.5	0.5	0.5	0.6	314	60	5.057293333	0.25	1.26
GTSW-1	6/1/2005	7.0	0.5	0.9	0.6	180	60	2.9124	0.45	1.31
GTSW-1	6/1/2005	7.5	0.5							22.72

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***6/1/2005***	***0***								
GTSW-2	6/1/2005	1	1	0.25	0.6	0	60	0.0312	0.25	0.01
GTSW-2	6/1/2005	2	1	0.35	0.6	0	60	0.0312	0.35	0.01
GTSW-2	6/1/2005	3	1	0.6	0.6	1	60	0.047206667	0.6	0.03
GTSW-2	6/1/2005	4	1	0.9	0.6	6	60	0.12724	0.9	0.11
GTSW-2	6/1/2005	5	1	1.2	0.6	13	60	0.239286667	1.2	0.29
GTSW-2	6/1/2005	6	1	1.6	0.6	25	60	0.431366667	1.6	0.69
GTSW-2	6/1/2005	7	1	1.9	0.6	27	60	0.46338	1.9	0.88
GTSW-2	6/1/2005	8	1	1.8	0.6	43	60	0.719486667	1.8	1.30
GTSW-2	6/1/2005	9	1	1.8	0.6	97	60	1.583846667	1.8	2.85
GTSW-2	6/1/2005	10	1	1.9	0.6	147	60	2.38418	1.9	4.53
GTSW-2	6/1/2005	11	1	2	0.6	111	60	1.80794	2	3.62
GTSW-2	6/1/2005	12	1	2	0.6	88	60	1.439786667	2	2.88
GTSW-2	6/1/2005	13	1	1.9	0.6	112	60	1.823946667	1.9	3.47
GTSW-2	6/1/2005	14	1	1.85	0.6	58	60	0.959586667	1.85	1.78
GTSW-2	6/1/2005	15	1	1.8	0.6	44	60	0.735493333	1.8	1.32
GTSW-2	6/1/2005	16	1	1.8	0.6	49	60	0.815526667	1.8	1.47
GTSW-2	6/1/2005	17	1	1.7	0.6	10	60	0.191266667	1.7	0.33
GTSW-2	6/1/2005	18	1	1.4	0.6	1	60	0.047206667	1.4	0.07
GTSW-2	6/1/2005	19.0	1	1.1	0.6	0	60	0.0312	1.1	0.03
GTSW-2	6/1/2005	20.0	1	0.7	0.6	0	60	0.0312	0.7	0.02
GTSW-2	6/1/2005	21.0	1	0.4	0.6	0	60	0.0312	0.4	0.01
										25.68

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	***6/1/2005***	***0***								
GTSW-3	6/1/2005	0.5	0.5	0.2	0.6	10	60	0.191266667	0.1	0.02
GTSW-3	6/1/2005	1	0.5	0.45	0.6	10	60	0.191266667	0.225	0.04
GTSW-3	6/1/2005	1.5	0.5	0.6	0.6	30	60	0.5114	0.3	0.15
GTSW-3	6/1/2005	2	0.5	1.25	0.6	70	60	1.151666667	0.625	0.72
GTSW-3	6/1/2005	2.5	0.5	1.4	0.6	116	60	1.887973333	0.7	1.32
GTSW-3	6/1/2005	3	0.5	1.6	0.6	120	60	1.952	0.8	1.56
GTSW-3	6/1/2005	3.5	0.5	1.7	0.6	198	60	3.20052	0.85	2.72
GTSW-3	6/1/2005	4	0.5	1.9	0.6	228	60	3.68072	0.95	3.50
GTSW-3	6/1/2005	4.5	0.5	1.9	0.6	234	60	3.77676	0.95	3.59
GTSW-3	6/1/2005	5.0	0.5	1.8	0.6	214	60	3.456626667	0.9	3.11
GTSW-3	6/1/2005	5.5	0.5	1.6	0.6	216	60	3.48864	0.8	2.79
GTSW-3	6/1/2005	6.0	0.5	1.4	0.6	188	60	3.040453333	0.7	2.13
GTSW-3	6/1/2005	6.5	0.5	1.55	0.6	148	60	2.400186667	0.775	1.86
GTSW-3	6/1/2005	7.0	0.5	1.4	0.6	110	60	1.791933333	0.7	1.25
GTSW-3	6/1/2005	7.5	0.5	0.6	0.6	72	60	1.18368	0.3	0.36
GTSW-3	6/1/2005	8.0	0.5	0.45	0.6	30	60	0.5114	0.225	0.12
		8.6								25.24
GTSW-1	***6/28/2005***	***0***								
GTSW-1	6/28/2005	0.5	0.5	0.3	0.6	0	60	0.0312	0.15	0.00
GTSW-1	6/28/2005	1	0.5	0.45	0.6	153	60	2.48022	0.225	0.56
GTSW-1	6/28/2005	1.5	0.5	0.5	0.6	159	60	2.57626	0.25	0.64
GTSW-1	6/28/2005	2	0.5	0.55	0.6	238	60	3.840786667	0.275	1.06
GTSW-1	6/28/2005	2.5	0.5	0.6	0.6	129	60	2.09606	0.3	0.63
GTSW-1	6/28/2005	3	0.5	0.6	0.6	246	60	3.96884	0.3	1.19
GTSW-1	6/28/2005	3.5	0.5	0.5	0.6	212	60	3.424613333	0.25	0.86
GTSW-1	6/28/2005	4	0.5	0.5	0.6	176	60	2.848373333	0.25	0.71
GTSW-1	6/28/2005	4.5	0.5	0.7	0.6	156	60	2.52824	0.35	0.88
GTSW-1	6/28/2005	5.0	0.5	0.55	0.6	143	60	2.320153333	0.275	0.64
GTSW-1	6/28/2005	5.5	0.5	0.65	0.6	139	60	2.256126667	0.325	0.73
GTSW-1	6/28/2005	6	0.5	0.6	0.6	116	60	1.887973333	0.3	0.57
GTSW-1	6/28/2005	6.5	0.5	0.5	0.6	36	60	0.60744	0.25	0.15
GTSW-1	6/28/2005	7.0	0.5		0.6		60	0.0312	1	0.03
										8.66

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	6/28/2005	***0***								
GTSW-2	6/28/2005	1	1	0.4	0.6	0	60	0.0312	0.4	0.01
GTSW-2	6/28/2005	2	1	0.65	0.6	4	60	0.095226667	0.65	0.06
GTSW-2	6/28/2005	3	1	1	0.6	11	60	0.207273333	1	0.21
GTSW-2	6/28/2005	4	1	1.5	0.6	14	60	0.255293333	1.5	0.38
GTSW-2	6/28/2005	5	1	1.6	0.6	13	60	0.239286667	1.6	0.38
GTSW-2	6/28/2005	6	1	1.5	0.6	8	60	0.159253333	1.5	0.24
GTSW-2	6/28/2005	7	1	1.5	0.6	64	60	1.055626667	1.5	1.58
GTSW-2	6/28/2005	8	1	1.6	0.6	77	60	1.263713333	1.6	2.02
GTSW-2	6/28/2005	9	1	1.7	0.6	18	60	0.31932	1.7	0.54
GTSW-2	6/28/2005	10	1	1.65	0.6	34	60	0.575426667	1.65	0.95
GTSW-2	6/28/2005	11	1	1.6	0.6	33	60	0.55942	1.6	0.90
GTSW-2	6/28/2005	12	1	1.5	0.6	24	60	0.41536	1.5	0.62
GTSW-2	6/28/2005	13	1	1.5	0.6	24	60	0.41536	1.5	0.62
GTSW-2	6/28/2005	14	1	1.55	0.6	25	60	0.431366667	1.55	0.67
GTSW-2	6/28/2005	15	1	1.45	0.6	12	60	0.22328	1.45	0.32
GTSW-2	6/28/2005	16	1	0.9	0.6	0	60	0.0312	0.9	0.03
GTSW-2	6/28/2005	17	1	0.65	0.6	0	60	0.0312	0.65	0.02
GTSW-2	6/28/2005	18	1	0.45	0.6	0	60	0.0312	0.45	0.01
GTSW-2	6/28/2005	19	1	0	0.6	0	60	0.0312	1	0.03
										9.61
GTSW-3	*6/28/2005*	***0***								
GTSW-3	6/28/2005	0.5	0.5	0.8	0.6	8	60	0.159253333	0.4	0.06
GTSW-3	6/28/2005	1	0.5	1	0.6	30	60	0.5114	0.5	0.26
GTSW-3	6/28/2005	1.5	0.5	1.2	0.6	60	60	0.9916	0.6	0.59
GTSW-3	6/28/2005	2	0.5	1.3	0.6	107	60	1.743913333	0.65	1.13
GTSW-3	6/28/2005	2.5	0.5	1.3	0.6	154	60	2.496226667	0.65	1.62
GTSW-3	6/28/2005	3	0.5	1	0.6	217	60	3.504646667	0.5	1.75
GTSW-3	6/28/2005	3.5	0.5	1.1	0.6	190	60	3.072466667	0.55	1.69
GTSW-3	6/28/2005	4	0.5	1.1	0.6	152	60	2.464213333	0.55	1.36
GTSW-3	6/28/2005	4.5	0.5	0.9	0.6	117	60	1.90398	0.45	0.86
GTSW-3	6/28/2005	5.0	0.5	0.8	0.6	88	60	1.439786667	0.4	0.58
GTSW-3	6/28/2005	5.5	0.5	1.6	0.6	0	60	0.0312	0.8	0.02
										9.93

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-1	***7/21/2005***	***0***								
GTSW-1	7/21/2005	0.5	0.5	0.15	0.6	16	60	0.287306667	0.075	0.02
GTSW-1	7/21/2005	1	0.5	0.35	0.6	96	60	1.56784	0.175	0.27
GTSW-1	7/21/2005	1.5	0.5	0.4	0.6	43	60	0.719486667	0.2	0.14
GTSW-1	7/21/2005	2	0.5	0.4	0.6	173	60	2.800353333	0.2	0.56
GTSW-1	7/21/2005	2.5	0.5	0.45	0.6	125	60	2.032033333	0.225	0.46
GTSW-1	7/21/2005	3	0.5	0.4	0.6	245	60	3.952833333	0.2	0.79
GTSW-1	7/21/2005	3.5	0.5	0.55	0.6	188	60	3.040453333	0.275	0.84
GTSW-1	7/21/2005	4	0.5	0.5	0.6	97	60	1.583846667	0.25	0.40
GTSW-1	7/21/2005	4.5	0.5	0.6	0.6	150	60	2.4322	0.3	0.73
GTSW-1	7/21/2005	5.0	0.5	0.6	0.6	98	60	1.599853333	1	1.60
GTSW-1	7/21/2005	5.5	0.5	0.5	0.6	97	60	1.583846667	1	1.58
GTSW-1	7/21/2005	6.0	0.5	0.4	0.6	45	60	0.7515	1	0.75
GTSW-1	7/21/2005	6.5	0.5	0.3	0.6	9	60	0.17526	1	0.18
GTSW-1	7/21/2005	7.0	0.5	0	0.6	0	60	0.0312	1	0.03
										8.35
GTSW-2	7/21/2005	***0***								
GTSW-2	7/21/2005	1	1	0.4	0.6	0	60	0.0312	0.4	0.01
GTSW-2	7/21/2005	2	1	0.6	0.6	5	60	0.111233333	0.6	0.07
GTSW-2	7/21/2005	3	1	0.95	0.6	11	60	0.207273333	0.95	0.20
GTSW-2	7/21/2005	4	1	1.35	0.6	4	60	0.095226667	1.35	0.13
GTSW-2	7/21/2005	5	1	1.5	0.6	3	60	0.07922	1.5	0.12
GTSW-2	7/21/2005	6	1	1.45	0.6	6	60	0.12724	1.45	0.18
GTSW-2	7/21/2005	7	1	1.4	0.6	36	60	0.60744	1.4	0.85
GTSW-2	7/21/2005	8	1	1.5	0.6	28	60	0.479386667	1.5	0.72
GTSW-2	7/21/2005	9	1	1.6	0.6	8	60	0.159253333	1.6	0.25
GTSW-2	7/21/2005	10	1	1.5	0.6	23	60	0.399353333	1.5	0.60
GTSW-2	7/21/2005	11	1	1.3	0.6	11	60	0.207273333	1.3	0.27
GTSW-2	7/21/2005	12	1	1.25	0.6	12	60	0.22328	1.25	0.28
GTSW-2	7/21/2005	13	1	1.25	0.6	15	60	0.2713	1.25	0.34
GTSW-2	7/21/2005	14	1	1.35	0.6	11	60	0.207273333	1.35	0.28
GTSW-2	7/21/2005	15	1	1.2	0.6	4	60	0.095226667	1.2	0.11
GTSW-2	7/21/2005	16	1	0.8	0.6	0	60	0.0312	0.8	0.02
GTSW-2	7/21/2005	17	1	0.4	0.6	0	60	0.0312	0.4	0.01
GTSW-2	7/21/2005	18	1	0.1	0.6	0	60	0.0312	1	0.03
GTSW-2	7/21/2005	18.5	1	0	0.6	0	60	0.0312	1	0.03
										4.51

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-3	7/21/2005	***0***								
GTSW-3	7/21/2005	0.5	0.5	0.5	0.6	5	60	0.111233333	0.25	0.03
GTSW-3	7/21/2005	1	0.5	0.7	0.6	16	60	0.287306667	0.35	0.10
GTSW-3	7/21/2005	1.5	0.5	0.6	0.6	60	60	0.9916	0.3	0.30
GTSW-3	7/21/2005	2	0.5	0.8	0.6	78	60	1.27972	0.4	0.51
GTSW-3	7/21/2005	2.5	0.5	0.9	0.6	149	60	2.416193333	0.45	1.09
GTSW-3	7/21/2005	3	0.5	0.75	0.6	156	60	2.52824	0.375	0.95
GTSW-3	7/21/2005	3.5	0.5	0.8	0.6	115	60	1.871966667	0.4	0.75
GTSW-3	7/21/2005	4	0.5	0.6	0.6	77	60	1.263713333	0.3	0.38
GTSW-3	7/21/2005	4.5	0.5	0.55	0.6	56	60	0.927573333	0.275	0.26
GTSW-3	7/21/2005	5.0	0.5	0.6	0.6	35	60	0.591433333	0.3	0.18
GTSW-3	7/21/2005	5.5	0	1.6	0.6	0	60	0.0312	0	0.00
										4.53
GTSW-1	***8/26/2005***	***0***								
GTSW-1	8/26/2005	0.5	0.5	0.2	0.6	40	60	0.671466667	0.1	0.07
GTSW-1	8/26/2005	1	0.5	0.2	0.6	124	60	2.016026667	0.1	0.20
GTSW-1	8/26/2005	1.5	0.5	0.4	0.6	122	60	1.984013333	0.2	0.40
GTSW-1	8/26/2005	2	0.5	0.3	0.6	53	60	0.879553333	0.15	0.13
GTSW-1	8/26/2005	2.5	0.5	0.2	0.6	170	60	2.752333333	0.1	0.28
GTSW-1	8/26/2005	3	0.5	0.3	0.6	85	60	1.391766667	0.15	0.21
GTSW-1	8/26/2005	3.5	0.5	0.4	0.6	87	60	1.42378	0.2	0.28
GTSW-1	8/26/2005	4	0.5	0.4	0.6	118	60	1.919986667	0.2	0.38
GTSW-1	8/26/2005	4.5	0.5	0.4	0.6	102	60	1.66388	0.2	0.33
GTSW-1	8/26/2005	5.0	0.5		0.6	42	60	0.0312	1	0.03
										2.31

DRAFT

TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***8/26/2005***	***0***								
GTSW-2	8/26/2005	1	1	0.3	0.6	0	60	0.0312	0.3	0.01
GTSW-2	8/26/2005	2	1	0.55	0.6	0	60	0.0312	0.55	0.02
GTSW-2	8/26/2005	3	1	0.8	0.6	0	60	0.0312	0.8	0.02
GTSW-2	8/26/2005	4	1	1.3	0.6	1	60	0.047206667	1.3	0.06
GTSW-2	8/26/2005	5	1	1.2	0.6	4	60	0.095226667	1.2	0.11
GTSW-2	8/26/2005	6	1	1.2	0.6	3	60	0.07922	1.2	0.10
GTSW-2	8/26/2005	7	1	1.3	0.6	21	60	0.36734	1.3	0.48
GTSW-2	8/26/2005	8	1	1.3	0.6	10	60	0.191266667	1.3	0.25
GTSW-2	8/26/2005	9	1	1.4	0.6	9	60	0.17526	1.4	0.25
GTSW-2	8/26/2005	10	1	1.3	0.6	13	60	0.239286667	1.3	0.31
GTSW-2	8/26/2005	11	1	1.1	0.6	8	60	0.159253333	1.1	0.18
GTSW-2	8/26/2005	12	1	1.1	0.6	7	60	0.143246667	1.1	0.16
GTSW-2	8/26/2005	13	1	1.2	0.6	4	60	0.095226667	1.2	0.11
GTSW-2	8/26/2005	14	1	1.1	0.6	4	60	0.095226667	1.1	0.10
GTSW-2	8/26/2005	15	1	0.9	0.6	0	60	0.0312	0.9	0.03
GTSW-2	8/26/2005	16	1	0.5	0.6	0	60	0.0312	0.5	0.02
GTSW-2	8/26/2005	17	1	0.2	0.6	0	60	0.0312	0.2	0.01
GTSW-2	8/26/2005	18	1	0	0.6	0	60	0.0312	1	0.03
										2.24
GTSW-3	***8/26/2005***	***0***								
GTSW-3	8/26/2005	0.5	0.5	0.35	0.6	0	60	0.0312	0.175	0.01
GTSW-3	8/26/2005	1	0.5	0.5	0.6	11	60	0.207273333	0.25	0.05
GTSW-3	8/26/2005	1.5	0.5	0.5	0.6	39	60	0.65546	0.25	0.16
GTSW-3	8/26/2005	2	0.5	0.6	0.6	80	60	1.311733333	0.3	0.39
GTSW-3	8/26/2005	2.5	0.5	0.5	0.6	115	60	1.871966667	0.25	0.47
GTSW-3	8/26/2005	3	0.5	0.5	0.6	93	60	1.51982	0.25	0.38
GTSW-3	8/26/2005	3.5	0.5	0.6	0.6	61	60	1.007606667	0.3	0.30
GTSW-3	8/26/2005	4	0.5	0.5	0.6	53	60	0.879553333	0.25	0.22
GTSW-3	8/26/2005	4.5	0.5	0.4	0.6	44	60	0.735493333	0.2	0.15
GTSW-3	8/26/2005	5.0	0.5	0.3	0.6	18	60	0.31932	0.15	0.05
GTSW-3	8/26/2005	5.3	0.3	1.6	0.6	0	60	0.0312	0.48	0.01
										2.19

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TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-1	***10/11/2005***	***0***								
GTSW-1	10/11/2005	0.5	0.5	0.25	0.6	0	60	0.0312	0.125	0.00
GTSW-1	10/11/2005	1	0.5	0.3	0.6	27	60	0.46338	0.15	0.07
GTSW-1	10/11/2005	1.5	0.5	0.2	0.6	50	60	0.831533333	0.1	0.08
GTSW-1	10/11/2005	2	0.5	0.3	0.6	35	60	0.591433333	0.15	0.09
GTSW-1	10/11/2005	2.5	0.5	0.45	0.6	45	60	0.7515	0.225	0.17
GTSW-1	10/11/2005	3	0.5	0.5	0.6	42	60	0.70348	0.25	0.18
GTSW-1	10/11/2005	3.5	0.5	0.5	0.6	93	60	1.51982	0.25	0.38
GTSW-1	10/11/2005	4	0.5	0.3	0.6	24	60	0.41536	0.15	0.06
GTSW-1	10/11/2005	4.5	0.5	0.5	0.6	79	60	1.295726667	0.25	0.32
GTSW-1	10/11/2005	5.0	0.5	0.5	0.6	60	60	0.9916	0.25	0.25
GTSW-1	10/11/2005	5.5	0.5	0.3	0.6	26	60	0.447373333	0.15	0.07
GTSW-1	10/11/2005	5.5	0.5		0.6	0	60	0.0312	1	0.03
				0.3						1.70

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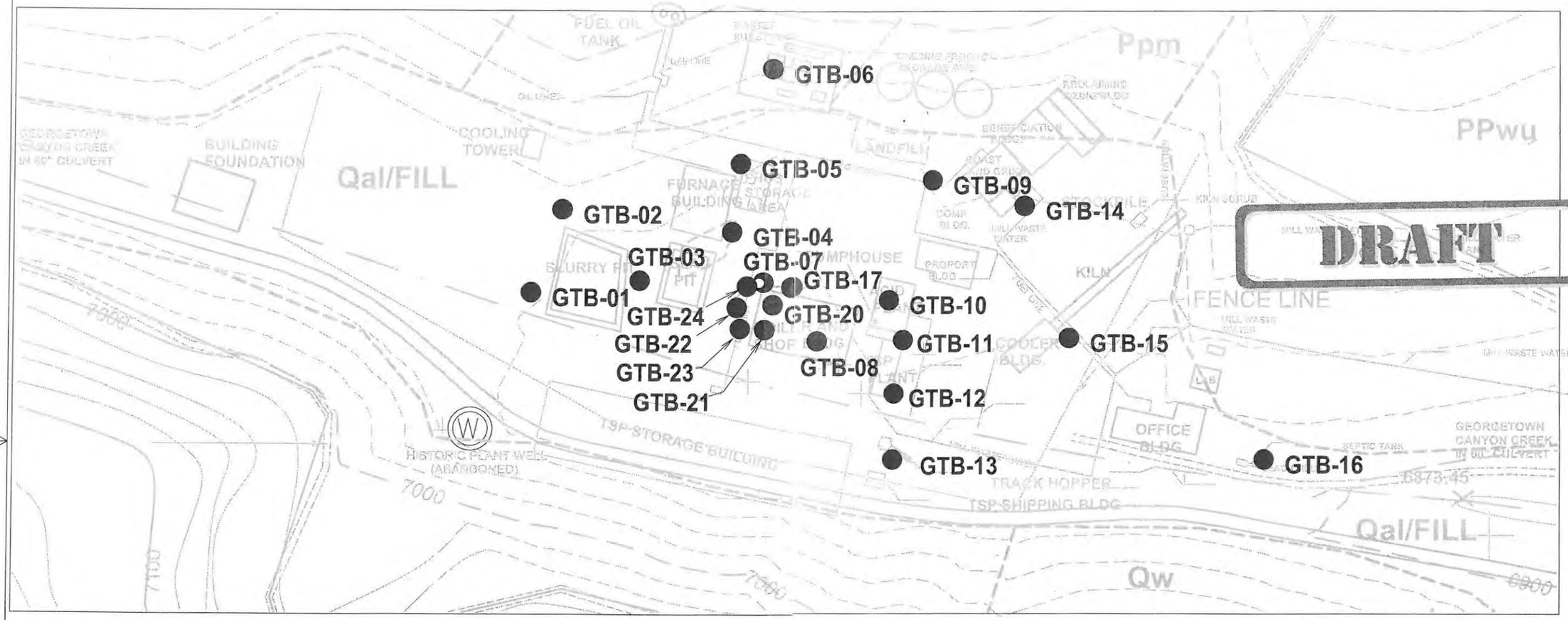
TABLE A.7.2
STREAMFLOW MEASUREMENTS AND
FLOW CALCULATIONS FOR GEORGETOWN CREEK

Surface Wate Station	Date	Distance to Initial (ft)	Width (ft)	Depth (ft)	Obs. Depth (ft)	Revolutions	Time (sec)	Velocity ft sec^{-1}	area ft^2	flow ft^3 sec^{-1}
GTSW-2	***10/11/2005***	***0***								
GTSW-2	10/11/2005	1	1	0.3	0.6	0	60	0.0312	0.3	0.01
GTSW-2	10/11/2005	2	1	0.7	0.6	0	60	0.0312	0.7	0.02
GTSW-2	10/11/2005	3	1	1.2	0.6	0	60	0.0312	1.2	0.04
GTSW-2	10/11/2005	4	1	1.3	0.6	0	60	0.0312	1.3	0.04
GTSW-2	10/11/2005	5	1	1.2	0.6	0	60	0.0312	1.2	0.04
GTSW-2	10/11/2005	6	1	1.2	0.6	8	60	0.159253333	1.2	0.19
GTSW-2	10/11/2005	7	1	1.2	0.6	10	60	0.191266667	1.2	0.23
GTSW-2	10/11/2005	8	1	1.4	0.6	2	60	0.063213333	1.4	0.09
GTSW-2	10/11/2005	9	1	1.4	0.6	1	60	0.047206667	1.4	0.07
GTSW-2	10/11/2005	10	1	1.3	0.6	0	60	0.0312	1.3	0.04
GTSW-2	10/11/2005	11	1	1.2	0.6	1	60	0.047206667	1.2	0.06
GTSW-2	10/11/2005	12	1	1.1	0.6	0	60	0.0312	1.1	0.03
GTSW-2	10/11/2005	13	1	1.2	0.6	3	60	0.07922	1.2	0.10
GTSW-2	10/11/2005	14	1	1.2	0.6	0	60	0.0312	1.2	0.04
GTSW-2	10/11/2005	15	1	0.7	0.6	0	60	0.0312	0.7	0.02
GTSW-2	10/11/2005	16	1	0.3	0.6	0	60	0.0312	0.3	0.01
GTSW-2	10/11/2005	17	1	0.1	0.6	0	60	0.0312	0.1	0.00
GTSW-2	10/11/2005	17.5	1	0		0	60	0.0312	1	0.03
										1.05
GTSW-3	***10/11/2005***	***0***								
GTSW-3	10/11/2005	0.5	0.5	0.4	0.6	0	60	0.0312	0.2	0.01
GTSW-3	10/11/2005	1	0.5	0.3	0.6	15	60	0.2713	0.15	0.04
GTSW-3	10/11/2005	1.5	0.5	0.5	0.6	56	60	0.927573333	0.25	0.23
GTSW-3	10/11/2005	2	0.5	0.6	0.6	58	60	0.959586667	0.3	0.29
GTSW-3	10/11/2005	2.5	0.5	0.6	0.6	65	60	1.071633333	0.3	0.32
GTSW-3	10/11/2005	3	0.5	0.6	0.6	54	60	0.89556	0.3	0.27
GTSW-3	10/11/2005	3.5	0.5	0.6	0.6	58	60	0.959586667	0.3	0.29
GTSW-3	10/11/2005	4	0.5	0.3	0.6	42	60	0.70348	0.15	0.11
GTSW-3	10/11/2005	4.5	0.5	0.2	0.6	8	60	0.159253333	0.1	0.02
GTSW-3	10/11/2005	5.0	0.3	0	0.6	0	60	0.0312	0	0.00
										1.57

DRAFT

APPENDIX A FIGURES

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS



KEY

● GTB-01 — SOIL AUGER BORING LOCATION AND DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIUM

Qw - QUATERNARY HILL WASH

TRdl - TRIASSIC LOWER DINWOODY FM.

Ppr - PERMIAN REX CHERT FM.

Ppm - PERMIAN PHOSPHORIA FM.

PPwu - PERMIAN-PENNSYLVANIAN UPPER WELLS FM.

MAP SCALE

0 200 400

CONTOUR INTERVAL = 20 FEET

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

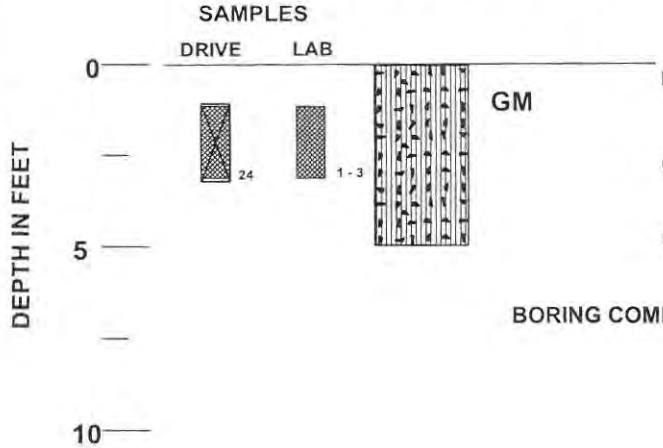
CENTRAL FARMERS FERTILIZER FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE
SOIL BORING LOCATIONS
CENTRAL FARMERS FERTILIZER FACILITY

12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE A.2.1	

GEOLOGIC LOG GTB-1

COORDINATES - NORTHING: 15632.937 EASTING:14221.066
GROUND SURFACE: 6921.34



DARK GRAYISH BLACK SILTY FINE TO MEDIUM GRAVEL, SOME FINE TO COARSE SAND, MOIST

GRADES VERY COARSE

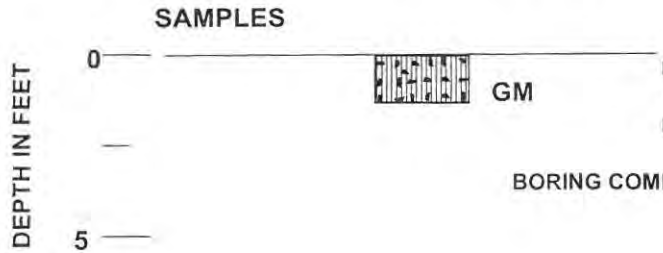
COBBLES AND BOULDERS, AUGER REFUSAL

BORING COMPLETED TO 5.0 FT ON 7-14-04

DRAFT

GEOLOGIC LOG GTB-2

COORDINATES - NORTHING: 15633.574 EASTING:14302.888
GROUND SURFACE: 6921.05



DARK GRAYISH BLACK SILTY FINE TO MEDIUM GRAVEL, SOME FINE TO COARSE SAND, MOIST

BORING CATCHING FIRE - END DRILLING

BORING COMPLETED TO 1.0 FT ON 7-14-04

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. (1 - 3) "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

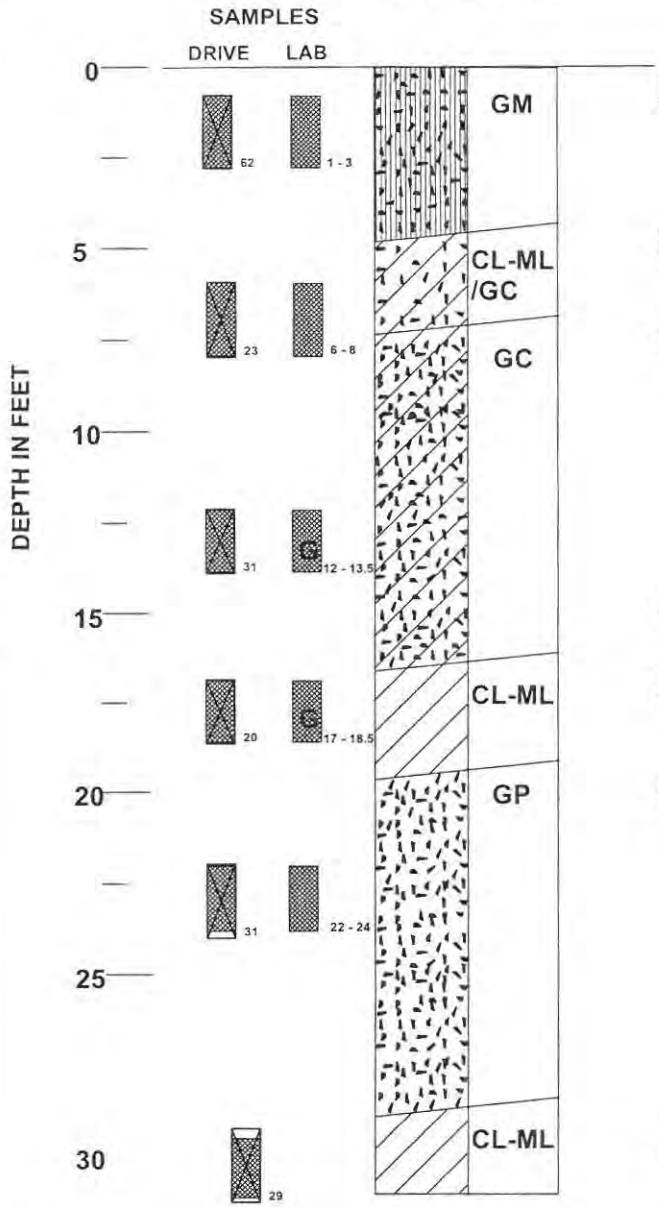
TITLE

GEOLOGIC LOG OF BORINGS GTB-1 AND GTB-2

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 1/12/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.2

GEOLOGIC LOG

COO. .NATES - NORTHING: 15460.423 EASTING:14247.099
GROUND SURFACE: 6915.84



LIGHT TO MEDIUM GRAY SILTY GRAVEL WITH FINE TO COARSE SAND AND SLAG, DAMP

LIGHT GREENISH GRAY TO MEDIUM BROWN CLAY WITH CLAYEY GRAVEL, DAMP, STIFF

MOTTLED GREENISH GRAY TO BLACK CLAYEY COARSE GRAVEL WITH SOME ROOTS IN THE CLAY AND LAYERS OF SILTY CLAY, DAMP

ROUGH DRILLING

MEDIUM BROWN SILTY CLAY WITH SOME FINE TO COARSE SAND AND FINE SILTY GRAVEL LENSES

LIGHT TO MEDIUM GRAY SANDY FINE TO COARSE GRAVEL, TRACE OF CLAY, SOME WEATHERED BOULDERS

DARK GRAY SILTY CLAY WITH TRACE OF VERY FINE GRAVEL, WET

BORING COMPLETED TO 31.0 FT ON 7-14-04

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

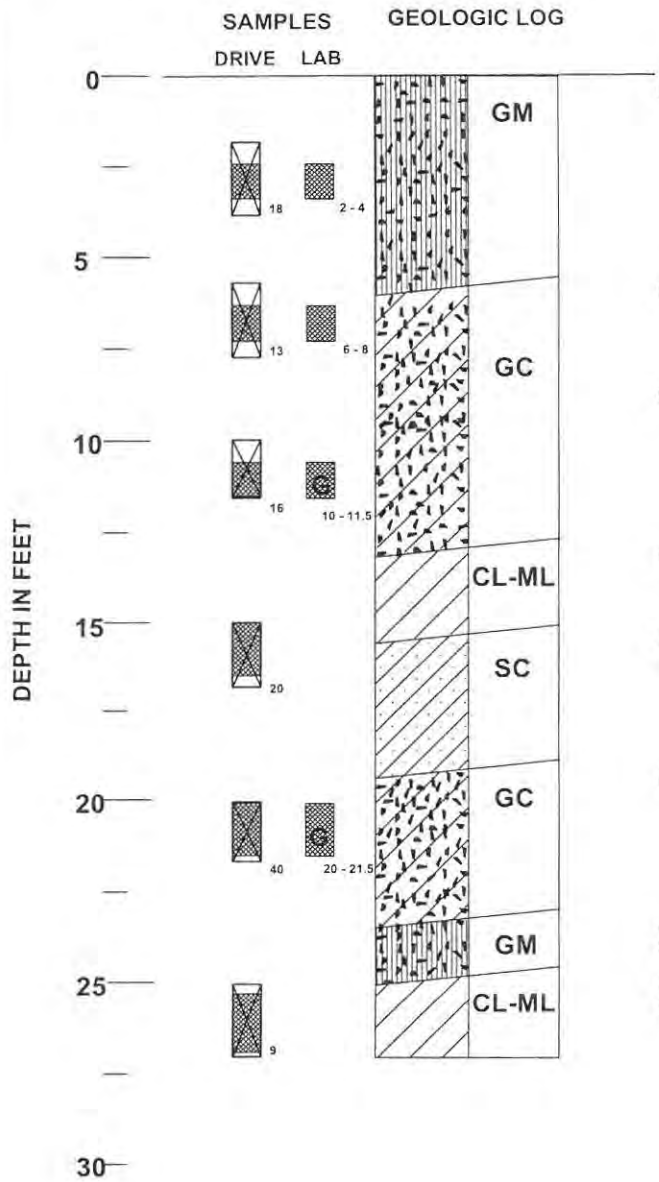
CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-3

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/20/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.3

COORDINATES - NORTHING: 15314.823
EASTING:14281.328
GROUND SURFACE: 6915.33



DARK BROWN SILTY FINE GRAVEL, SOME COARSE SAND, MOIST

MEDIUM GRAY TO MEDIUM BROWN CLAYEY MEDIUM GRAVEL, WET

GRADES COARSER

DARK GRAY SILTY CLAY WITH TRACE OF COARSE SAND

DARK GRAY FINE TO COARSE SANDY CLAY, TRACE OF COARSE ANGULAR GRAVEL

LIGHT TO MEDIUM GRAY COARSE GRAVELLY CLAY, WET

LIGHT TO MEDIUM GRAY COARSE SILTY GRAVEL, SOME FINE TO COARSE SAND

DARK GRAY SILTY CLAY WITH FINE SANDY CLAY STRINGERS, DRY

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

BORING COMPLETED TO 27.0 FT ON 7-14-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-4

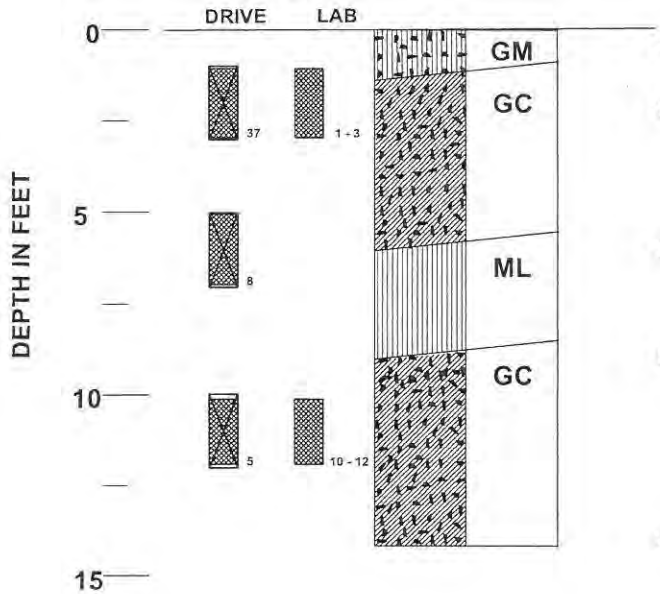
DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/20/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.4

GEOLOGIC LOG

COORDINATES - NORTHING: 15284.224
EASTING:14413.151

GROUND SURFACE: 6916.93

DRAFT



DARK BROWN SILTY COARSE GRAVEL

MEDIUM BROWN CLAYEY COARSE GRAVEL, STIFF, DRY

DARK BROWN SILT WITH TRACE OF MEDIUM TO COARSE GRAVEL, TRACE OF CLAY

MEDIUM BROWN CLAYEY FINE GRAVEL

AUGER REFUSAL @ 14.0'

BORING COMPLETED TO 14.0 FT ON 7-14-04

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN (1 - 3)

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-5

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 12/27/04

SCALE

NU-WEST MINING, INC.

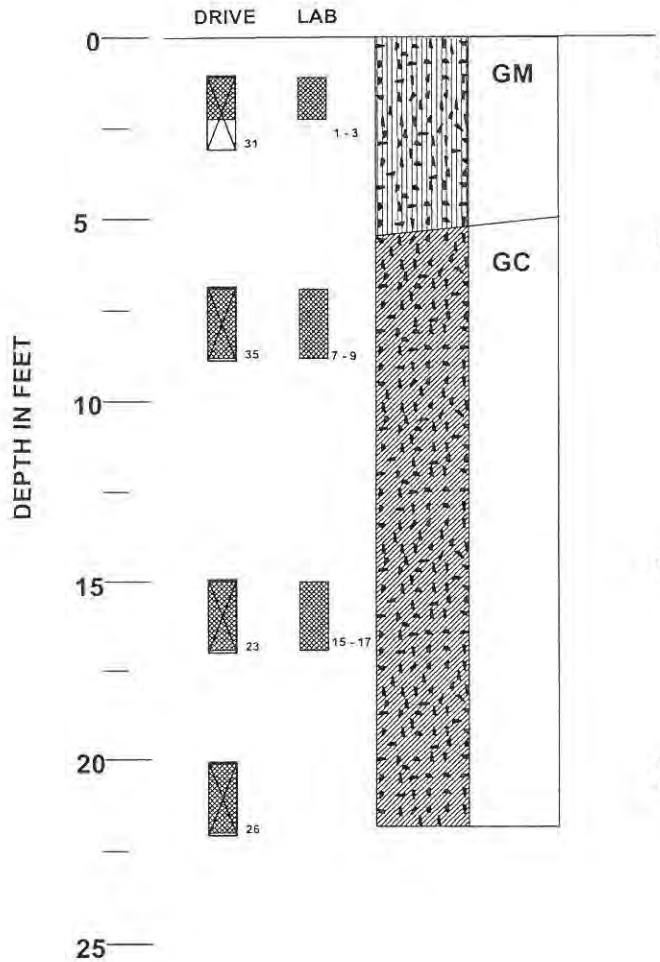
SHEET FIGURE-A.2.5

GEOLOGIC LOG

COORDINATES - NORTHING: 15235.465
EASTING:14577.589

GROUND SURFACE: 6951.4

DRAFT



MEDIUM BROWN SILTY MEDIUM TO COARSE GRAVEL SOME FINE TO COARSE SAND, MOIST

LIGHT GREENISH GRAY TO TAN FINE CLAYEY GRAVEL, DRY

GRADES MEDIUM BROWN WITH COARSER GRAVEL

GRADES MEDIUM YELLOWISH BROWN WITH SOME FINE TO COARSE SAND

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

BORING COMPLETED TO 22.0 FT ON 7-14-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-6

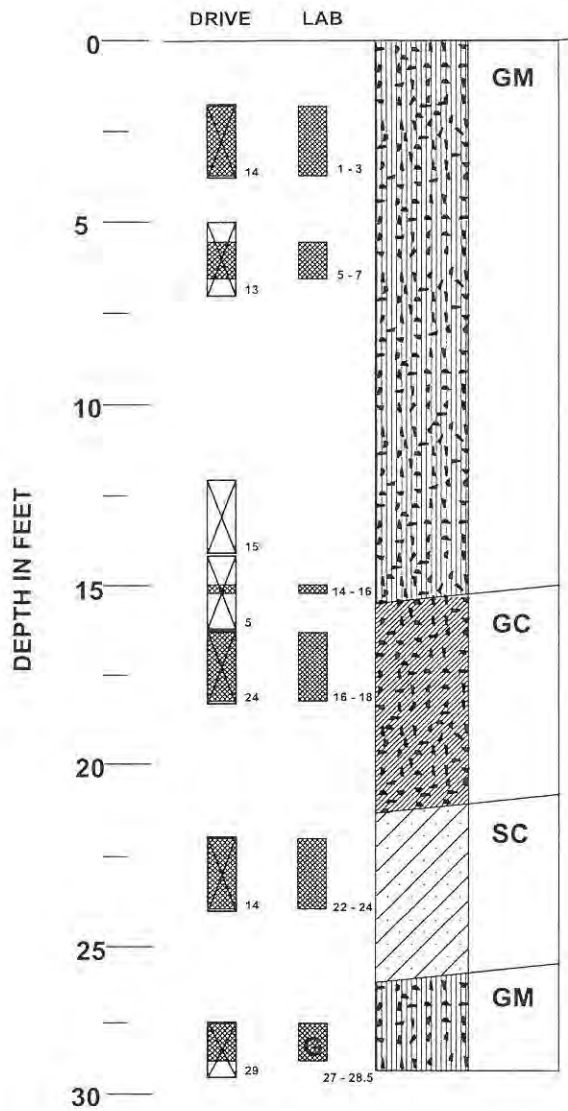
DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/27/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.6

GEOLOGIC LOG

COORDINATES - NORTHING: 15296.449
EASTING:14214.854

GROUND SURFACE: 6912.38

DRAFT



DARK BROWN SILTY COARSE GRAVEL, TRACE OF COARSE SAND

GRADES WITH VERY COARSE LIMESTONE GRAVEL AND SOME SILTY CLAY

GRADES MOIST WITH NOTABLE FUEL-LIKE ODOR
NO RECOVERY BUT SOFT, ROCK IN BIT

MEDIUM GRAY CLAYEY COARSE GRAVEL
TO 2 INCHES, STRONG FUEL ODOR

MEDIUM GRAY FINE SANDY CLAY, WET, SHEEN ON SAMPLER,
STRONG FUEL ODOR

MEDIUM GRAY SILTY FINE GRAVEL
WITH SOME FINE TO COARSE SAND,
TRACE OF CLAY, SLIGHT FUEL ODOR

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. (1 - 3)
"G" INDICATES GEOTECHNICAL SAMPLE TAKEN

BORING COMPLETED TO 28.5 FT ON 7-13-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

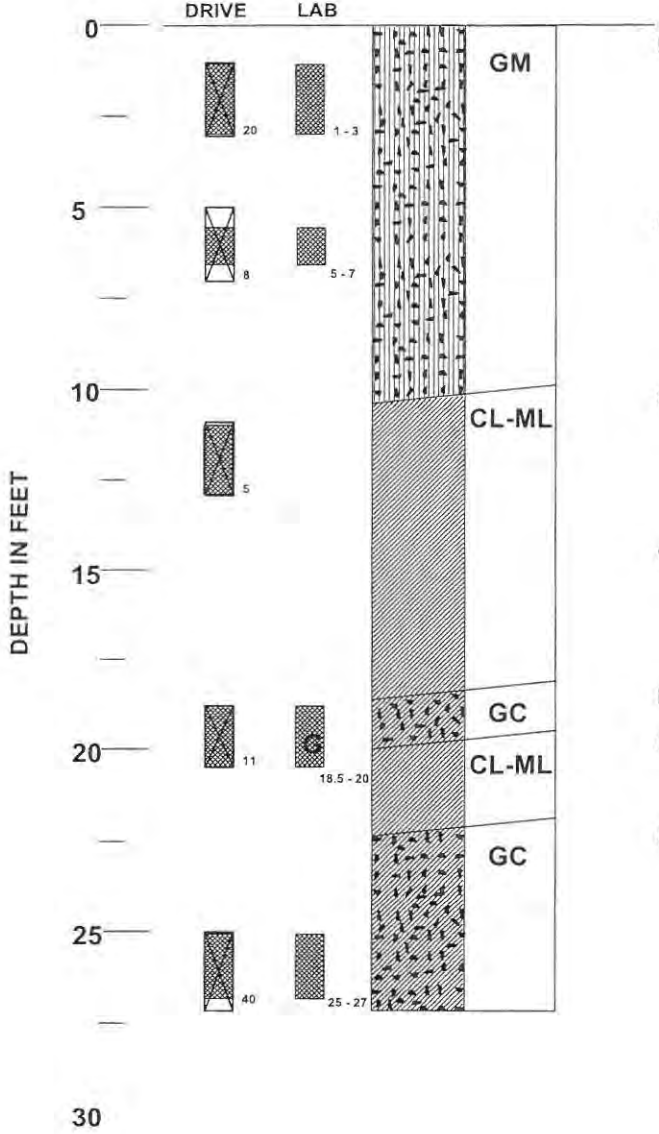
GEOLOGIC LOG OF BORING GTB-7

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/28/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.7

GEOLOGIC LOG

COORDINATES - NORTHING: 15194.25
EASTING:14102.871

GROUND SURFACE: 6911.59



DARK BROWN TO BLACK SILTY COARSE SHALEY GRAVEL

GRADES MOIST WITH TRACE OF CLAY

DARK GRAY SILTY CLAY, TRACE OF GRAVEL, MOIST TO WET

VERY SOFT DRILLING CONDITIONS

DARK BROWN CLAYEY GRAVEL

DARK GRAY SILTY CLAY WITH TRACE OF FINE GRAVEL

LIGHT BROWN TO LIGHT GRAYISH BROWN CLAYEY GRAVEL

KEY

DRIVE — 61 — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — 1 - 3 — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

DRAFT

BORING COMPLETED TO 27 FT ON 7-13-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

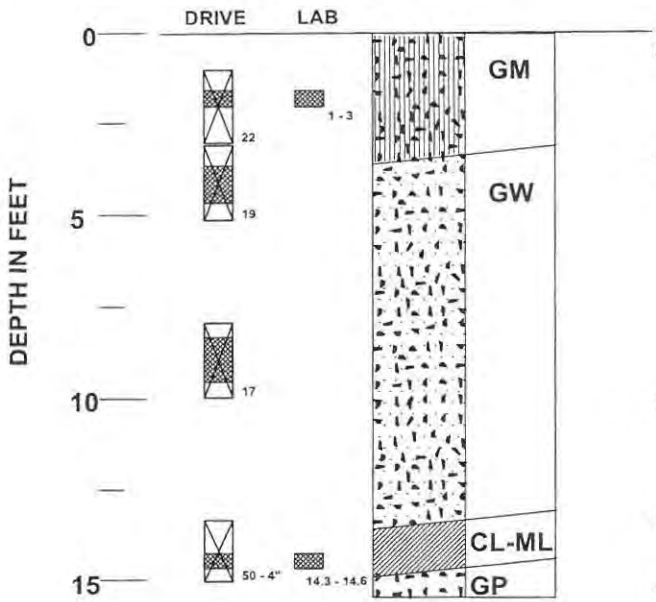
GEOLOGIC LOG OF BORING GTB-8

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/28/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.8

GEOLOGIC LOG

COORDINATES - NORTHING: 14980.572
EASTING:14370.873

GROUND SURFACE: 6917.99



DARK BROWN SILTY COARSE GRAVEL WITH SOME SAND AND WOOD, MOIST

ROUNDED FINE TO COARSE GRAVEL, TRACE OF COARSE SAND

GRADES WITH SOME SILT

DARK BROWN SILTY CLAY WITH TRACE OF COARSE SANDY FINE GRAVEL

AUGER REFUSAL, BIT GRINDING ON BOULDERS

BORING COMPLETED TO 15 FT ON 7-14-04

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-9

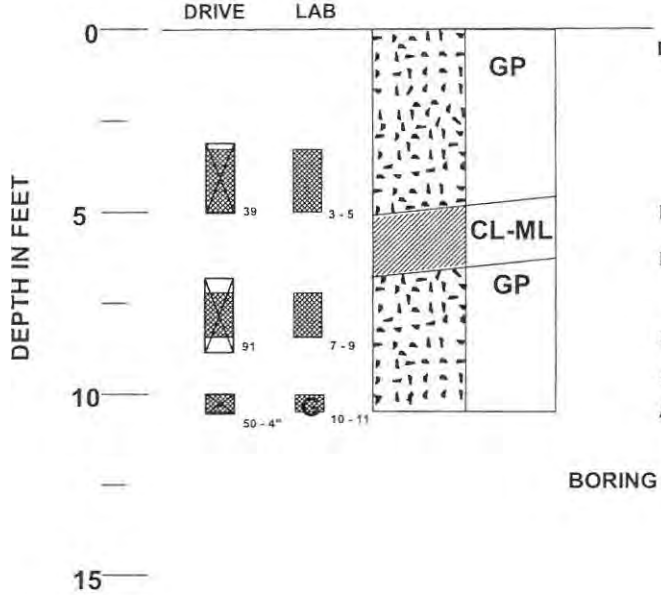
DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/28/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.9

GEOLOGIC LOG

COORDINATES - NORTHING: 15069.141
EASTING:14263.864

GROUND SURFACE: 6913.94

DRAFT



DARK BROWN FINE TO COARSE GRAVEL

DARK BROWN SILTY CLAY WITH SOME COARSE SAND

REDDISH ORANGE BROWN TO GRAY COARSE SAND AND COARSE GRAVEL

GRADES WITH SOME SILTY CLAY

GRADES WITHOUT CLAY

AUGER REFUSAL, BIT GRINDING ON BOULDERS

BORING COMPLETED TO 10.5 FT ON 7-14-04

KEY

DRIVE — 61 — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — 1 - 3 — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-10

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 01/11/05

SCALE

NU-WEST MINING, INC.

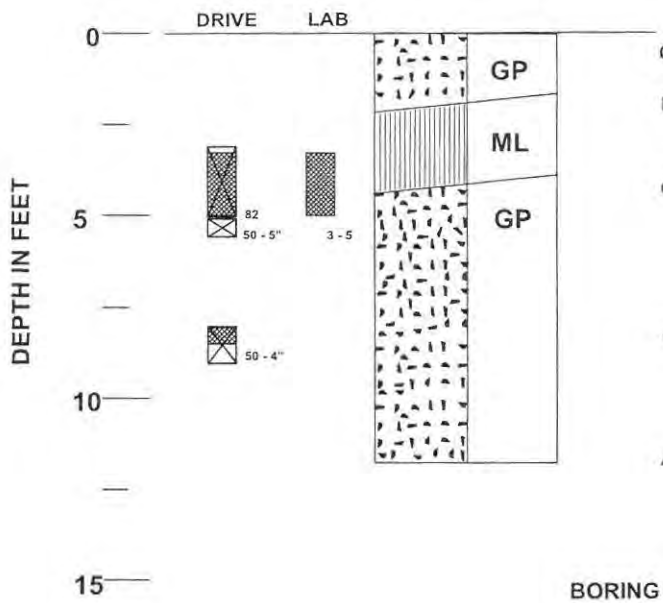
SHEET

FIGURE-A.2.10

GEOLOGIC LOG

COORDINATES - NORTHING: 15050.666
EASTING:14179.291

GROUND SURFACE: 6910.99



CONCRETE, COBBLES, VERY COARSE GRAVEL, SOME SILT

DARK BROWN SILT GRADING WITH SOME COARSE GRAVEL

ORANGE-BROWN TO LIGHT GRAY COARSE SANDY GRAVEL

VERY ROCKY, ROUGH DRILLING

AUGER REFUSAL AT 12', BIT GRINDING ON BOULDERS

BORING COMPLETED TO 12.0 FT ON 7-13-04

DRAFT

KEY

DRIVE — 61 — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — 1 - 3 — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-11

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

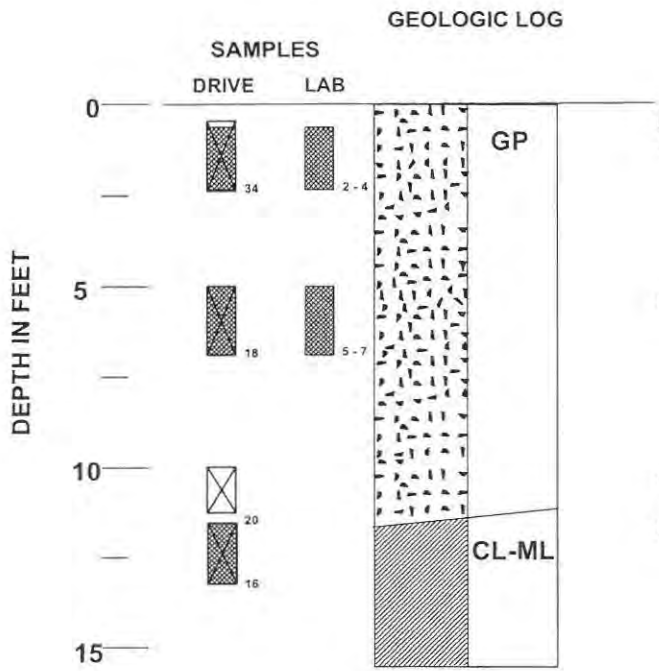
DATE: 01/11/05

SCALE

NU-WEST MINING, INC.

SHEET

FIGURE-A.2.11



COORDINATES - NORTHING: 15067.879
EASTING:14073.744

GROUND SURFACE: 6910.75

LIGHT GRAY SLAG, LIGHT GRAY FINE TO COARSE SANDY GRAVEL, STRONG FETID ODOR

LIGHT GRAY SLAG, ODOR

NO RECOVERY

DARK BROWN SILTY CLAY, TRACE COARSE SAND

BORING COMPLETED TO 16.0 FT ON 7-13-04

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-12

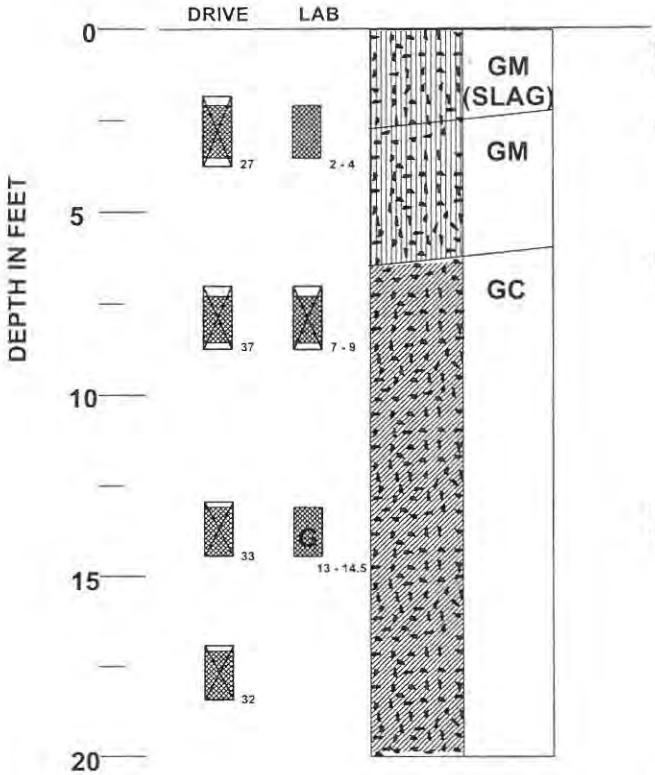
DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 01/11/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.12

GEOLOGIC LOG

COORDINATES - NORTHING: 1
EASTING:139 .145

GROUND SURFACE: 6911.84

DRAFT



LIGHT GRAY SLAG, LIGHT GRAY VERY COARSE FINE TO COARSE SILTY GRAVEL

DARK BROWN SILTY COARSE ANGULAR GRAVEL WITH SOME COARSE SAND

MOTTLED ORANGE-YELLOW TO MEDIUM BROWN CLAYEY COARSE GRAVEL

MOTTLED DARK BROWN TO GREENISH GRAY CLAYEY GRAVEL, GRADES MOIST

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

BORING COMPLETED TO 20.0 FT ON 7-13-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

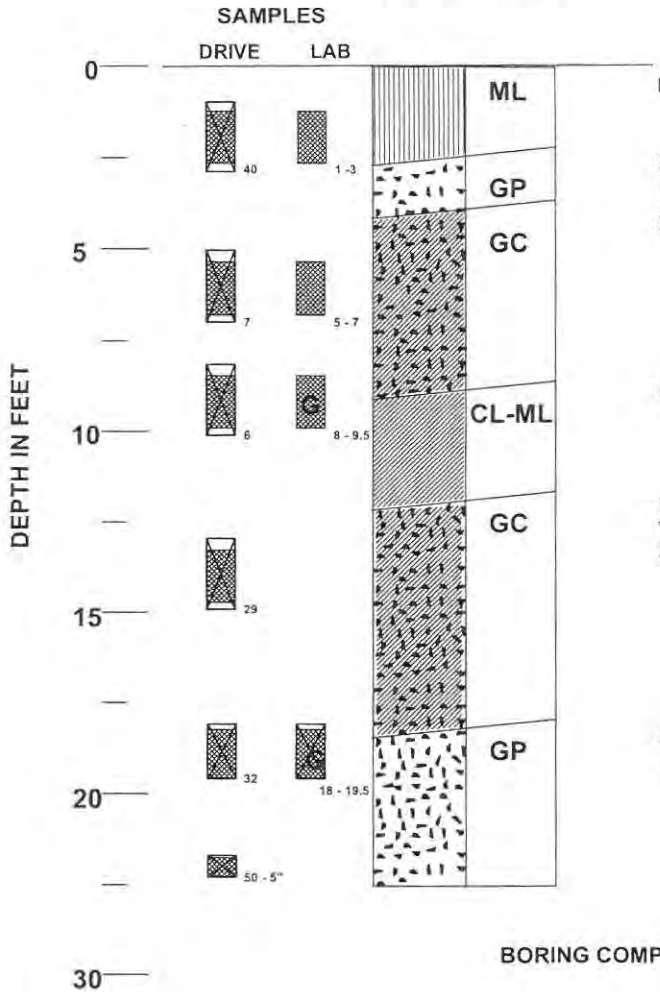
GEOLOGIC LOG OF BORING GTB-13

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 1/16/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.13

GEOLOGIC LOG

COORDINATES - NORTHING: 14874.168
EASTING:14329.597

GROUND SURFACE: 6920.87



DARK BROWN SILT WITH TRACE FINE GRAVEL

LIGHT TO MEDIUM GRAY COBBLES WITH SOME FINE TO COARSE SAND AND SOME SILT

MEDIUM BROWN CLAYEY GRAVEL, MOIST TO WET

MEDIUM BROWN SILTY CLAY WITH SOME COARSE ANGULAR GRAVEL, MOIST

MEDIUM ORANGE-BROWN TO LIGHT GRAY CLAYEY GRAVEL WITH SOME FINE TO COARSE SANDY STRINGERS, MOIST TO WET

ORANGE-BROWN SANDY FINE TO COARSE GRAVEL AND BOULDERS, MOIST TO DRY

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN (1 - 3)

BORING COMPLETED TO 25.0 FT ON 7-12-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

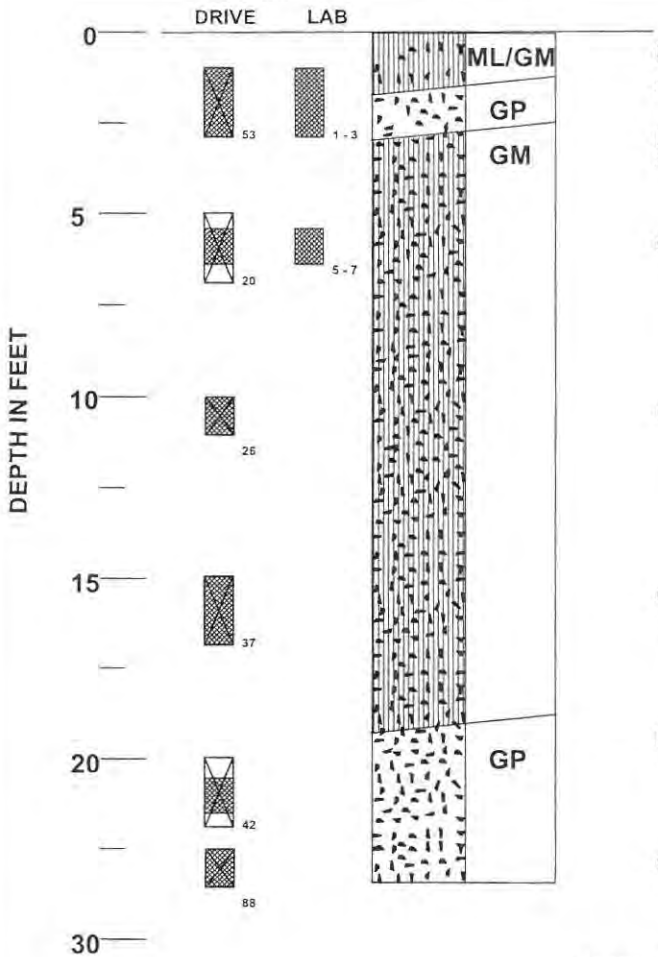
GEOLOGIC LOG OF BORING GTB-14

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 01/11/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.14

GEOLOGIC LOG

COORDINATES - NORTHING: 14889.888
EASTING:14111.284

GROUND SURFACE: 6906.47



DARK BROWN SILT WITH INTERBEDDED SILTY GRAVEL

LIGHT GRAY LIMESTONE GRAVEL (ROAD BASE)

MEDIUM BROWN FINE TO COARSE SANDY GRAVEL WITH SOME SILT, TRACE OF CLAY

GRADES WITH MORE CLAY, SOME FINE TO MEDIUM SAND

GRADES WITH SOME COARSE SAND

GRADES WET WITH COBBLES OF LIGHT ORANGE-BROWN SANDSTONE AND LIMESTONE

LIGHT GRAY TO LIGHT ORANGE-BROWN SANDY FINE TO COARSE GRAVEL WITH SOME SILT, WET

GRADES MOTTLED ORANGE-BROWN TO DARK BROWN WITH TRACE OF CLAY

BORING COMPLETED TO 26.5 FT ON 7-12-04

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

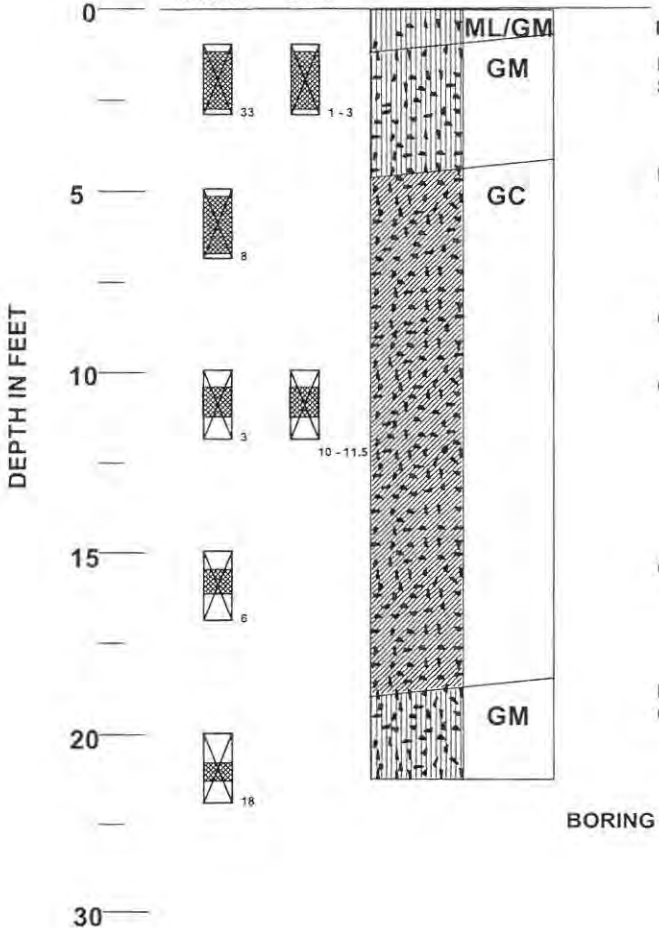
GEOLOGIC LOG OF BORING GTB-15

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 01/11/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.15

GEOLOGIC LOG

COORDINATES - NORTHING: 14559.037
EASTING:13998.795

GROUND SURFACE: 6900.21



DARK BROWN SILT WITH INTERBEDDED SILTY GRAVEL

LIGHT GRAY SILTY GRAVEL (SLAG) OVER MEDIUM BROWN SILTY GRAVEL

LIGHT TO MEDIUM BROWN CLAYEY MEDIU TO COARSE LIMESTONE GRAVEL, MOIST

GRADES DAMP

GRADES WET WITH FINER GRAVEL UP TO 1/2 "

GRADES MEDIUM GRAY IN COLOR, WET

MEDIUM BROWN SILTY COARSE GRAVEL AND COBBLES, TRACE OF FINE TO COARSE SAND, WET

BORING COMPLETED TO 22.5 FT ON 7-12-04

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-16

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 01/13/05

SCALE

NU-WEST MINING, INC.

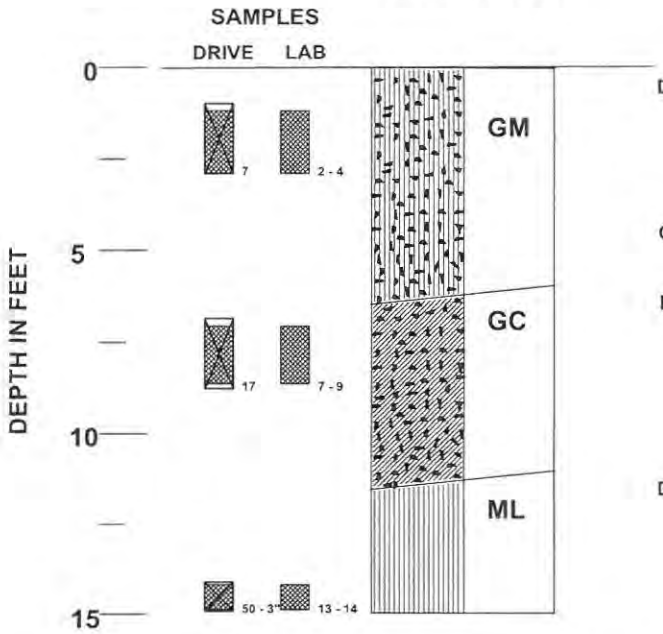
SHEET

FIGURE-A.2.16

GEOLOGIC LOG

COORDINATES - NORTHING: NOT SURVEYED APPROX. 15257
EASTING: NOT SURVEYED APPROX. 14215

GROUND SURFACE: NOT SURVEYED, APPROX. 6912.2



DARK BROWN SILTY VERY FINE TO FINE GRAVEL, DAMP, MINOR ODOR

GRADES COARSER

DARK BROWN MEDIUM TO COARSE CLAYEY GRAVEL, MOIST, NO ODOR

DARK BROWN SILT, TRACE OF FINE GRAVEL, DAMP

BORING COMPLETED TO 15.0 FT ON 7-14-04

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. "G" INDICATES GEOTECHNICAL SAMPLE TAKEN (1 - 3)

DRAFT

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

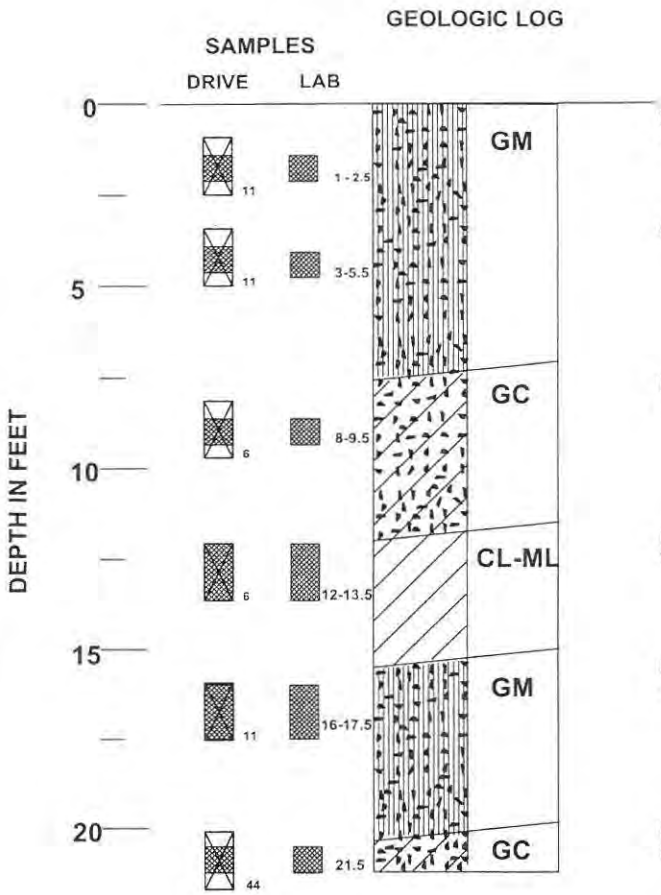
GEOLOGIC LOG OF BORING GTB-17

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 01/11/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.2.17

GEOLOGIC LOG

COORDINATES - NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED

GROUND SURFACE: APPROXIMATELY 6912 ON CONCRETE PAD



DARK BROWN SILTY FINE GRAVEL, SOME FINE TO COARSE SAND, SLIGHT PHOS ODOR

GRADES WITH INCREASING AMOUNT OF VERY FINE GRAVEL

DARK BROWN CLAYEY FINE GRAVEL, SOME VERY FINE TO MEDIUM GRAINED SAND, MOIST, NO ODOR

LIGHT TO MEDIUM BROWN SILTY CLAY TRACE OF VERY FINE SAND

MEDIUM TO DARK BROWN VERY SILTY FINE TO COARSE SANDY FINE GRAVEL, WET, NO ODOR

MEDIUM BROWN CLAYEY VERY FINE GRAVEL, SOME FINE TO COARSE SAND, NO ODOR

AUGER REFUSAL AT 21 FEET

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL.

BORING COMPLETED TO 21.0 FT ON 10/12/05
BORING INITIATED BENEATH SHOP BUILDING FOUNDATION

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-20

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN, P.G.

DATE: 12/30/05

SCALE

NU-WEST MINING, INC.

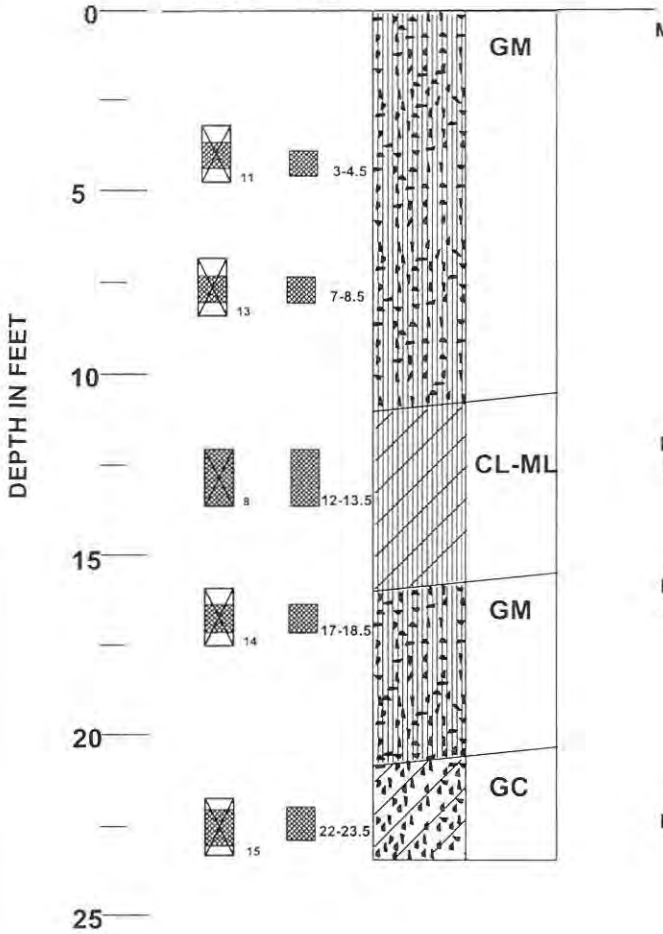
SHEET

FIGURE-A.2.18

GEOLOGIC LOG

COORDINATES - NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED

GROUND SURFACE: APPROXIMATELY 6912 ON CONCRETE PAD



MEDIUM TO DARK BROWN SILTY FINE GRAVEL, MOIST

MEDIUM BROWN SILTY CLAY, SOME LENSES OF VERY FINE SANDY GRAVEL, NO ODOR, MOIST

LIGHT TO MEDIUM BROWN VERY SILTY FINE GRAVEL, MOIST, NO ODOR

MEDIUM TO DARK BROWN SILTY CLAYEY FINE TO MEDIUM GRAVEL, MOIST, NO ODOR

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED (61)

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL. (1 - 3)

BORING COMPLETED TO 23.5 FT ON 10/12/05
BORING INITIATED BENEATH SHOP BUILDING FOUNDATION

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

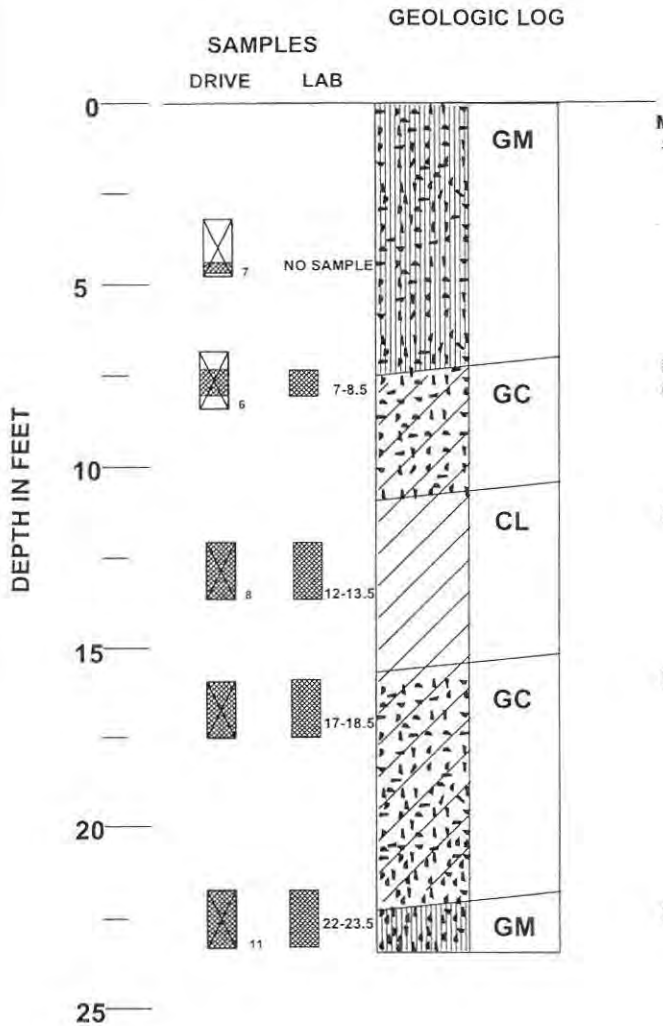
GEOLOGIC LOG OF BORING GTB-21

DRAWN BY J.S.BROWN, P.G.	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/31/05	SCALE	NU-WEST MINING, INC.	SHEET FIGURE- A.2.19	

GEOLOGIC LOG

COORDINATES - NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED

GROUND SURFACE: APPROXIMATELY 6912



MEDIUM BROWN VERY SILTY FINE TO COARSE SANDY GRAVEL, NO ODOR

MEDIUM BROWN SILTY CLAYEY VERY FINE GRAVEL, MOIST, NO ODOR, MOIST

DARK GRAY TO BLACK CLAY, SOME WOOD, SLIGHT ODOR

DARK GRAY CLAYEY VERY FINE GRAVEL, MOIST

LIGHT GRAY SILTY FINE GRAVEL, STRONG PETROLEUM ODOR

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL.

BORING COMPLETED TO 24.5 FT ON 10/12/05
BORING INITIATED 38 FEET NORTH OF CENTER OF SHOP BUILDING FOUNDATION

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

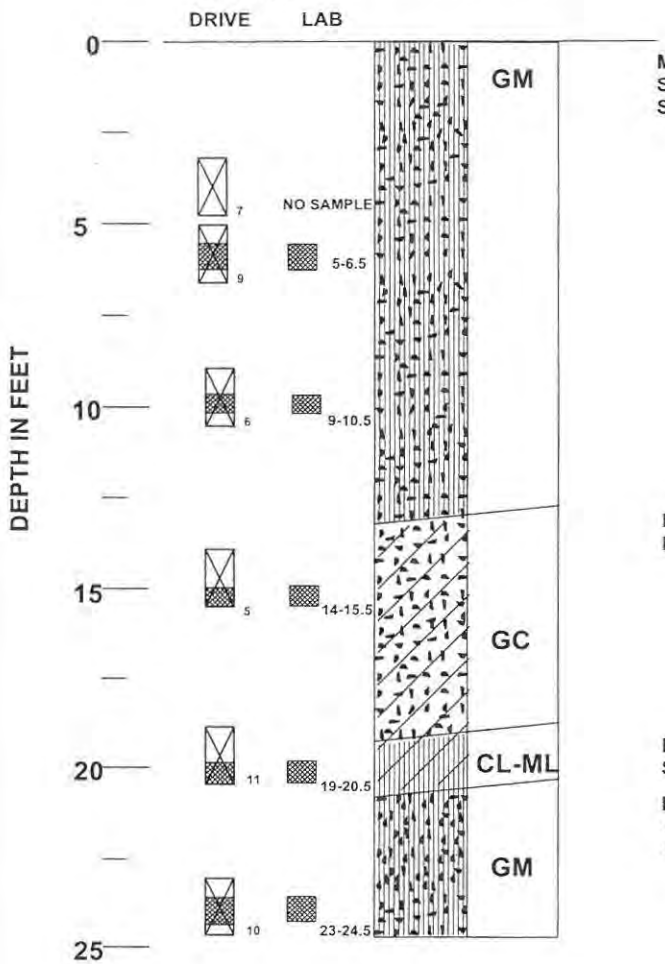
GEOLOGIC LOG OF BORING GTB-22

DRAWN BY J.S.BROWN, P.G.	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/31/05	SCALE	NU-WEST MINING, INC.	SHEET FIGURE-A.2.20	

GEOLOGIC LOG

COORDINATES - NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED

GROUND SURFACE: APPROXIMATELY 6912



MOTTLED ORANGE-BROWN TO DARK BROWN SILTY FINE TO COARSE SANDY FINE GRAVEL, SLIGHT PHOS ODOR

DARK GRAY TO BLACK SILTY CLAYEY VERY FINE GRAVEL, STRONG HYDROCARBON ODOR

DARK GRAY SILTY CLAY, TRACE OF FINE GRAVEL, STRONG HYDROCARBON ODOR

MEDIUM TO DARK BROWN VERY SILTY FINE GRAVEL, SOME FINE TO COARSE SAND STRONG PETROLEUM ODOR

DRAFT

KEY

DRIVE — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL.

BORING COMPLETED TO 24.5 FT IN WATER ON 10/12/05
BORING INITIATED 14 FEET NORTH OF NW CORNER OF SHOP BUILDING FOUNDATION

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-23

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN, P.G.

DATE: 12/31/05

SCALE

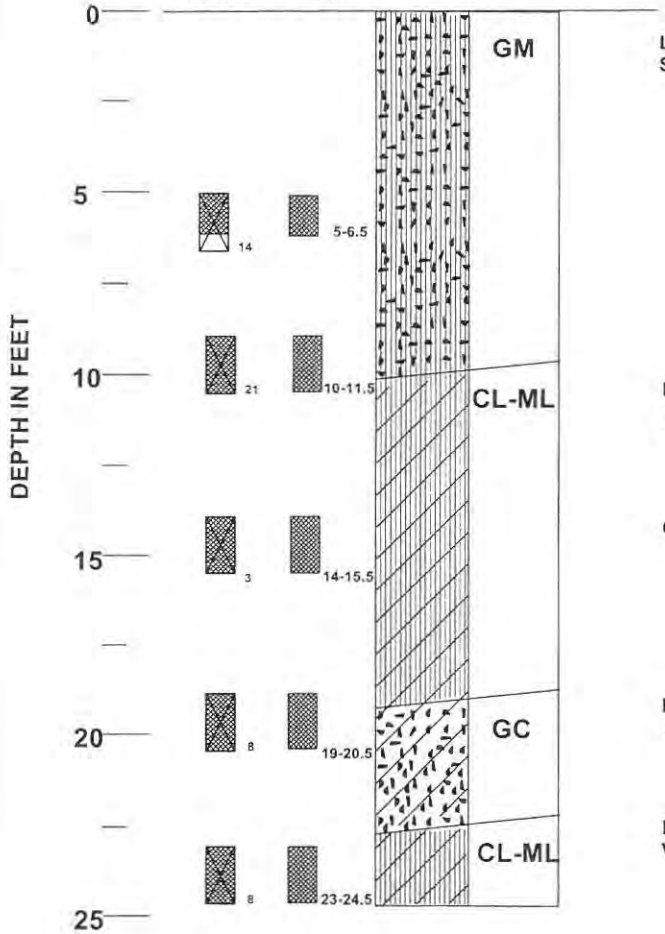
NU-WEST MINING, INC.

SHEET FIGURE-A.2.21

GEOLOGIC LOG

SAMPLES

DRIVE LAB



COORDINATES - NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED

GROUND SURFACE: APPROXIMATELY 6912

LIGHT GRAY SILTY FINE TO COARSE SANDY GRAVEL, SLIGHT PHOS ODOR

DARK GRAY TO BLACK SILTY CLAYEY WITH FINE CLAYEY GRAVEL LENSES, MOIST, STRONG HYDROCARBON ODOR

GRADES LESS GRAVEL AND LESS ODOR

MEDIUM TO DARK GRAY CLAYEY VERY FINE GRAVEL, MOIST

DARK GRAY SILTY CLAY WITH SOME CLAYEY VERY FINE GRAVEL, MOIST

DRAFT

KEY

DRIVE

61 — APPROXIMATE DEPTH AND RECOVERY AT WHICH A DISTURBED SAMPLE WAS EXTRACTED

BLOW COUNTS TO DRIVE SPT OR D&M SAMPLER ONE FOOT WITH A 140 LB HAMMER FALLING 30 INCHES

LAB

1 - 3 — LABORATORY ANALYTICAL SAMPLE AND COMPOSITED DEPTH INTERVAL.

BORING COMPLETED TO 24.5 FT IN WATER ON 10/12/05
BORING INITIATED 18 FEET NORTH OF NE CORNER OF SHOP BUILDING FOUNDATION

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG OF BORING GTB-24

DRAWN BY J.S.BROWN, P.G.	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/31/05	SCALE	NU-WEST MINING, INC.	SHEET FIGURE-A.2.22	

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

SOIL CLASSIFICATION CHART

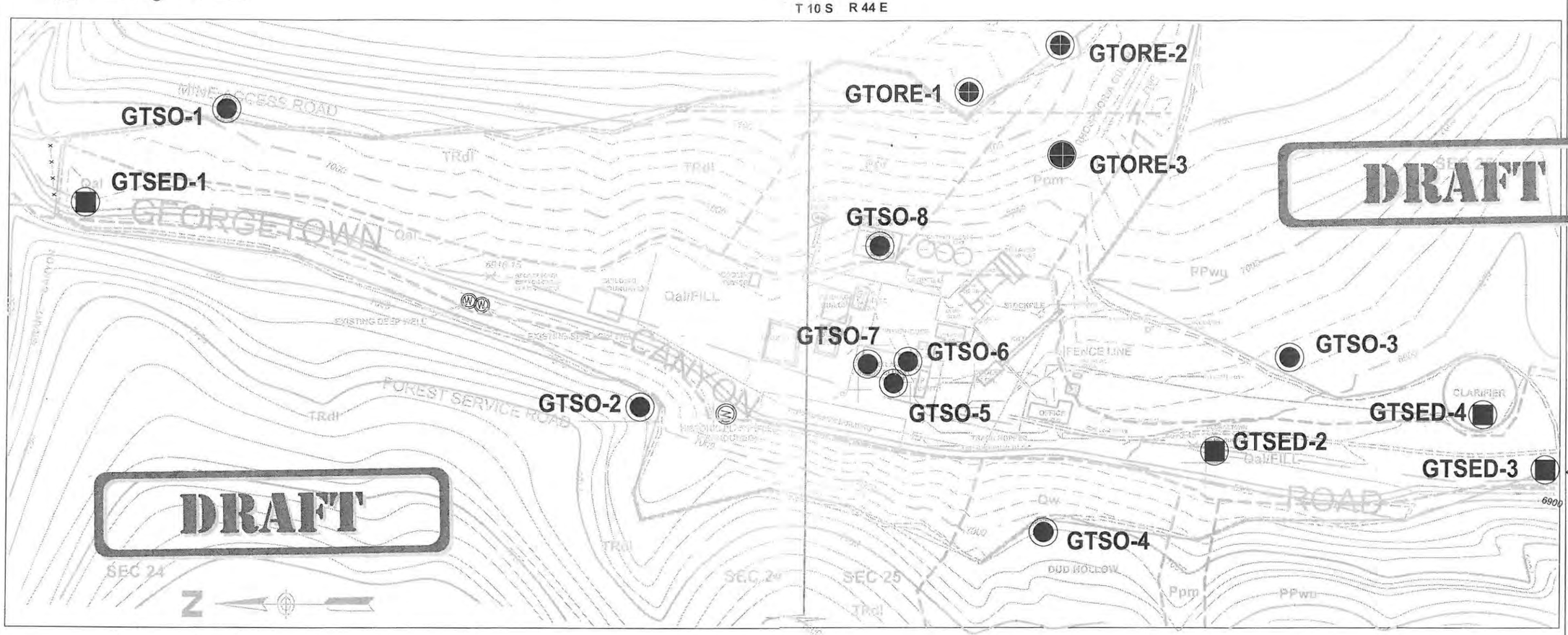
DRAFT

finFINAL SITE INVESTIGATION REPORT

UNIFIED SOIL CLASSIFICATION SYSTEM

NU-WEST INDUSTRIES INC. AND NU-WEST MINING INC.

FIGURE A.2.23



KEY

GTSED-1 — SEDIMENT SAMPLING LOCATION AND SAMPLE ID DESIGNATION

GTSO-1 — SURFACE SOIL (BACKGROUND) SAMPLING LOCATION AND SAMPLE ID DESIGNATION GT-SO5 THROUGH GT-SO8 WILL INCLUDE SELECTED ORGANICS ANALYSES

GTORE-1 — ORE STOCKPILE SAMPLING LOCATION AND SAMPLE ID DESIGNATION

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIUM

Qw - QUATERNARY HILL WASH

TRdl - TRIASSIC LOWER DINWOODY FM.

Ppr - PERMIAN REX CHERT FM.

Ppm - PERMIAN PHOSPHORIA FM.

PPwu - PERMIAN-PENNSYLVANIAN UPPER WELLS FM.

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

CENTRAL FARMERS FERTILIZER FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE
SURFACE SOIL, ORE STOCKPILE AND SEDIMENT SAMPLE SITES CENTRAL FARMERS FERTILIZER FACILITY

SIZE	CAGE CODE	DWG NO	REV
B			

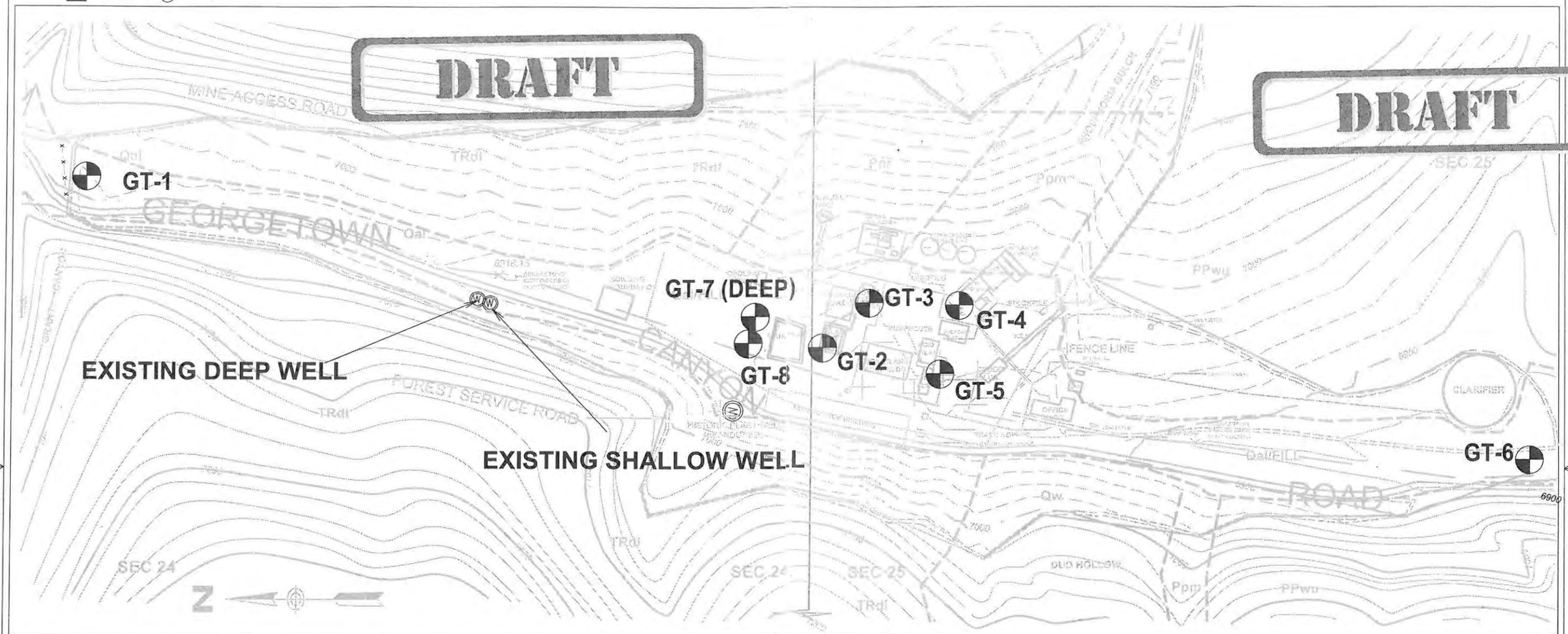
2/6/05

DRAWN BY J.S. BROWN

SCALE

SHEET

FIGURE A.3.1



KEY

GT-1 — MONITOR WELL INSTALLATION LOCATION AND DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIUM

Qw - QUATERNARY HILL WASH

TRdl - TRIASSIC LOWER DINWOODY FM.

Ppr - PERMIAN REX CHERT FM.

Ppm - PERMIAN PHOSPHORIA FM.

PPwu - PERMIAN-PENNSYLVANIAN UPPER WELLS FM.

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

CENTRAL FARMERS FERTILIZER FACILITY
A A

TITLE
LOCATION MAP OF MONITORING WELLS AT THE CENTRAL FARMERS FERTILIZER FACILITY

SIZE	CAGE CODE	DWG NO	REV
B			

2/21/05

DRAWN BY J.S. BROWN

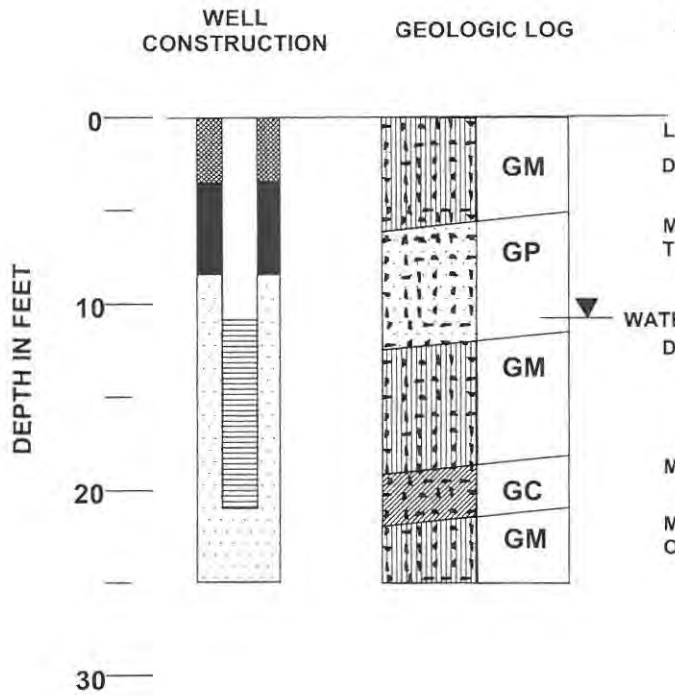
SCALE

SHEET

FIGURE A.4.1

COORDINATES - NORTHING:17817.64
EASTING:14808.84

MEASURING POINT ELEVATION: 6963.245
GROUND SURFACE: 6961.25



LIGHT TO MEDIUM GRAY SLAG ON SURFACE

DARK BROWN LIMESTONE GRAVEL TO 1 INCH, ROUNDED, WITH SOME SILT, (FILL)

MEDIUM BROWN LIMESTONE GRAVEL TO 1.5 INCHES, SUBROUNDED TO ANGULAR TRACE SILT

WATER LEVEL 11.01 FEET ON 6-18-04

DARK BROWN LIMESTONE GRAVEL TO 1 INCH, ANGULAR, WITH SOME SILT

MEDIUM TO DARK BROWN CLAYEY GRAVEL, TRACE OF COARSE SAND

MEDIUM BROWN SILTY COARSE LIMESTONE GRAVEL, TRACE OF MEDIUM TO COARSE SAND

DRAFT

BORING COMPLETED TO 25.6 FT ON 5-26-04
WELL COMPLETED ON 5-27-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-1

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 01/12/05

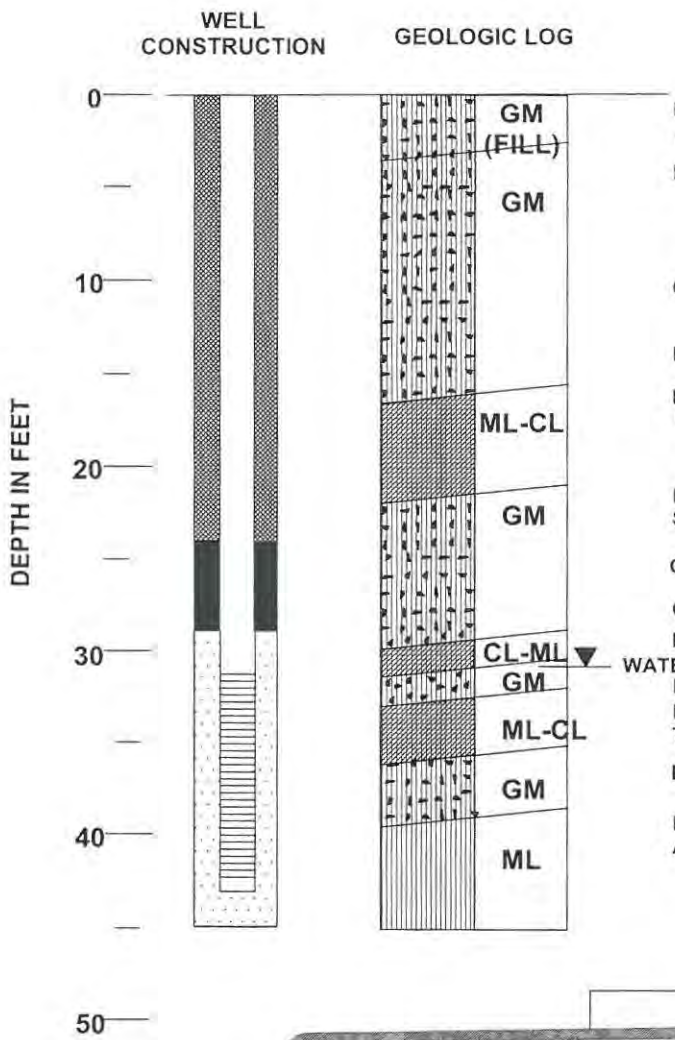
SCALE

NU-WEST MINING, INC.

SHEET

FIGURE-A.4.2

COORDINATES - NORTHING: 15464.701
EASTING:14200.912
MEASURING POINT ELEVATION: 6918.303
GROUND SURFACE: 6916.07



LIGHT GRAY FINE TO MEDIUM ANGULAR GRAVEL AND SLAG WITH TRACE OF SILT, STRONG ODOR (FILL)

MEDIUM BROWN SILTY LIMESTONE GRAVEL WITH TRACE OF CLAY

GRADES WITH MORE SILT

DARK BROWN LIMESTONE GRAVEL TO 1 INCH, ANGULAR, WITH SOME SILT

MEDIUM TO DARK BROWN SILTY CLAY WITH TRACE OF FINE GRAVEL AND COARSE SAND, SOME ROOTS AND BRANCHES

MEDIUM GRAYISH-BROWN SILTY FINE ANGULAR LIMESTONE GRAVEL TO 1.5 INCHES, SOME FRAGMENTS OF WOOD

GRADES WITH INCREASING NATIVE ORGANIC MATERIALS

GRADES COARSER WITH ABUNDANT NATIVE ORGANIC MATERIALS

DARK GRAY SILTY CLAY

WATER LEVEL 34.44 FEET ON 6-18-04

DARK GRAY COARSE SILTY LIMESTONE GRAVEL

DARK BROWN TO BLACK SILT AND SILTY CLAY WITH SOME MEDIUM TO COARSE SAND, TRACE FINE GRAVEL

DARK GRAY SILTY MEDIUM GRAVEL WITH FINE TO COARSE SAND

DARK GRAY SILT WITH SOME VERY FINE GRAVEL, SOME MEDIUM TO COARSE SAND AND NATIVE ORGANIC MATERIALS

DRAFT

BORING COMPLETED TO 45.0 FT ON 6-01-04
WELL COMPLETED ON 6-03-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-2

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 1/12/05

SCALE

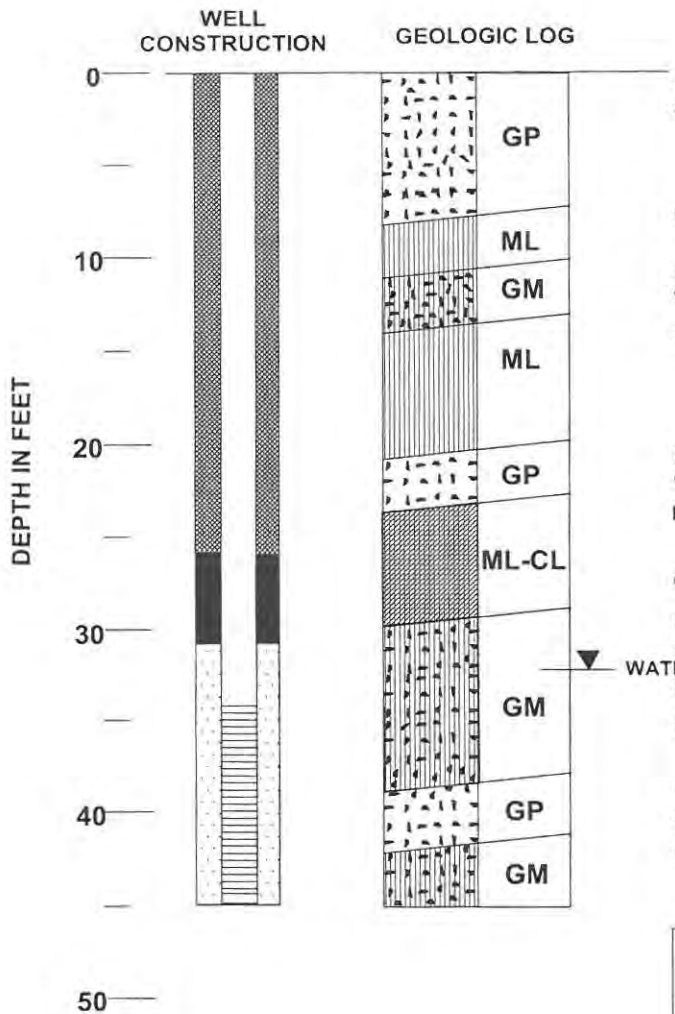
NU-WEST MINING, INC.

SHEET

FIGURE-A.4.3

COORDINATES - NORTHING: 15263.737
EASTING:14307.431

MEASURING POINT ELEVATION: 6916.802
GROUND SURFACE: 6914.11



LIGHT GRAY FINE TO MEDIUM SUBANGULAR GRAVEL TO 1.5 INCHES, SOME SLAG

DARK GRAY TO BLACK SILT WITH SOME FINE GRAVEL, TRACE OF CLAY, DAMP

DARK GRAY COARSE LIMESTONE AND CHERT GRAVEL TO 2 INCHES WITH SOME BLACK SILT AND CLAY

BLACK SILT WITH SOME FINE TO MEDIUM GRAVEL

DARK BROWN MEDIUM TO COARSE SUBANGULAR COARSE CHERT GRAVEL WITH INTERBEDDED OF BLACK SILTY GRAVEL

MEDIUM TO DARK BROWN SILTY CLAY WITH TRACE OF VERY FINE GRAVEL

GRADES WITH INCREASING DARK GRAY MEDIUM GRAVEL

MEDIUM BROWN SILTY FINE GRAVEL WITH TRACE FINE TO COARSE SAND AND TRACE OF CLAY, MOIST

WATER LEVEL 34.33 FEET ON 6-18-04

GRADES WITH COARSER GRAVEL, LESS SILT

GRADES WITH SILTY CLAY STRINGERS

LIGHT BROWN COARSE ANGULAR LIMESTONE GRAVEL TO 2 INCHES

GRADES WITH SOME SILT

LIGHT BROWN SILTY FINE TO MEDIUM GRAVEL WITH TRACE OF COARSE SAND

DRAFT

BORING COMPLETED TO 45.0 FT ON 6-03-04
WELL COMPLETED ON 6-04-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

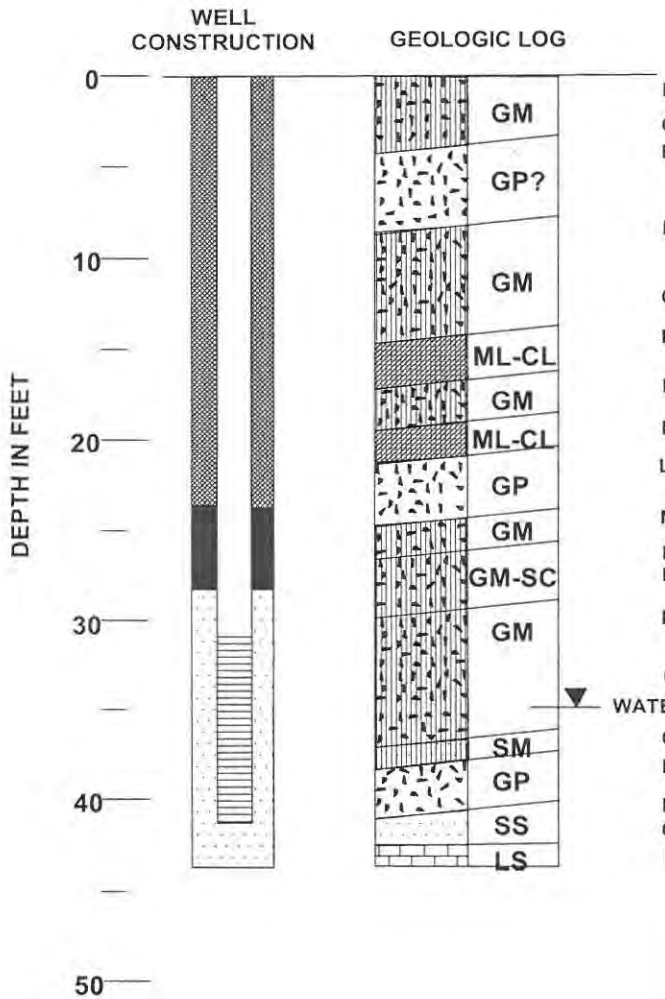
TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-3

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/02/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.4.4

COORDINATES - NORTHING: 14957.54
EASTING:14293.382

MEASURING POINT ELEVATION: 6915.966
GROUND SURFACE: 6913.70



DARK BROWN SILTY FINE TO MEDIUM GRAVEL, TRACE OF COARSE SAND
GRADES VERY COARSE
BOULDERS - NO RETURN

DARK BROWN SILTY FINE TO MEDIU

GRADES WITH SOME INTERBEDDED ILTY CLAY

MEDIUM BROWN SILTY CLAY

MEDIUM BROWN SILTY FINE GRAVEL WITH SILTY CLAY INTERBEDS, MOIST

MEDIUM BROWN SILTY CLAY

LIGHT GRAY MEDIUM TO COARSE SUBANGULAR LIMESTONE GRAVEL, TRACE OF SILT

MEDIUM BROWN FINE TO COARSE GRAVEL WITH SOME SILTY CLAY INTERBEDS

LIGHT BROWN SILTY MEDIUM GRAINED ANGULAR GRAVEL WITH SOME FINE TO COARSE SANDY GRAVEL LENSES AND FINE TO COARSE SANDY CLAY

MEDIUM BROWN SILTY FINE TO MEDIUM GRAVEL WITH TRACE COARSE SAND

GRADES WITH MORE FINE TO COARSE SAND, ORGANIC (PETROLEUM) ODOR IN SAMPLE

WATER LEVEL 37.41 FEET ON 6-18-04

ORANGE-BROWN SILTY VERY FINE SAND

LIGHT ORANGE BROWN BOULDERS (WELLS FM)

DARK GRAY SILTY FINE SAND

ORANGE-BROWN SILTY VERY FINE TO FINE SANDSTONE

LIGHT GRAY LIMESTONE BEDROCK

DRAFT

BORING COMPLETED TO 43.5 FT ON 6-05-04
WELL COMPLETED ON 6-06-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

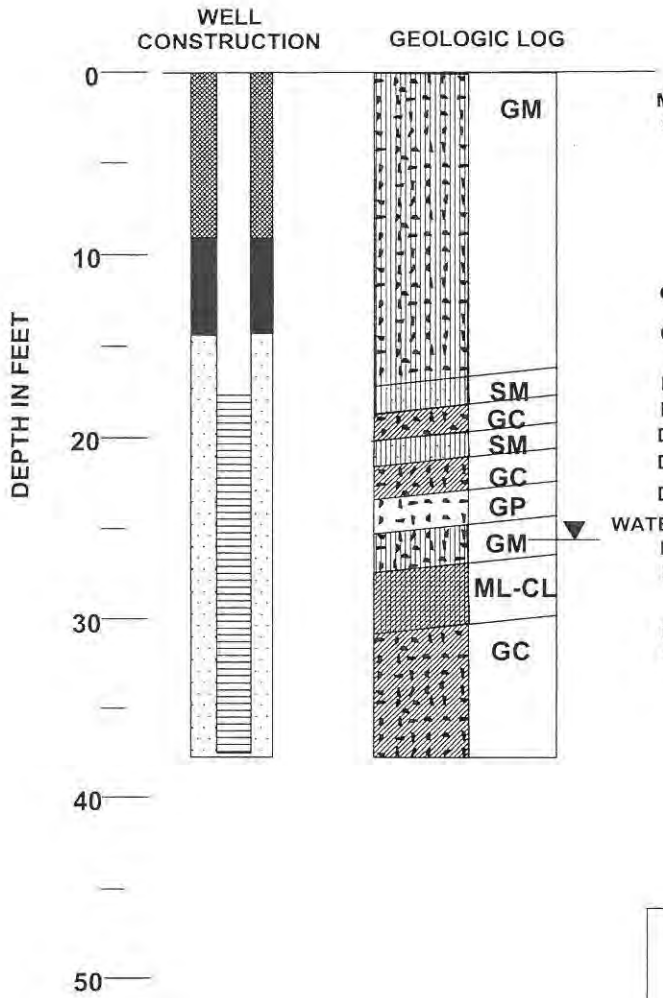
TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-4

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 1/12/05	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.4.5

COORDINATES - NORTHING: 15032.019
EASTING: 14118.991

MEASURING POINT ELEVATION: 6912.098
GROUND SURFACE: 6909.97



MEDIUM BROWN SILTY FINE GRAVEL WITH TRACE OF COARSE SAND, SLIGHT ODOR

GRADES LIGHT TO MEDIUM BROWN

GRADES WITH SOME MEDIUM TO COARSE LIGHT BROWN SAND

LIGHT BROWN VERY FINE TO MEDIUM VERY SILTY SAND WITH SOME VERY FINE GRAVEL

DARK GRAY CLAYEY FINE GRAVEL

DARK GRAY SILTY VERY FINE TO COARSE SAND WITH SOME FINE GRAVEL

DARK GRAY CLAYEY VERY FINE GRAVEL, SOME SILT

DARK GRAY COBBLES, BOULDERS

WATER LEVEL 27.41 FEET ON 6-18-04

DARK BROWN TO GRAY SILTY MEDIUM TO COARSE GRAVEL WITH SOME MEDIUM TO COARSE SAND

DARK BROWN TO GRAY SILTY CLAY WITH TRACE OF FINE GRAVEL

DARK BROWN TO GRAY SILTY CLAYEY VERY FINE TO FINE SUBANGULAR GRAVEL, MOIST TO WET

DRAFT

BORING COMPLETED TO 37.5 FT ON 6-06-04
WELL COMPLETED ON 6-08-04

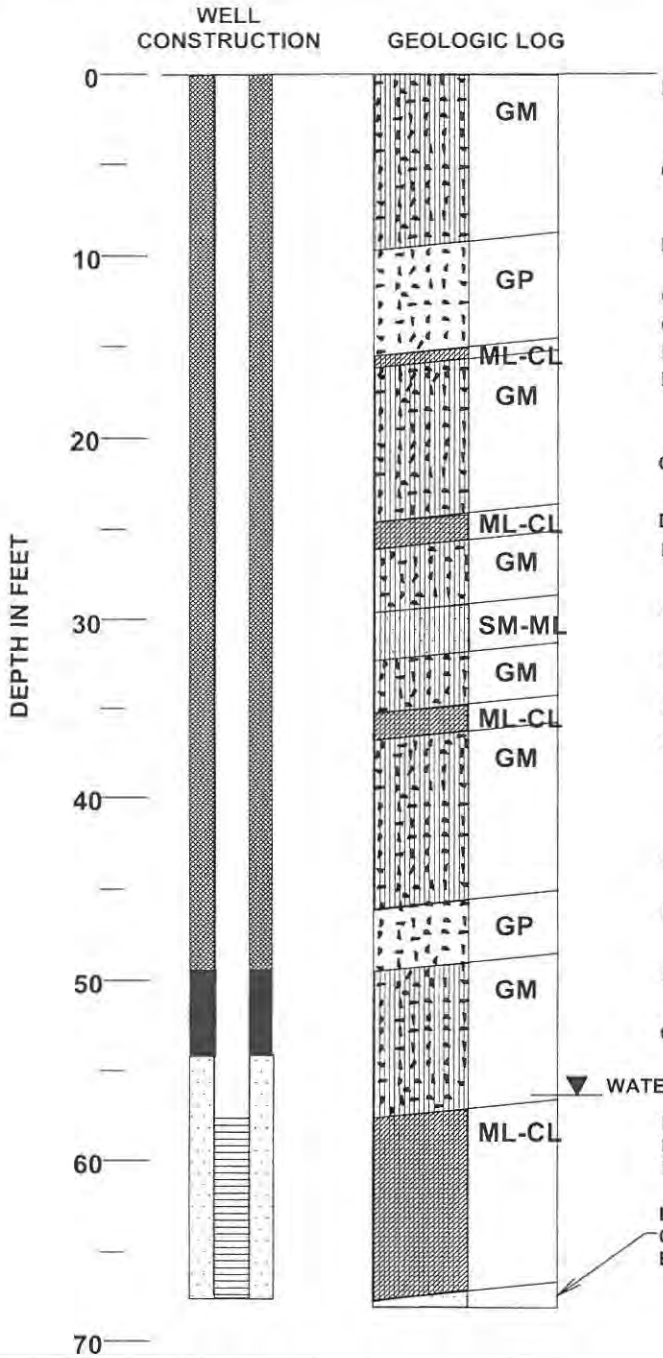
CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-5

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/03/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.4.6

MEASURING POINT ELEVATION: 6858.277 COORDINATES - NORTHING: 13123.317
GROUND SURFACE: 6855.98 EASTING: 13900.19



LIGHT GRAY TO TAN SILTY GRAVEL WITH SOME FINE TO COARSE SAND (SLAG)

GRADES DARK BROWN WITH INCREASING SILT

LIGHT BROWN FINE TO MEDIUM SANDY FINE SUBANGULAR GRAVEL, TRACE OF SILT

GRADES WITH COARSER GRAVEL

COBBLES, VERY COARSE LIMESTONE GRAVEL

DARK BROWN SILTY CLAY

DARK BROWN VERY SILTY FINE TO COARSE SANDY COARSE SUBANGULAR LIMESTONE GRAVEL

GRADES WITH MORE SILT

DARK BROWN SILTY CLAY WITH TRACE OF FINE GRAVEL, SOME FINE TO COARSE SAND

LIGHT BROWN SILTY FINE TO COARSE GRAVEL WITH SOME FINE SILTY SAND

LIGHT BROWN SILTY VERY FINE SAND WITH SOME FINE GRAVEL

DARK BROWN VERY SILTY COARSE GRAVEL WITH SOME COARSE SAND, TRACE OF CLAY

DARK BROWN SILTY CLAY, TRACE OF FINE GRAVEL

DARK BROWN VERY SILTY FINE TO COARSE GRAVEL WITH SOME MEDIUM TO COARSE SAND

GRADES WITH SOME DARK BROWN CLAY INTERBEDS

BORING COMPLETED TO 68.5 FT ON 6-09-04
WELL COMPLETED ON 6-10-04

MEDIUM BROWN FINE TO COARSE SANDY FINE GRAVEL

MEDIUM BROWN SILTY SUBANGULAR COARSE GRAVEL WITH SOME FINE TO COARSE SAND

GRADES WITH MORE SILT

▼ WATER LEVEL 58.61 FEET ON 6-18-04

MEDIUM BROWN SILTY CLAY WITH INTERBEDDED LENSES OF SILTY FINE TO COARSE SAND

LIGHT ORANGE BROWN CALCAREOUS SANDSTONE BEDROCK (WELLS FM)

DRAFT

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-6

SIZE	CAGE CODE	DWG NO	REV
A			0

DRAWN BY J.S.BROWN

DATE: 1/12/05

SCALE

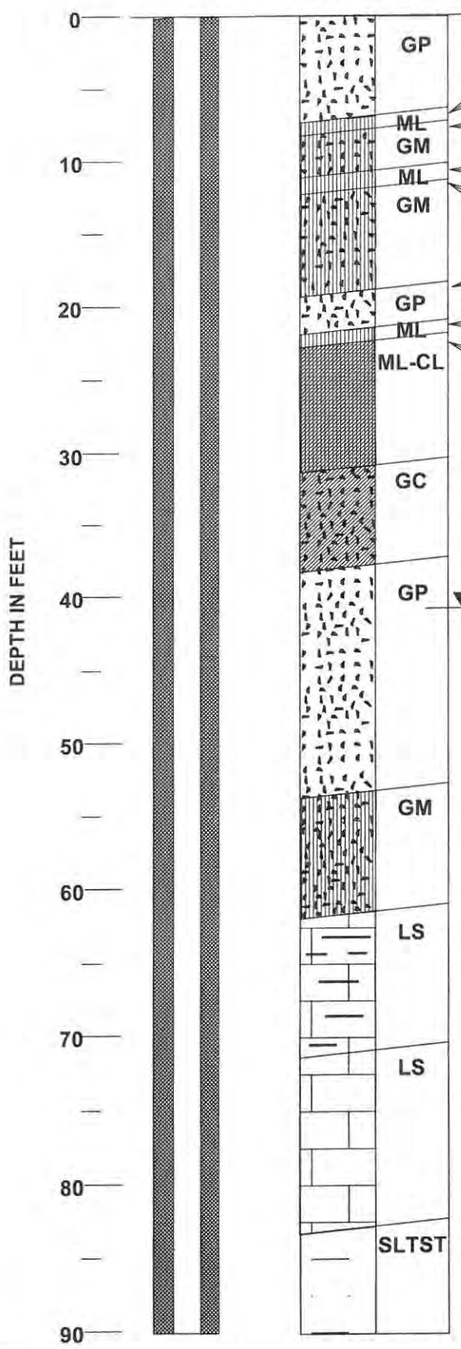
NU-WEST MINING, INC.

SHEET

FIGURE-A.4.7

COORDINATES - NORTHING: 15752.218
EASTING: 14287.623

MEASURING POINT ELEVATION: 6923.95
GROUND SURFACE: 6921.22



LIGHT GRAY FINE TO COARSE SANDY GRAVEL, STRONG PHOS ODOR, CUTTINGS IGNITING ON CONTACT WITH ATMOSPHERE

LIGHT GRAY SILT WITH SOME VERY FINE GRAVEL MILD PHOS ODOR

MEDIUM GRAY TO TAN SILTY VERY COARSE SUBANGULAR LIMESTONE GRAVEL WITH SOME COARSE SAND

LIGHT GRAY SILT, SOME MEDIUM TO COARSE GRAVEL, STRONG PHOS ODOR

DARK GRAY SILTY COARSE LIMESTONE GRAVEL, NATURAL ORGANIC MATERIAL, SLIGHT PHOS ODOR

MEDIUM GRAY COARSE ANGULAR LIMESTONE GRAVEL WITH NATURAL ORGANIC MATERIAL, TRACE OF SILT, SLIGHT ODOR

MEDIUM GRAY SILT WITH TRACE FINE GRAVEL

DARK GRAY SILTY CLAY WITH TRACE OF FINE GRAVEL

GRADES WITH SOME COARSE GRAINED ANGULAR LIMESTONE GRAVEL

DARK BROWN CLAYEY VERY COARSE GRAVEL TO 2 INCHES

WATER LEVEL 42.39 FEET ON 6-18-04

MEDIUM TO DARK GRAY FINE TO MEDIUM SUBROUNDED SANDY FINE TO COARSE GRAVEL WITH SOME SILTY CLAY INTERBEDS

GRADES COARSE, ANGULAR

GRADES RUSTY BROWN COLOR AT 44'

GRADES WITH COBBLES, TRACE OF SILT, SUBSTANTIAL GROUND WATER DISCHARGE AT 50'

LIGHT GRAY TO MEDIUM BROWN VER[illegible] MEDIUM TO COARSE GRAVEL

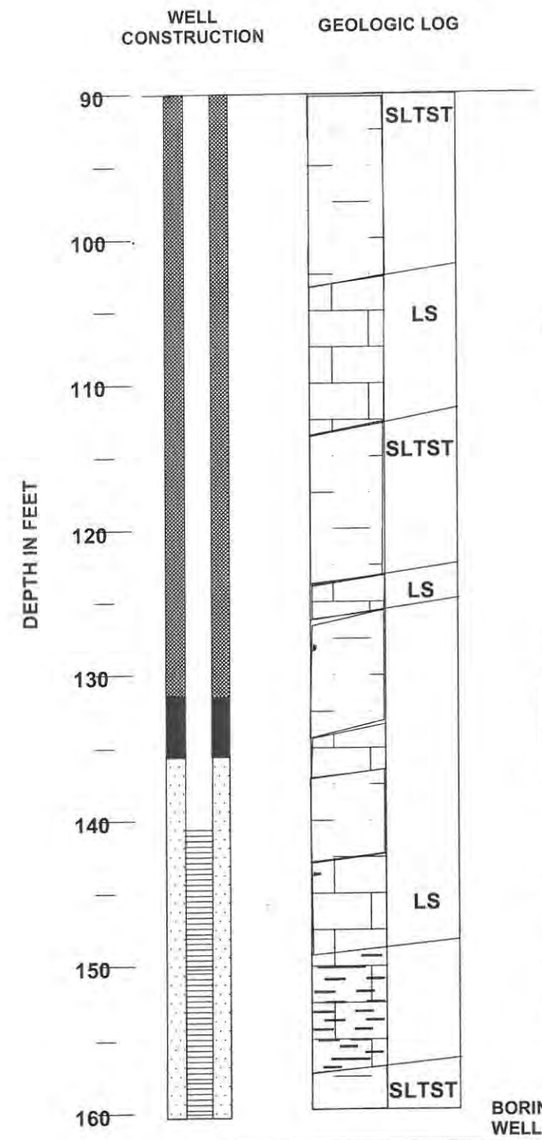
DRAFT

MED[illegible] LIMESTONE WITH INTERBEDDED SHALEY SILTSTONE, MAKING WATER

DARK GRAY CRYSTALLINE LIMESTONE, ABUNDANT CALCITE VEINS

MEDIUM TO DARK GRAY TO TAN CALCAREOUS SILTSTONE

WATER SHUTTING OFF



MEDIUM TO DARK GRAY TO TAN CALCAREOUS SILTSTONE

DARK GRAY CRYSTALLINE LIMESTONE, ABUNDANT THIN CALCITE VEINS

GRADES WITH THIN BEDS OF OLIVE BROWN CALCAREOUS SILTSTONE

INTERBEDDED MEDIUM GRAY SHALEY LIMESTONE AND LIGHT OLIVE BROWN SHALEY CALCAREOUS SILTSTONE

DRAFT

DARK BROWN TO OLIVE BROWN COARSE CRYSTALLINE LIMESTONE AND INTERBEDDED CALCAREOUS SHALE

DARK GRAY SHALEY LIMESTONE, WATER IS DARK BROWN TO BLACK

OCCASIONAL PETROLEUM-LIKE ODOR

LIGHT OLIVE-BROWN CALCAREOUS SILTSTONE, HARD

BORING COMPLETED TO 160.0 FT ON 6-17-04
WELL COMPLETED ON 6-28-04

FINAL SITE INVESTIGATION REPORT

TITLE **GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-7**

SIZE	CAGE CODE	DWG NO	REV
B			

1/15/05

DRAWN BY J.S. BROWN

SCALE

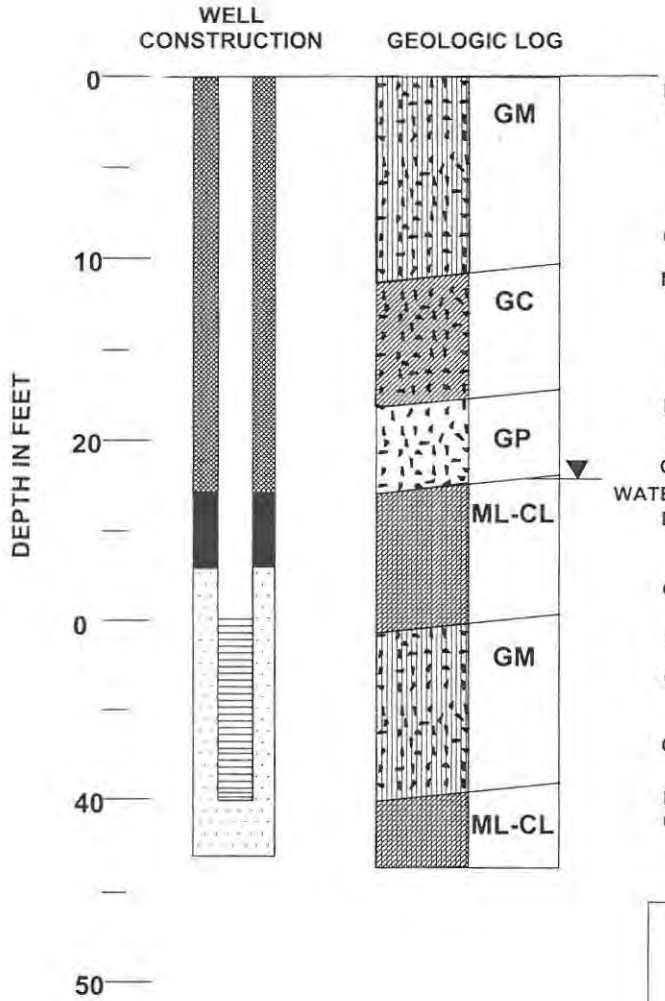
NU-WEST MINING AND NU-WEST INDUSTRIES, INC.

SHEET **FIGURE A.4.8**

COORDINATES - NORTHING: 15754.885
EASTING: 14275.259

MEASURING POINT ELEVATION: 69[illegible]
GROUND SURFACE: 6920.76

DRAFT



LIGHT GRAY VERY SILTY VERY FINE GRAVEL WITH T[illegible]CE OF MEDIUM TO COARSE SAND (SLAG), SLIGHT ODOR

GRADES WITH COARSER SUBANGULAR GRAVEL

MEDIUM GRAY VERY COARSE SUBANGULAR CLAYEY LIMESTONE GRAVEL

MEDIUM GRAY COARSE LIMESTONE GRAVEL WITH NATURAL ORGANIC MATERIAL, TRACE OF SILT, SLIGHT ODOR

GRADES WITH INCREASING ORGANIC DETRITUS

WATER LEVEL 24.04 FEET ON 7-07-04

DARK GRAY SILTY CLAY WITH TRACE OF VERY FINE SAND

GRADES WITH SOME MEDIUM GRAINED ANGULAR LIMESTONE GRAVEL

DARK BROWN SILTY VERY FINE GRAVEL WITH SOME FINE TO COARSE SAND, WET

GRADES WITH MORE FINE TO COARSE SAND, ORGANIC ODOR IN SAMPLE

GRADES COARSER AND VERY SILTY WITH TRACE OF CLAY

DARK BROWNISH GRAY SILTY CLAY WITH SOME COARSE ANGULAR GRAVEL, FAINT ODOR

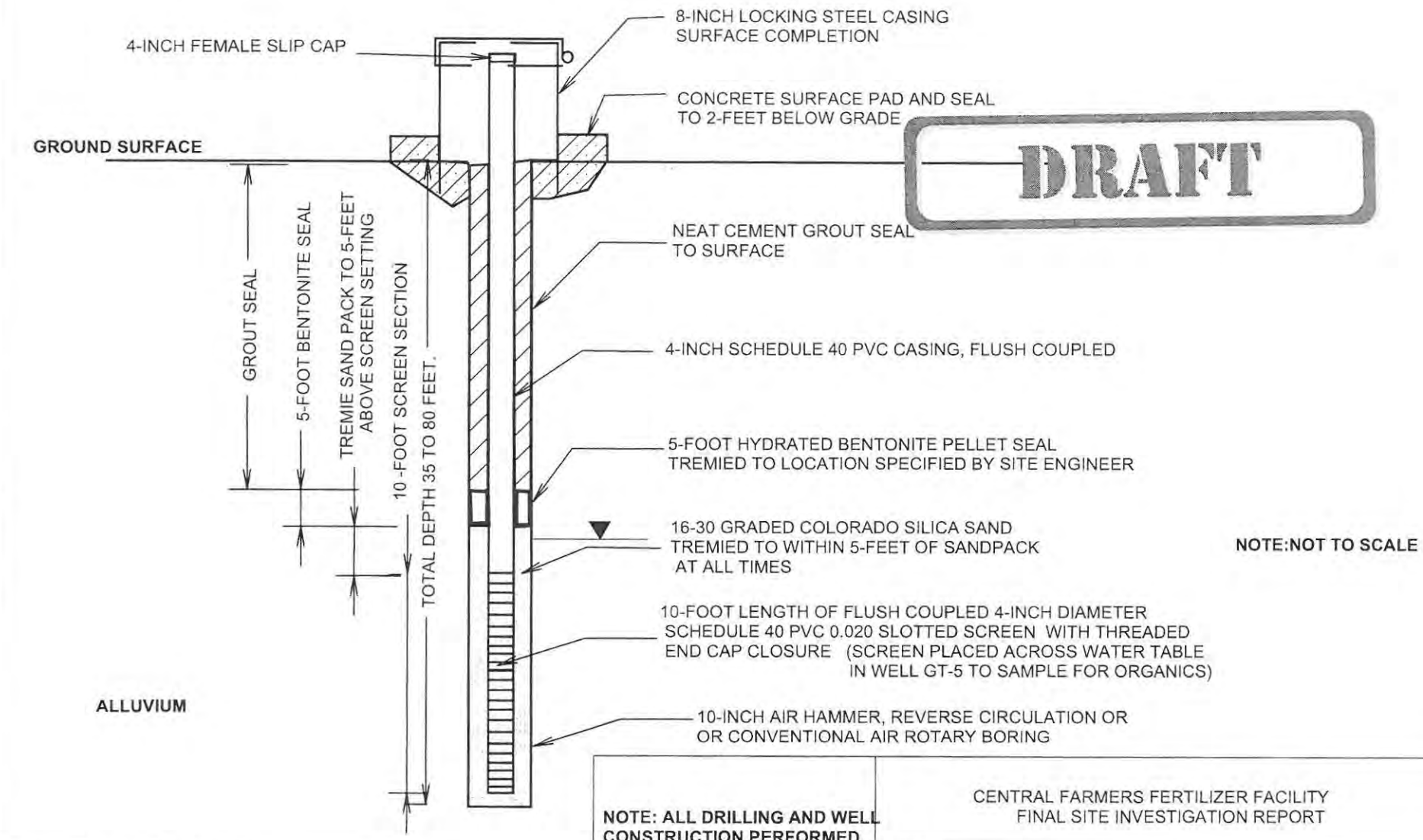
BORING COMPLETED TO 43.0 FT ON 6-29-04
WELL COMPLETED ON 7-01-04

CENTRAL FARMERS FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

GEOLOGIC LOG AND SCHEMATIC DIAGRAM OF WELL GT-8

DRAWN BY J.S.BROWN	SIZE A	CAGE CODE	DWG NO	REV 0
DATE: 12/03/04	SCALE	NU-WEST MINING, INC.	SHEET	FIGURE-A.4.9



NOTE: ALL DRILLING AND WELL CONSTRUCTION PERFORMED BY IDAHO LICENSED WATER WELL DRILLER.

CENTRAL FARMERS FERTILIZER FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

SCHEMATIC DIAGRAM OF TYPICAL SHALLOW WELL CONSTRUCTION

SIZE	CAGE CODE	DWG NO	REV
A			0

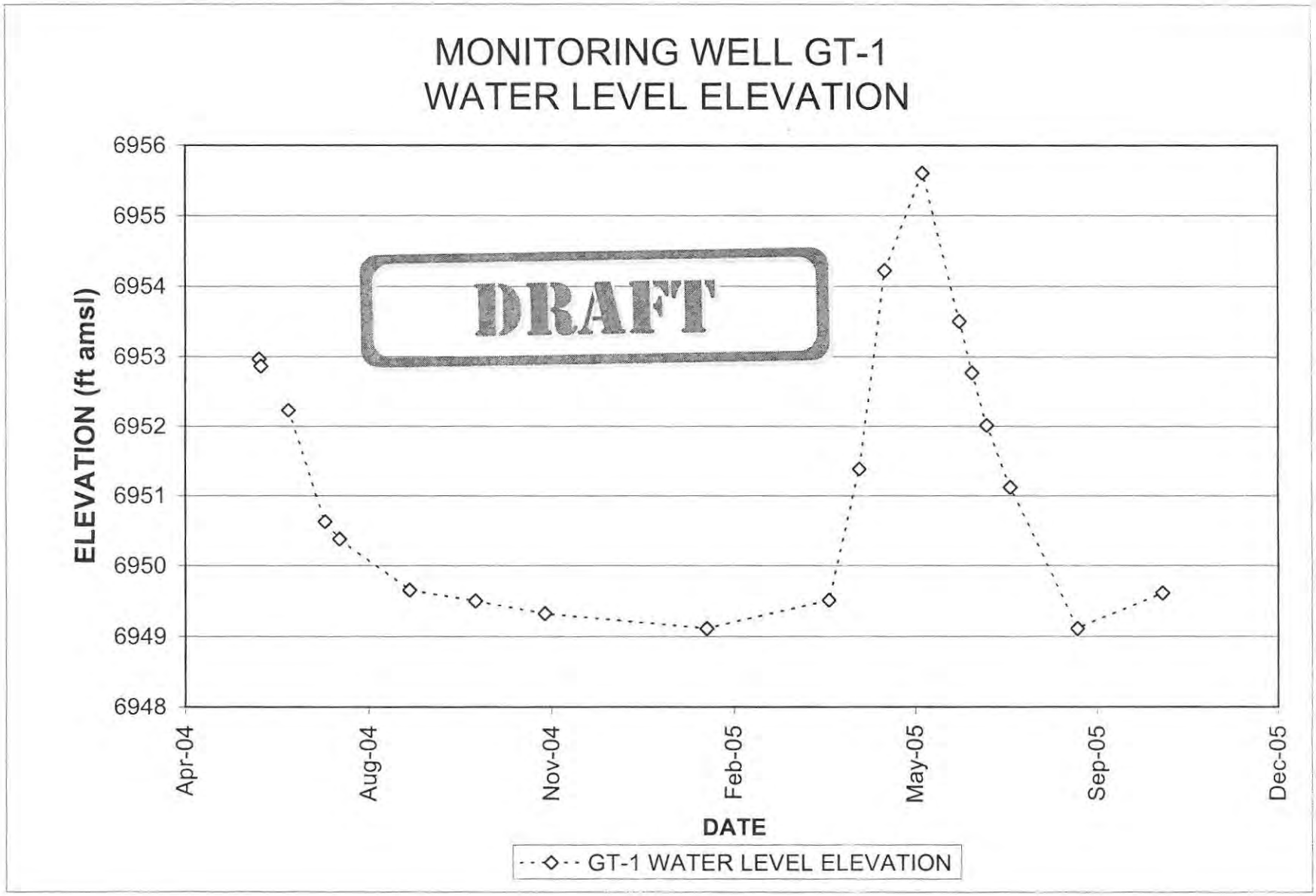
DRAWN BY J.S.BROWN

DATE: 2/21/05

SCALE

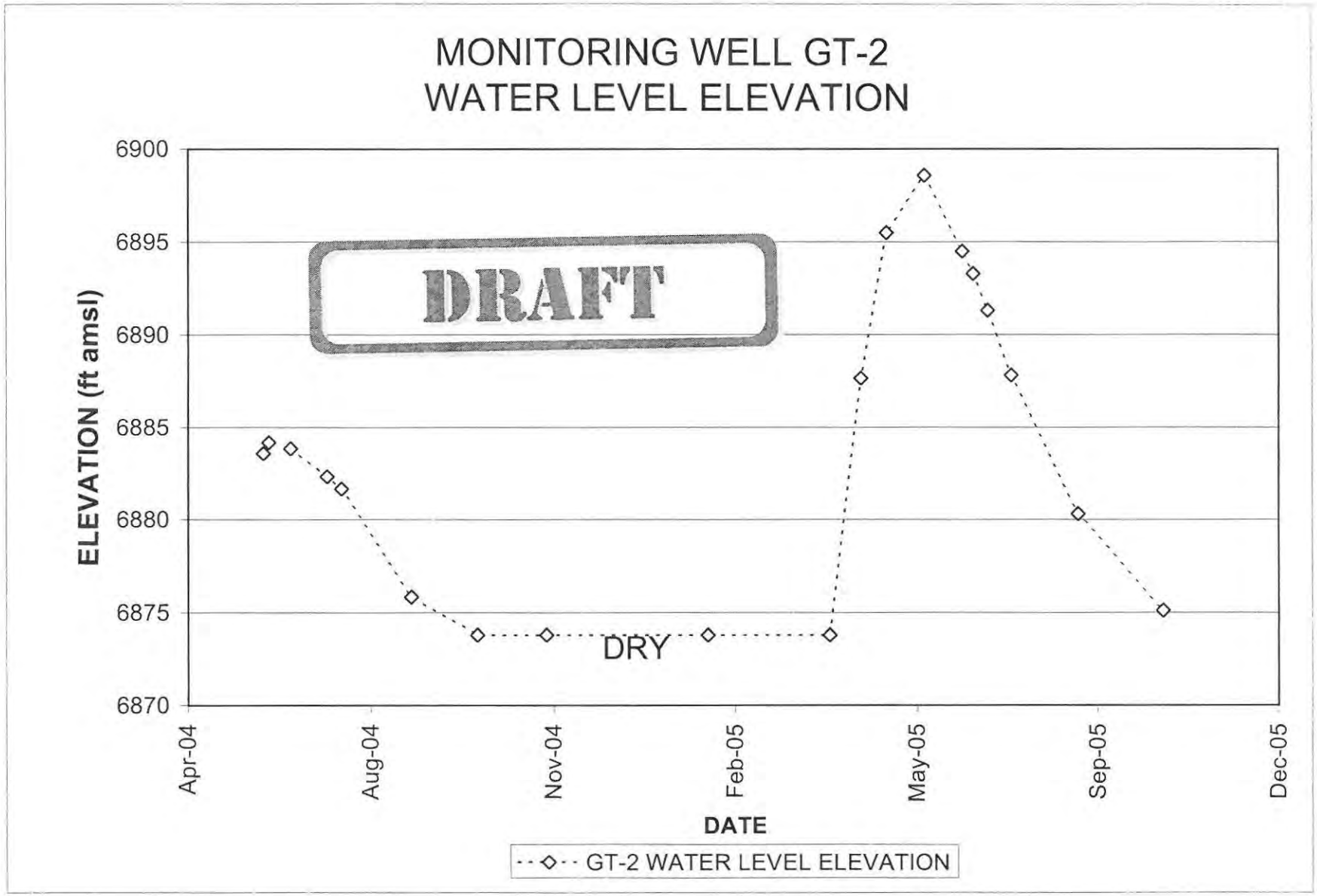
SHEET

FIGURE A.4.10



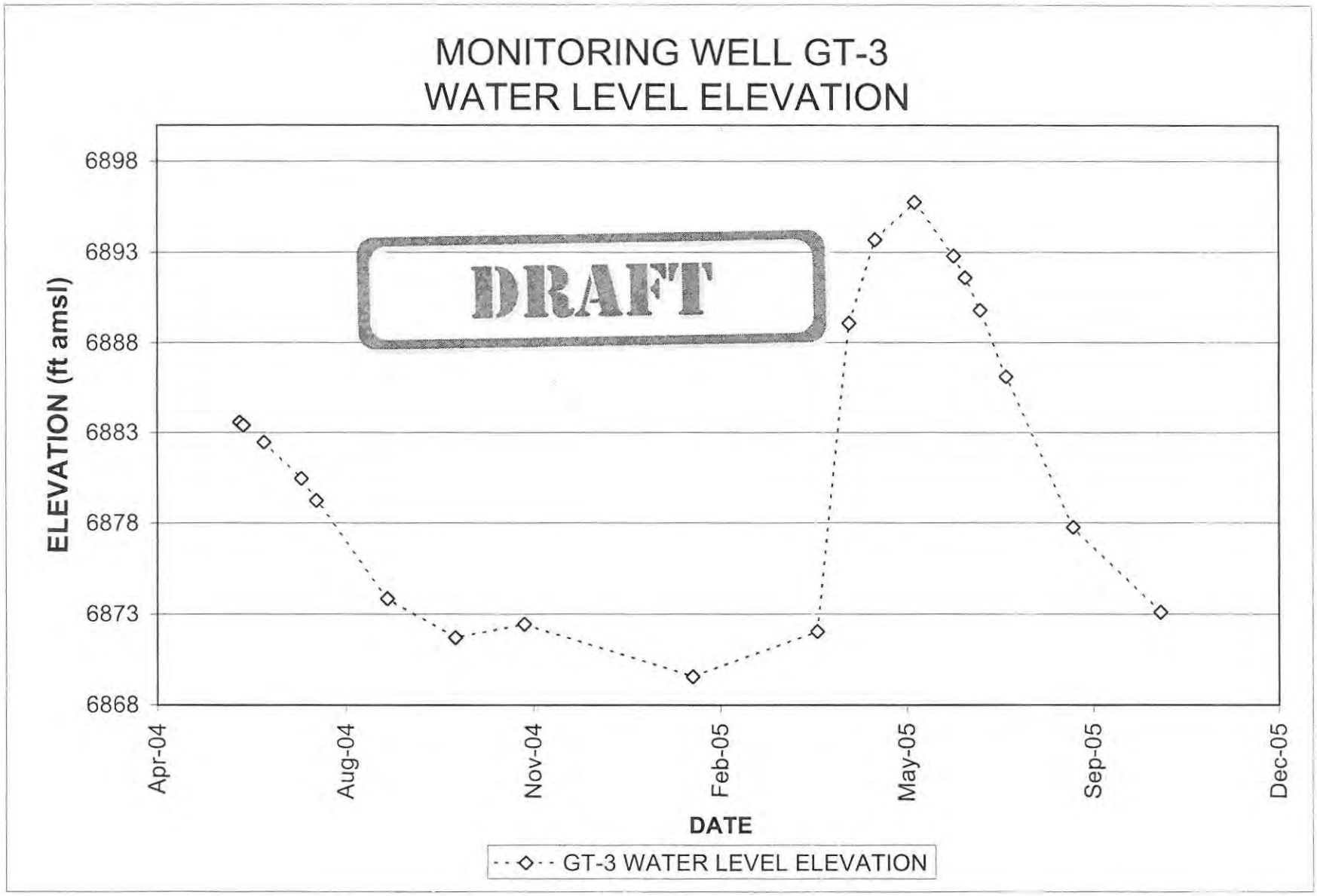
Georgetown canyon water levels.xlsgt-1 Chart 1

FIGURE A.4.11



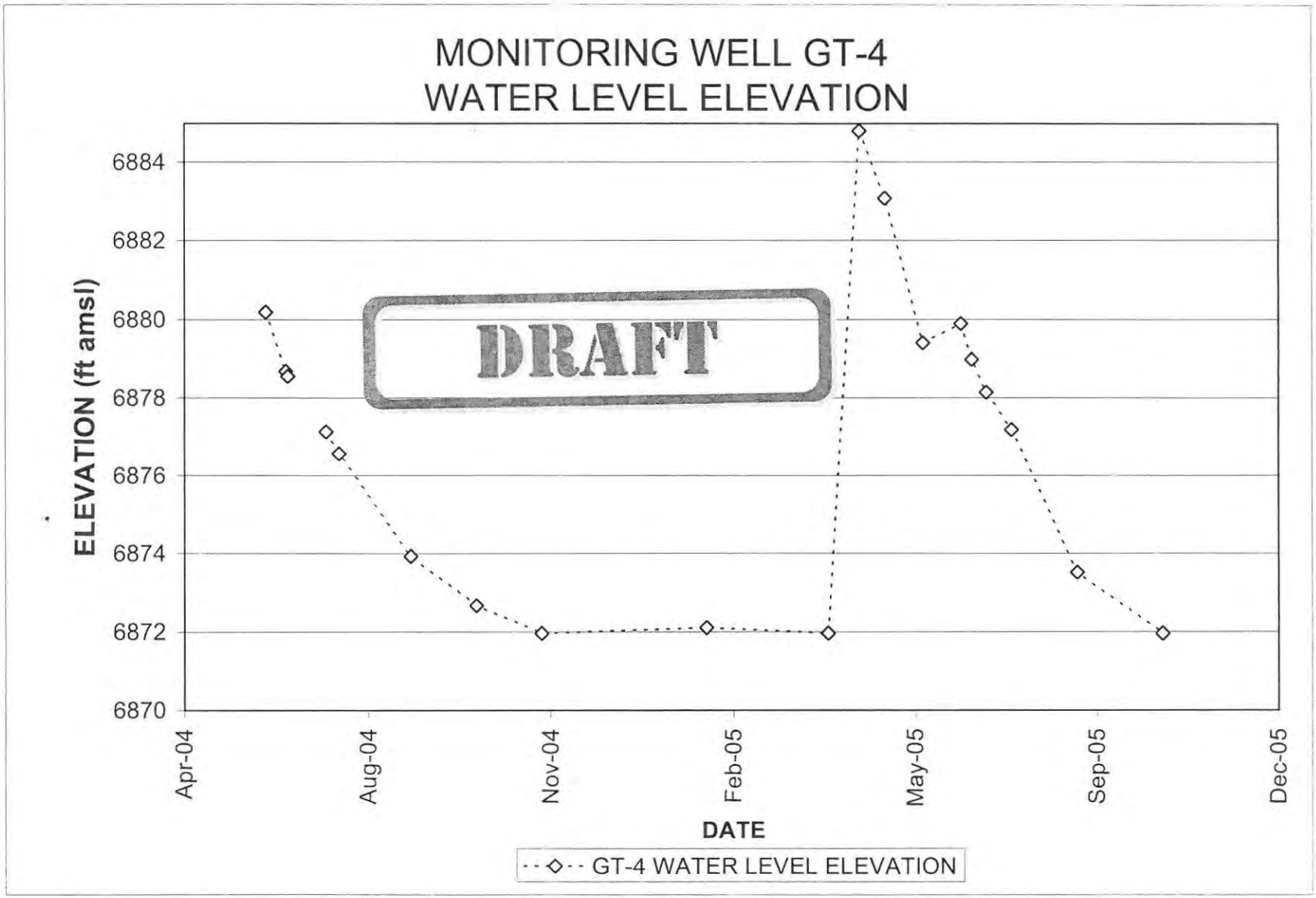
Georgetown canyon water levels.xlsgt-2 Chart 1

FIGURE A.4.12



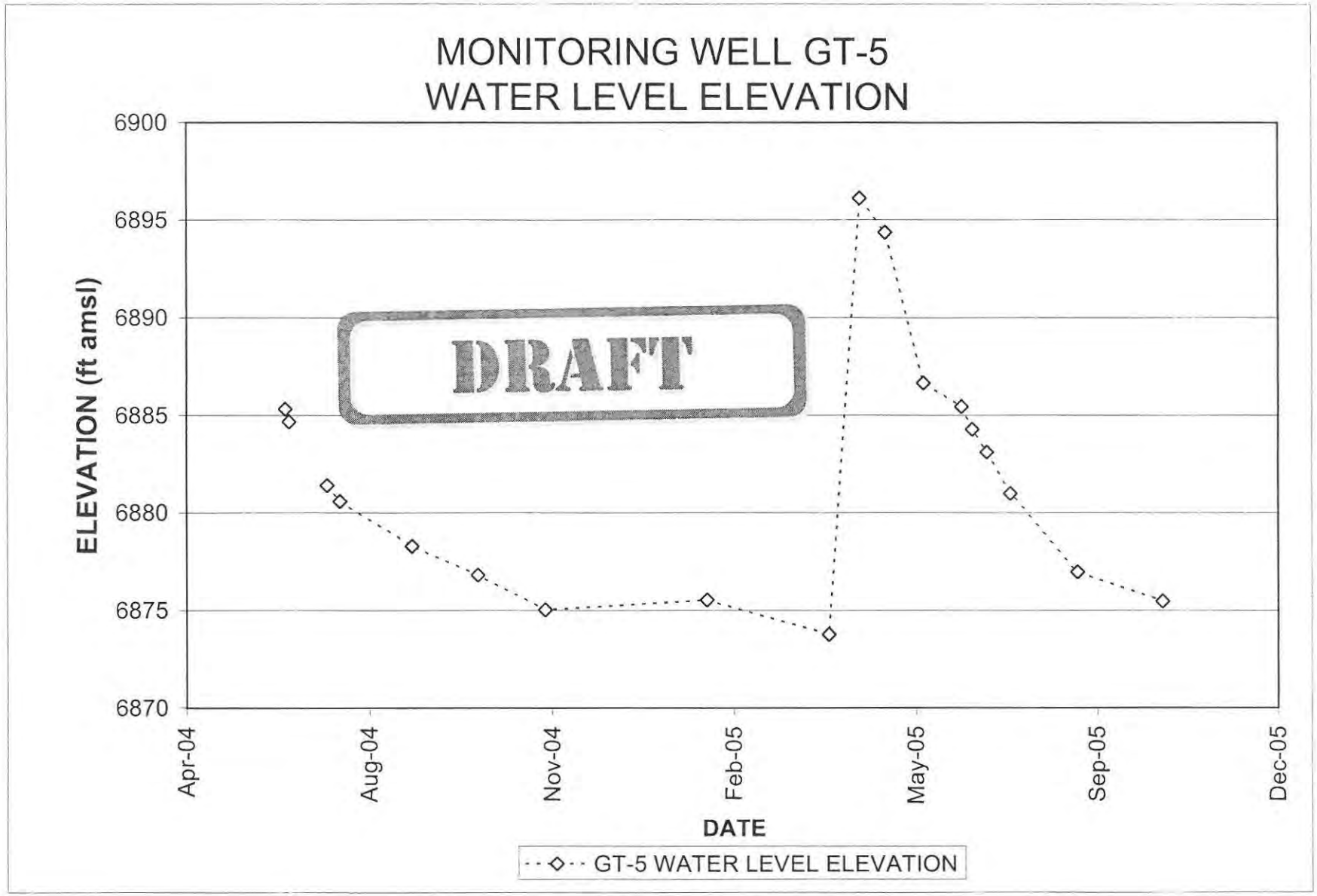
Georgetown canyon water levels.xlsgt-3 Chart 1

FIGURE A.4.13



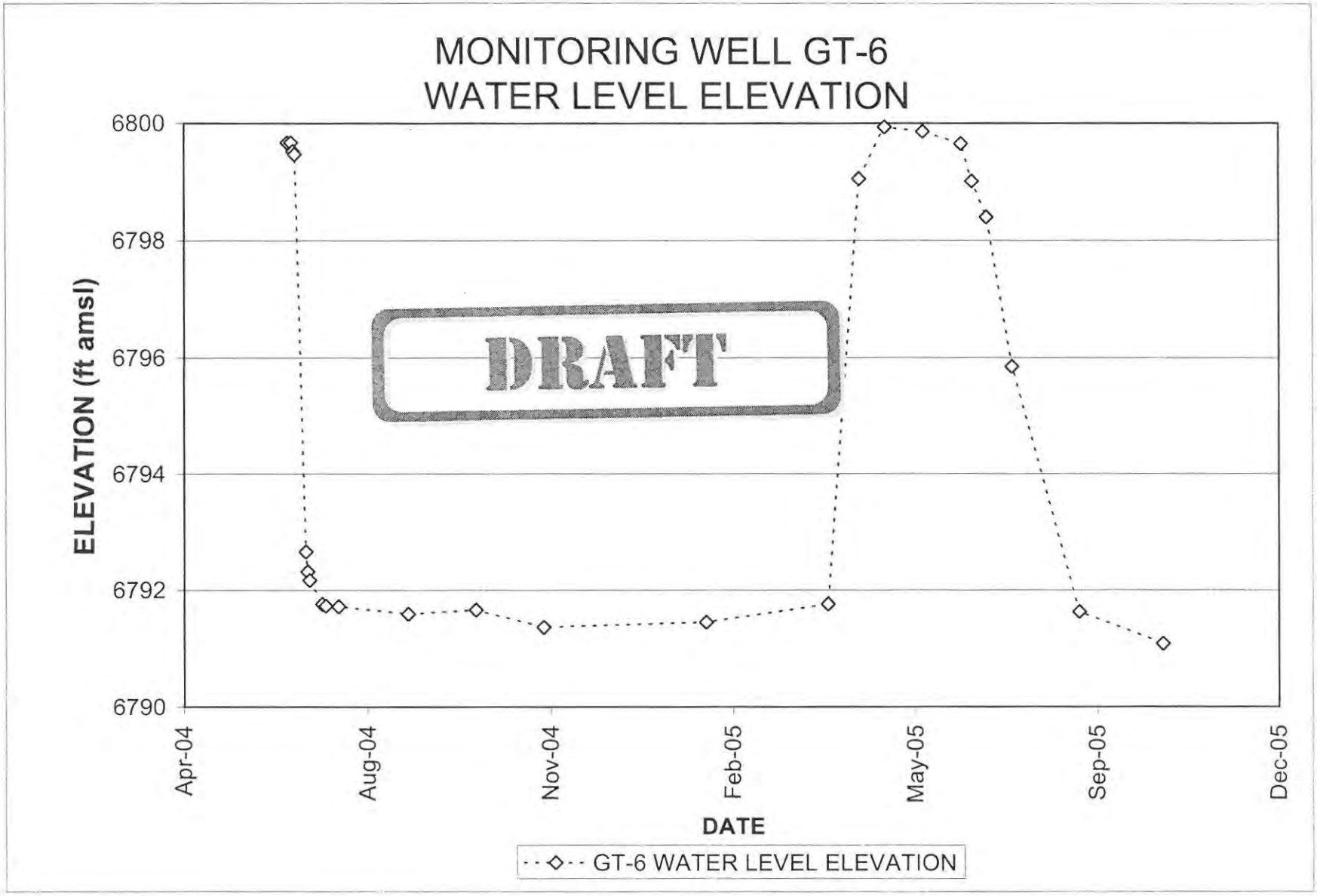
Georgetown canyon water levels.xlsgt-4 Chart 1

FIGURE A.4.14



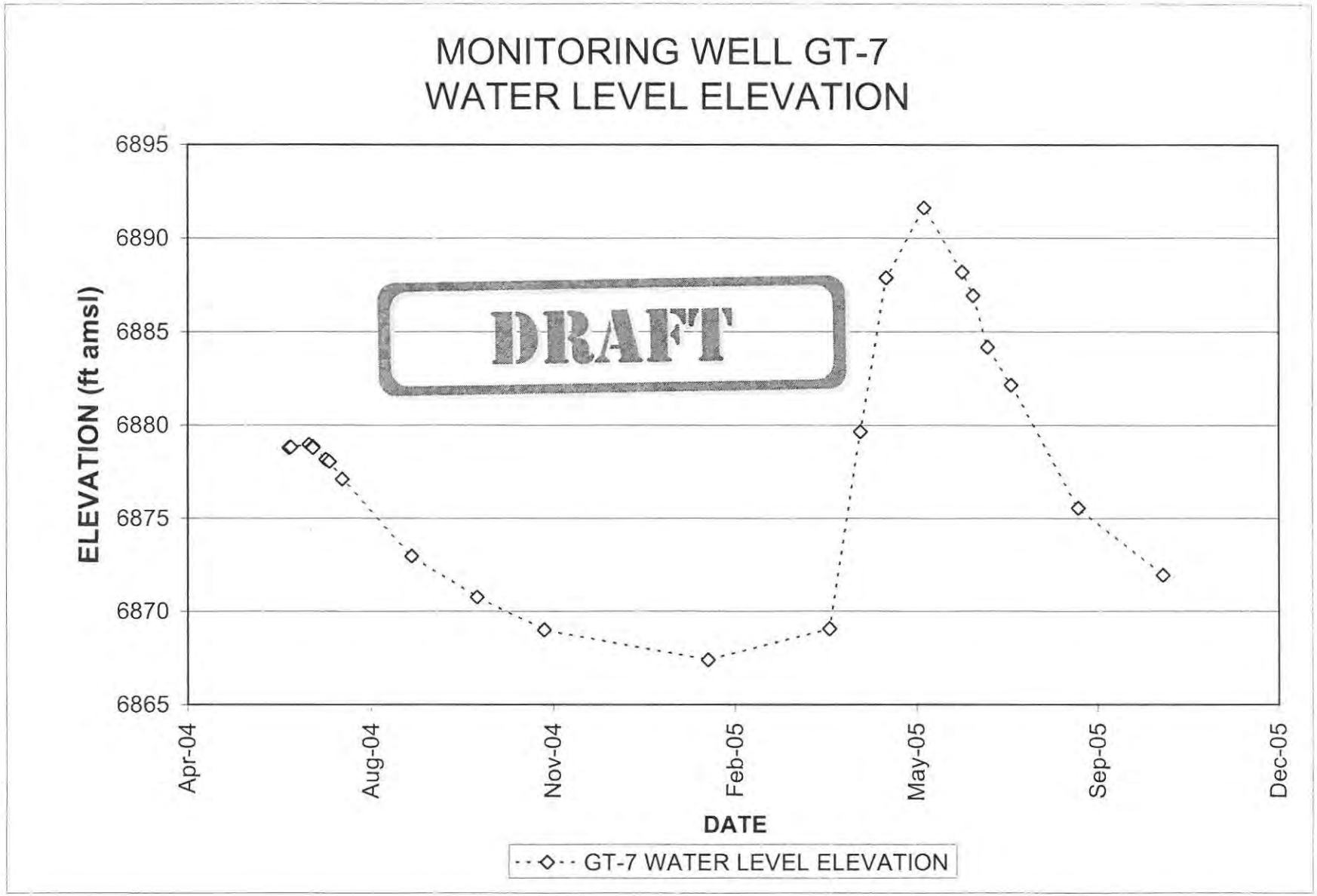
Georgetown canyon water levels.xlsgt-5 Chart 1

FIGURE A.4.15



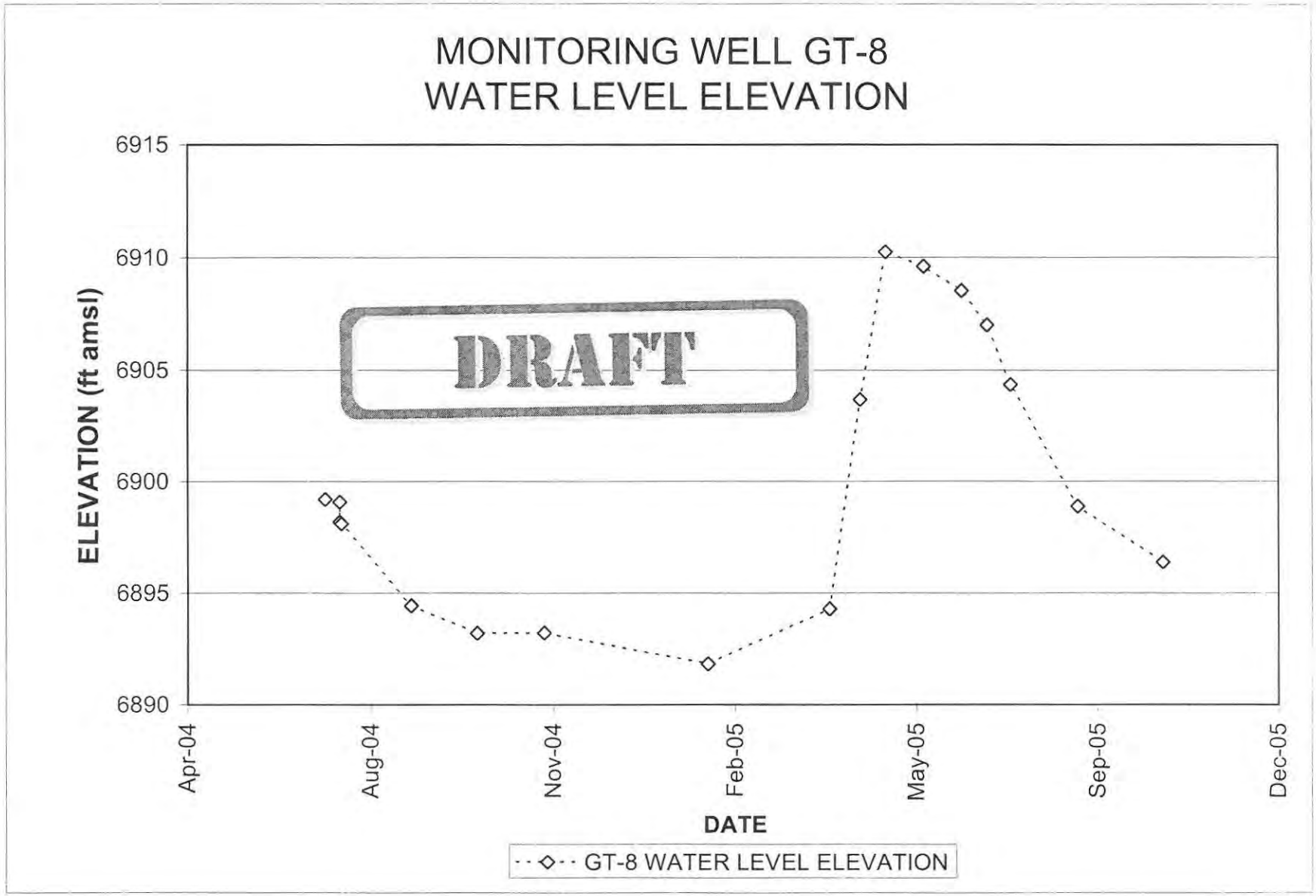
Georgetown canyon water levels.xlsgt-6 Chart 1

FIGURE A.4.16



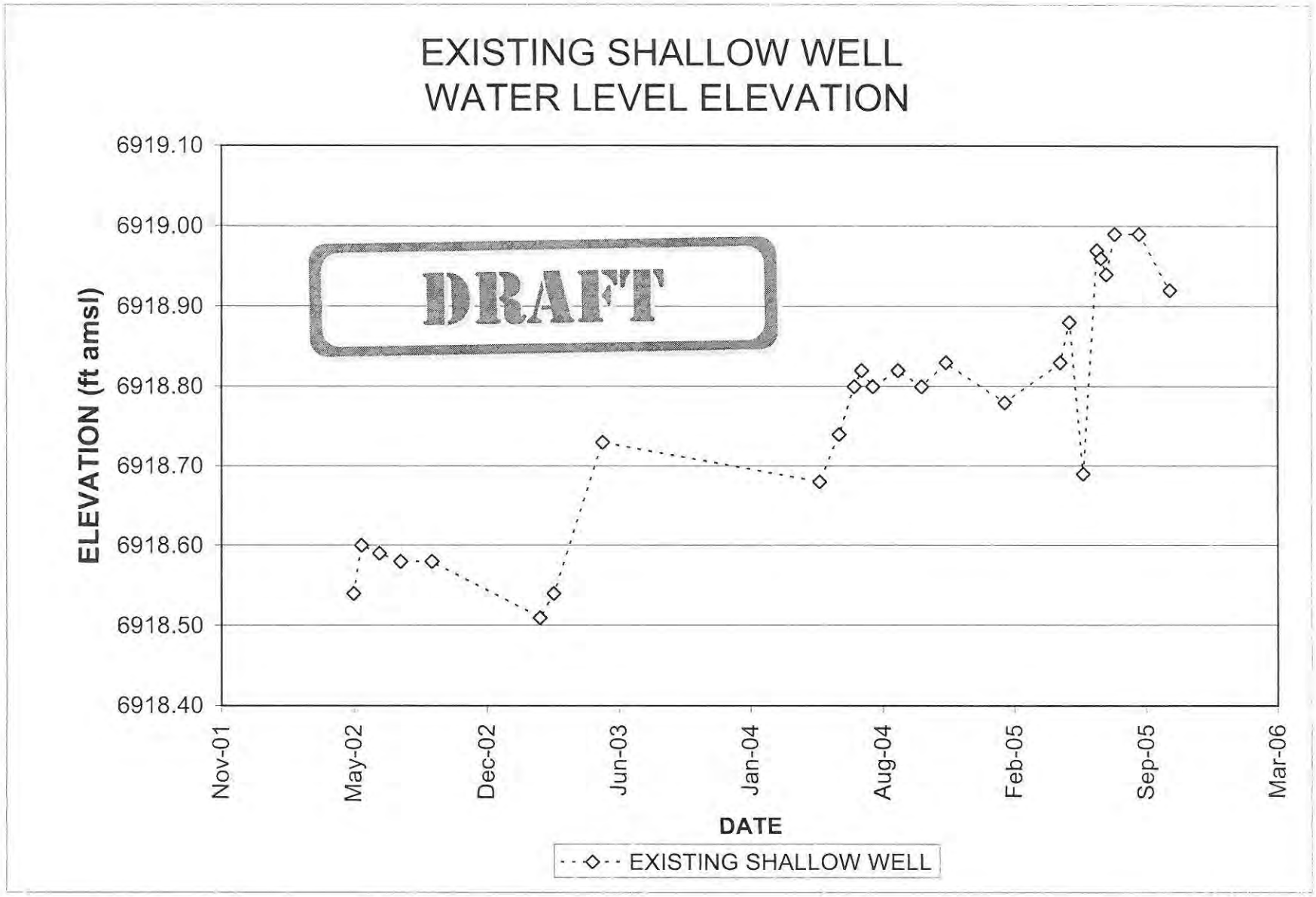
Georgetown canyon water levels.xlsgt-7 Chart 1

FIGURE A.4.17



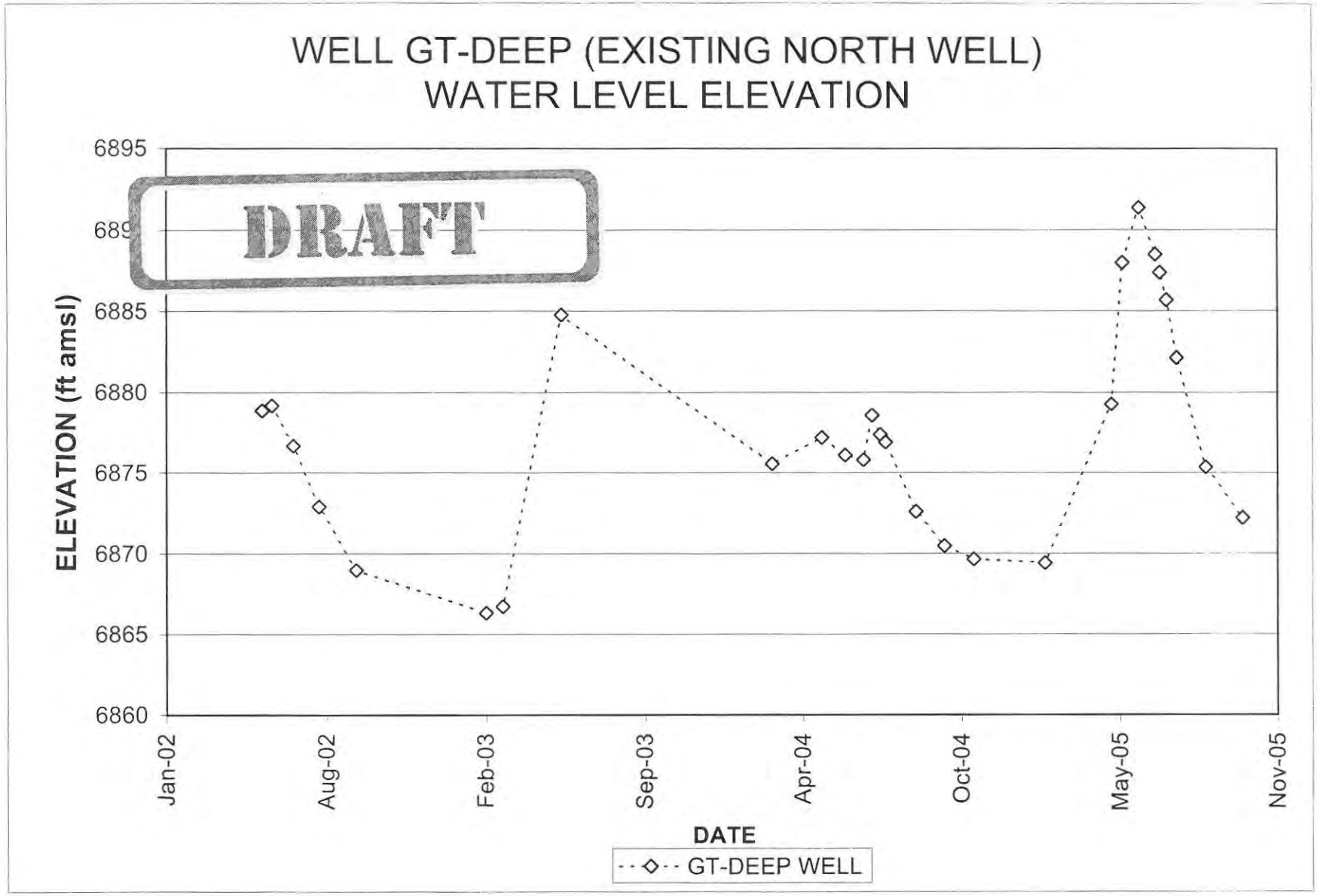
Georgetown canyon water levels.xlsgt-8 Chart 1

FIGURE A.4.18



Georgetown canyon water levels.xlsgt-shallow Chart 1

FIGURE A.4.19



Georgetown canyon water levels.xlsgt-deep Chart 1

FIGURE A.4.20

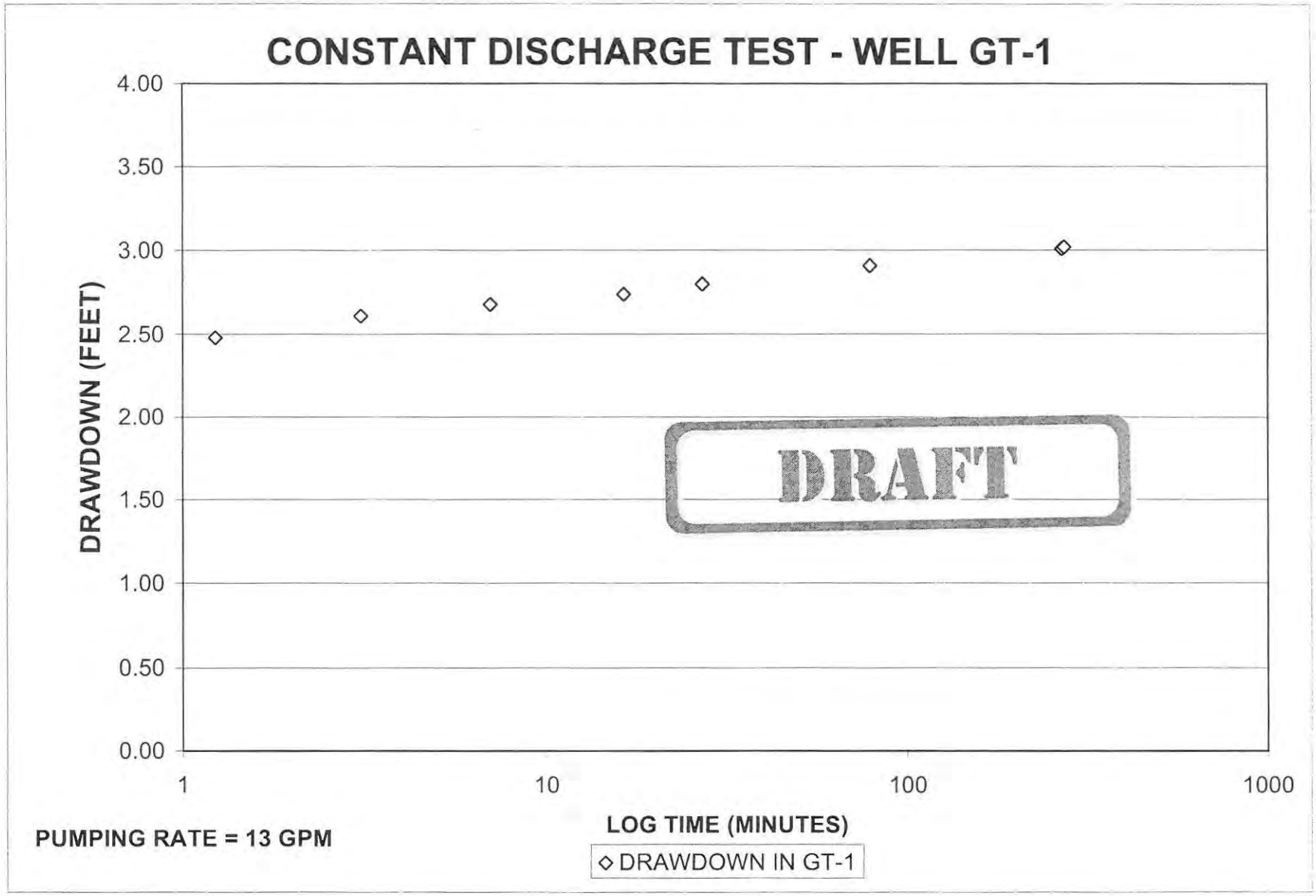

CONSTANT DISCHARGE TEST - WELL GT-1
DRAWDOWN (FEET)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1
10
100
1000
LOG TIME (MINUTES)
DRAFT
PUMPING RATE = 13 GPM
DRAWDOWN IN GT-1

FIGURE A.5.1

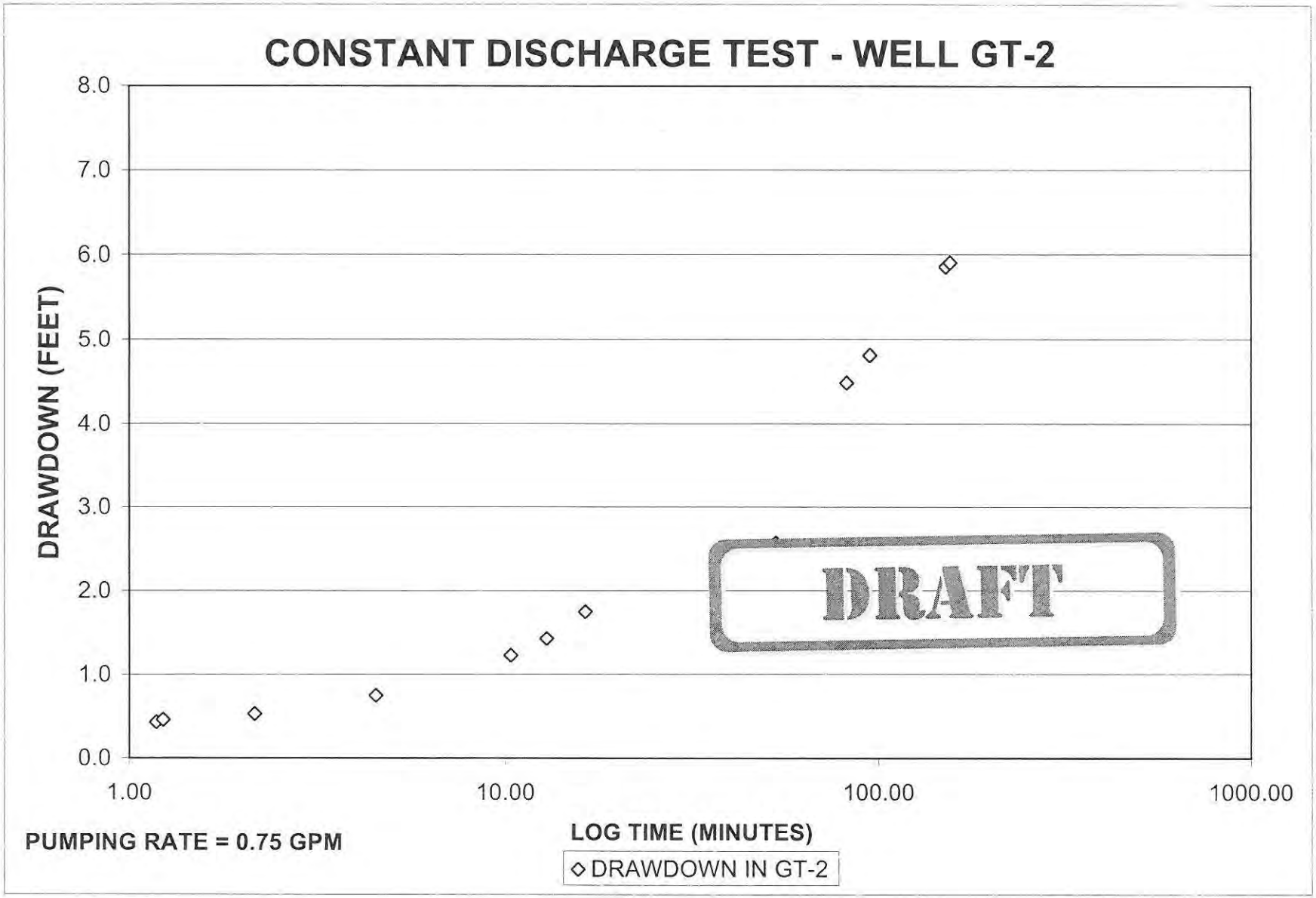

CONSTANT DISCHARGE TEST - WELL GT-2
DRAWDOWN (FEET)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1.00
10.00
100.00
1000.00
LOG TIME (MINUTES)
DRAFT
PUMPING RATE = 0.75 GPM
DRAWDOWN IN GT-2

FIGURE A.5.2

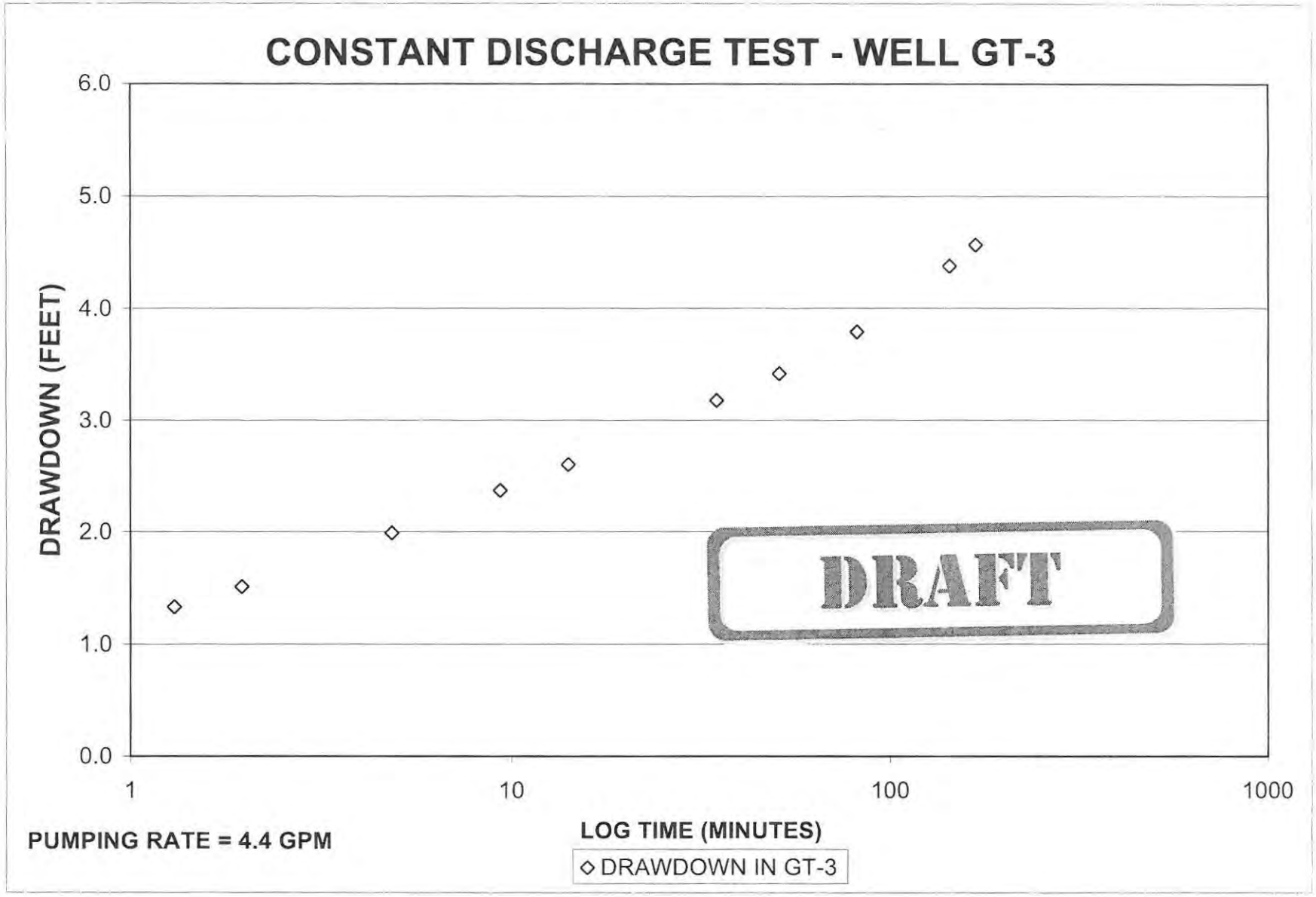

CONSTANT DISCHARGE TEST - WELL GT-3
DRAWDOWN (FEET)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
10
100
1000
LOG TIME (MINUTES)
DRAFT
PUMPING RATE = 4.4 GPM
DRAWDOWN IN GT-3

FIGURE A.5.3

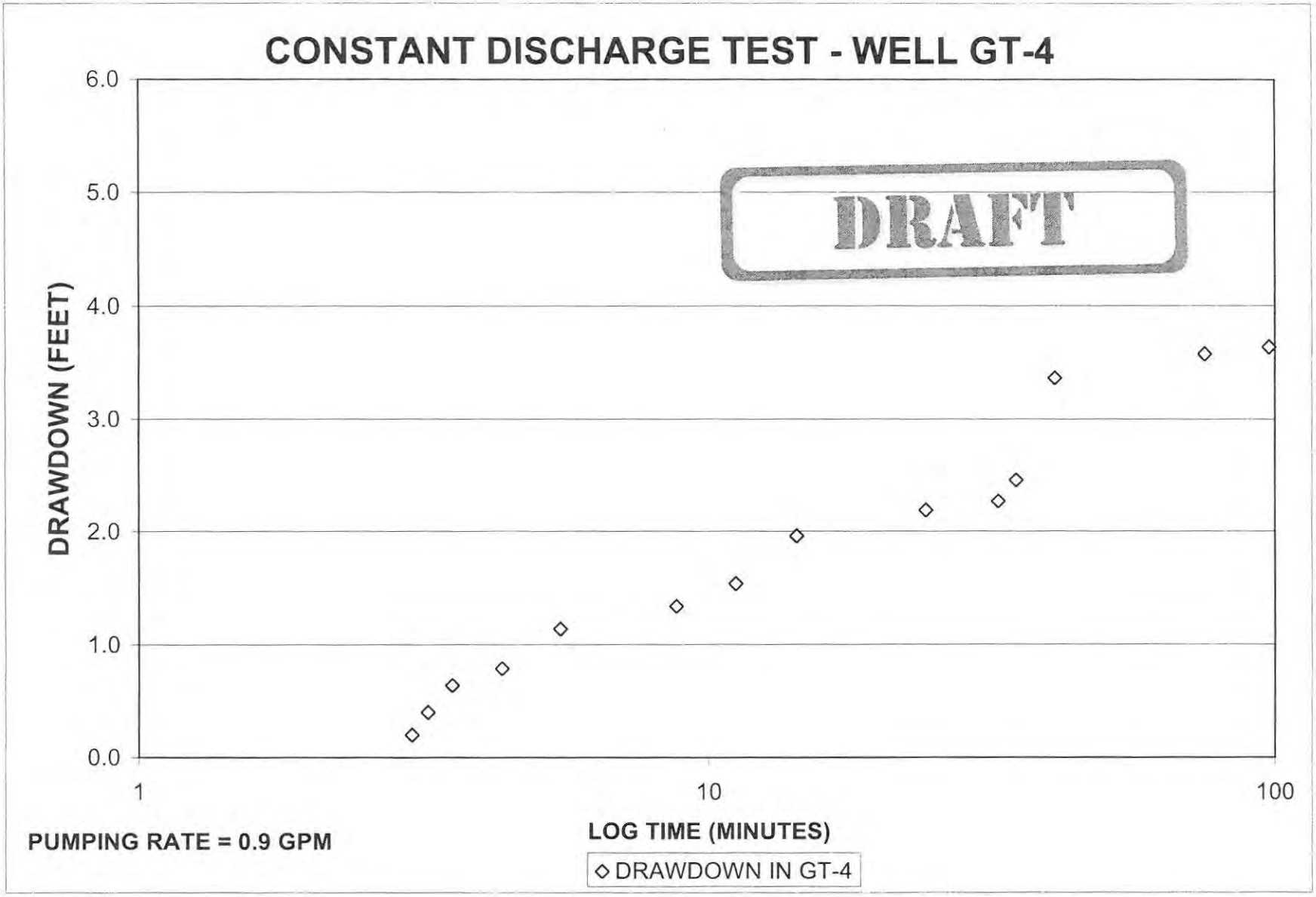

CONSTANT DISCHARGE TEST - WELL GT-4
DRAFT
DRAWDOWN (FEET)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
10
100
LOG TIME (MINUTES)
PUMPING RATE = 0.9 GPM
DRAWDOWN IN GT-4

FIGURE A.5.4

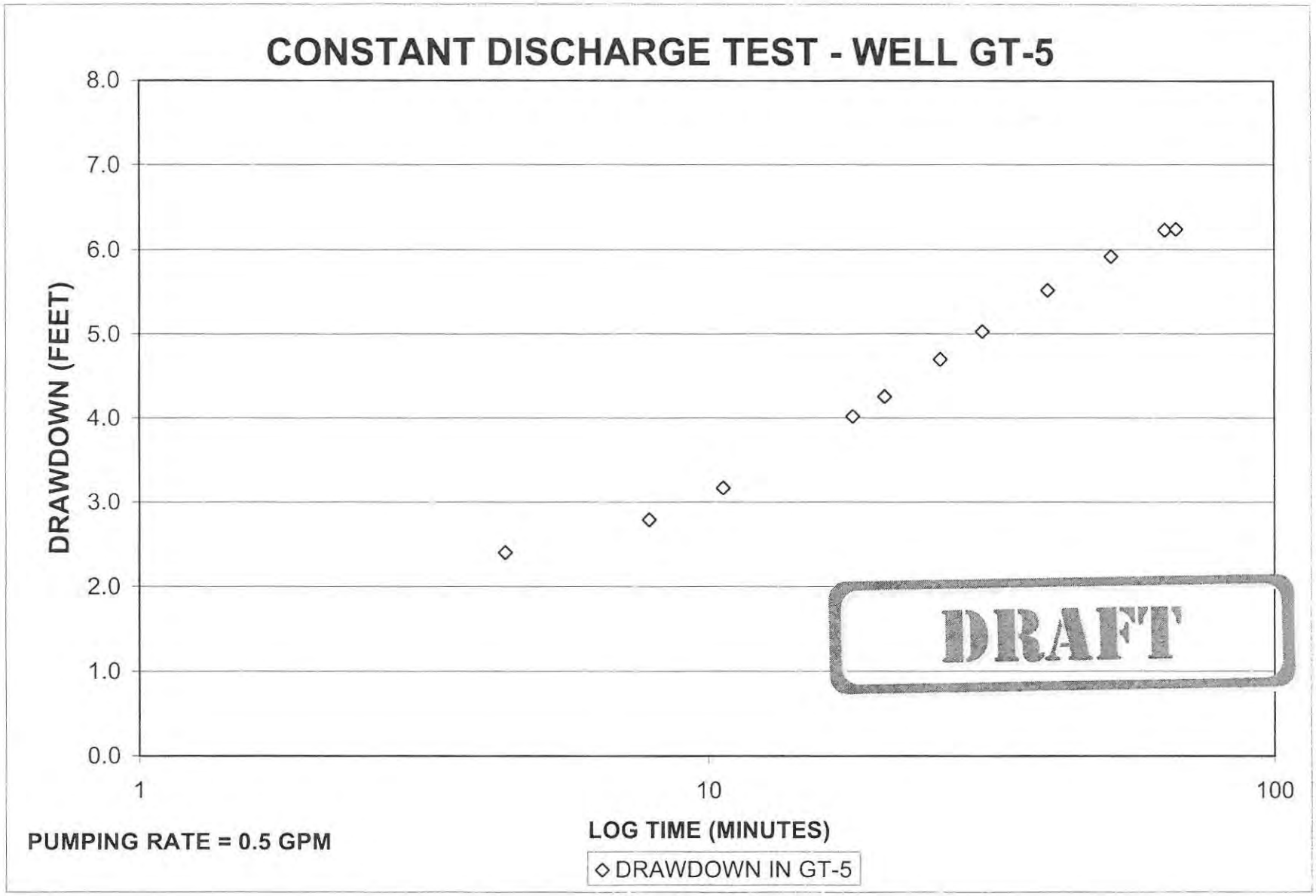
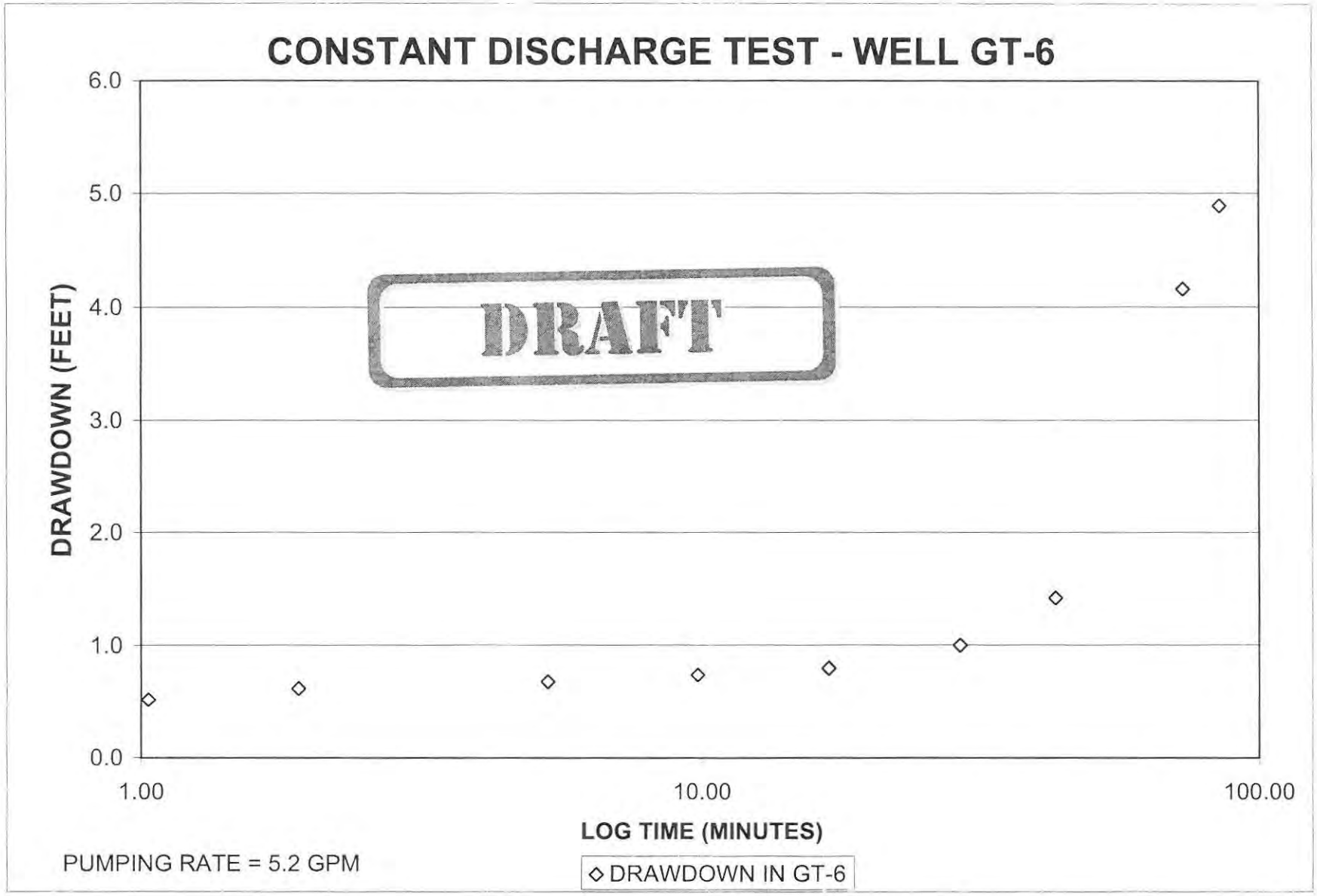

CONSTANT DISCHARGE TEST - WELL GT-5
DRAWDOWN (FEET)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
10
100
LOG TIME (MINUTES)
PUMPING RATE = 0.5 GPM
DRAWDOWN IN GT-5
DRAFT

FIGURE A.5.5



Agruim GTC Specific Capacity Tests.xlsgt-6 Chart 1

FIGURE A.5.A

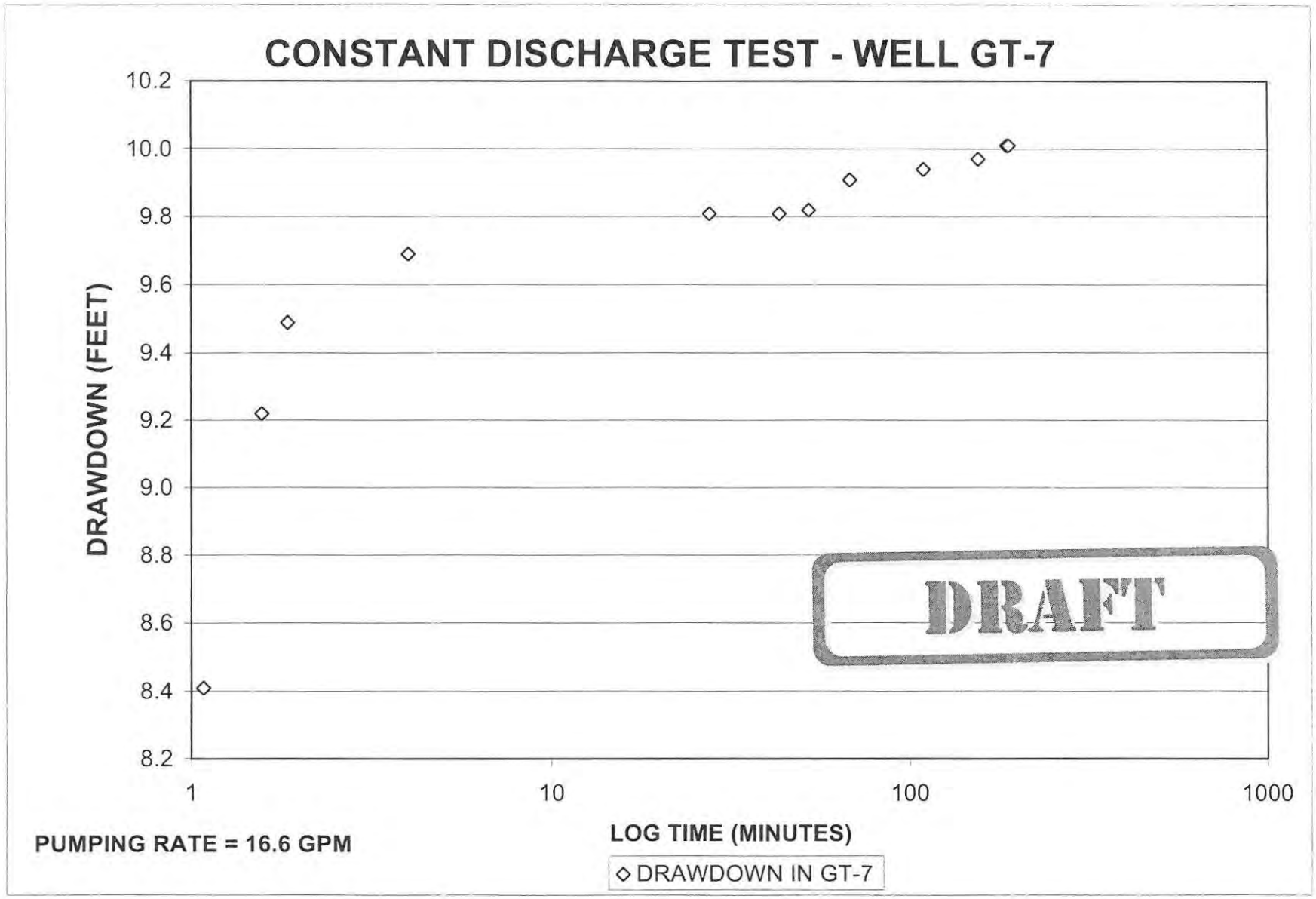

CONSTANT DISCHARGE TEST - WELL GT-7
DRAWDOWN (FEET)
10.2
10.0
9.8
9.6
9.4
9.2
9.0
8.8
8.6
8.4
8.2
1
10
100
1000
LOG TIME (MINUTES)
DRAFT
PUMPING RATE = 16.6 GPM
DRAWDOWN IN GT-7

FIGURE A.5.6

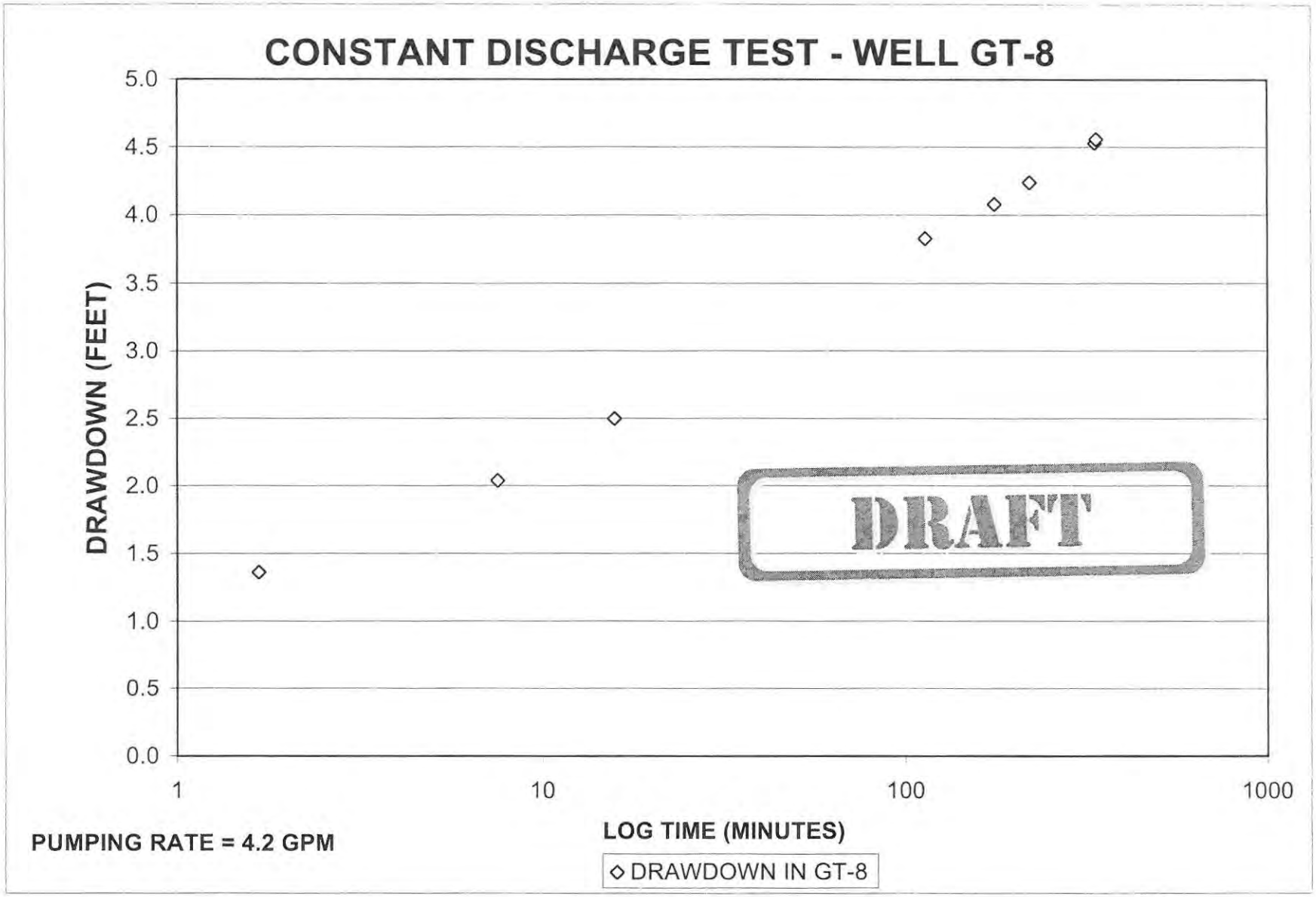
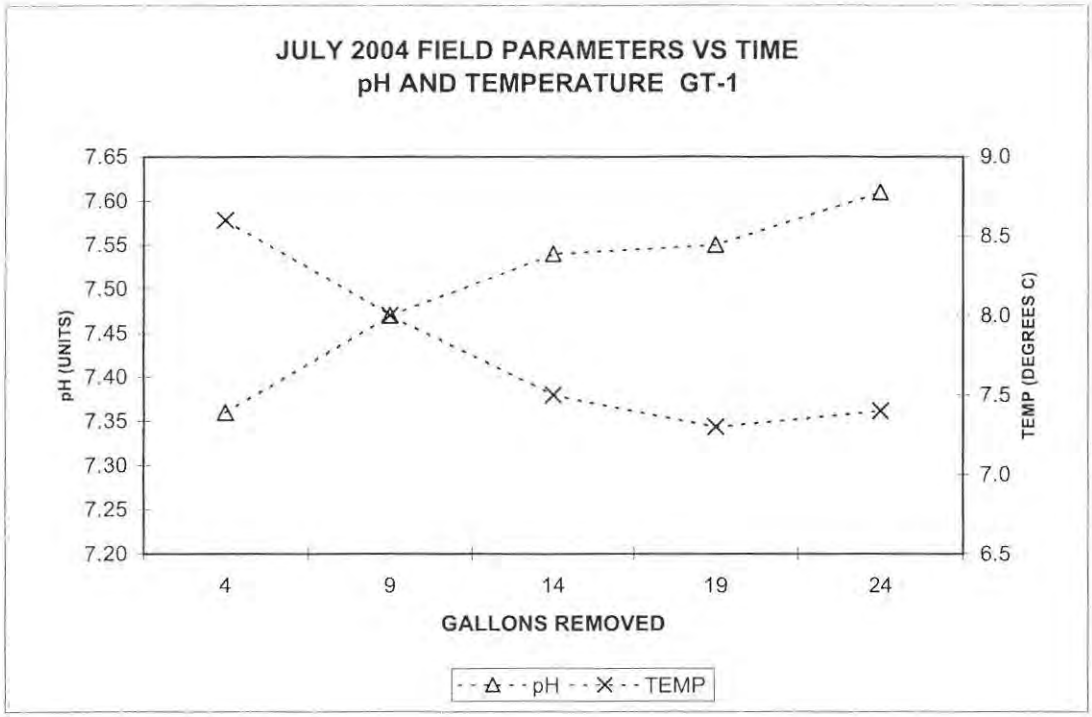
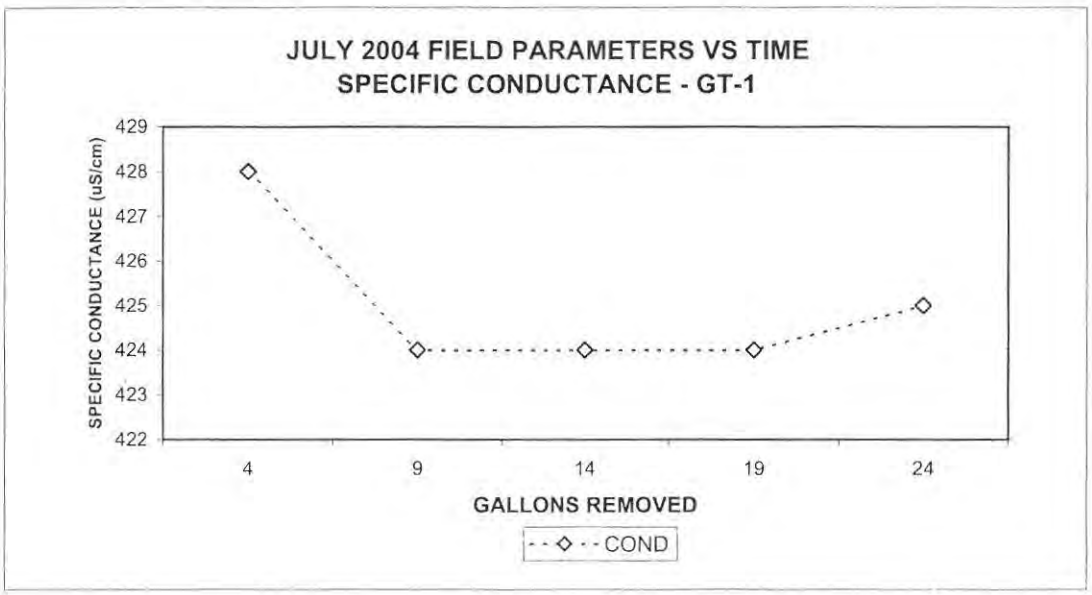

CONSTANT DISCHARGE TEST - WELL GT-8
DRAWDOWN (FEET)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1
10
100
1000
LOG TIME (MINUTES)
DRAFT
PUMPING RATE = 4.2 GPM
◇ DRAWDOWN IN GT-8

FIGURE A.5.7

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

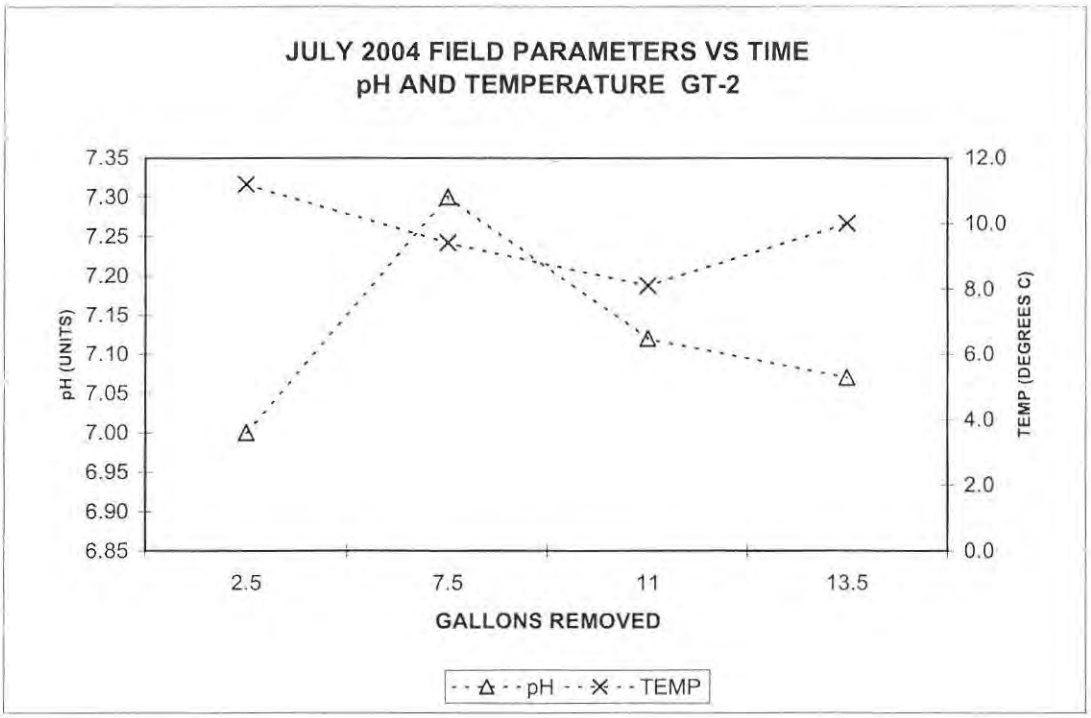


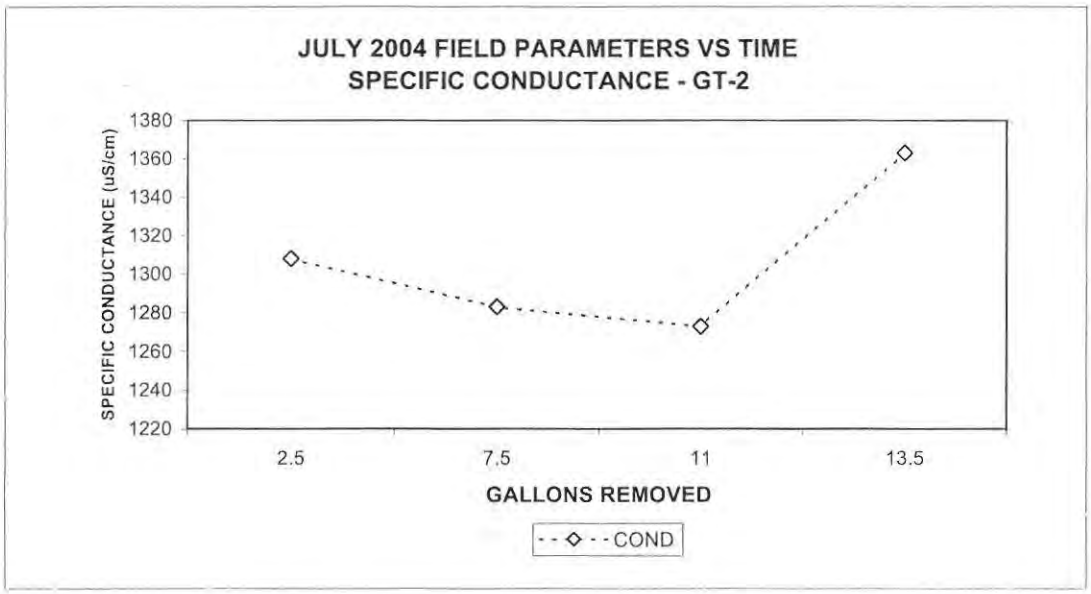


DRAFT

FIGURE A.6.1

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

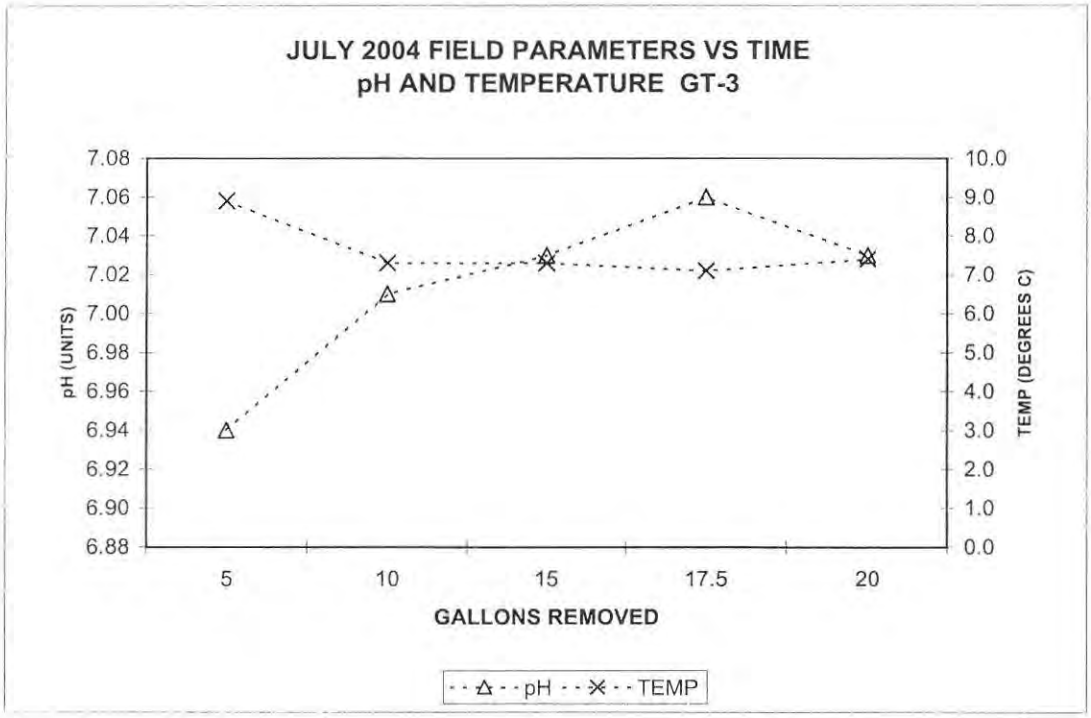


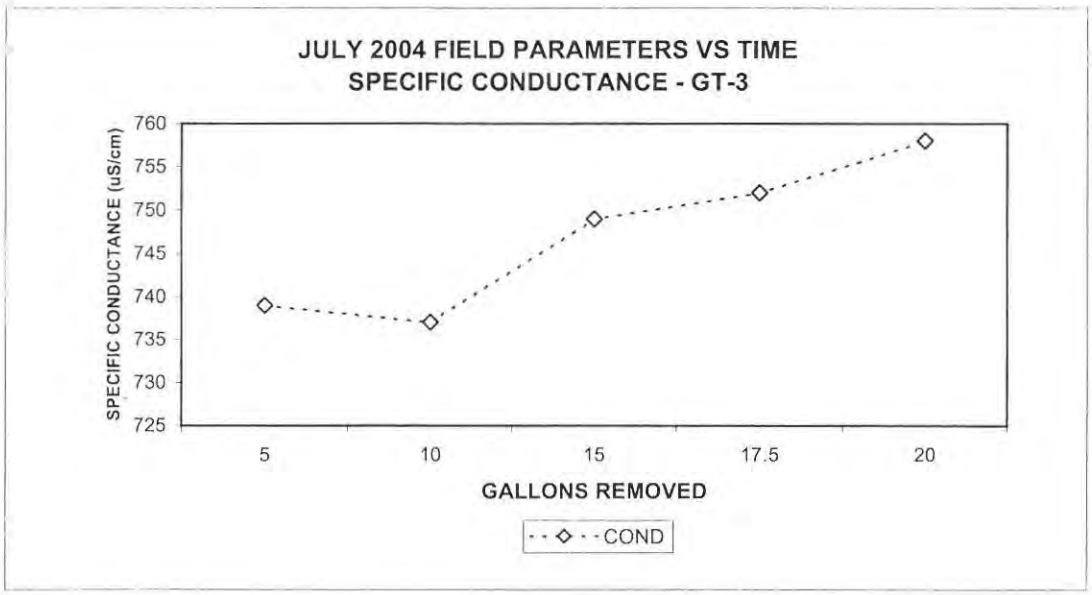


DRAFT

FIGURE A.6.2

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

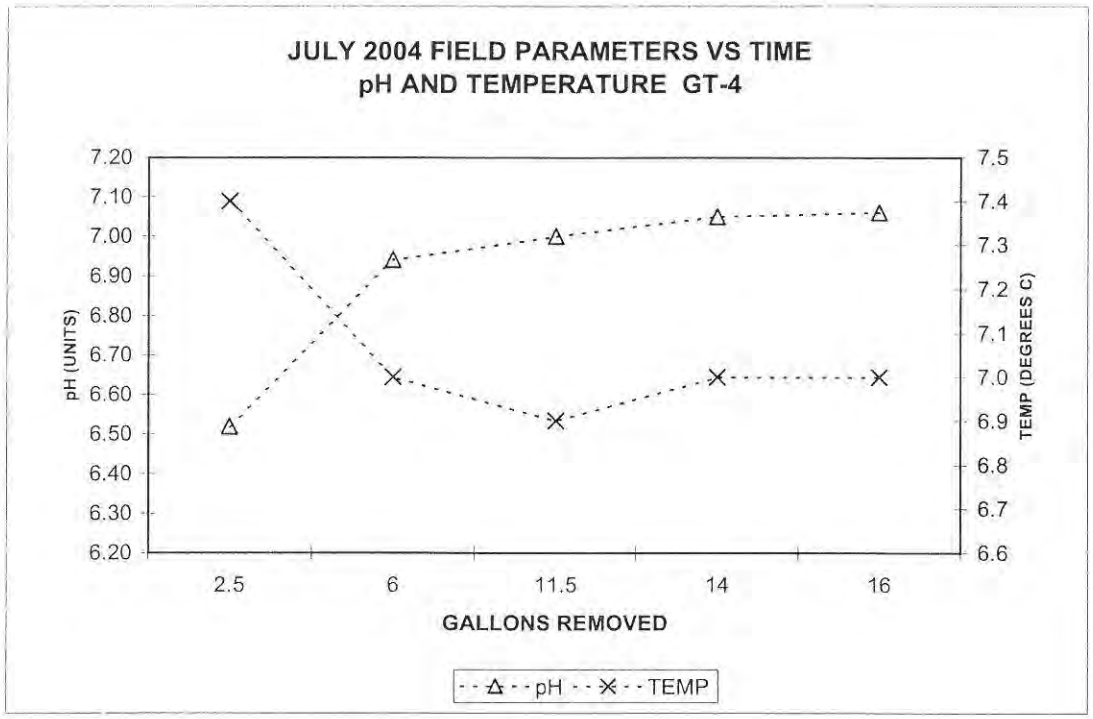


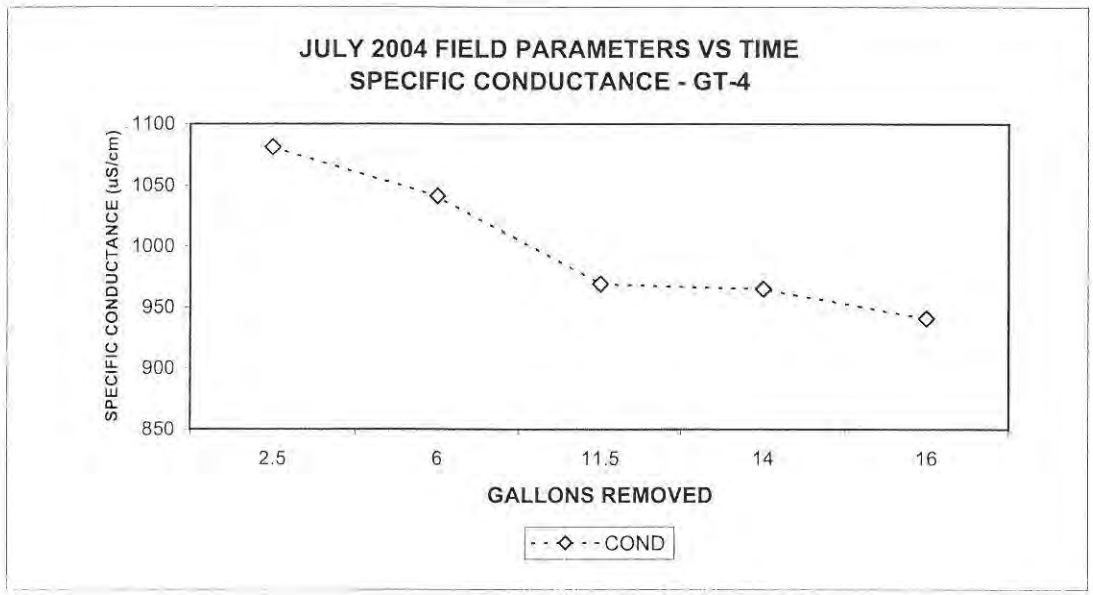


DRAFT

FIGURE A.6.3

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

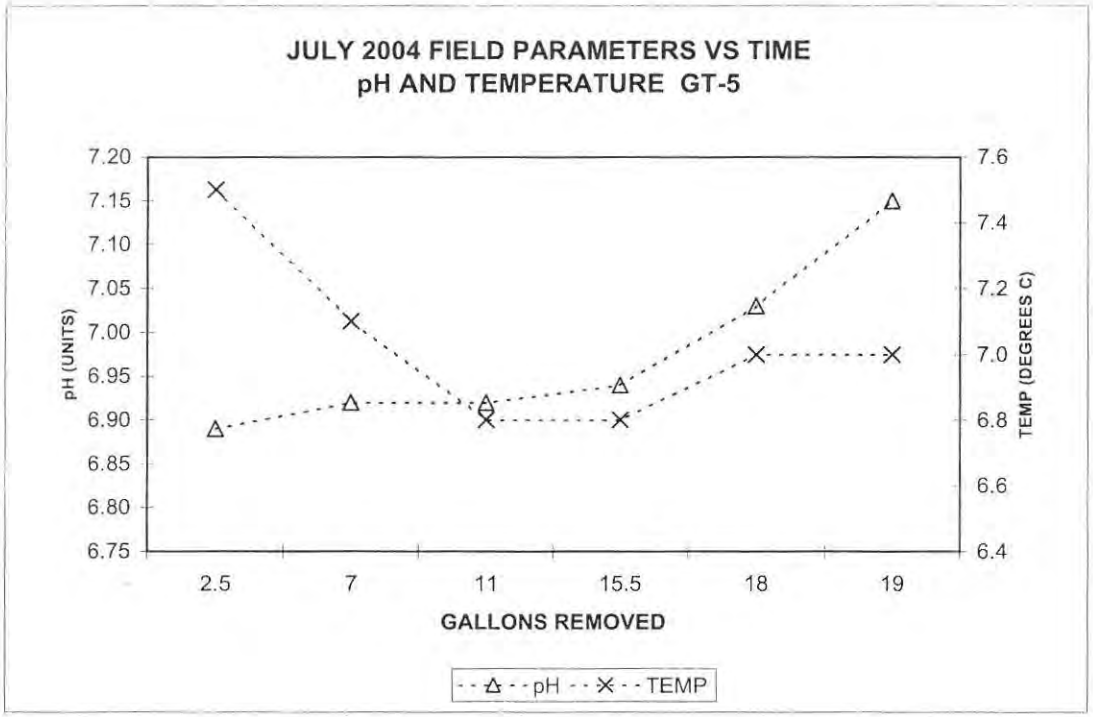


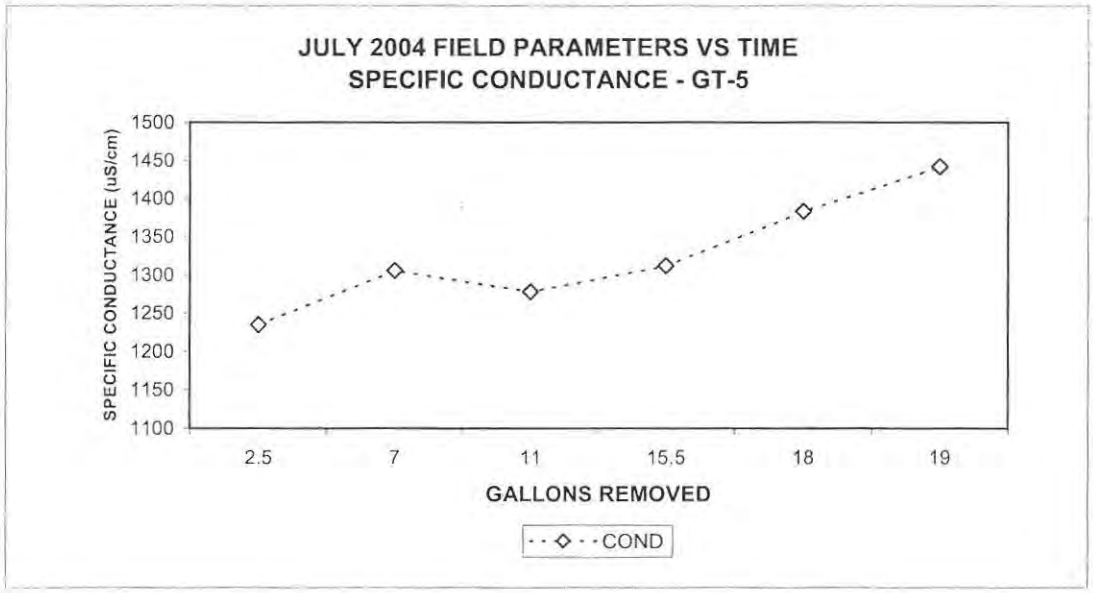


DRAFT

FIGURE A.6.4

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

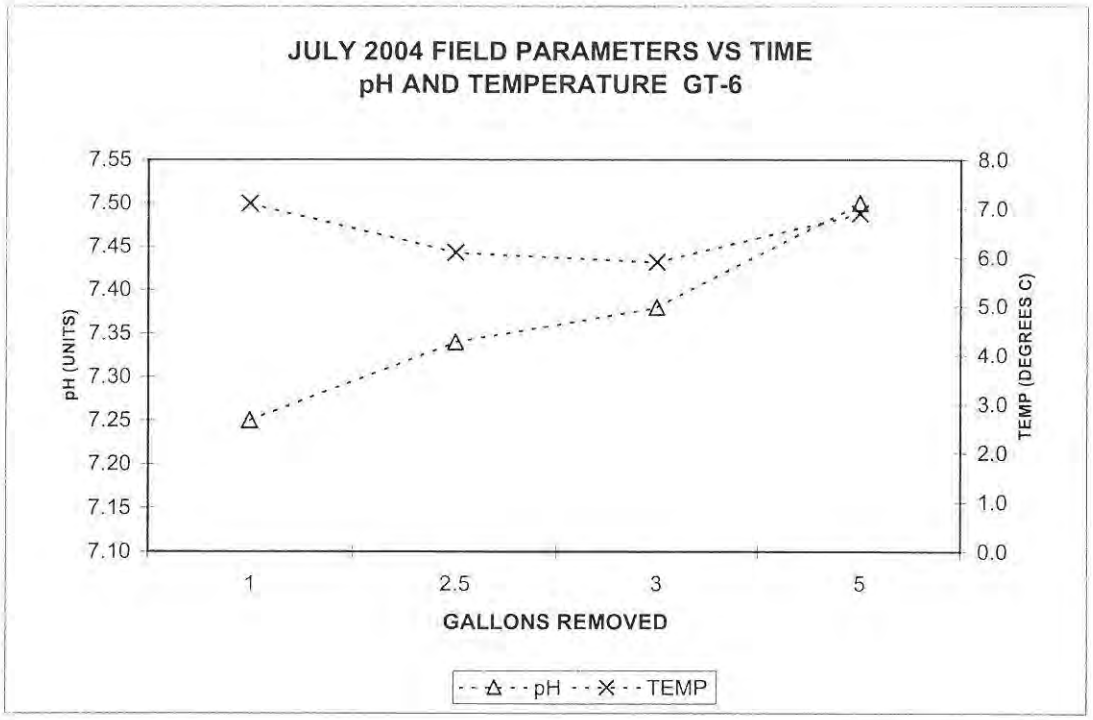


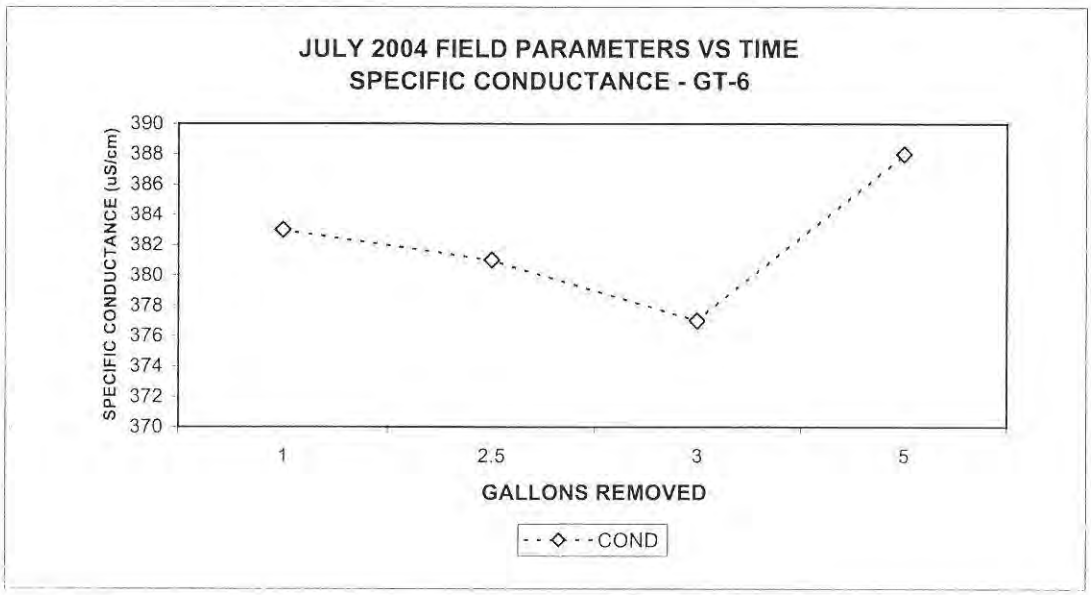


DRAFT

FIGURE A.6.5

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

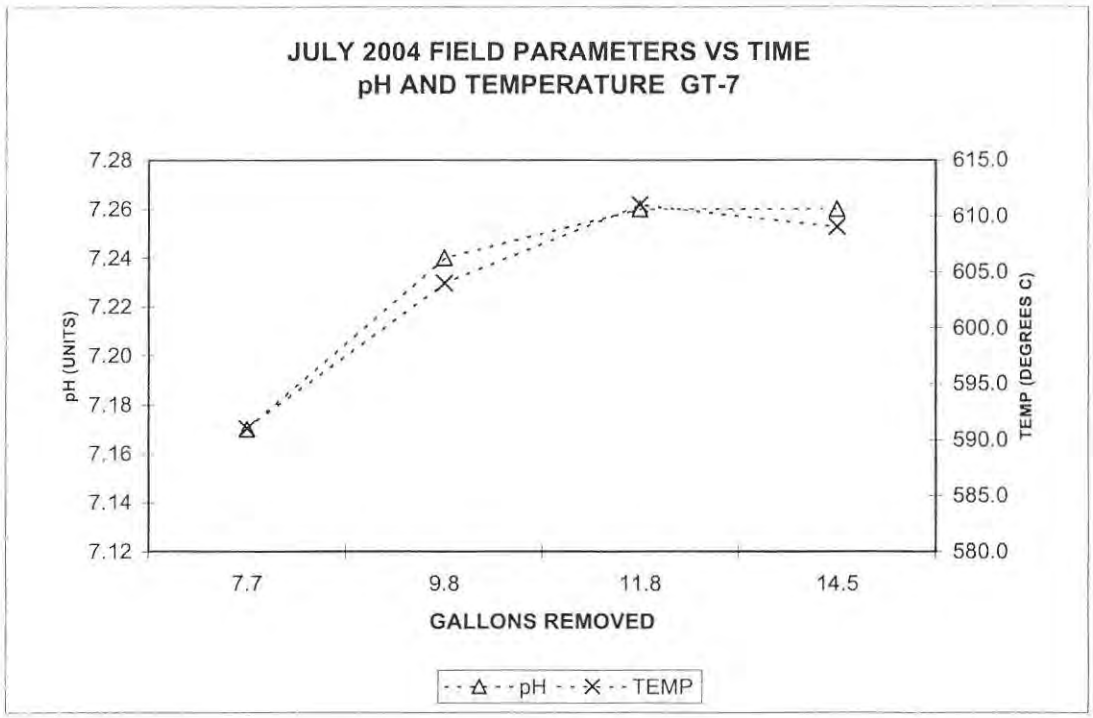


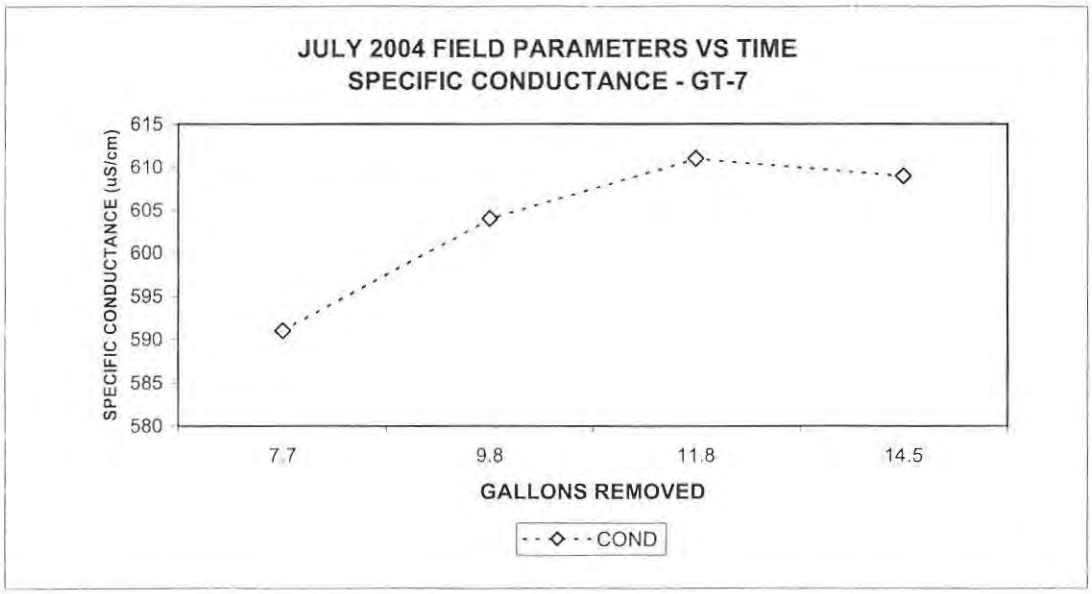


DRAFT

FIGURE A.6.6

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

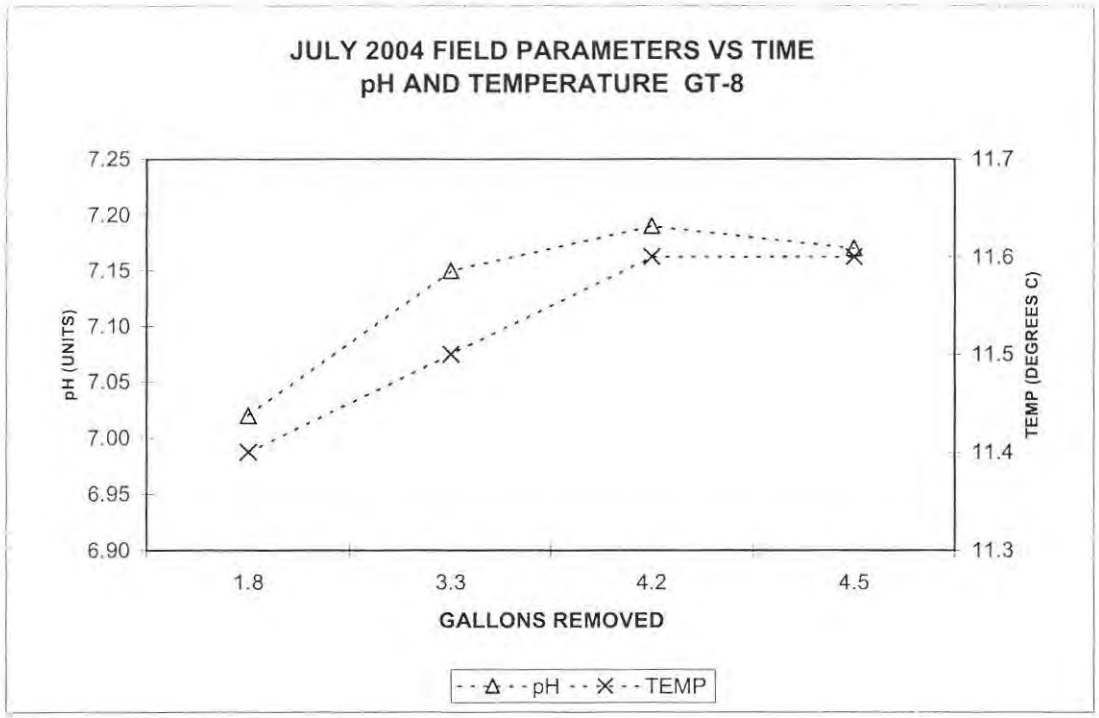


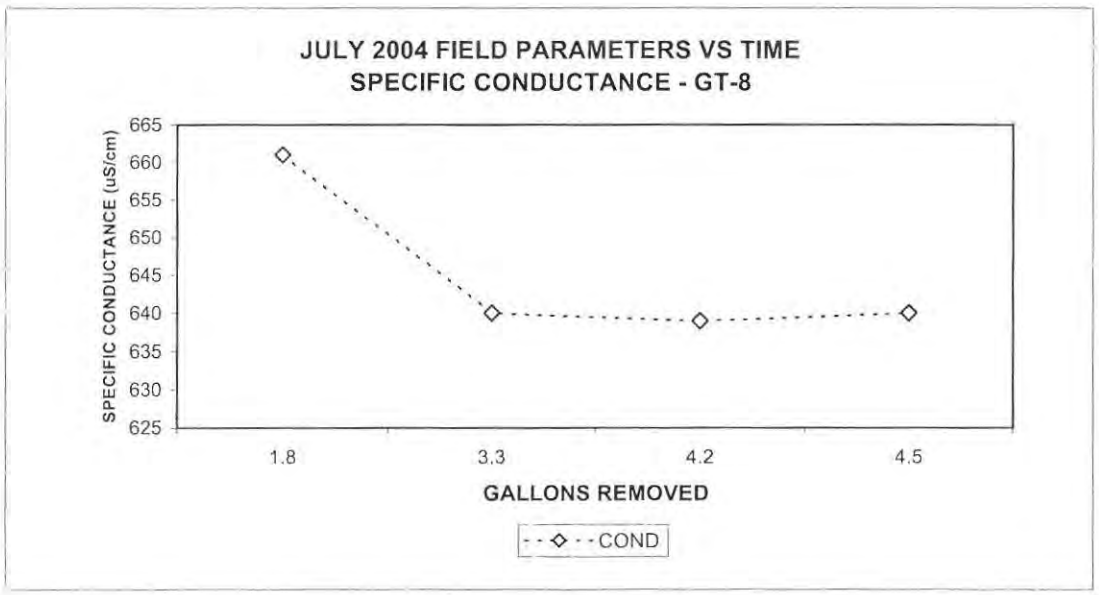


DRAFT

FIGURE A.6.7

GROUND WATER SAMPLING
FIELD WATER QUALITY PARAMETERS

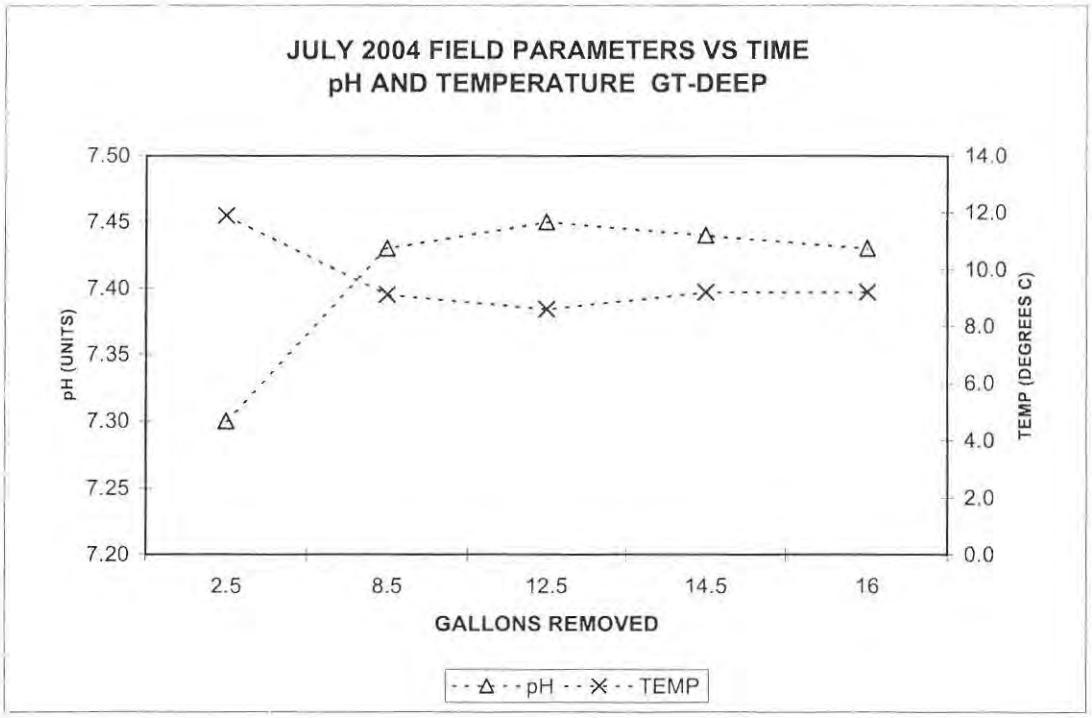


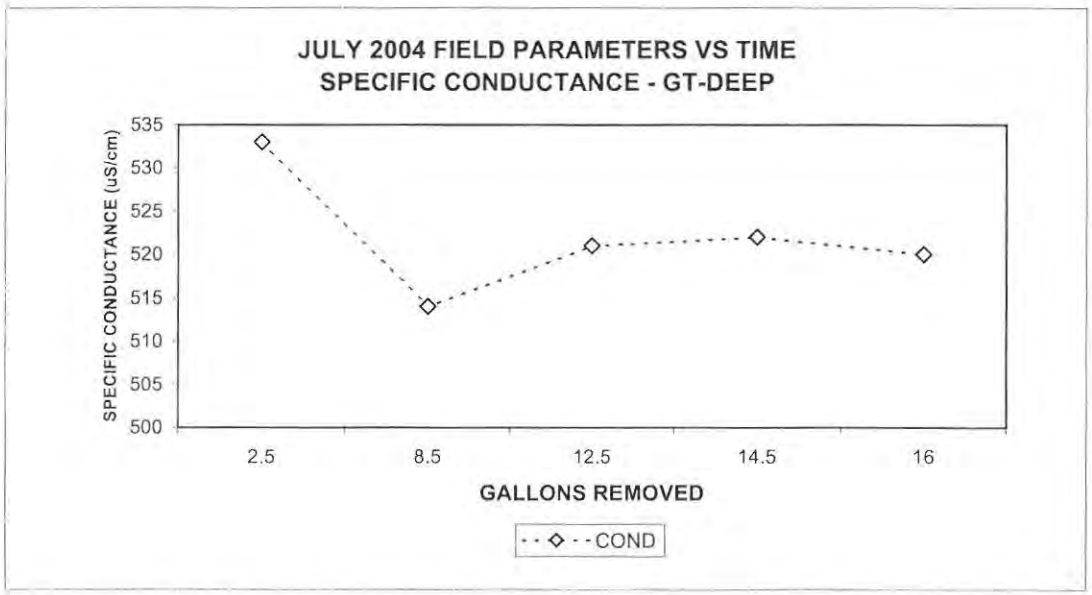


DRAFT

FIGURE A.6.8

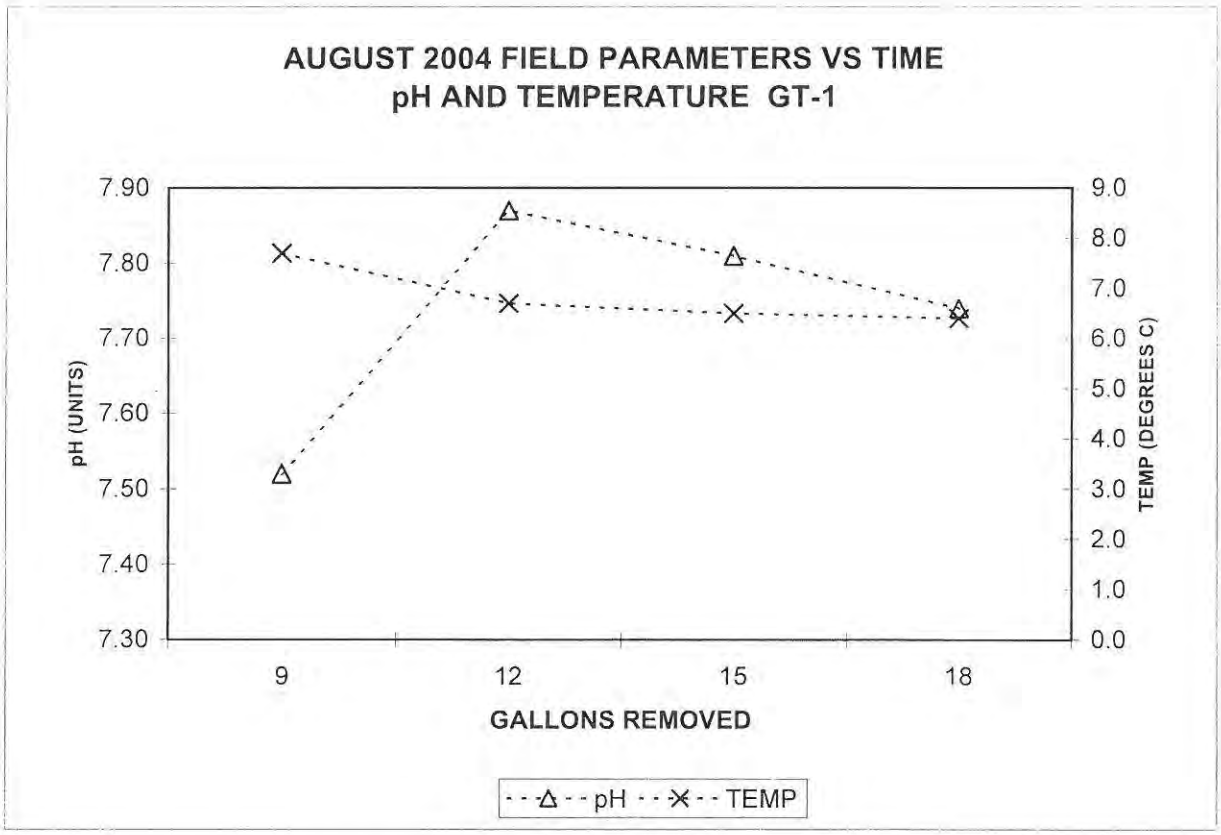
SAMPLING
FIELD WATER QUALITY PARAMETERS





DRAFT

FIGURE A.6.9



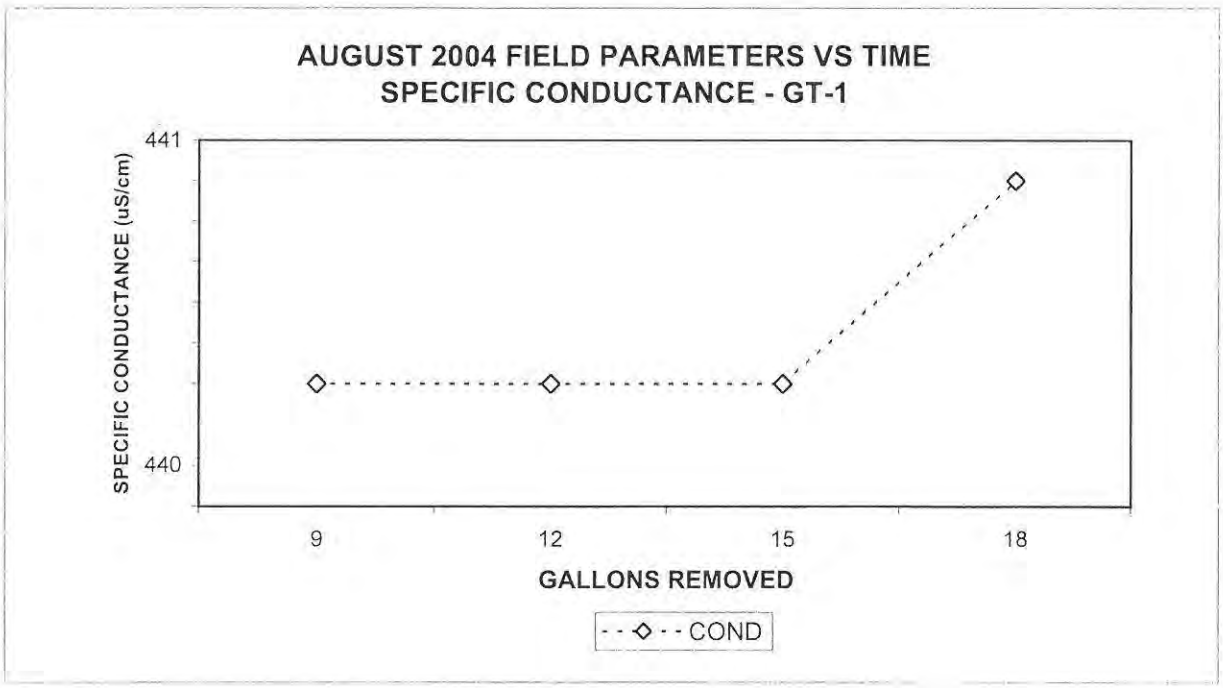


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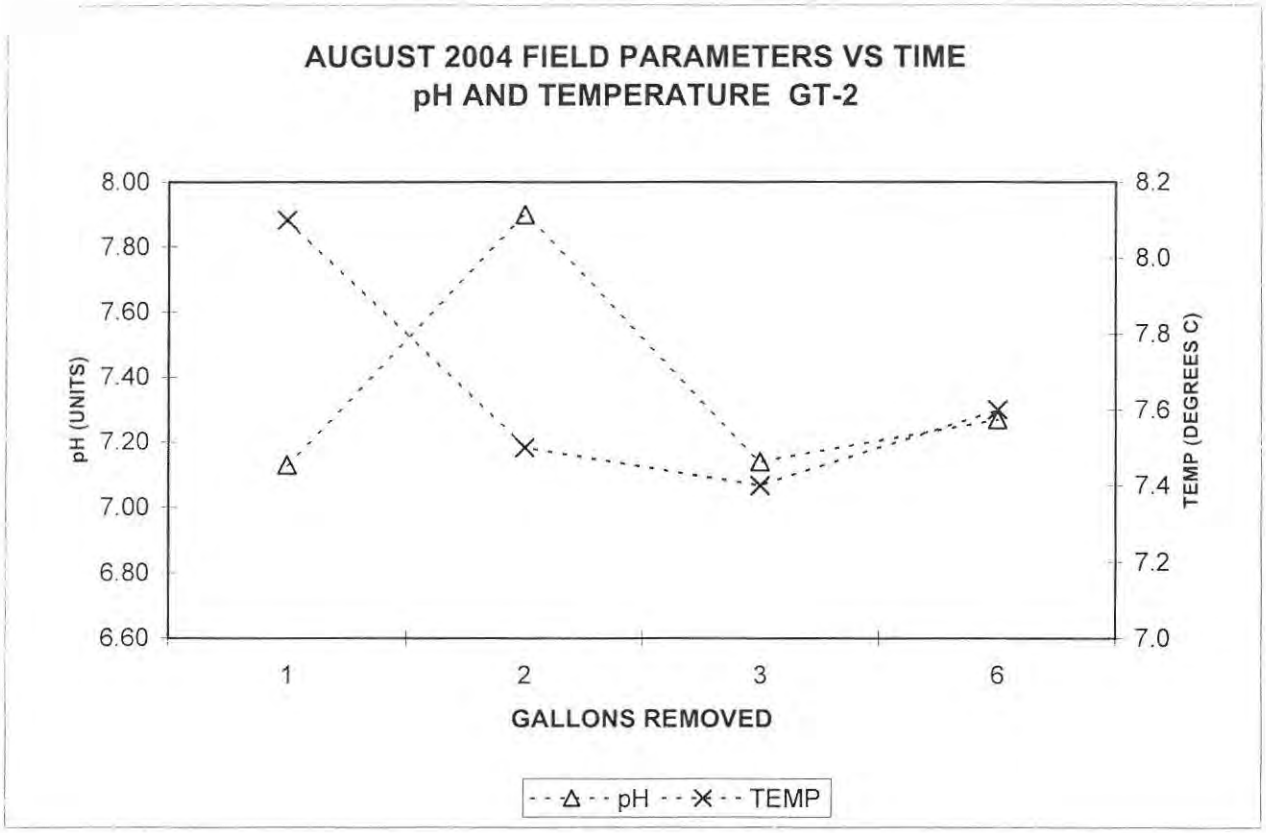
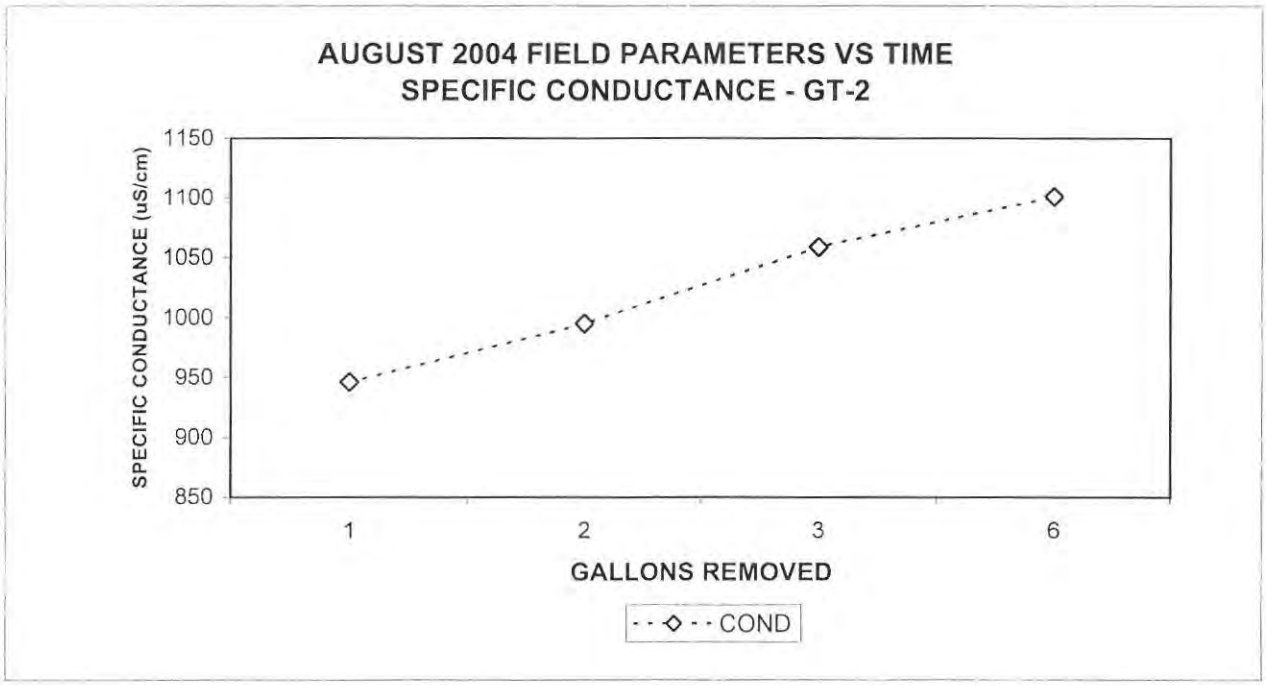
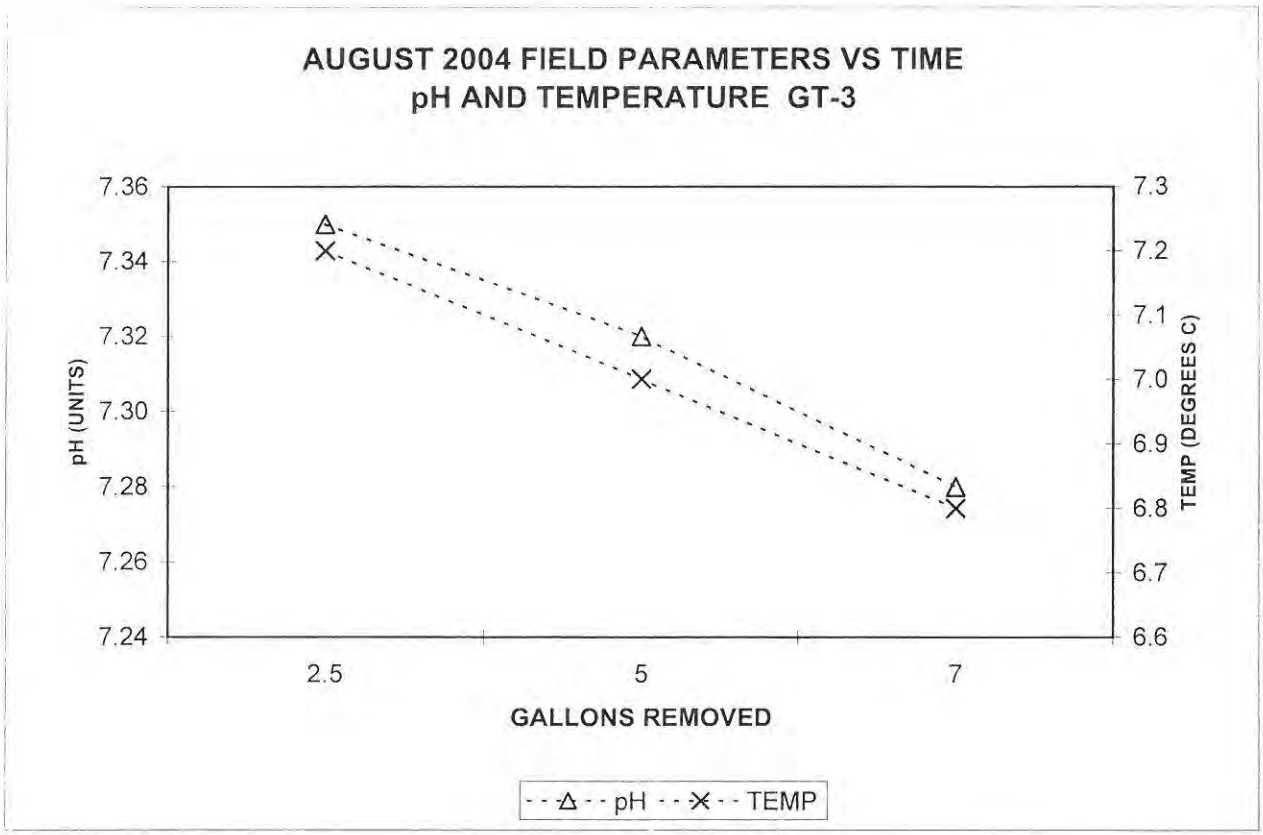
FIGURE A.6.10

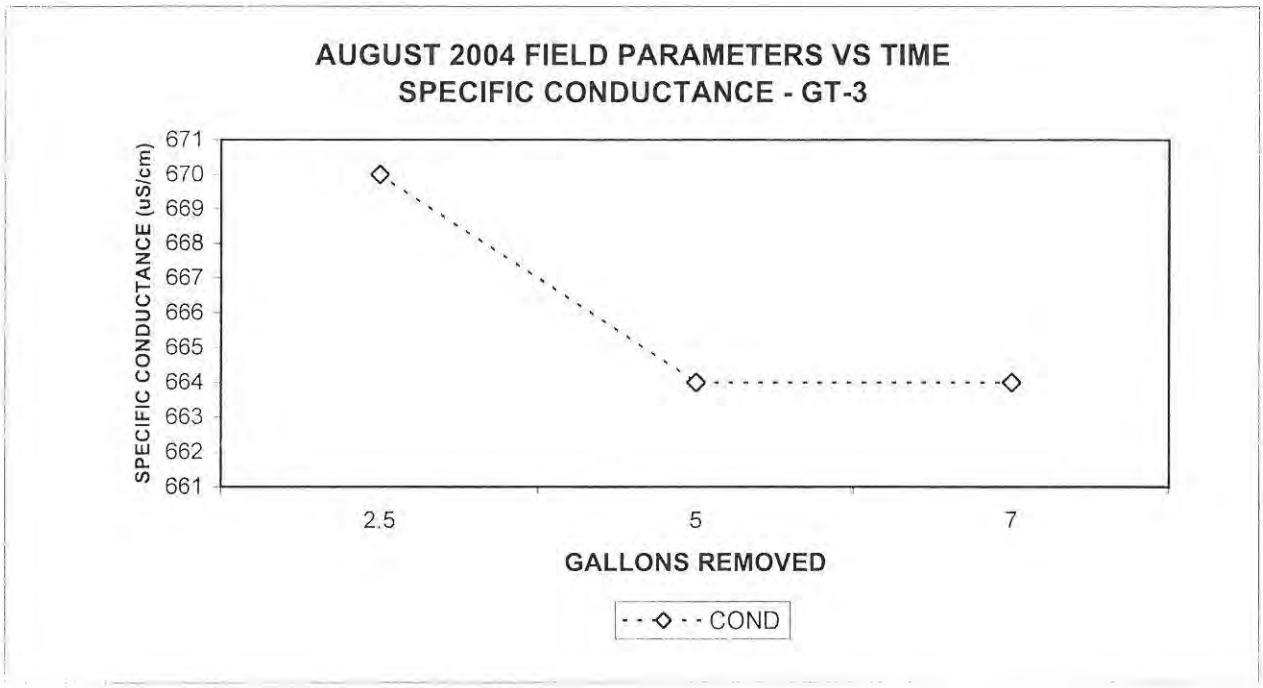




DRAFT

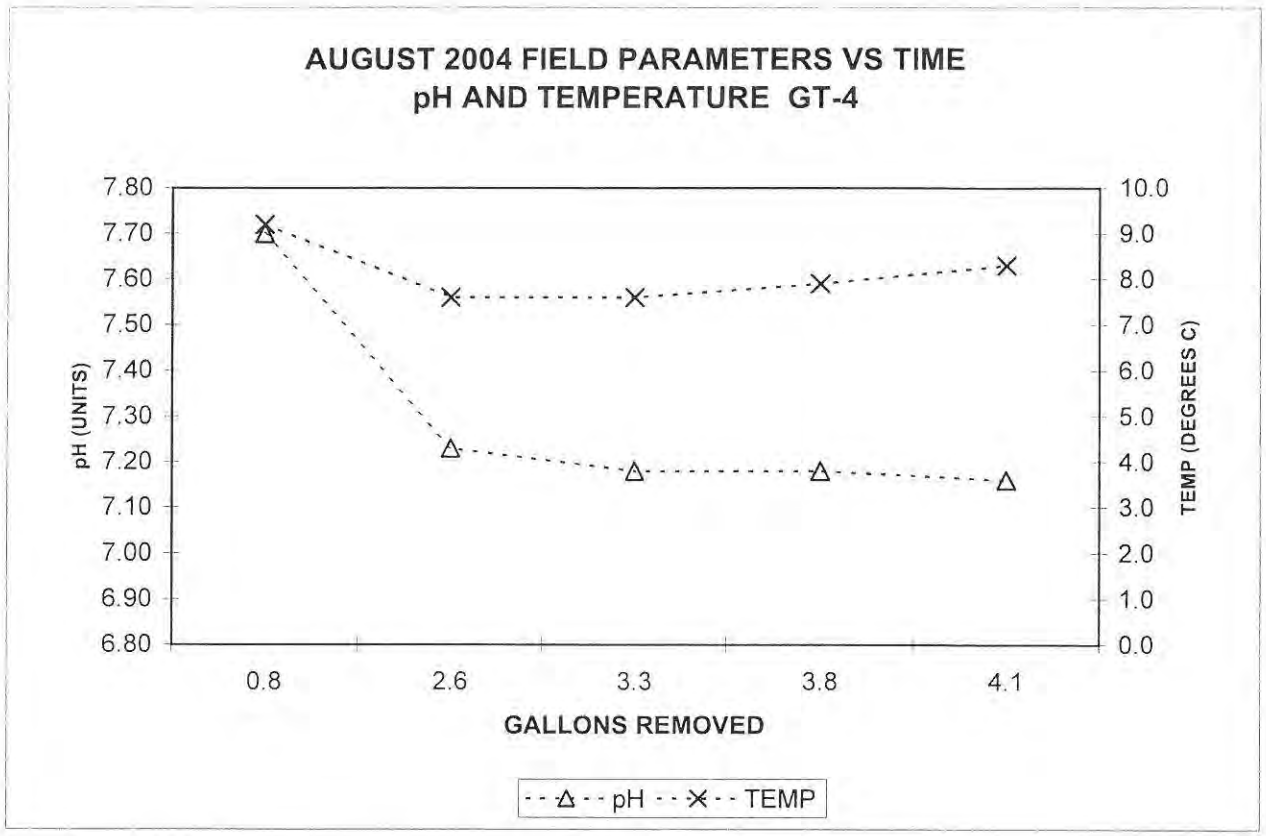
FIGURE A.6.11





DRAFT

FIGURE A.6.12



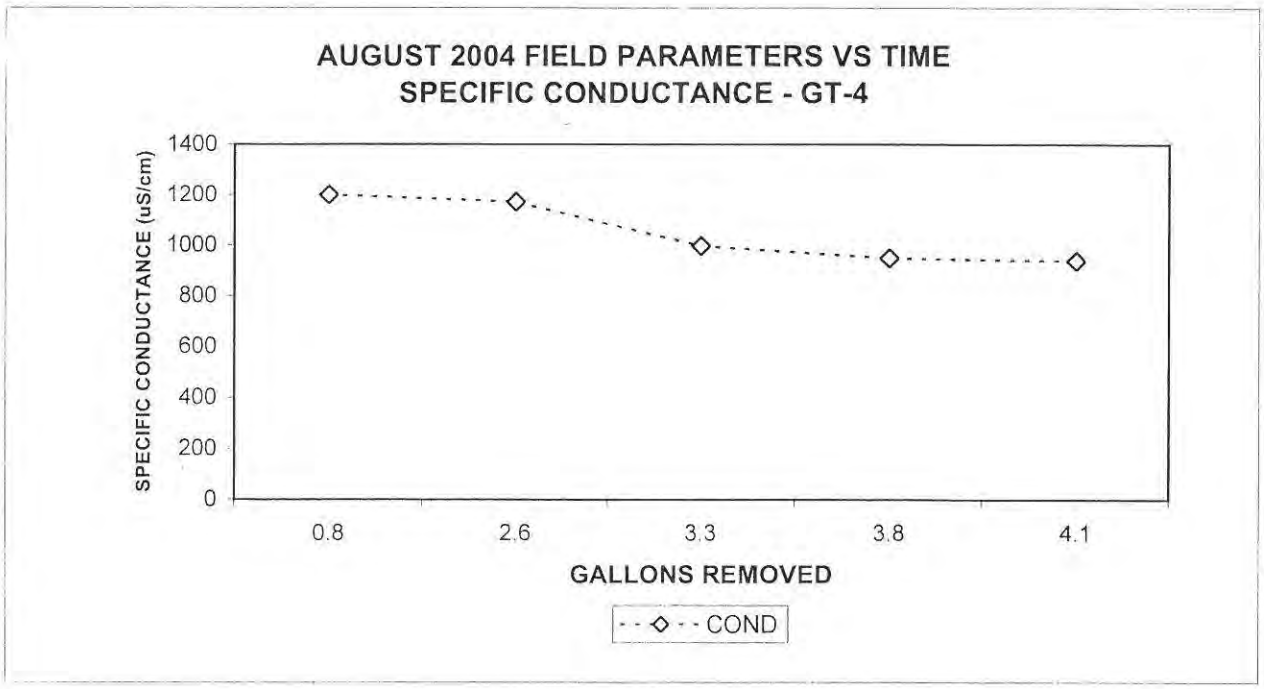


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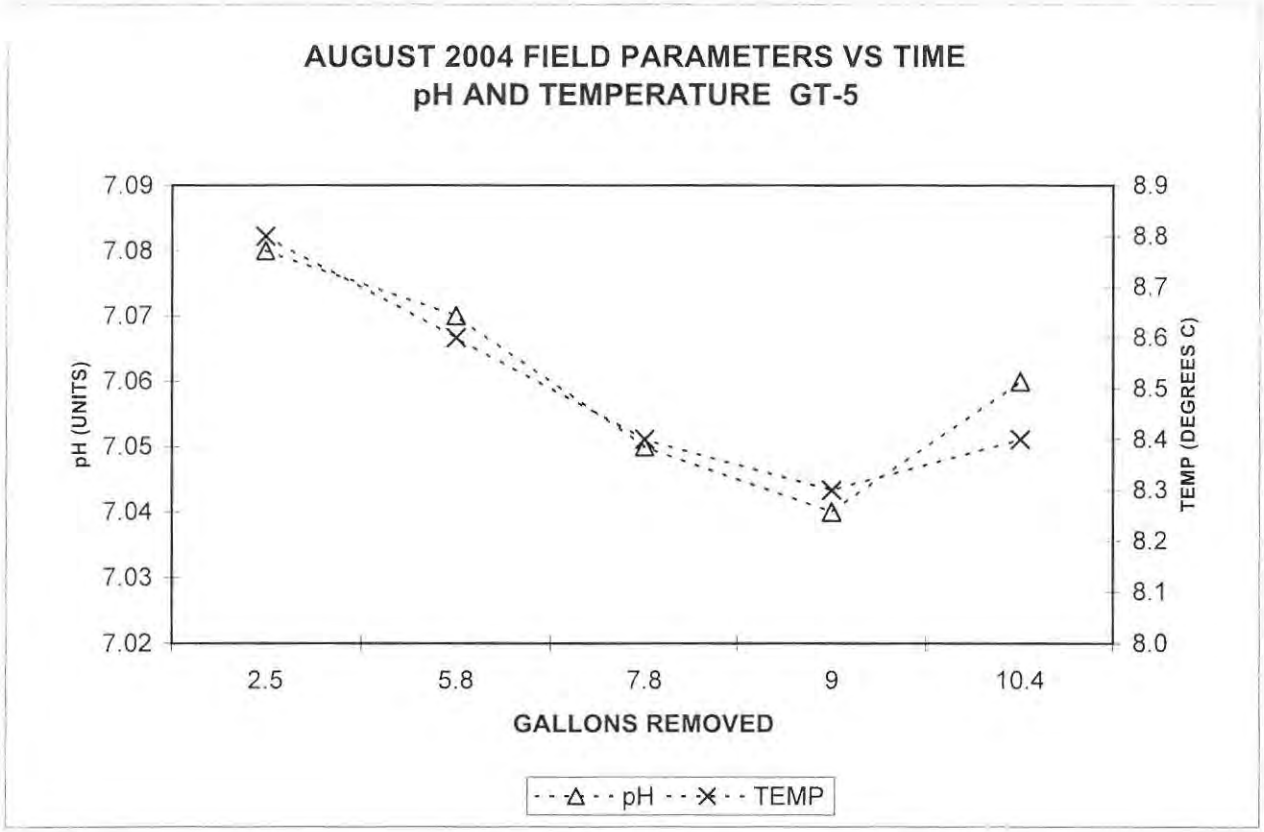
FIGURE A.6.13



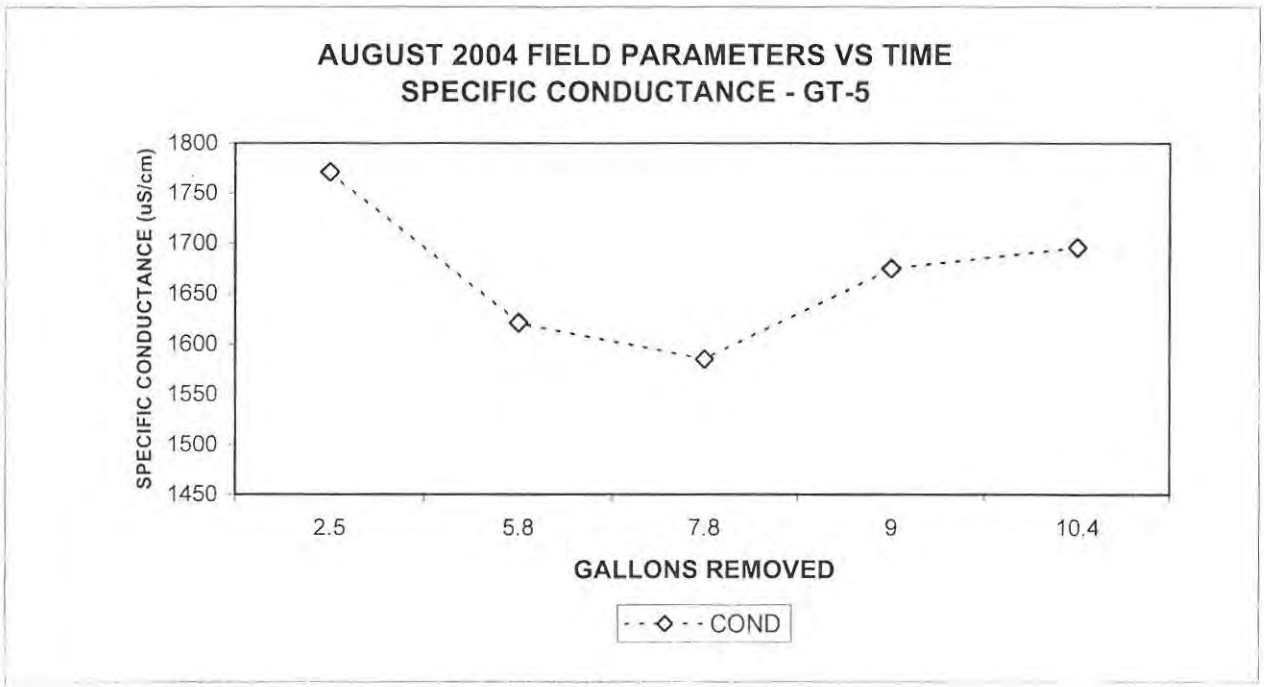


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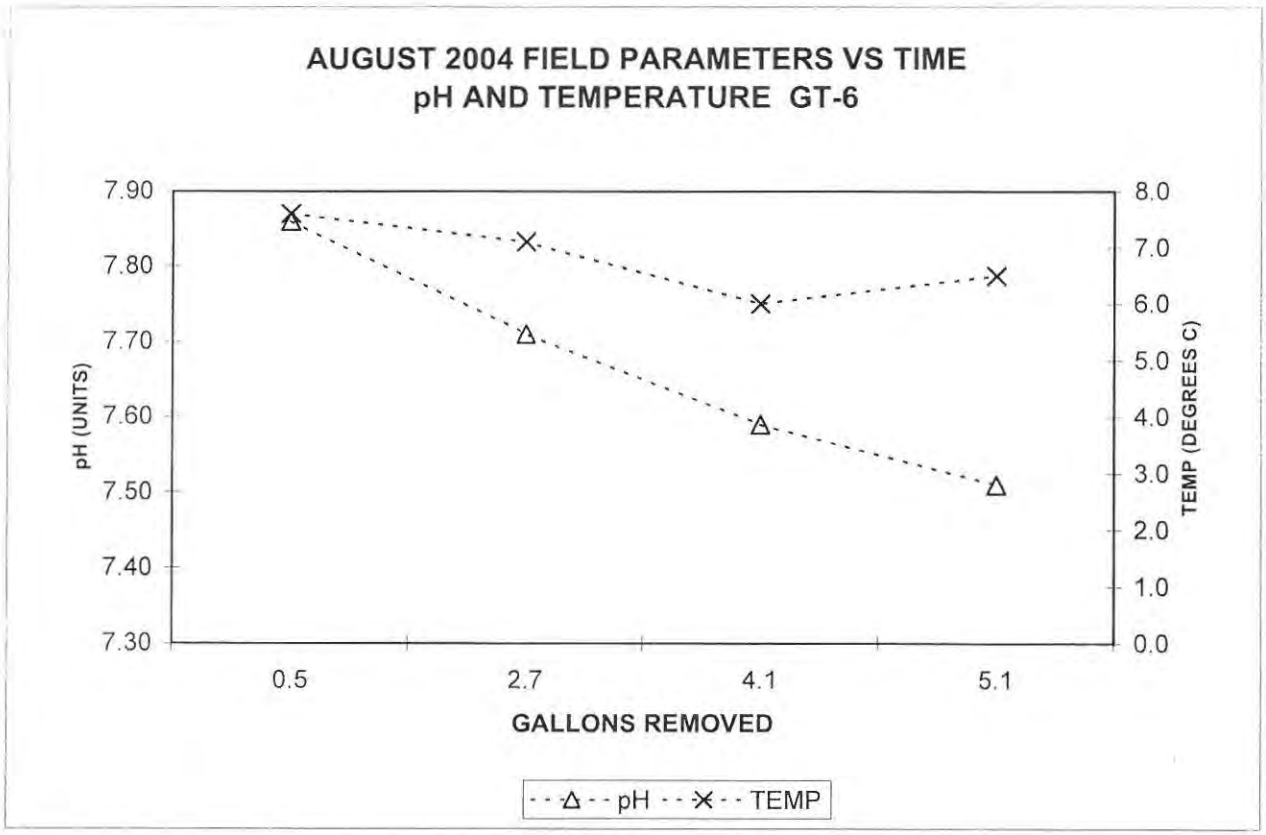
FIGURE A.6.14



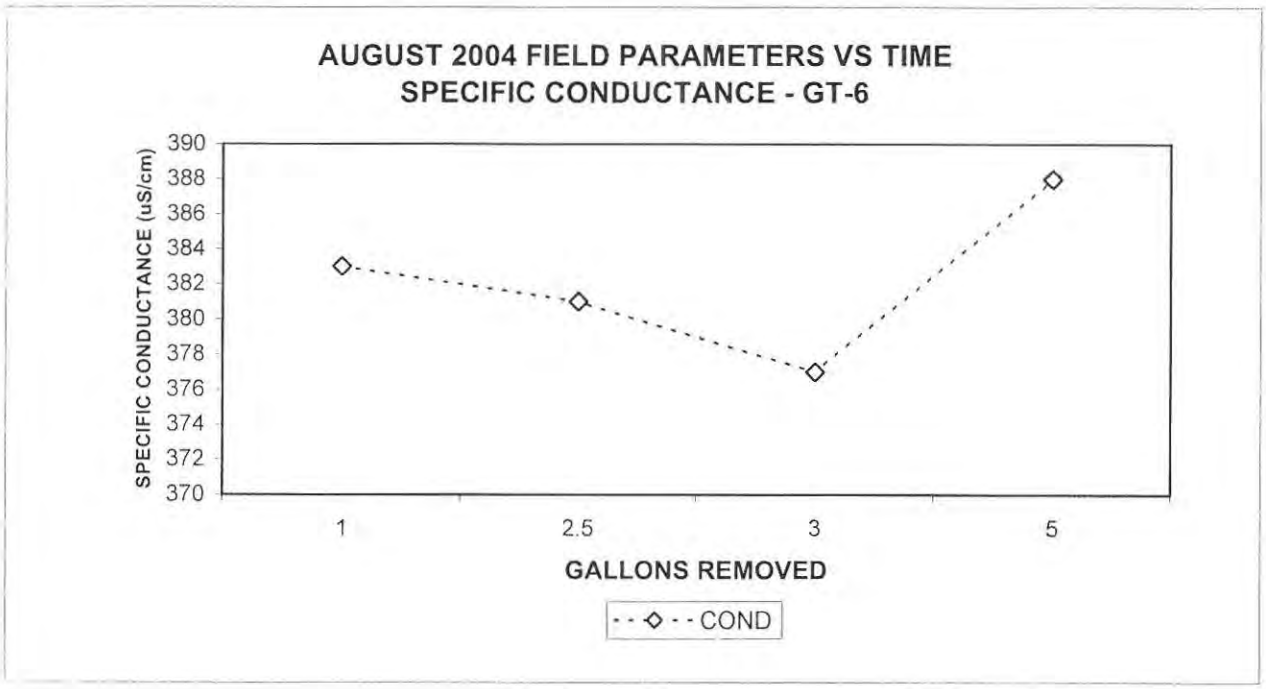


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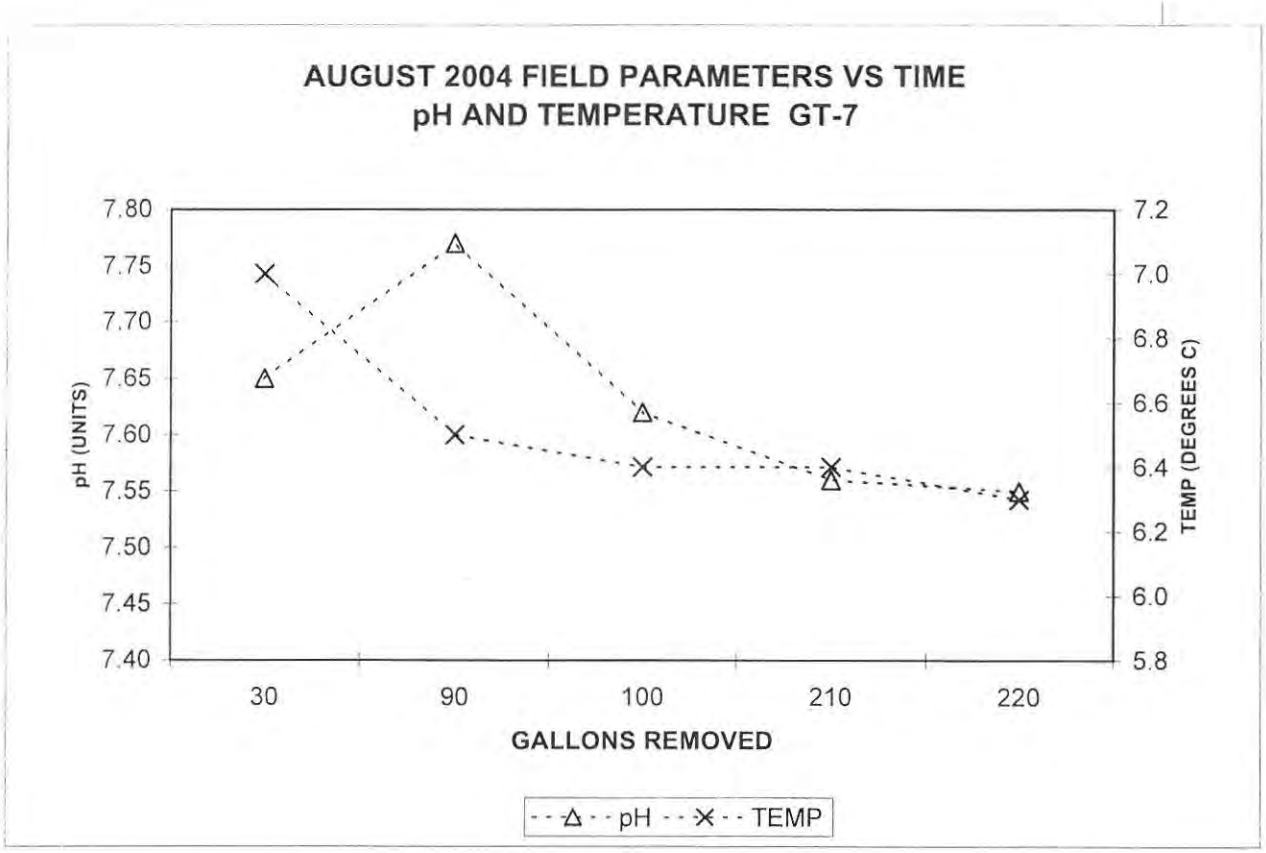
FIGURE A.6.15



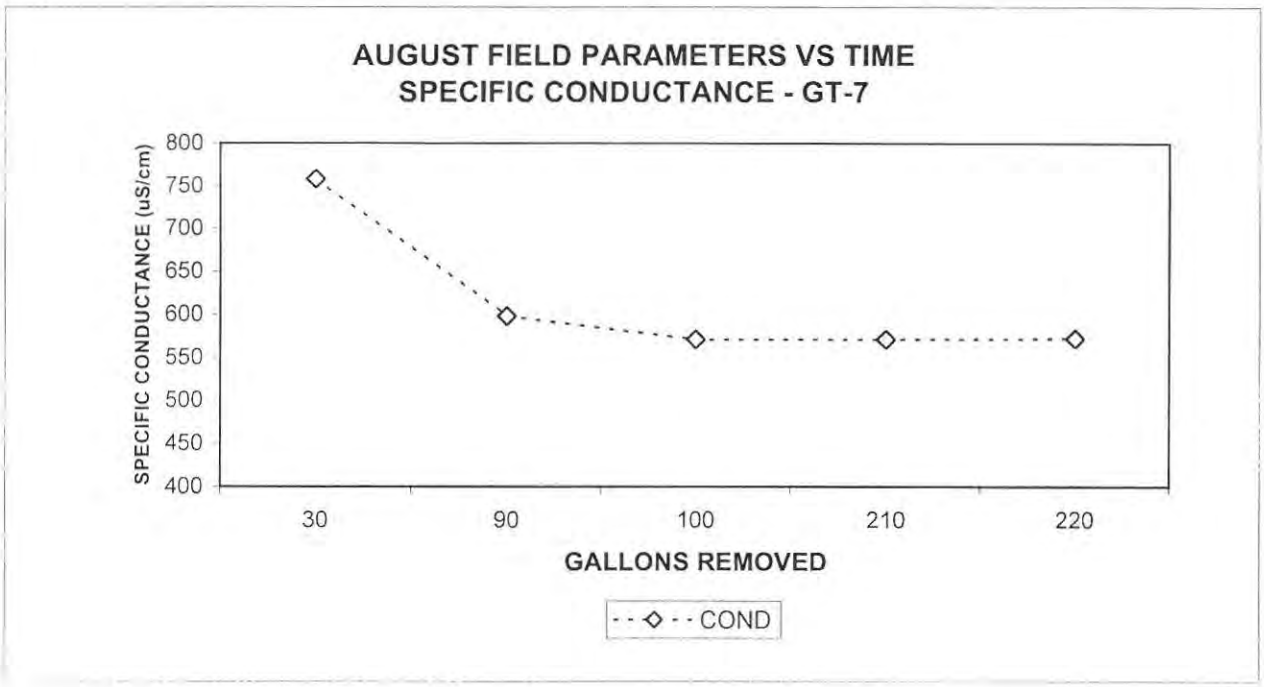


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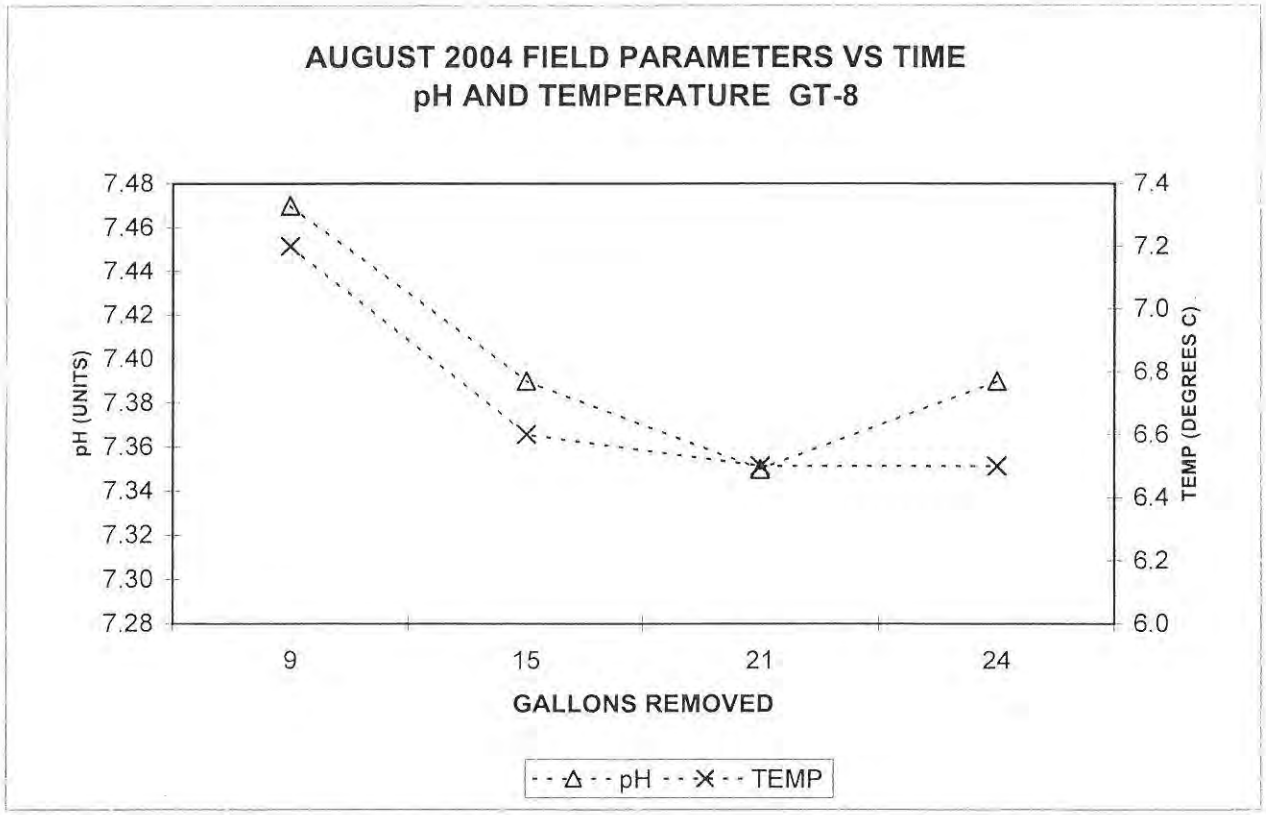
FIGURE A.6.16



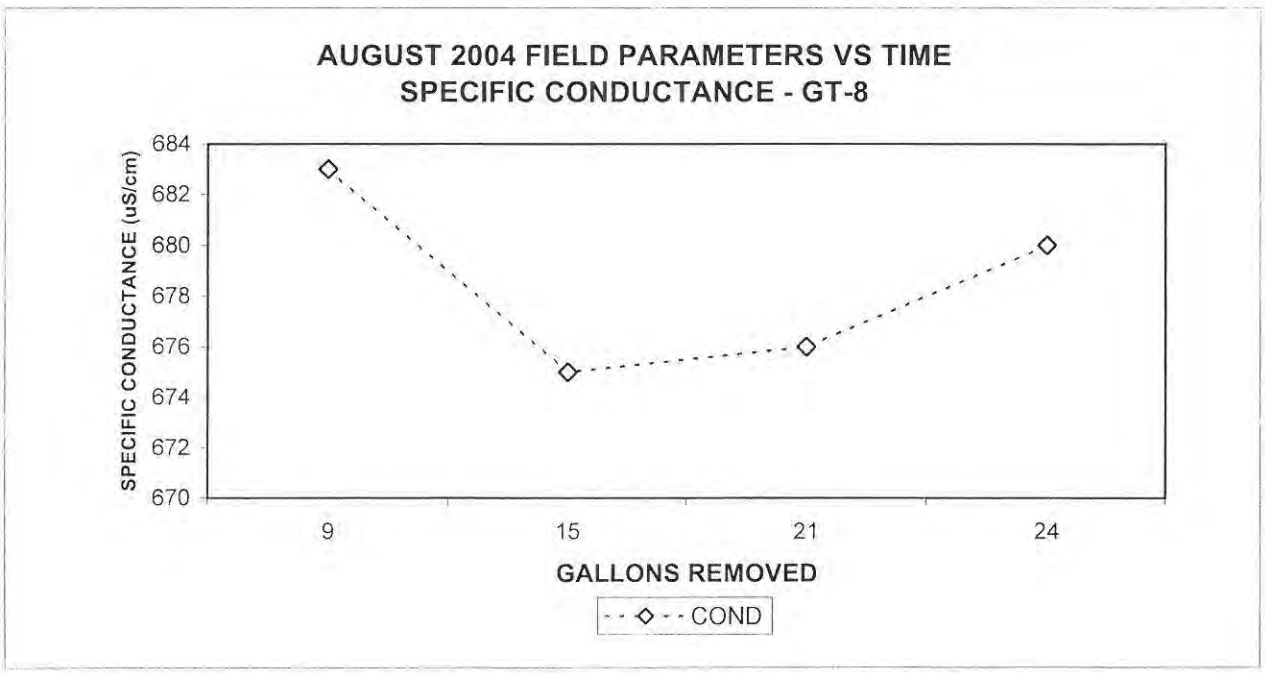


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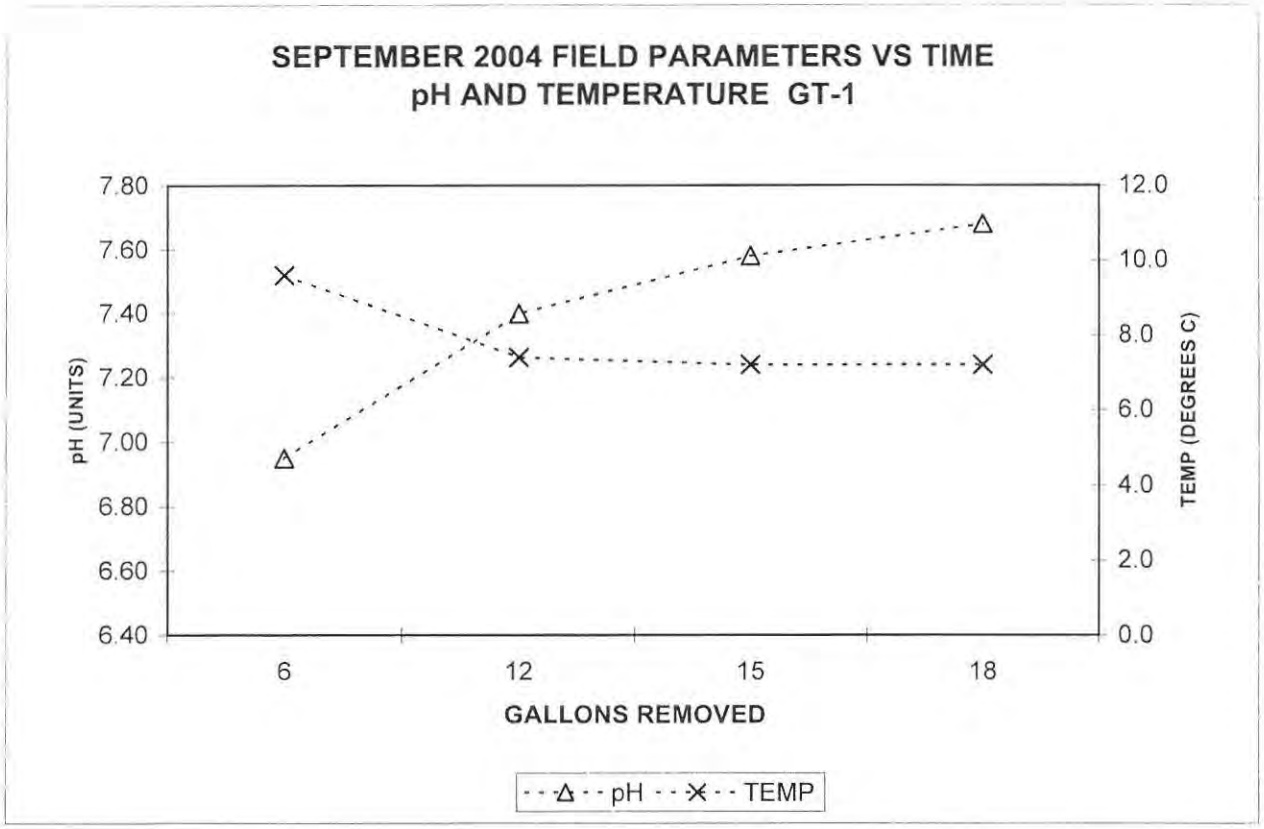
FIGURE A.6.17



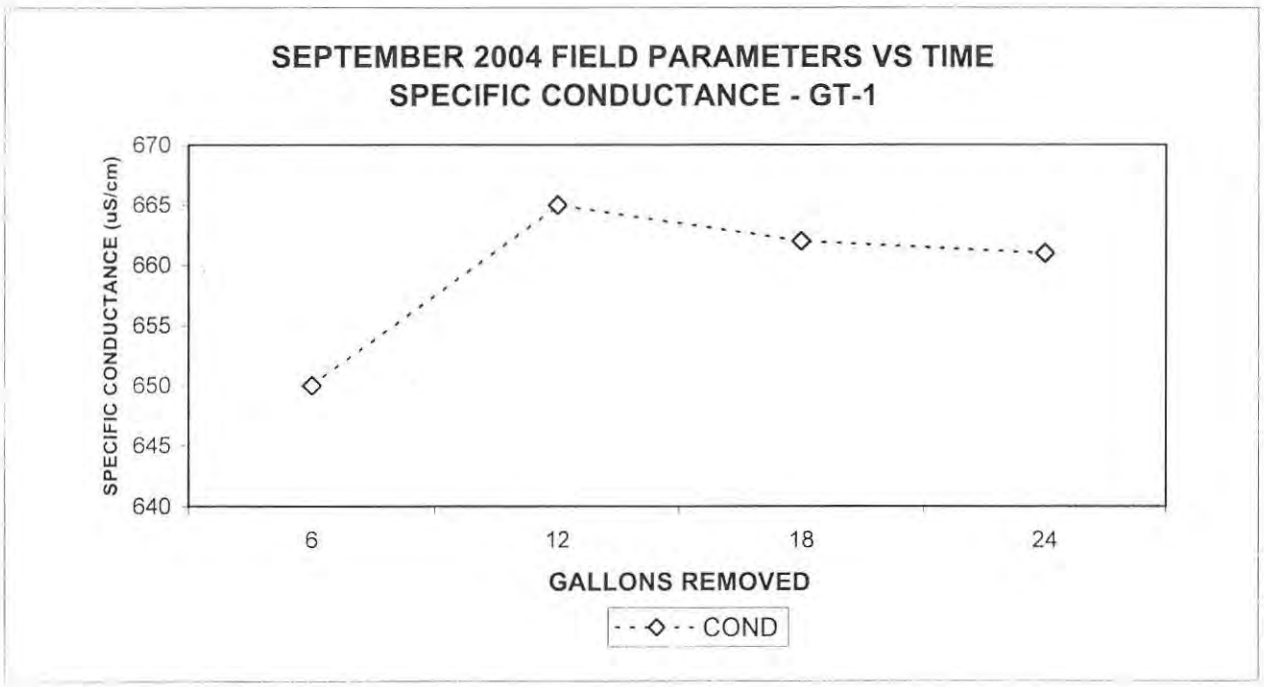


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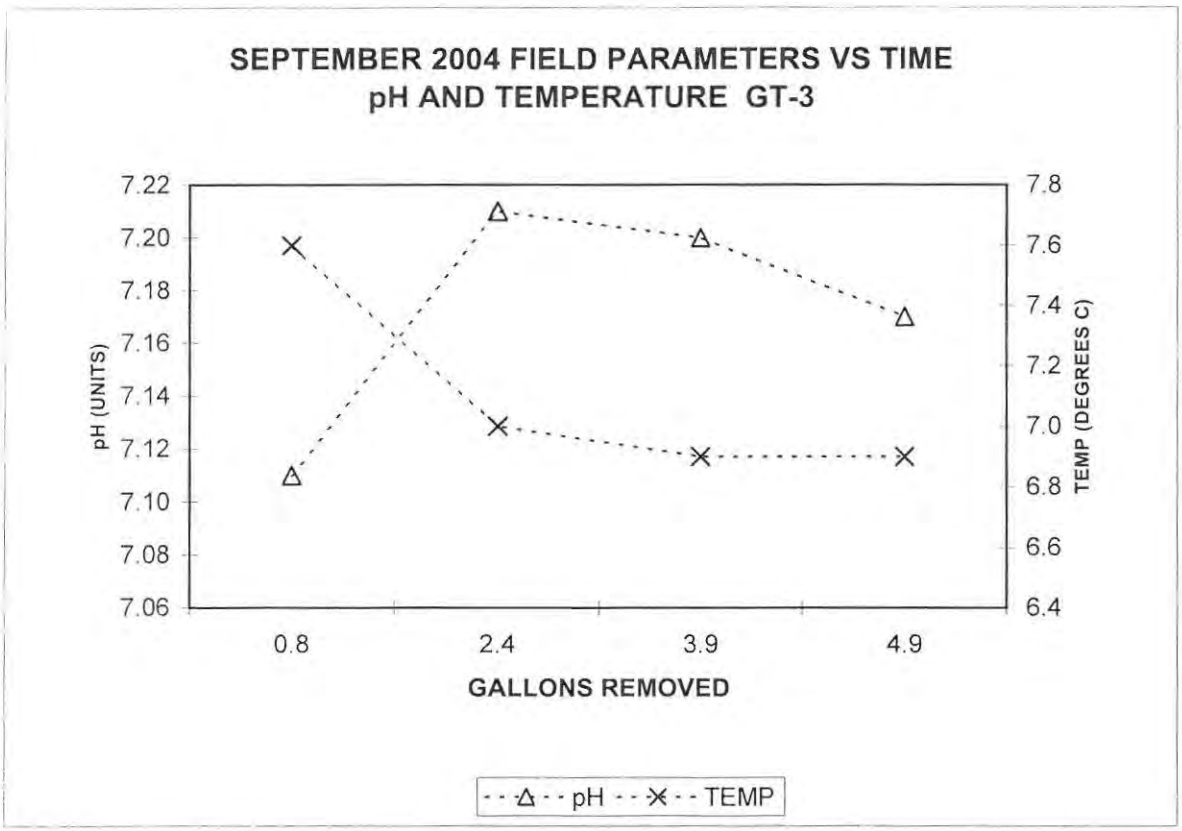
FIGURE A.6.18



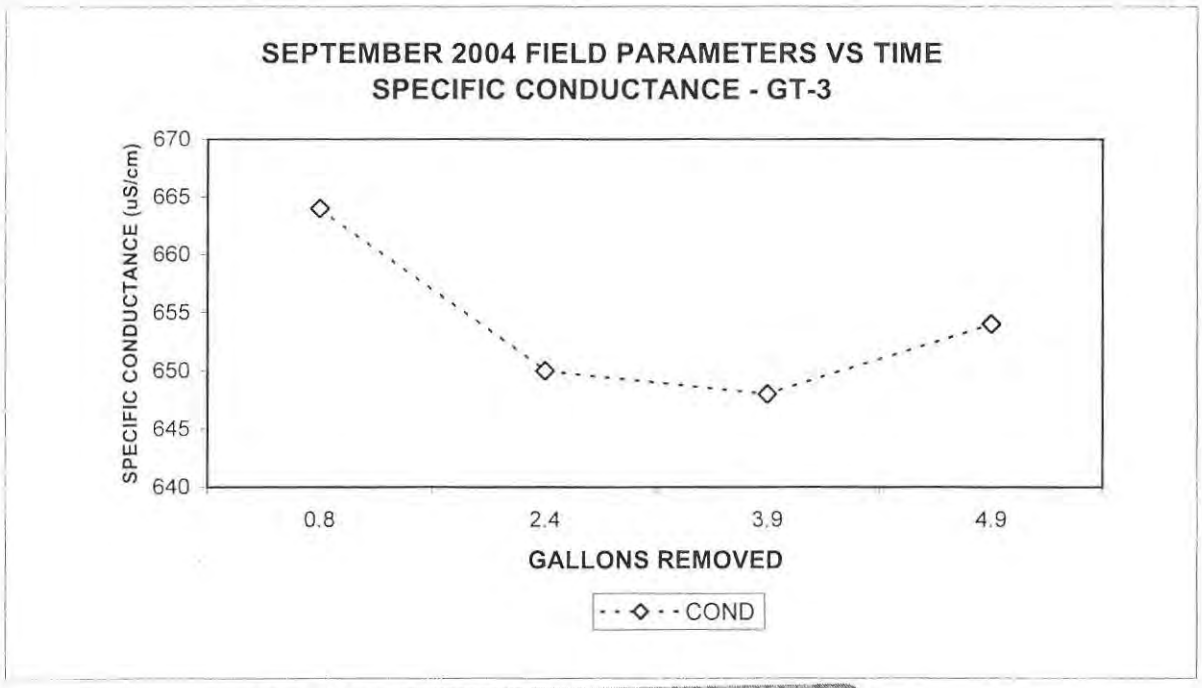


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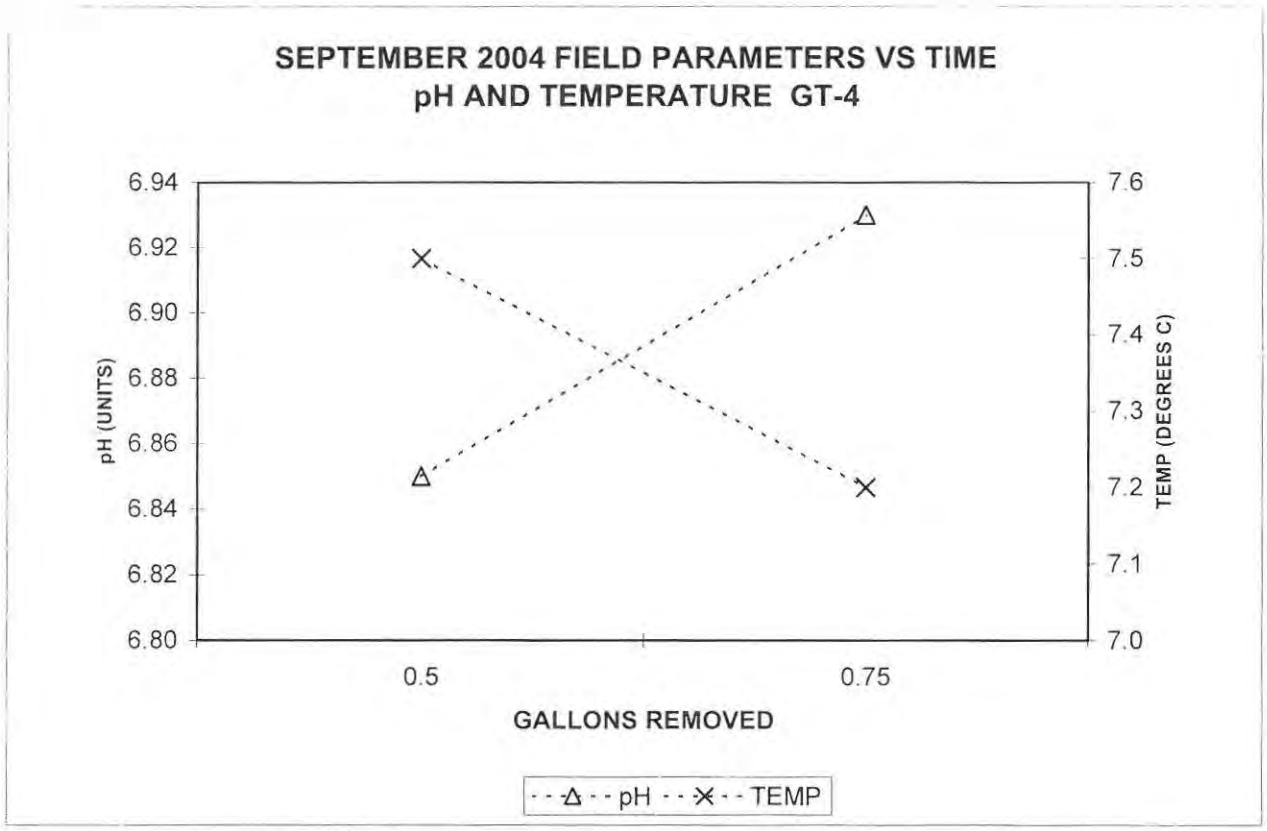
FIGURE A.6.19



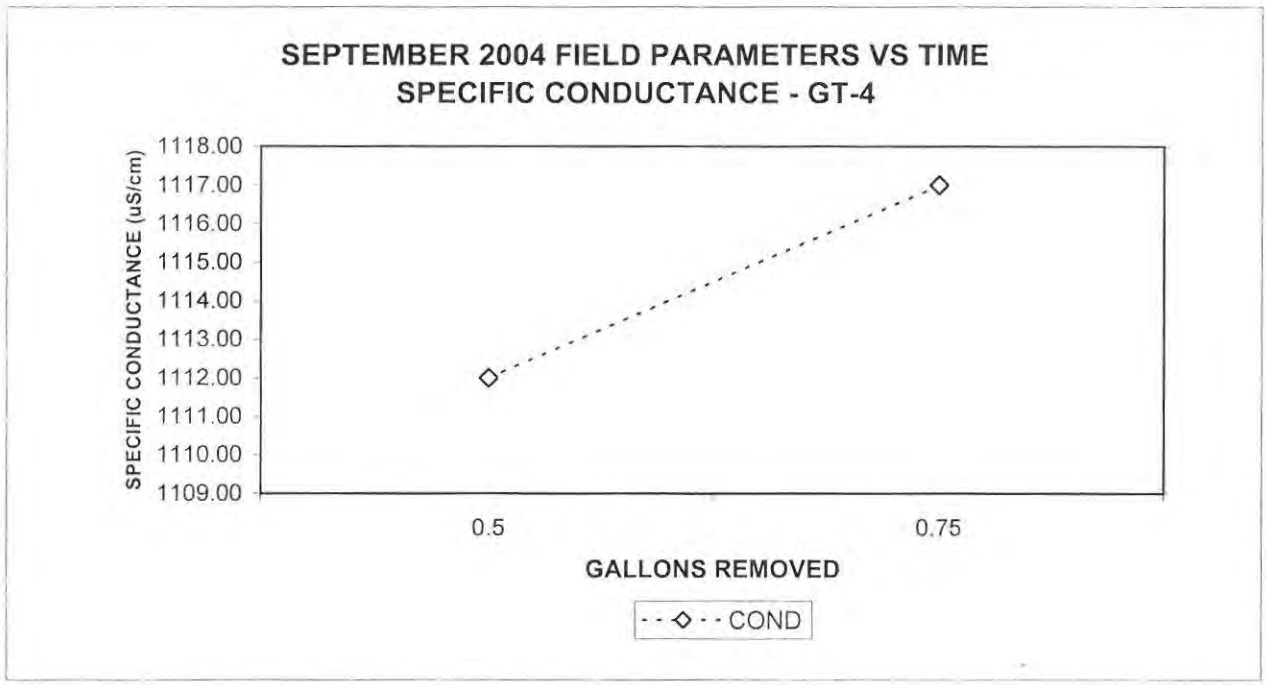


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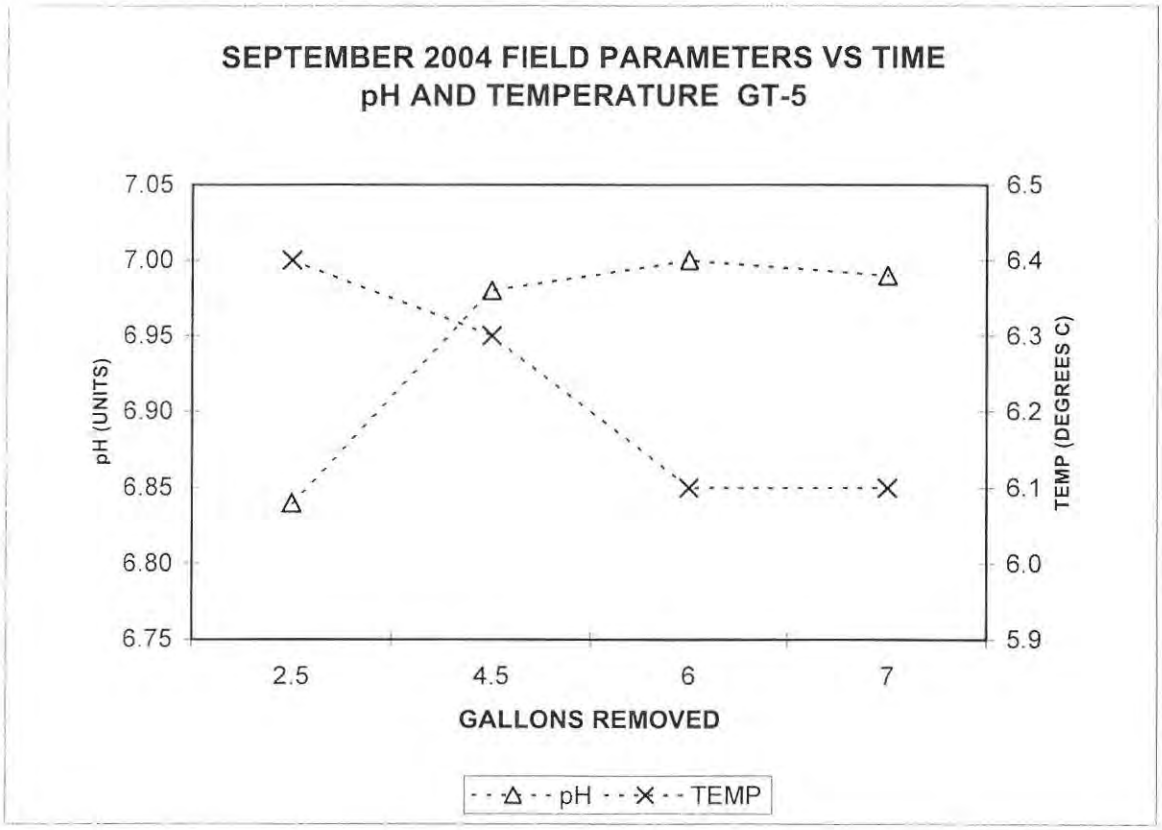
FIGURE A.6.20



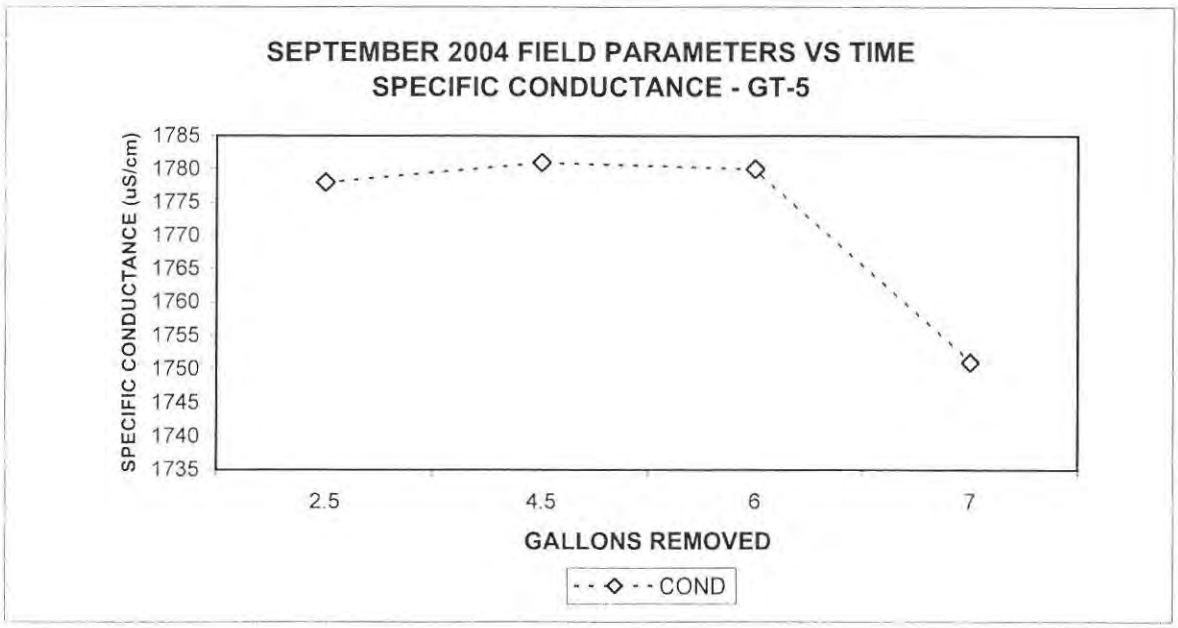


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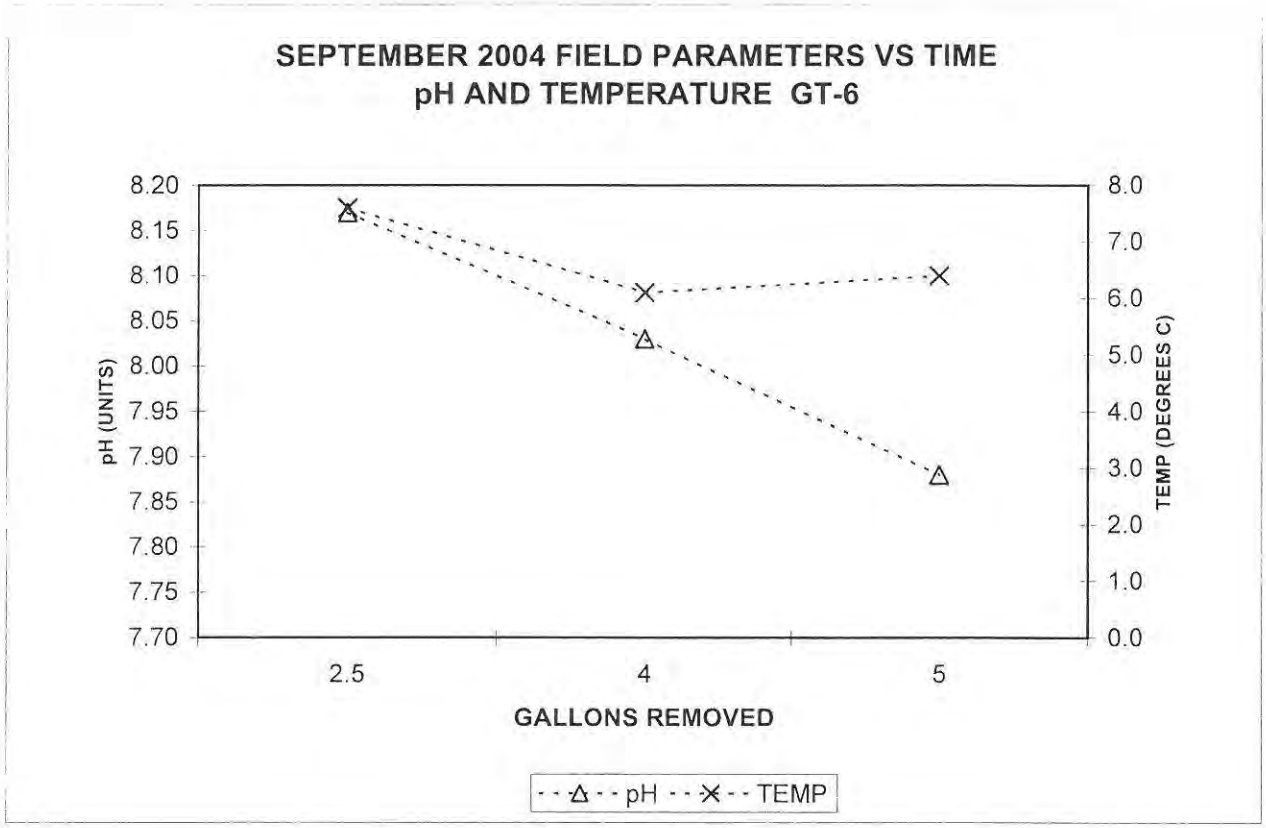
FIGURE A.6.21



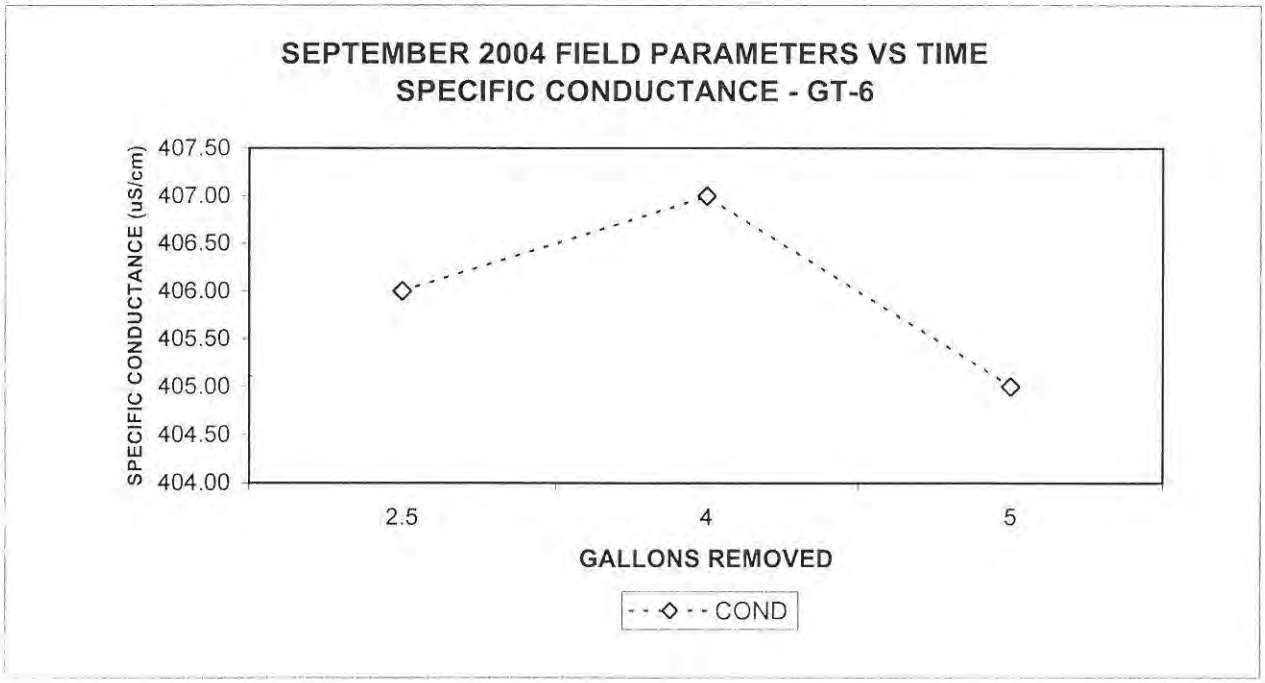


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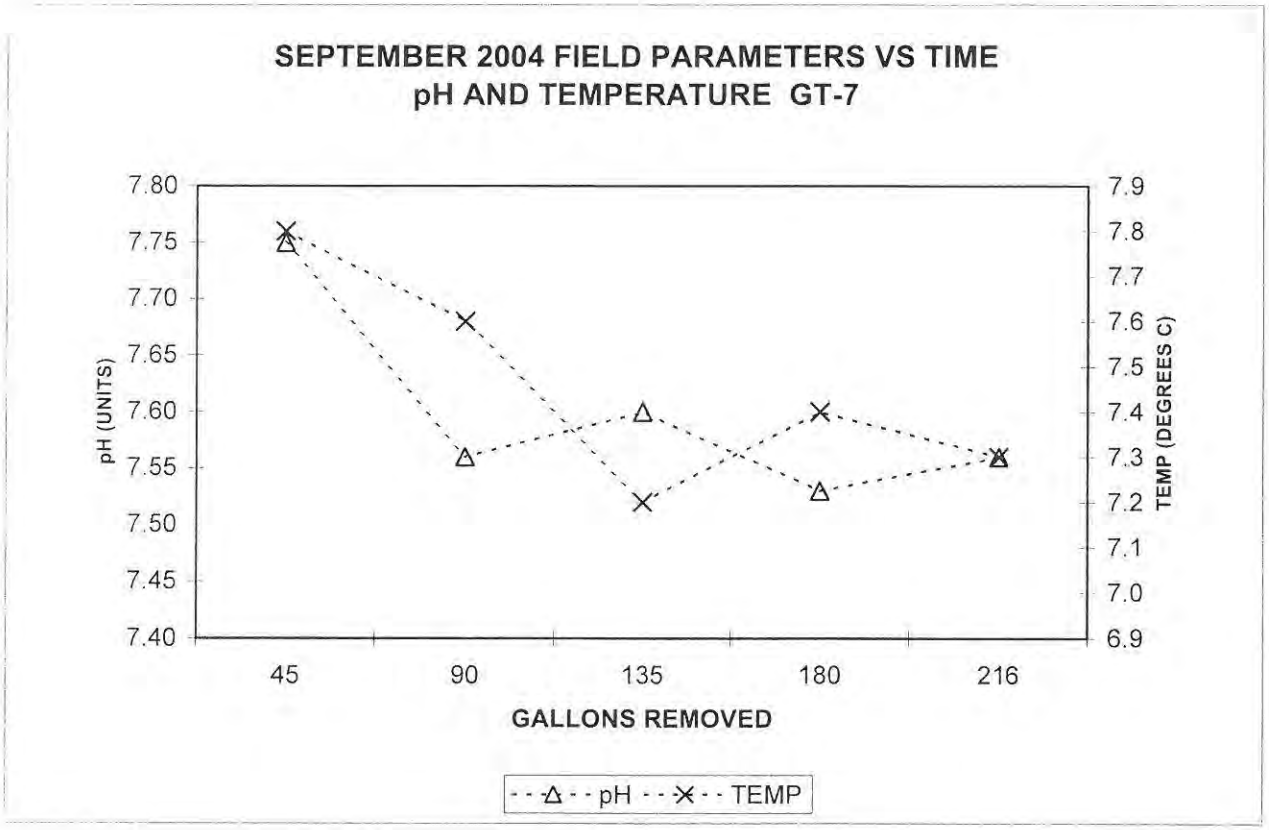
FIGURE A.6.22



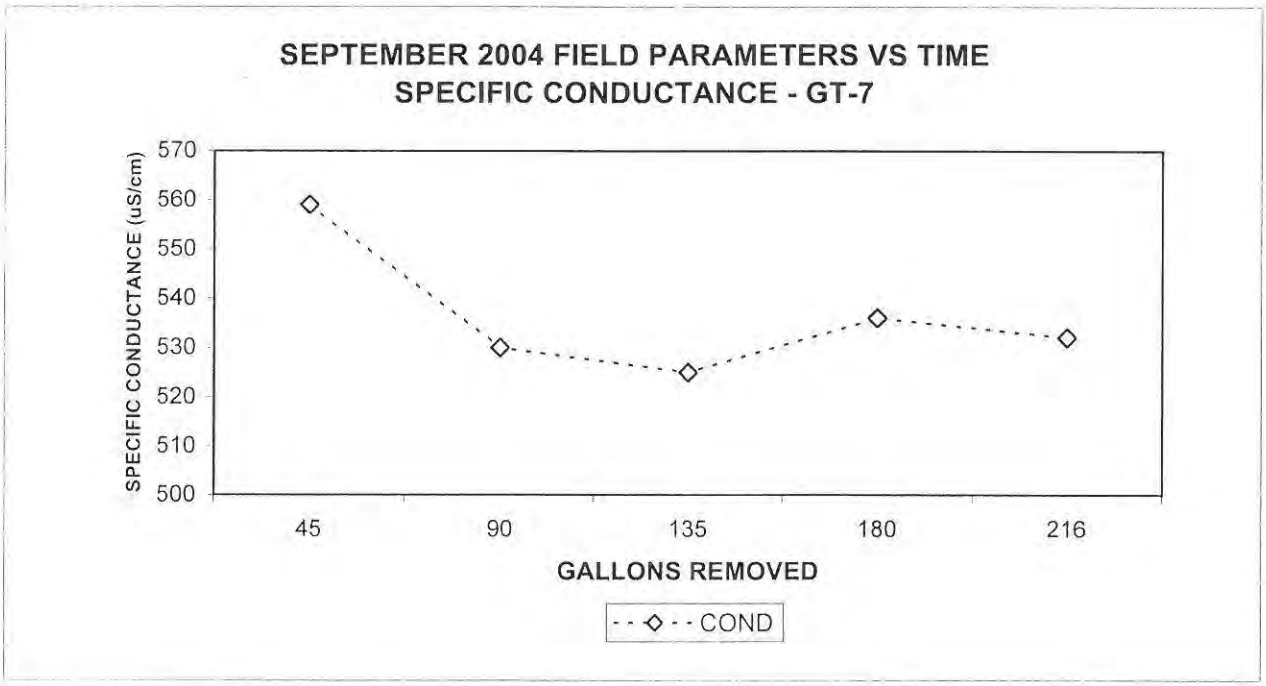


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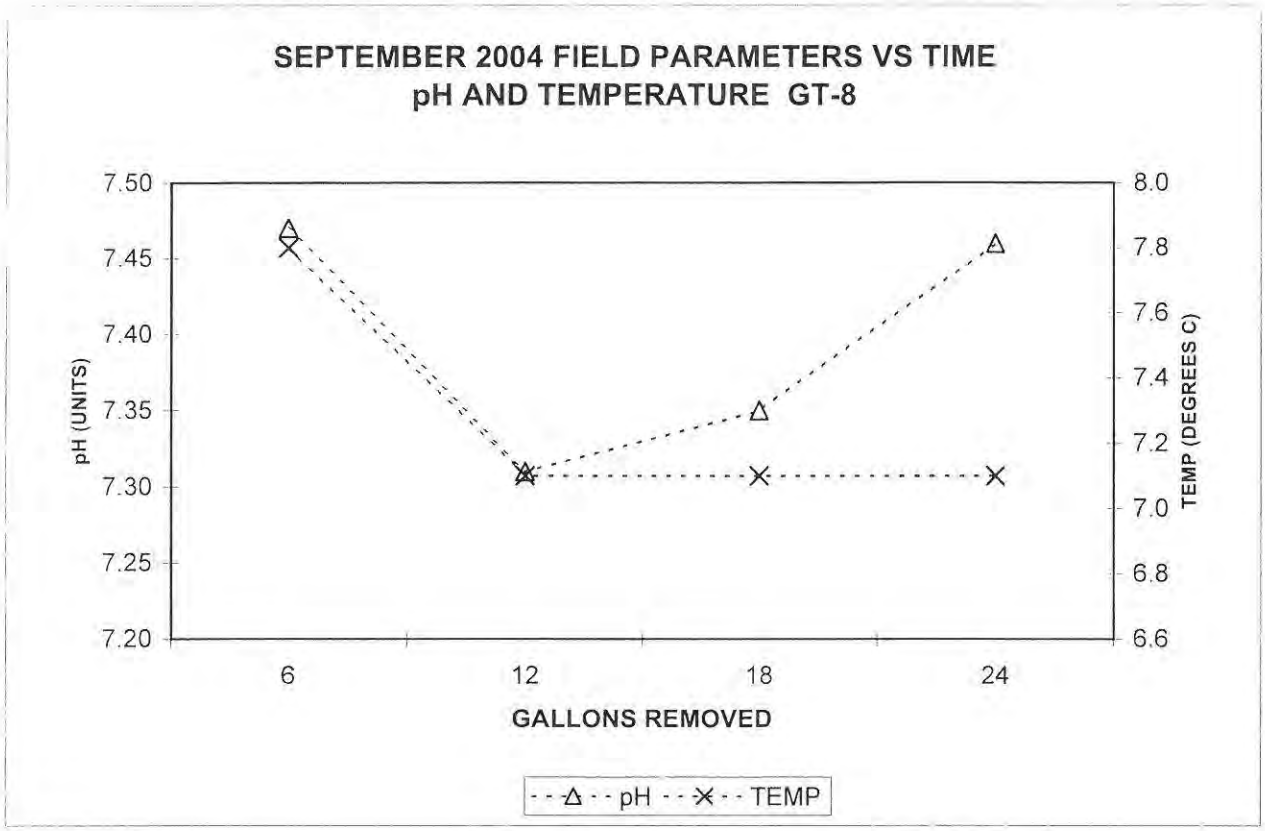
FIGURE A.6.23



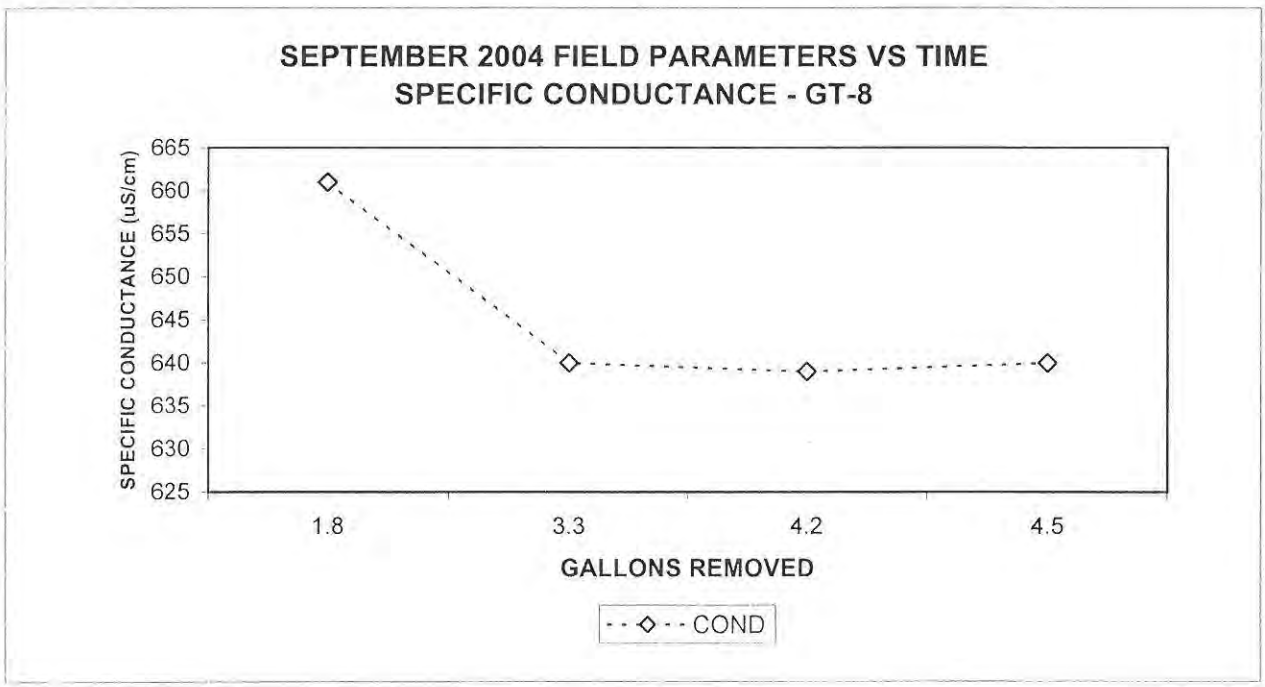


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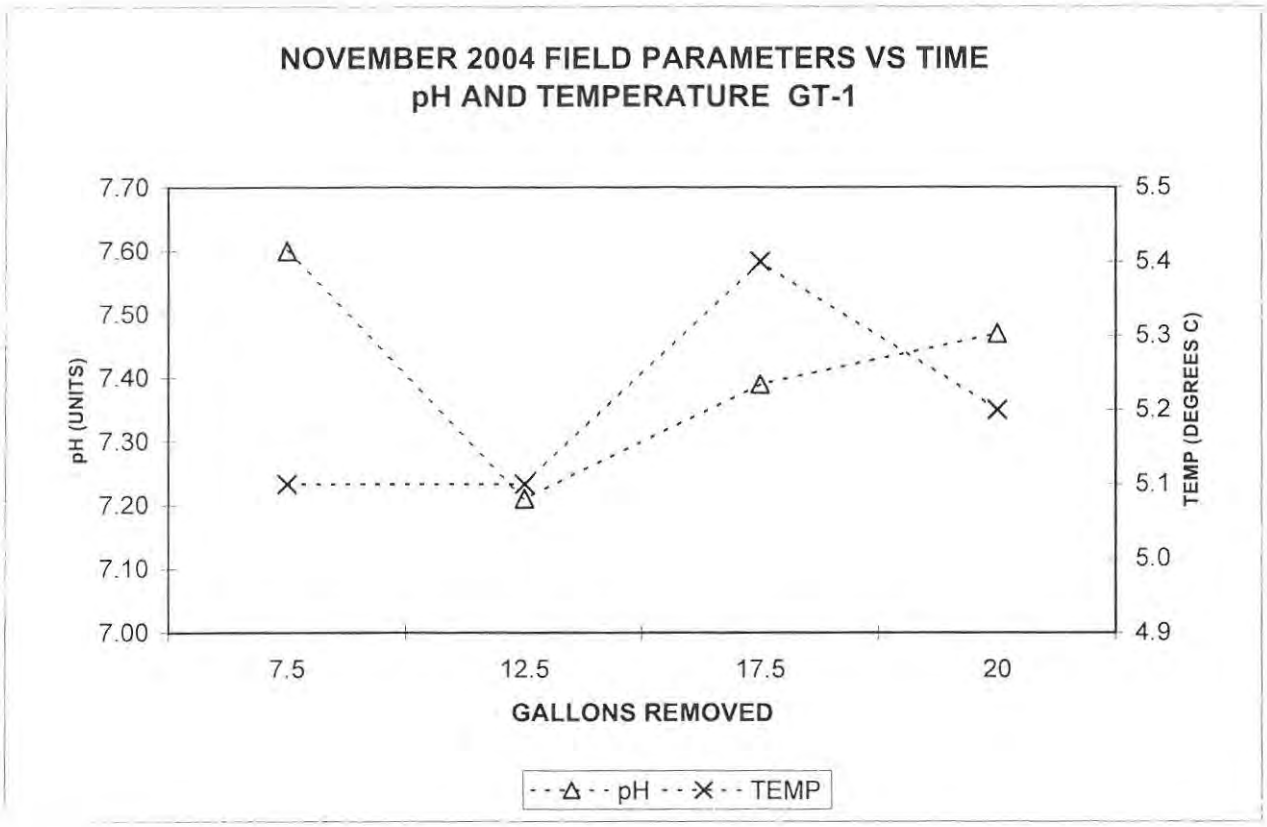
FIGURE A.6.24



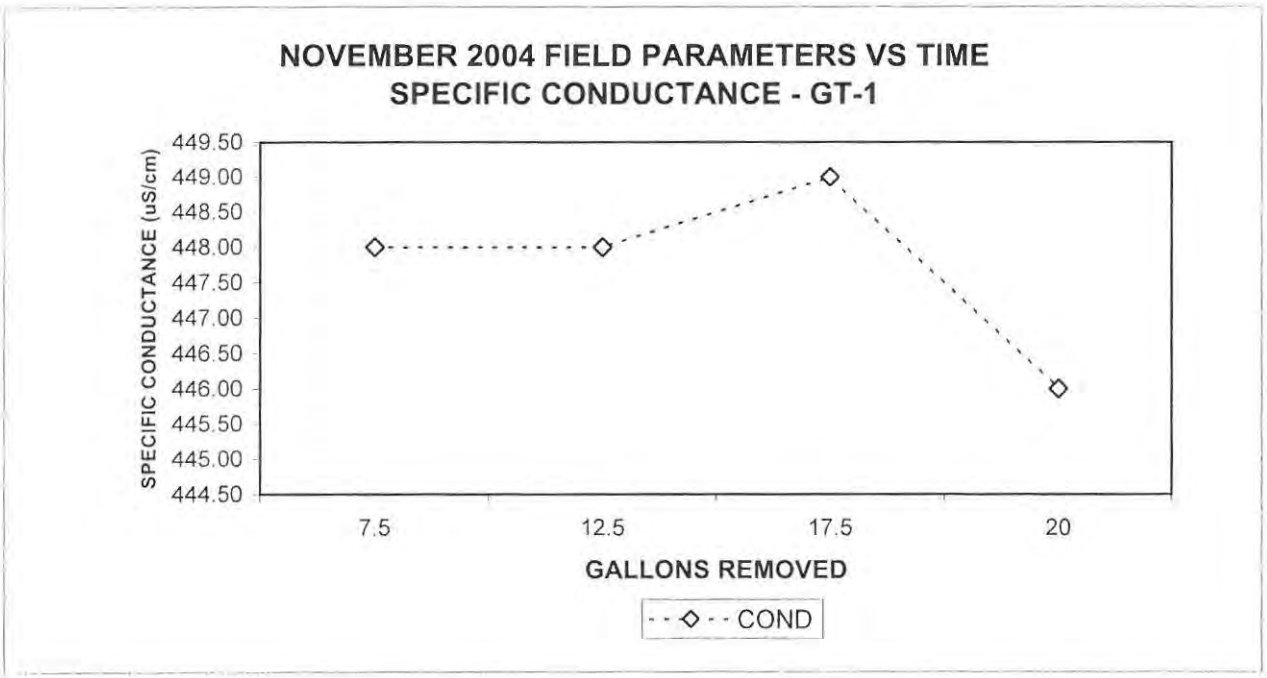


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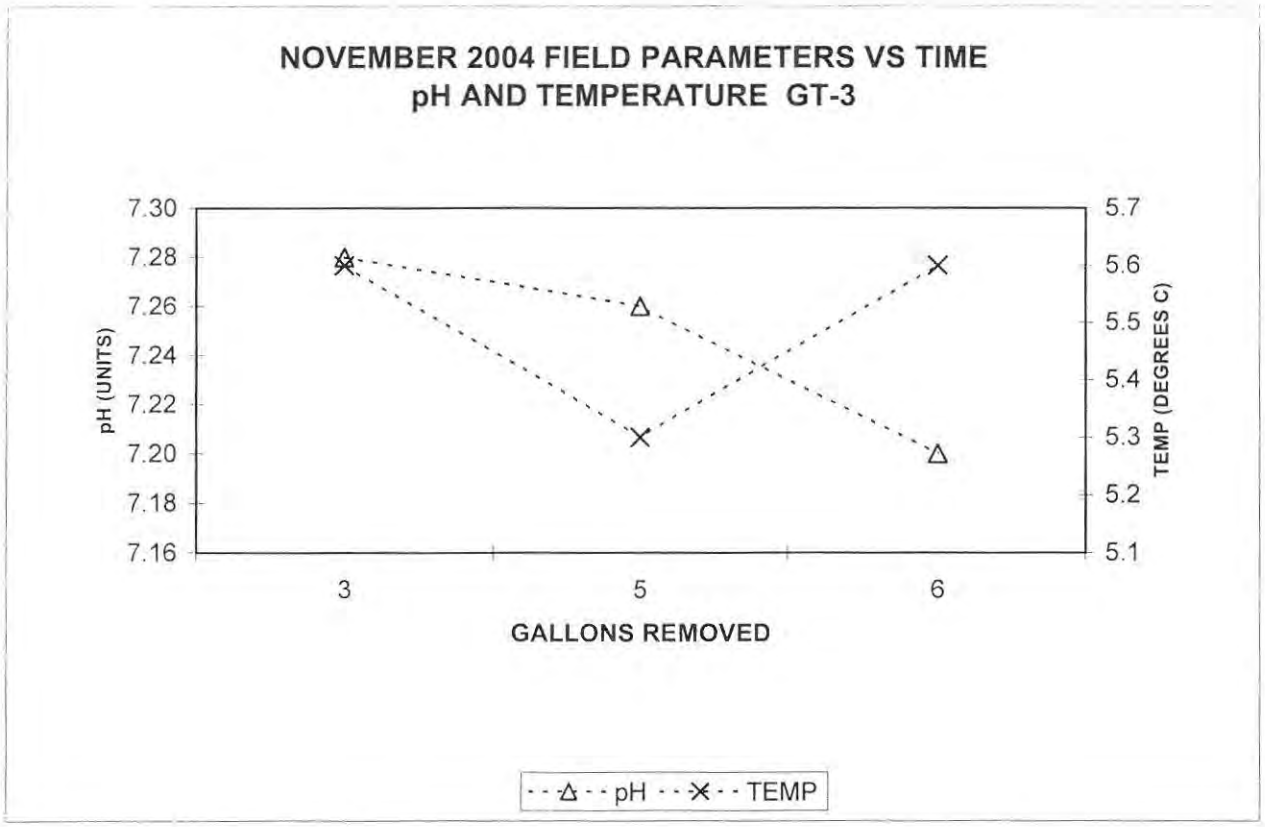
FIGURE A.6.25



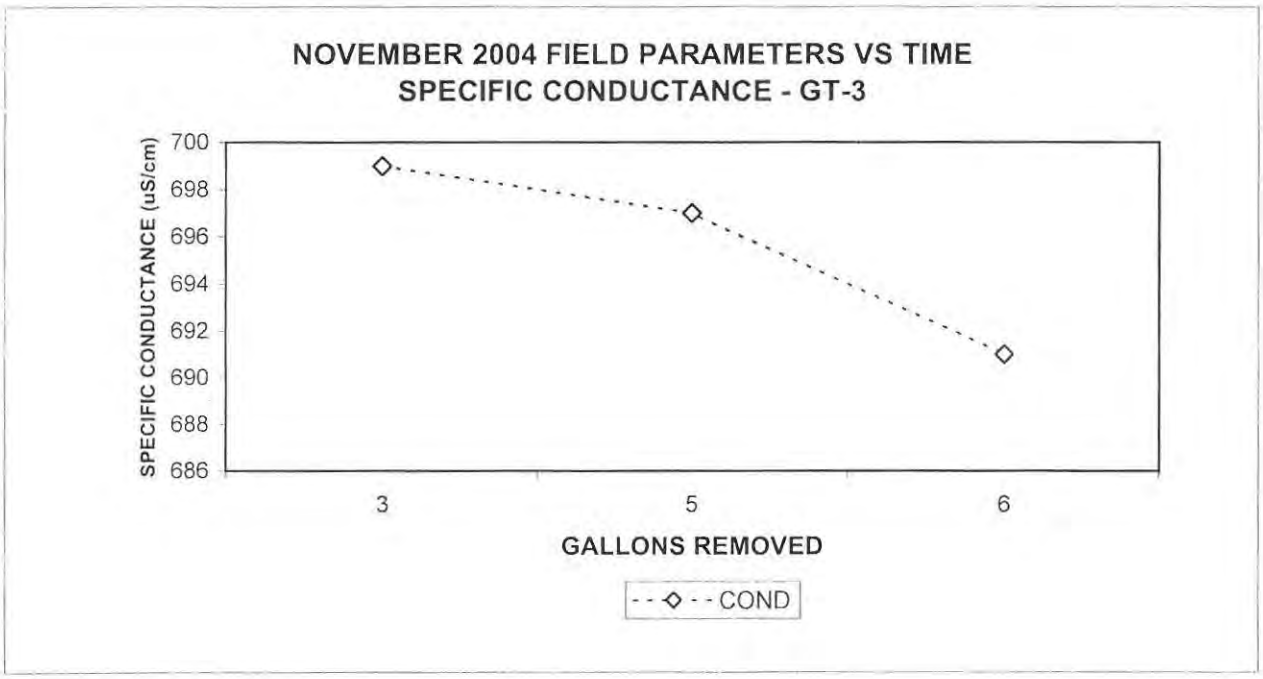


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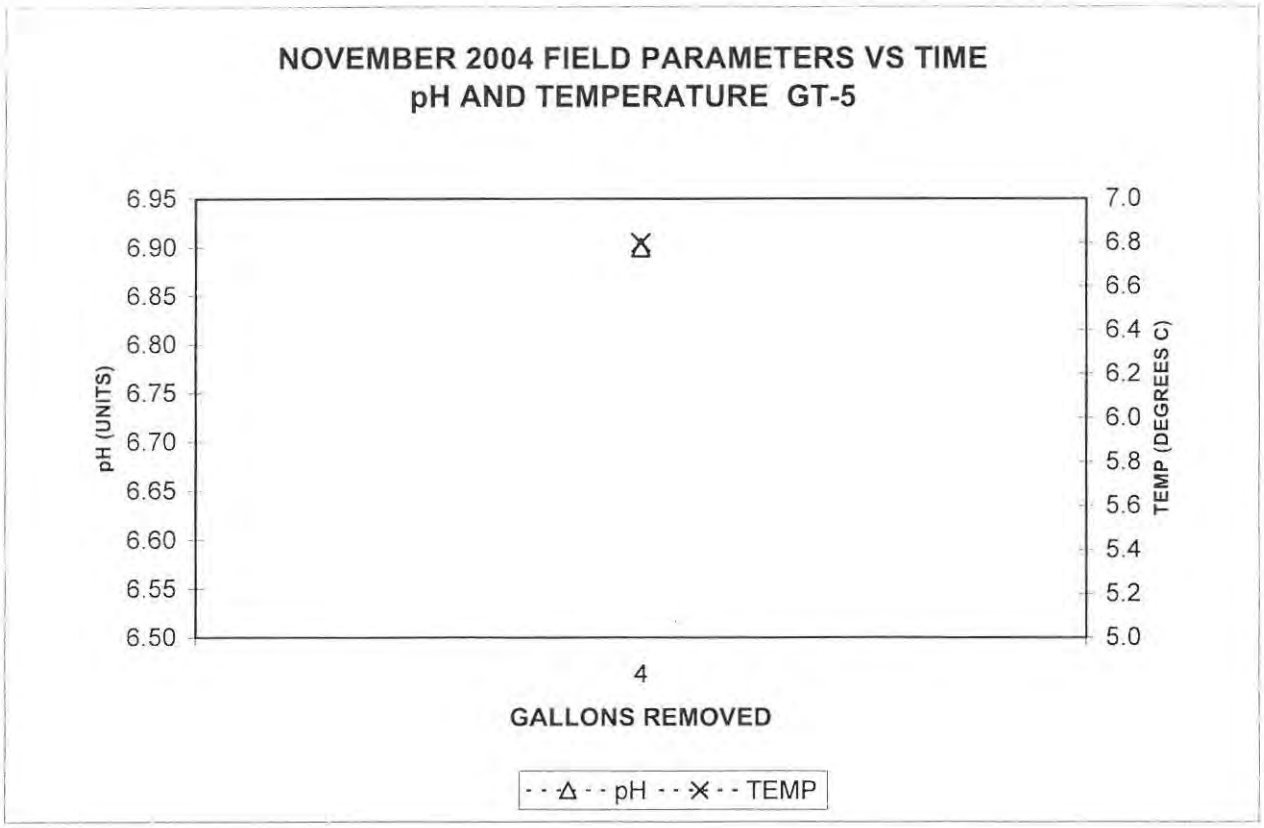
FIGURE A.6.26



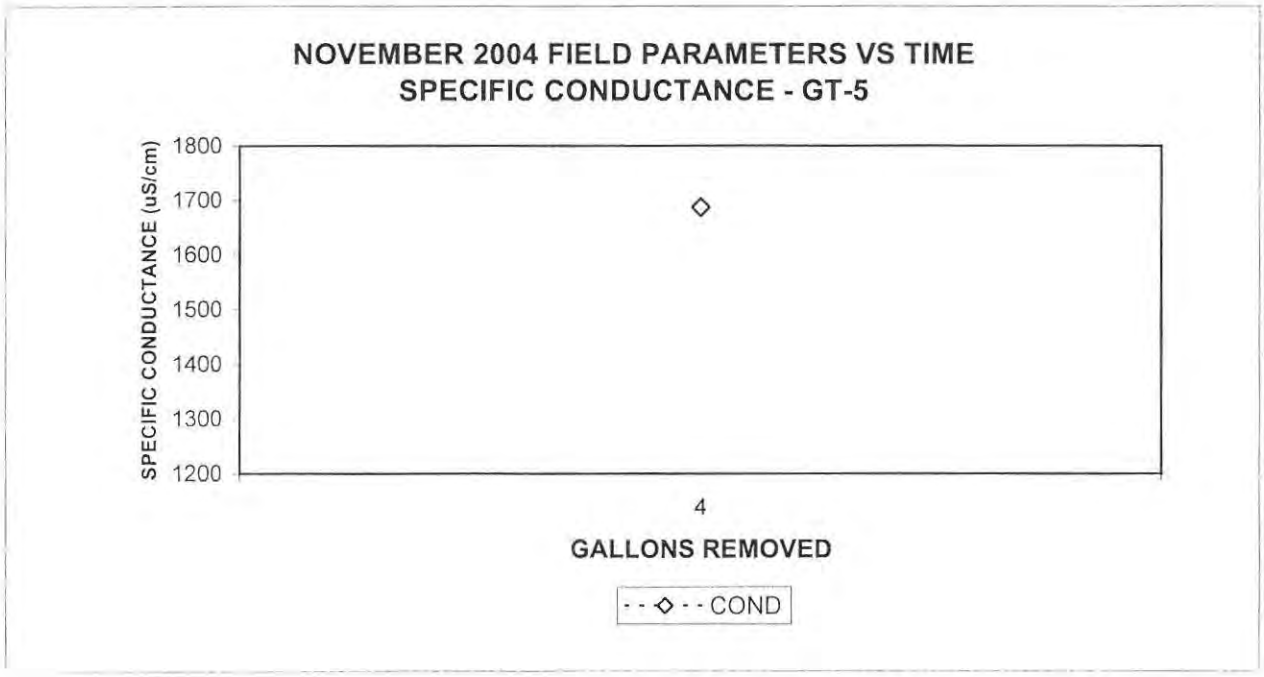


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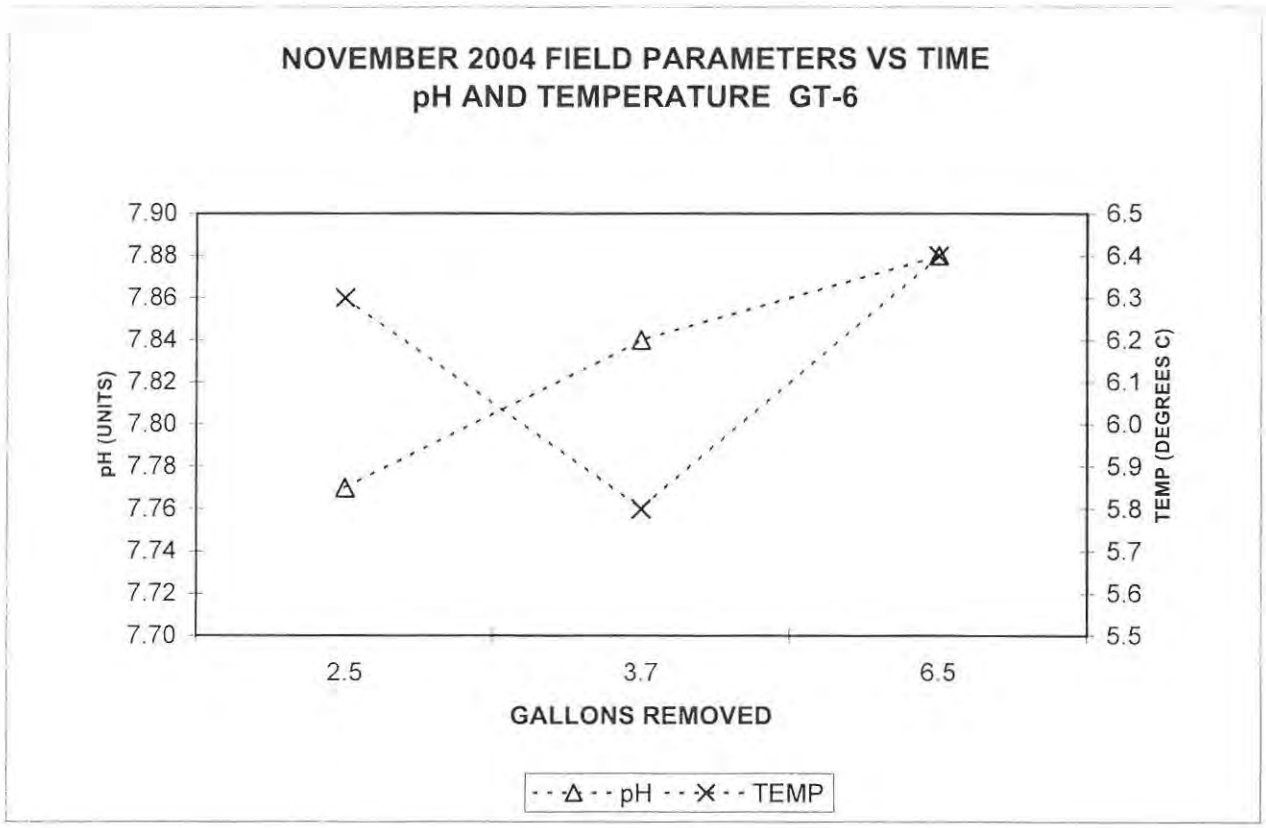
FIGURE A.6.27



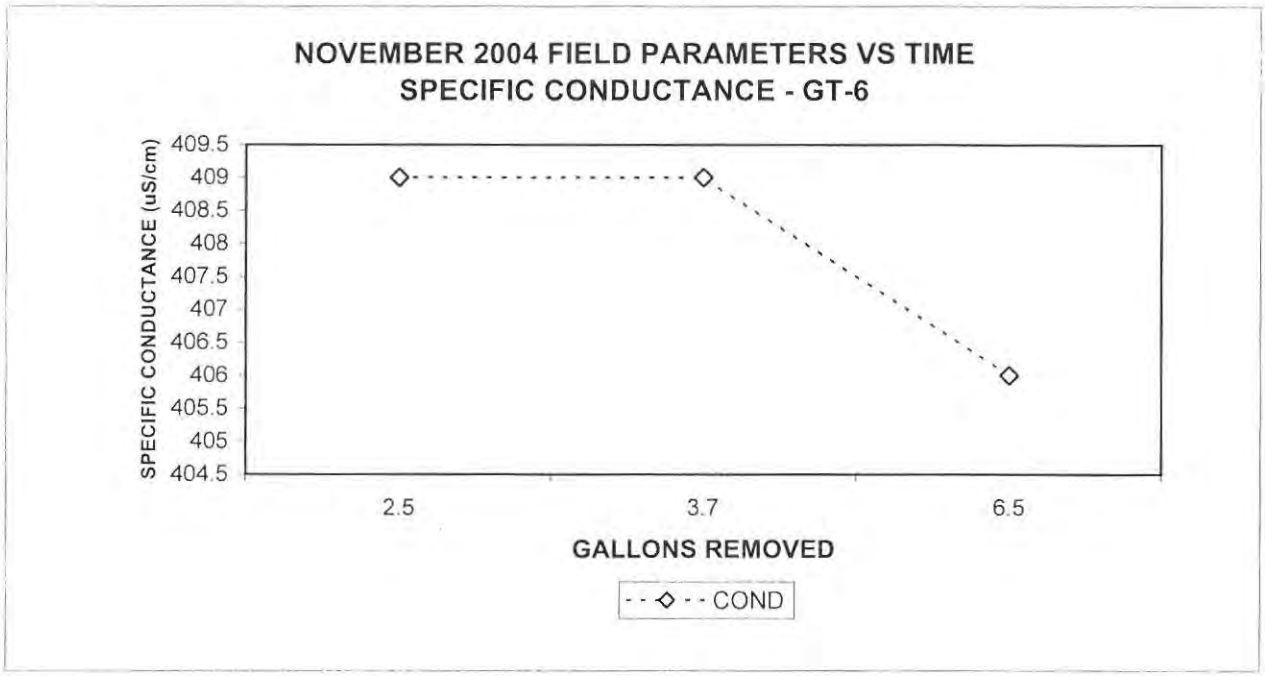


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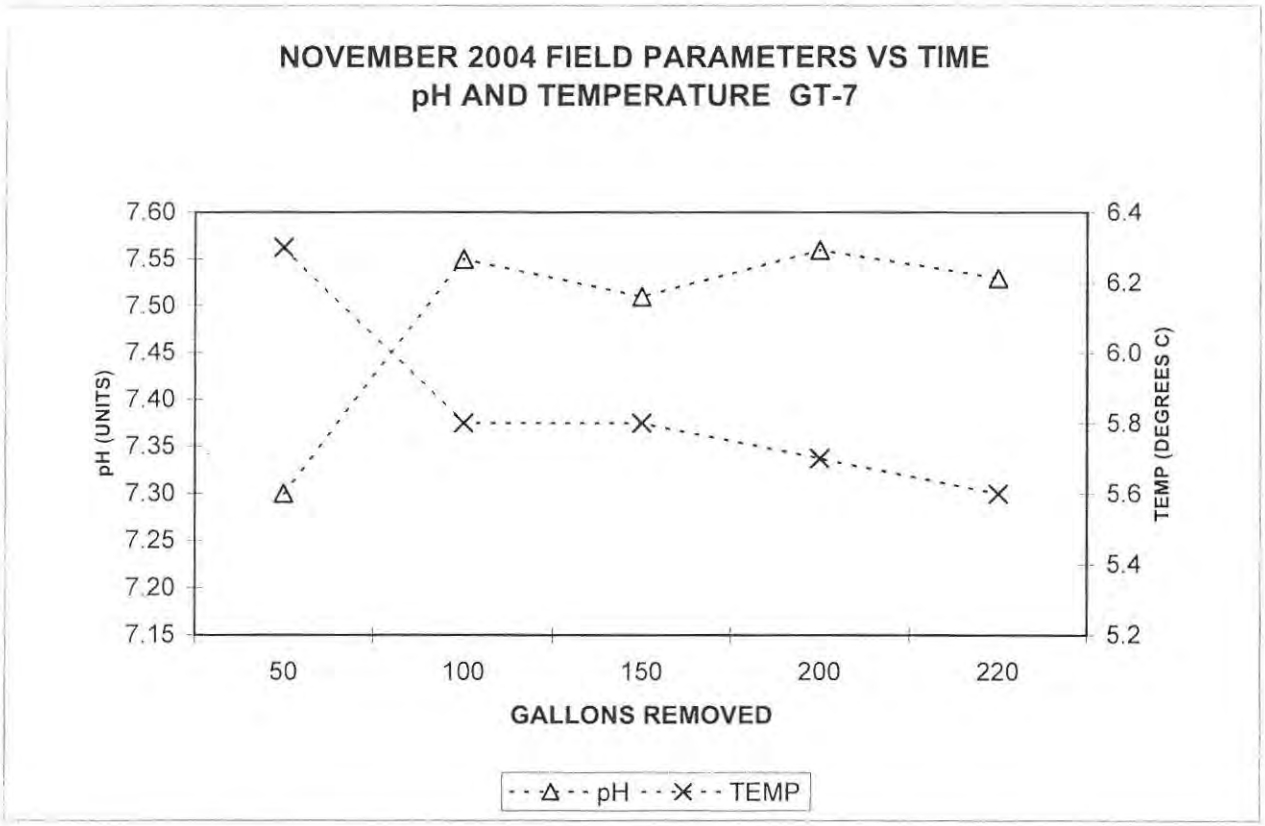
FIGURE A.6.28



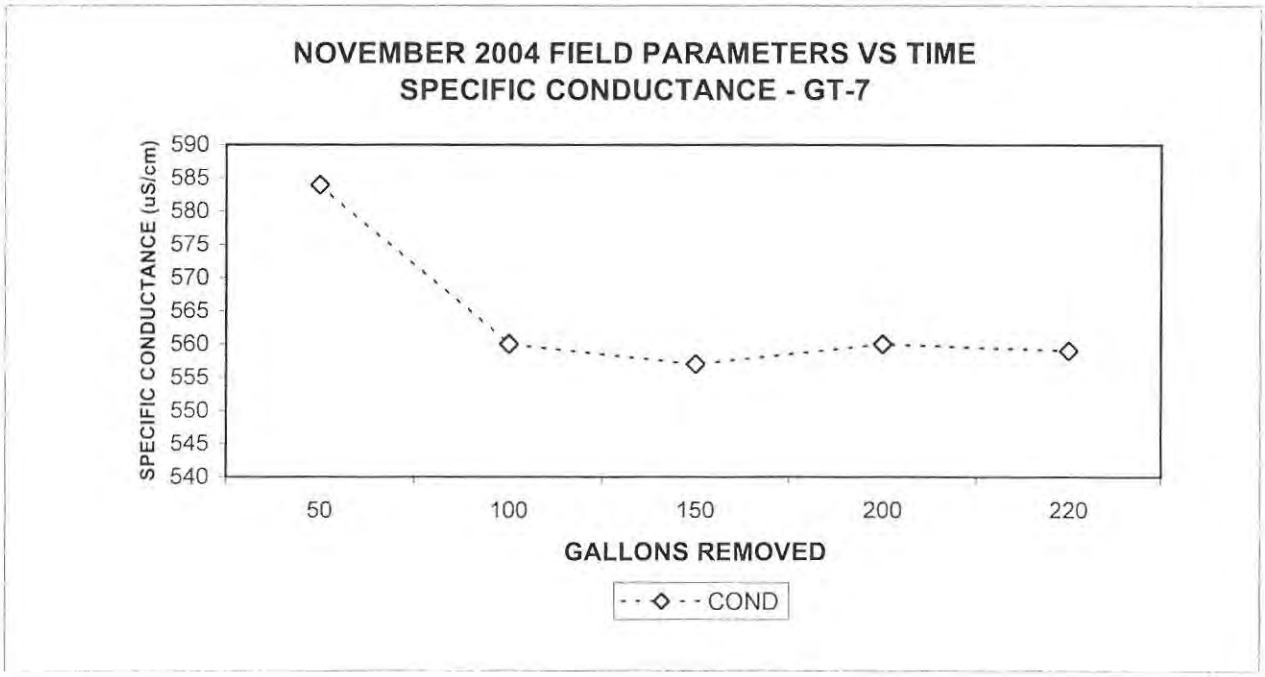


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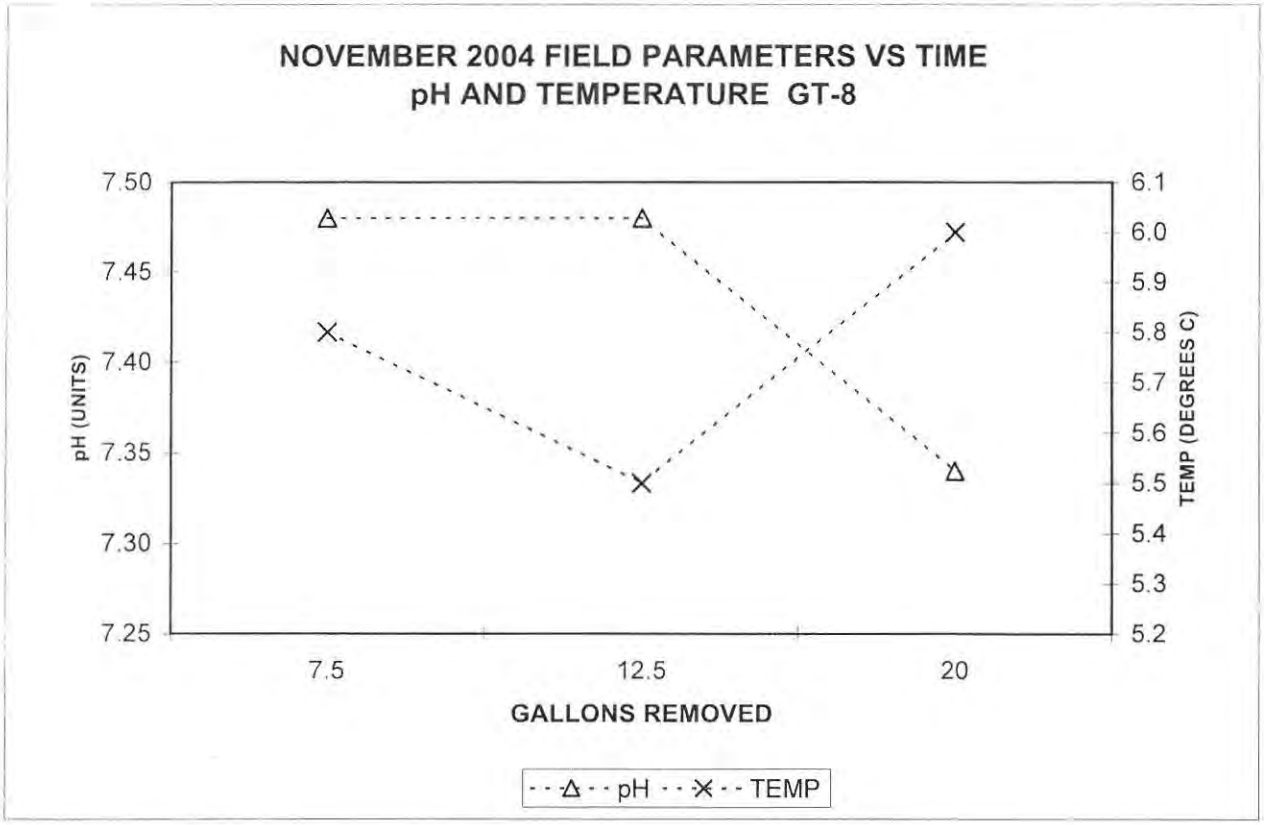
FIGURE A.6.29



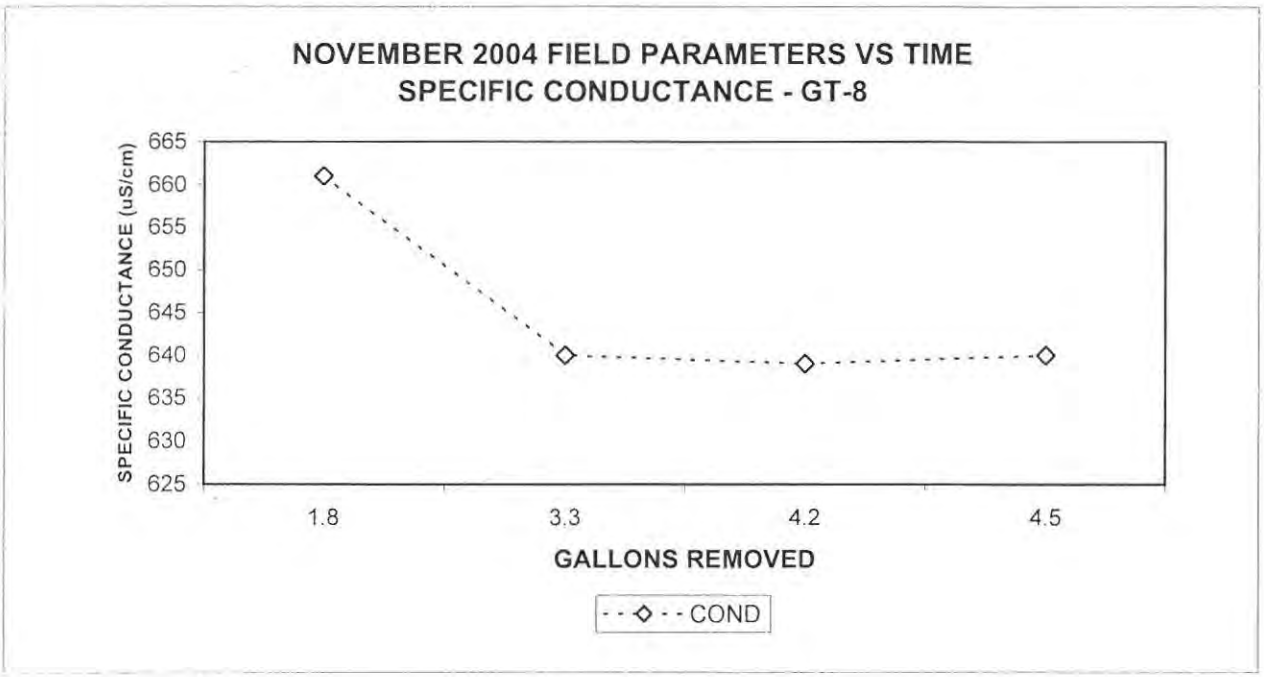


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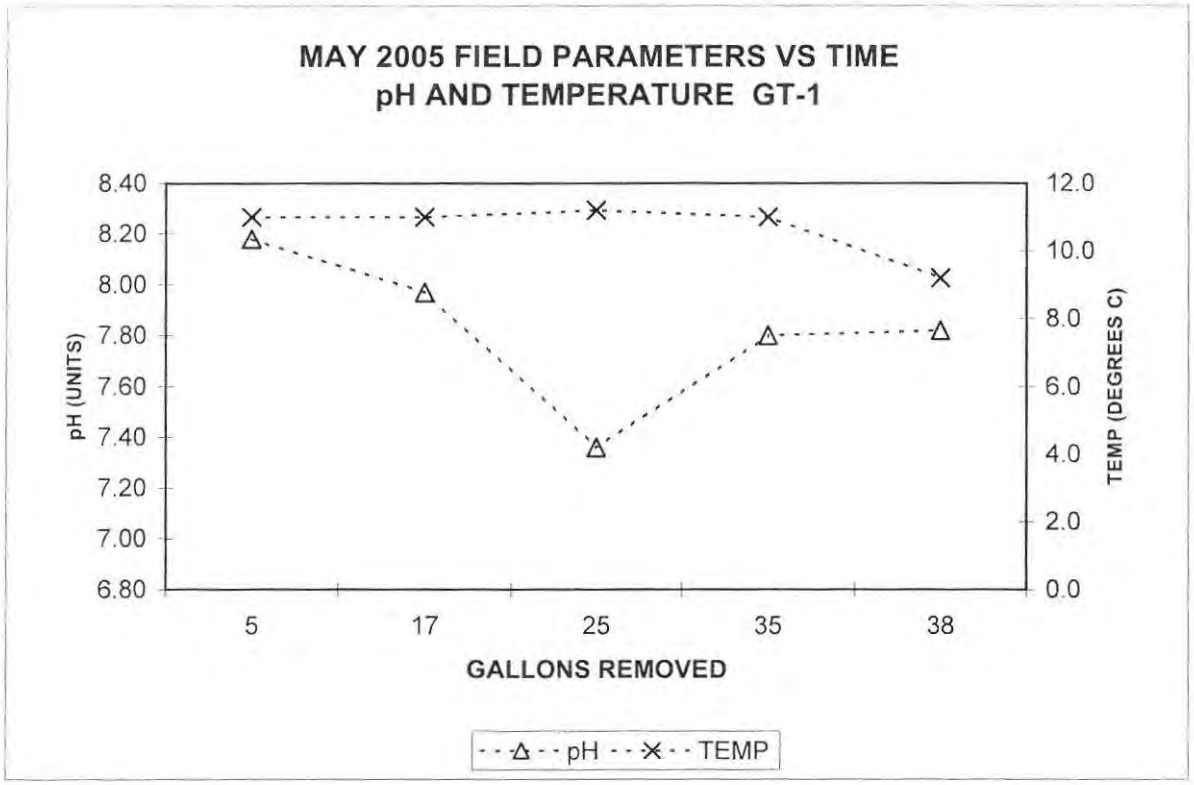
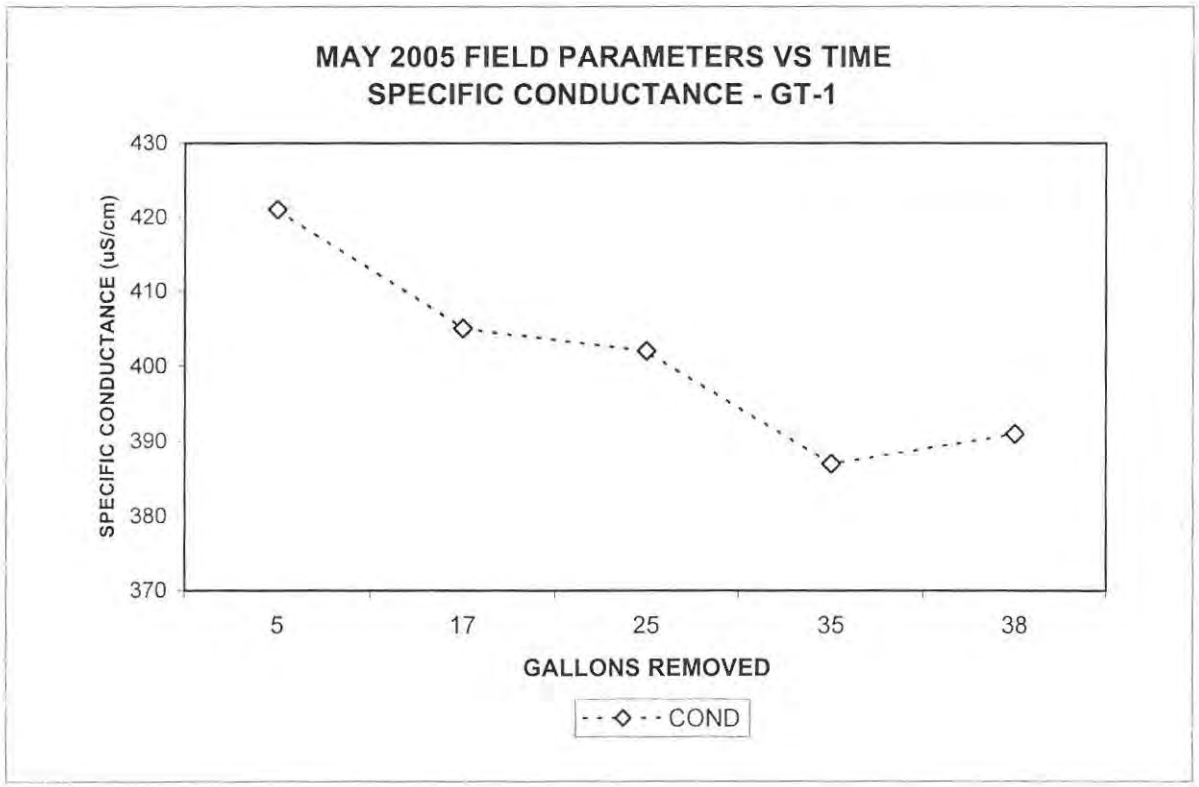
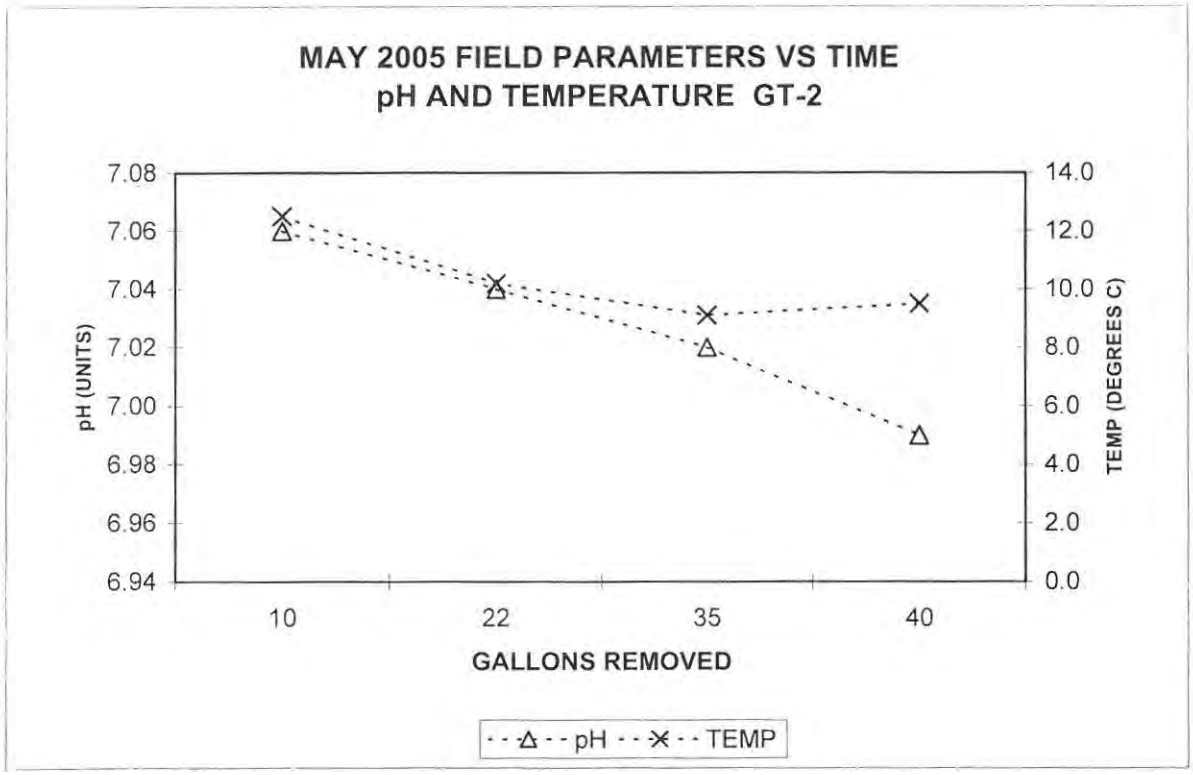
FIGURE A.6.30


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-1
pH (UNITS)
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
6.80
TEMP (DEGREES C)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
5
17
25
35
38
GALLONS REMOVED
pH
TEMP


MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-1
SPECIFIC CONDUCTANCE (uS/cm)
430
420
410
400
390
380
370
5
17
25
35
38
GALLONS REMOVED
COND



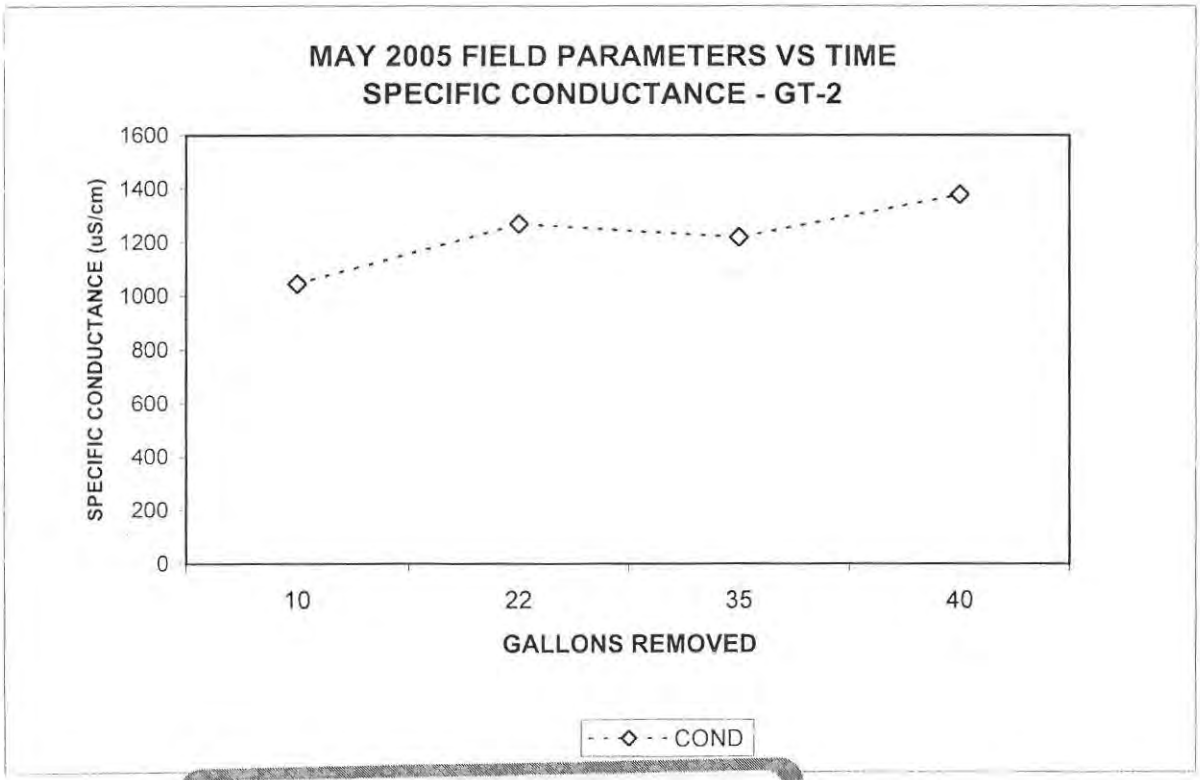


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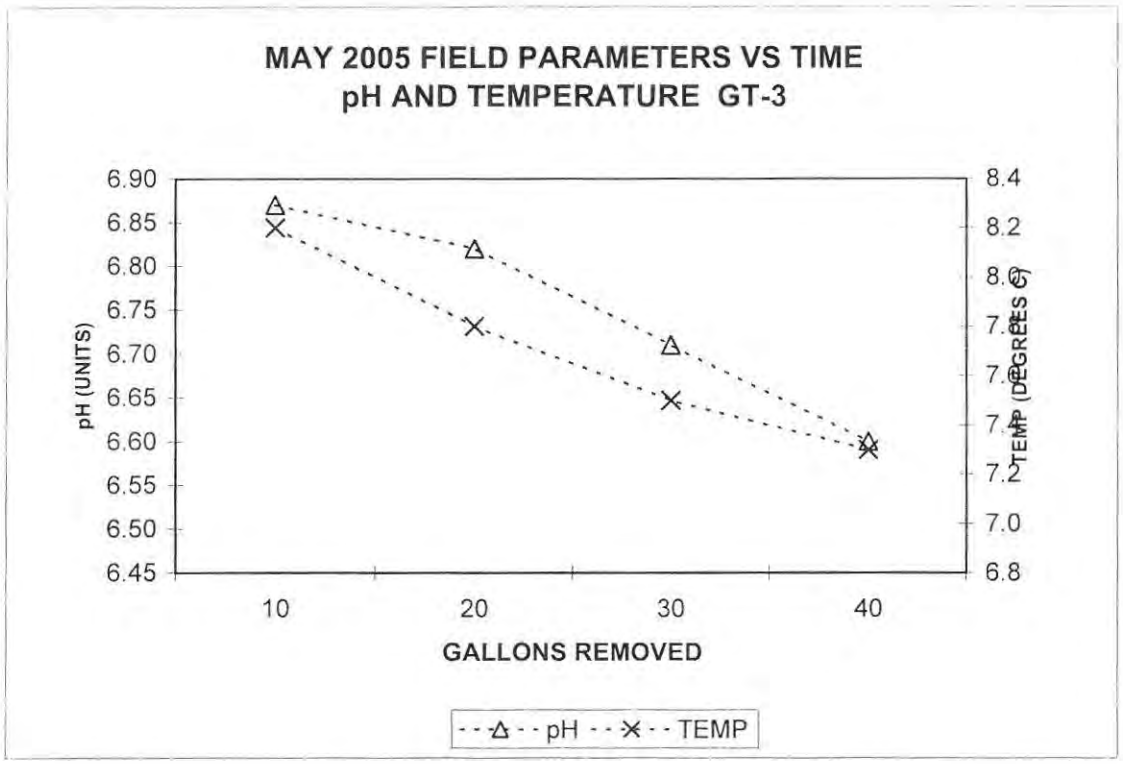
FIGURE A.6.32


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-3
pH (UNITS)
6.90
6.85
6.80
6.75
6.70
6.65
6.60
6.55
6.50
6.45
TEMP (DEGREES C)
8.4
8.2
8.0
7.8
7.6
7.4
7.2
7.0
6.8
10
20
30
40
GALLONS REMOVED
pH
TEMP

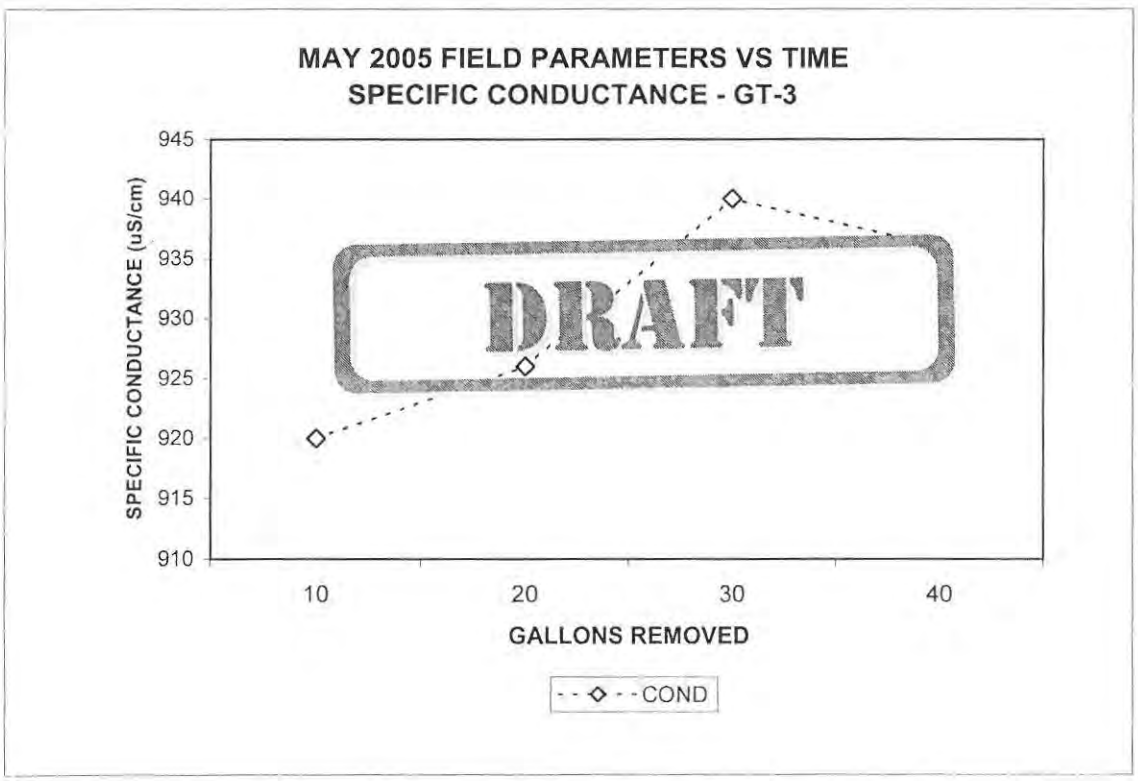
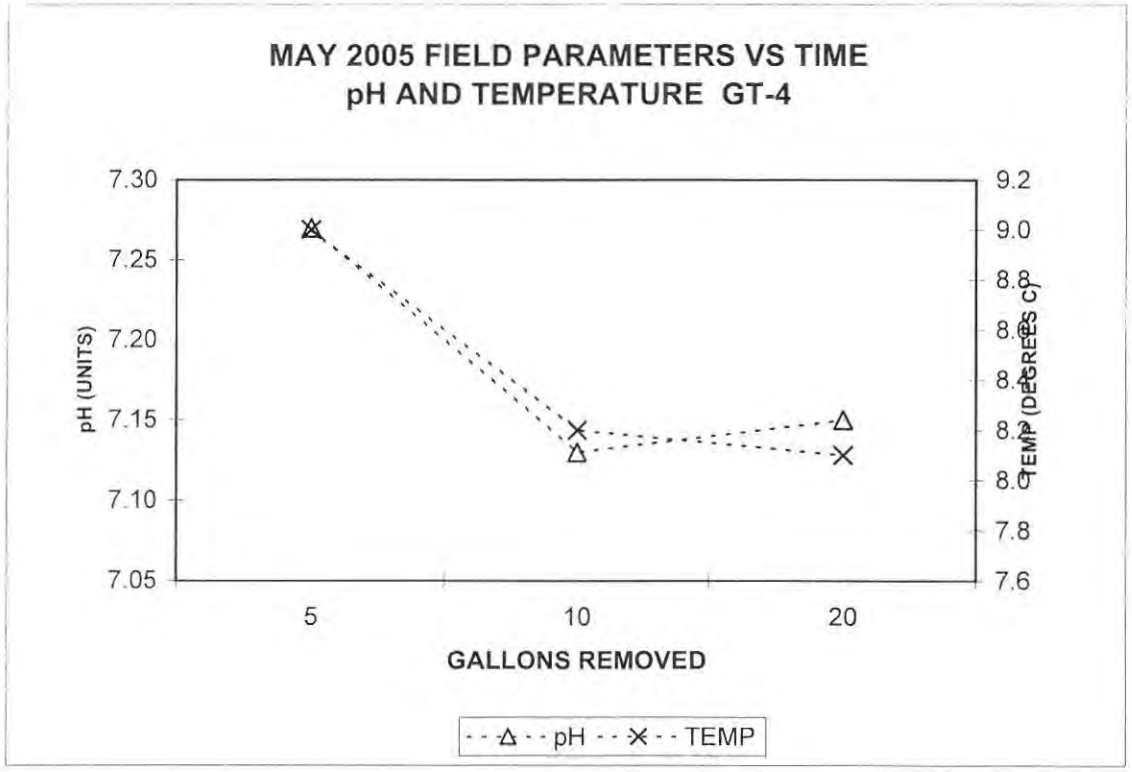

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-3
SPECIFIC CONDUCTANCE (uS/cm)
945
940
935
930
925
920
915
910
10
20
30
40
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.33


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-4
pH (UNITS)
7.30
7.25
7.20
7.15
7.10
7.05
9.2
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
TEMP (DEGREES C)
5
10
20
GALLONS REMOVED
pH
TEMP

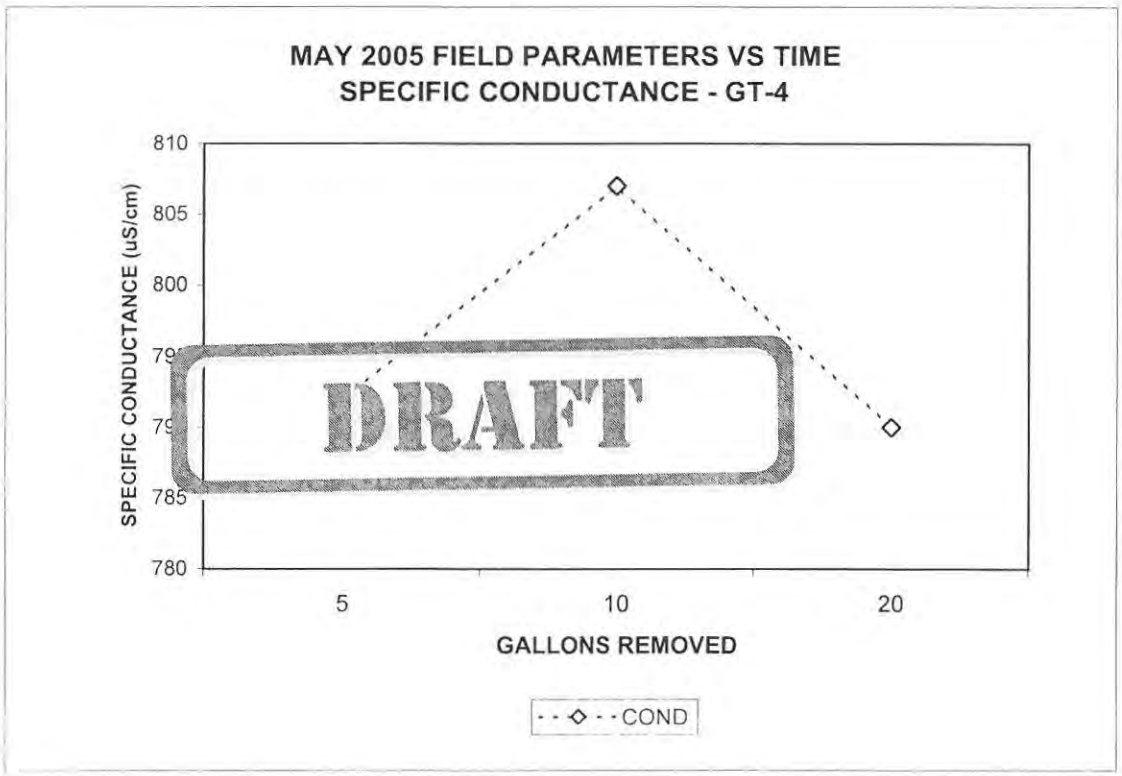
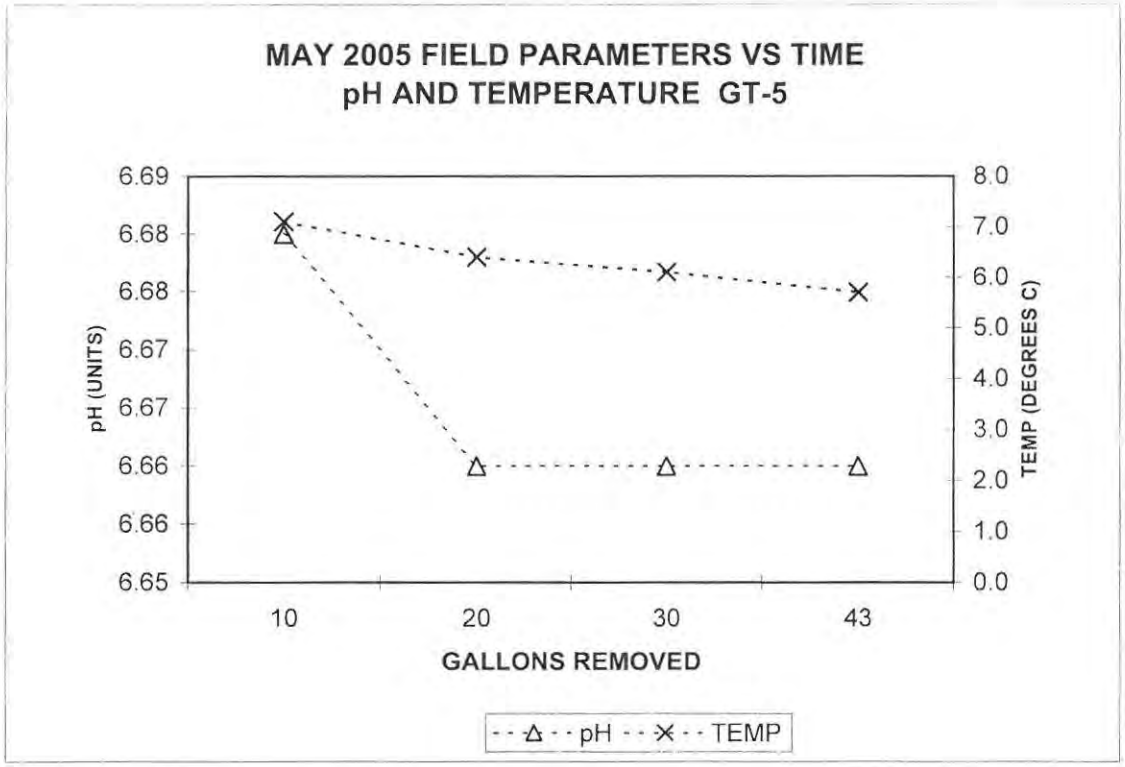

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-4
SPECIFIC CONDUCTANCE (uS/cm)
810
805
800
795
790
785
780
5
10
20
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.34


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-5
pH (UNITS)
6.69
6.68
6.68
6.67
6.67
6.66
6.66
6.65
TEMP (DEGREES C)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
10
20
30
43
GALLONS REMOVED
pH
TEMP

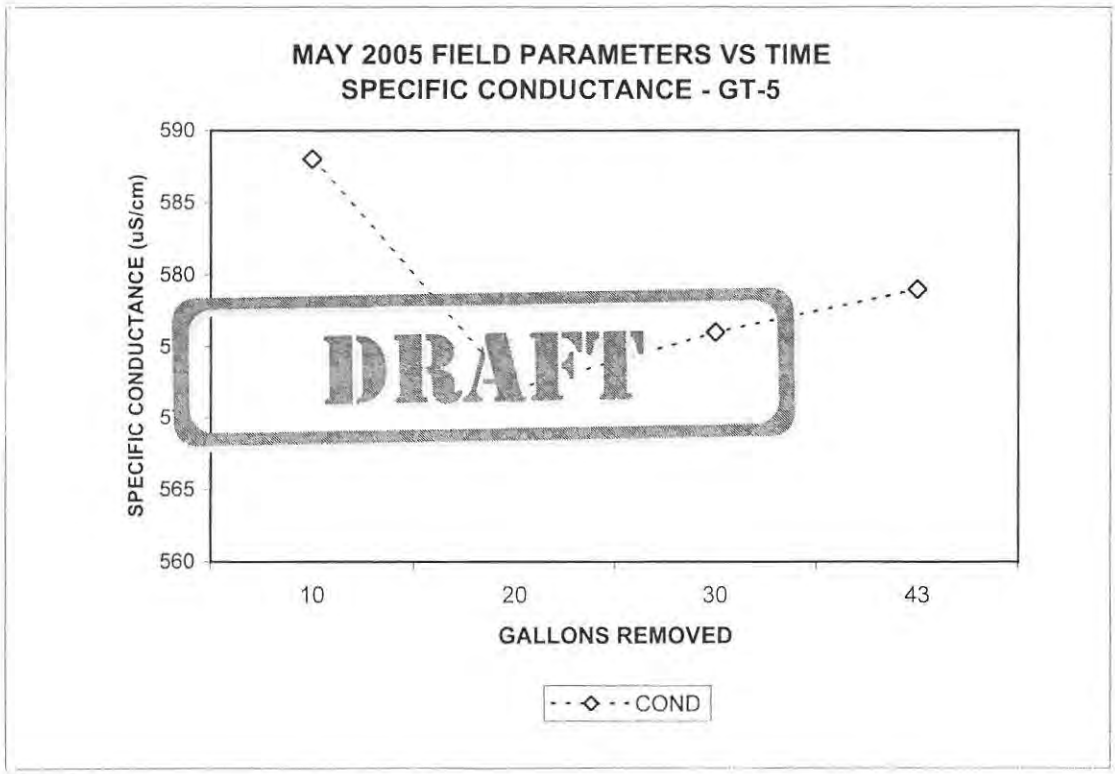
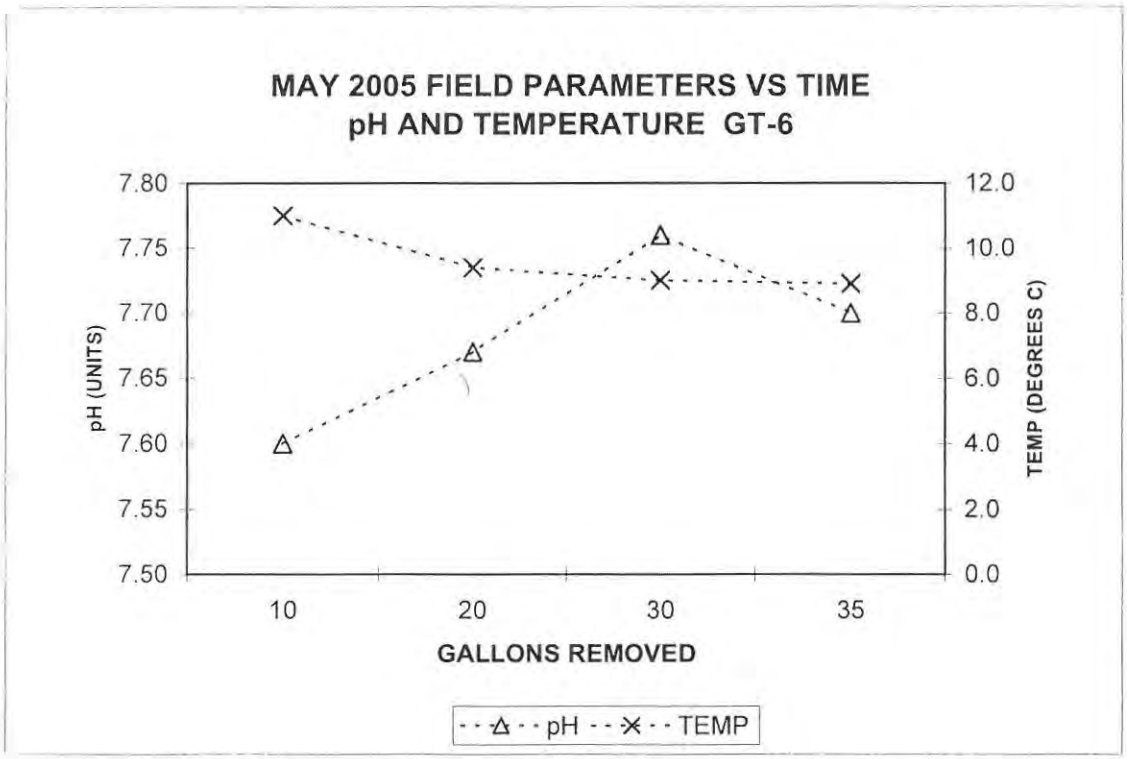

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-5
SPECIFIC CONDUCTANCE (uS/cm)
590
585
580
565
560
10
20
30
43
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.35


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-6
7.80
7.75
7.70
7.65
7.60
7.55
7.50
pH (UNITS)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
10
20
30
35
GALLONS REMOVED
pH
TEMP

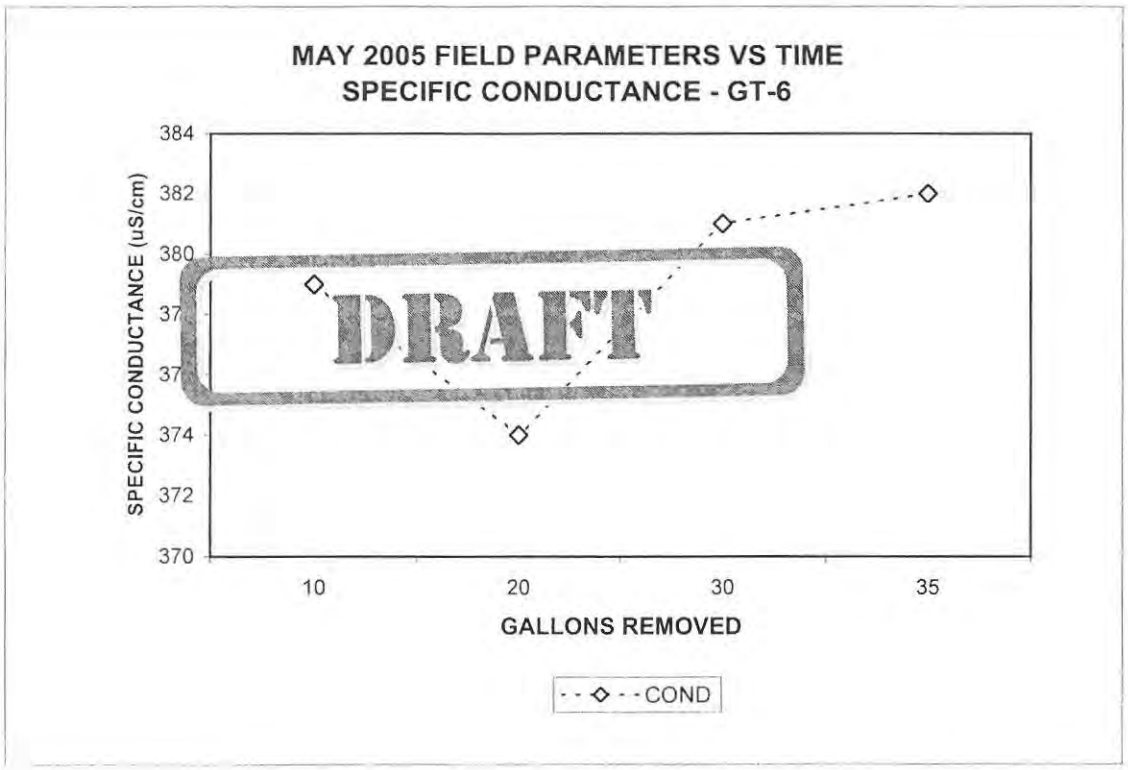
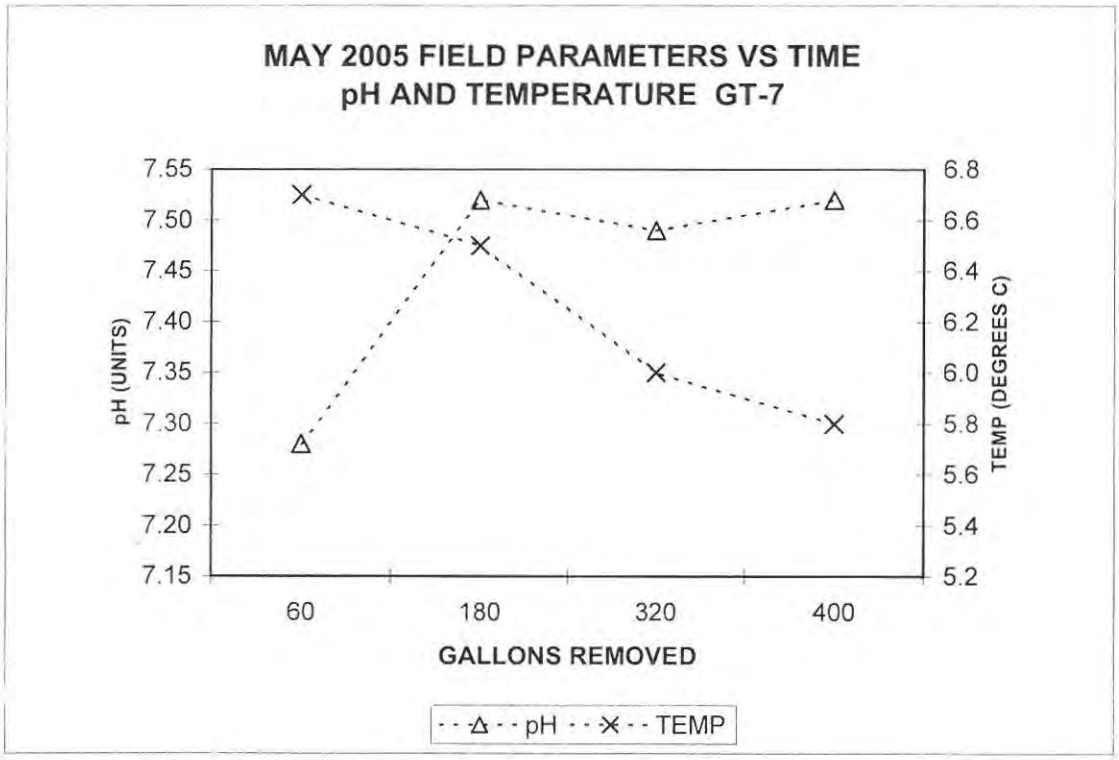

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-6
384
382
380
374
372
370
SPECIFIC CONDUCTANCE (uS/cm)
10
20
30
35
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.36


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-7
7.55
7.50
7.45
7.40
7.35
7.30
7.25
7.20
7.15
pH (UNITS)
6.8
6.6
6.4
6.2
6.0
5.8
5.6
5.4
5.2
TEMP (DEGREES C)
60
180
320
400
GALLONS REMOVED
pH
TEMP

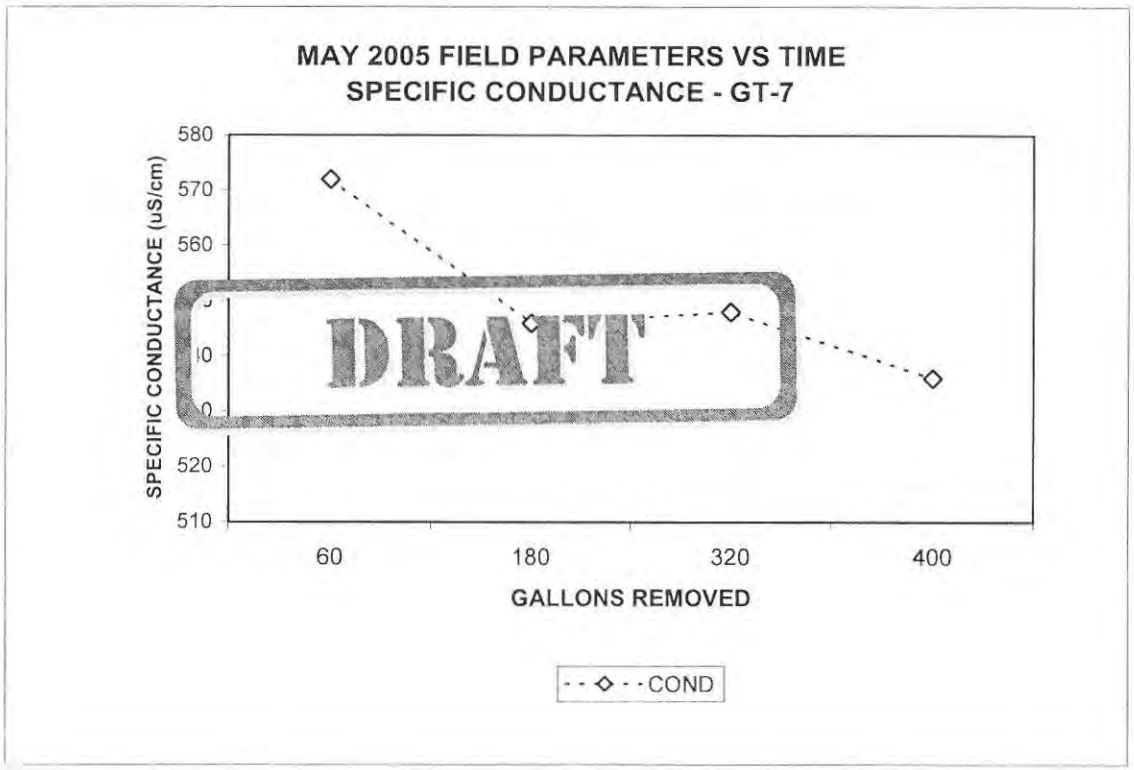
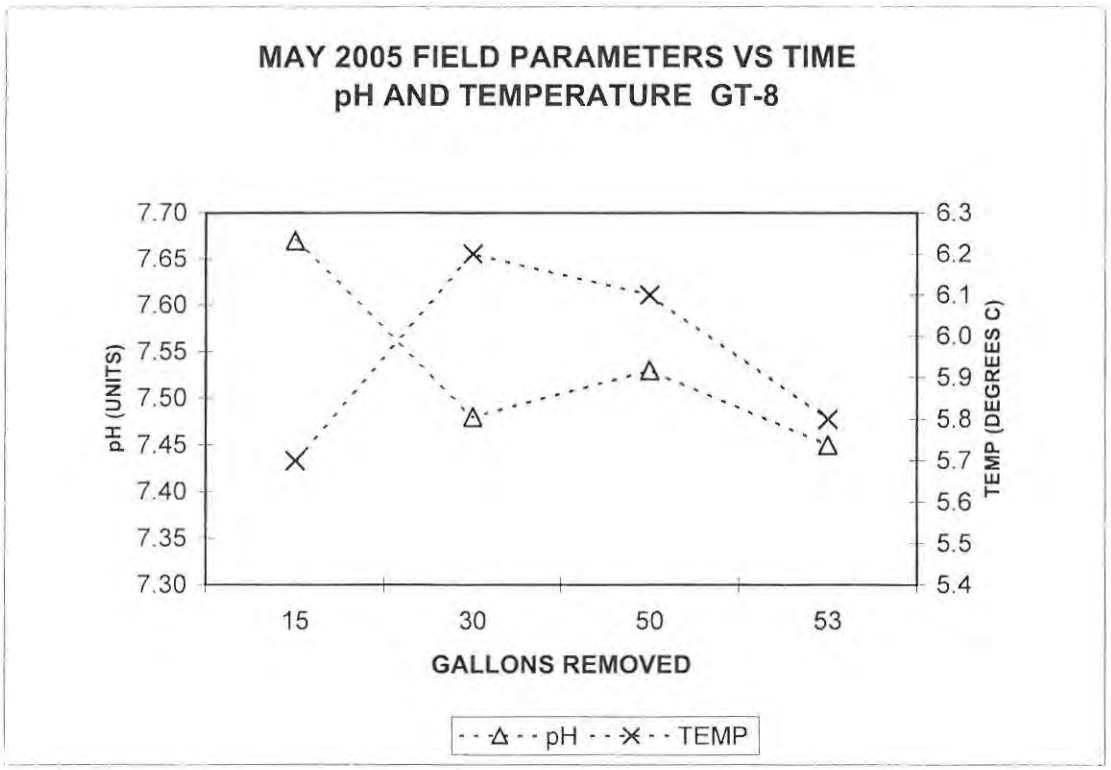

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-7
580
570
560
520
510
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
60
180
320
400
GALLONS REMOVED
COND

FIGURE A.6.37


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-8
pH (UNITS)
7.70
7.65
7.60
7.55
7.50
7.45
7.40
7.35
7.30
TEMP (DEGREES C)
6.3
6.2
6.1
6.0
5.9
5.8
5.7
5.6
5.5
5.4
15
30
50
53
GALLONS REMOVED
pH
TEMP

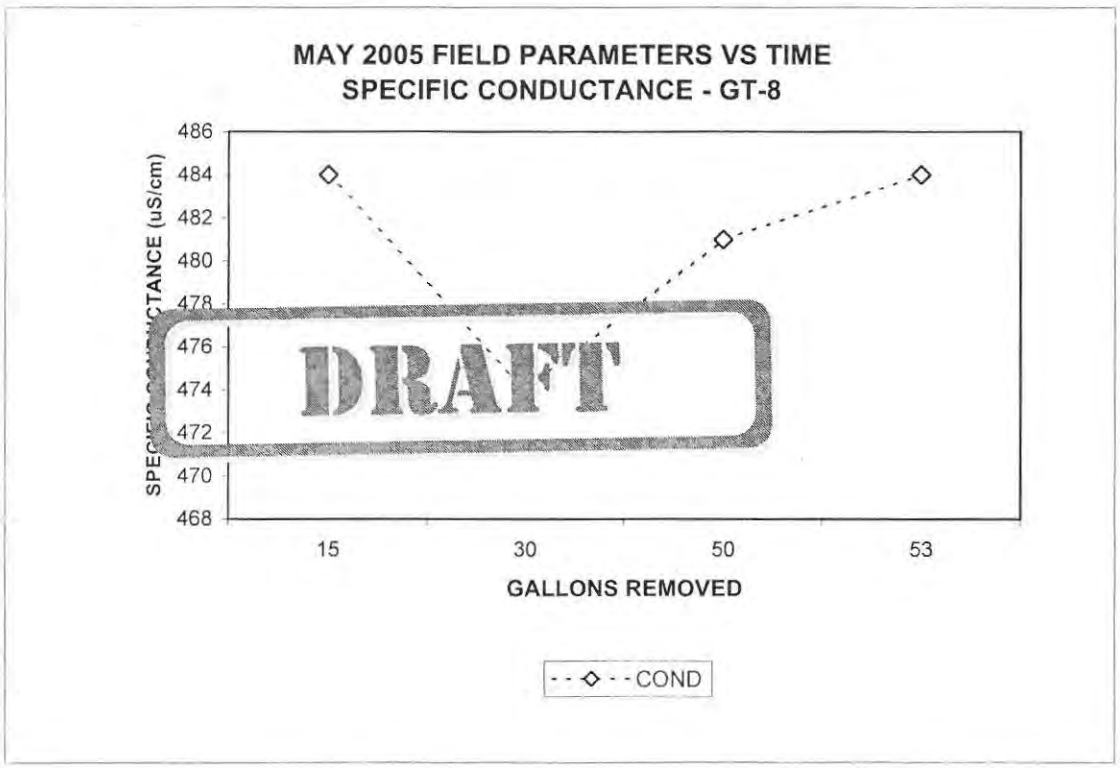
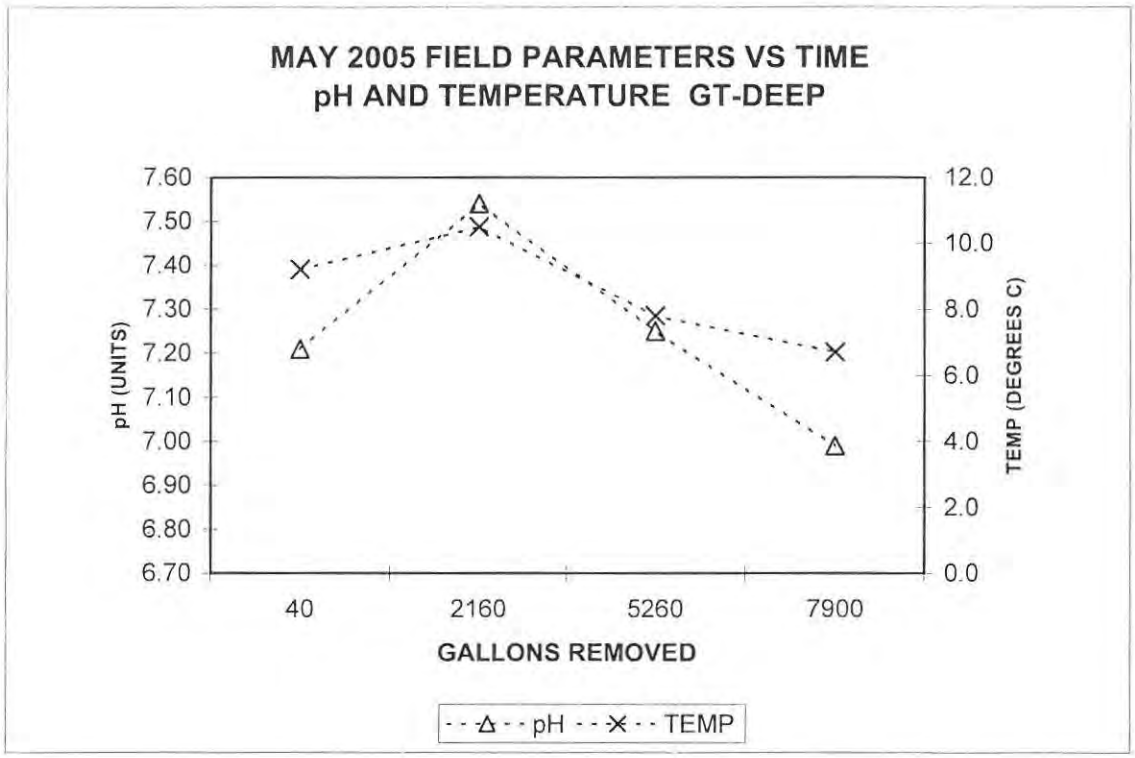

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-8
SPECIFIC CONDUCTANCE (uS/cm)
486
484
482
480
478
476
474
472
470
468
DRAFT
15
30
50
53
GALLONS REMOVED
COND

FIGURE A.6.38


MAY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-DEEP
pH (UNITS)
7.60
7.50
7.40
7.30
7.20
7.10
7.00
6.90
6.80
6.70
TEMP (DEGREES C)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
40
2160
5260
7900
GALLONS REMOVED
pH
TEMP

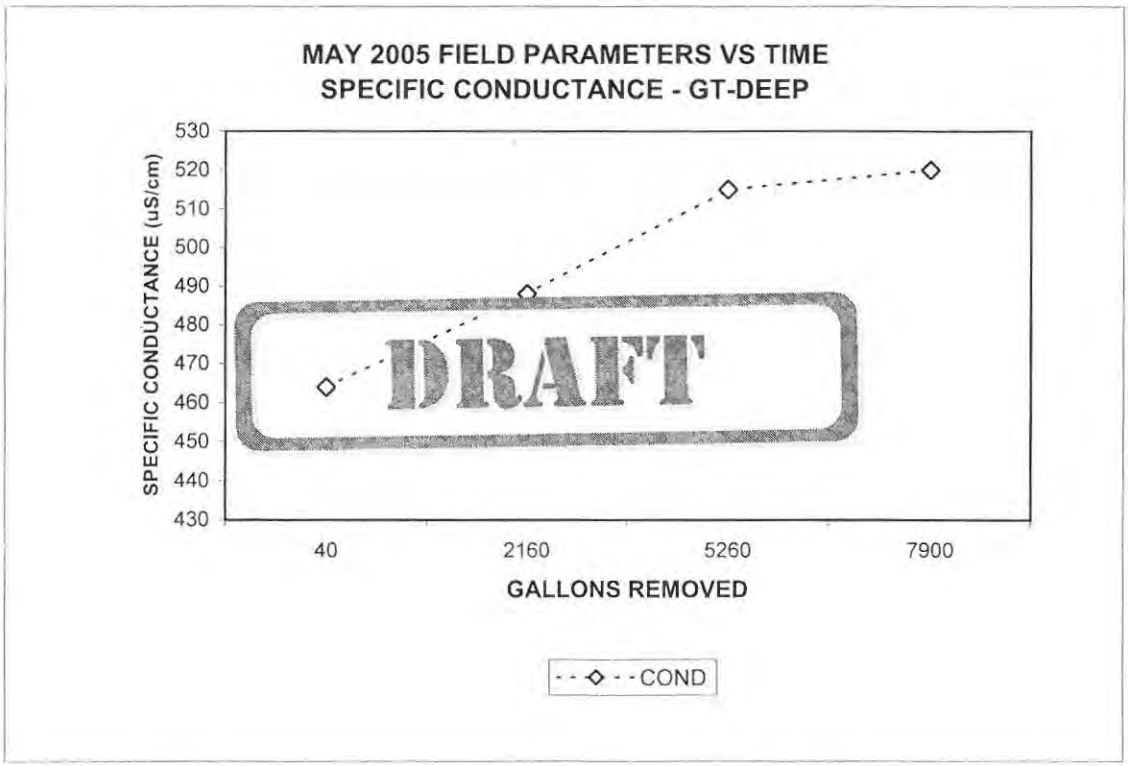
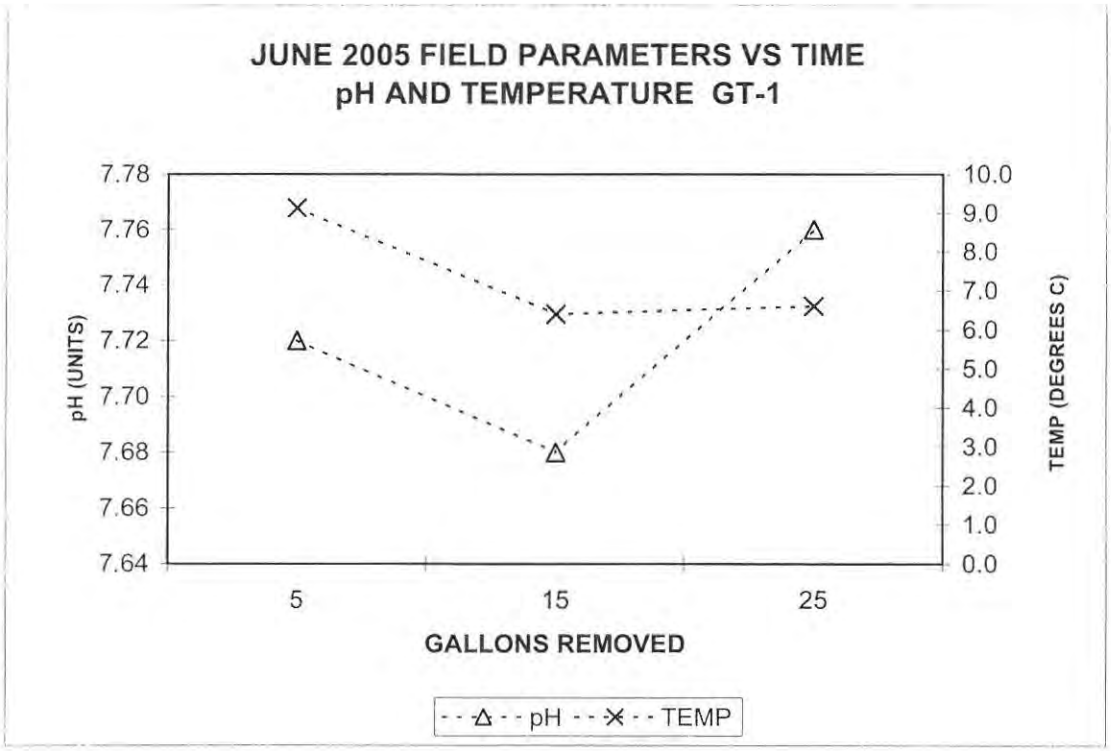

MAY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-DEEP
SPECIFIC CONDUCTANCE (uS/cm)
530
520
510
500
490
480
470
460
450
440
430
40
2160
5260
7900
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.39


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-1
7.78
7.76
7.74
7.72
7.70
7.68
7.66
7.64
pH (UNITS)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
TEMP (DEGREES C)
5
15
25
GALLONS REMOVED
pH
TEMP

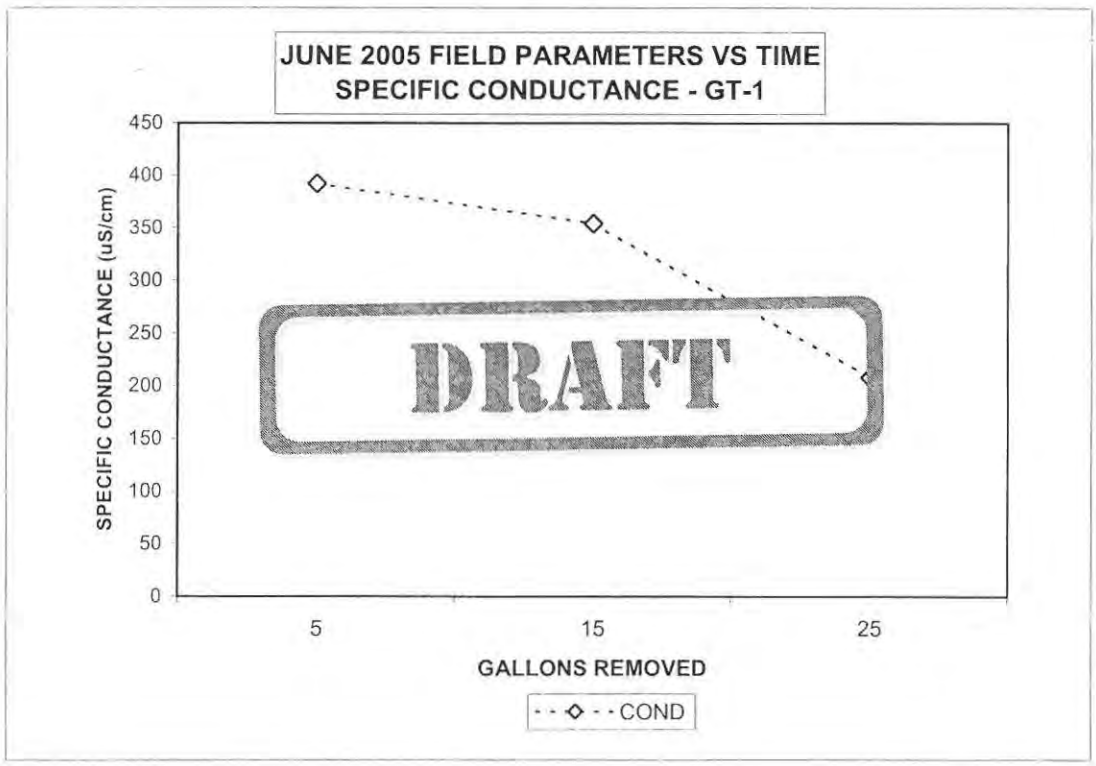
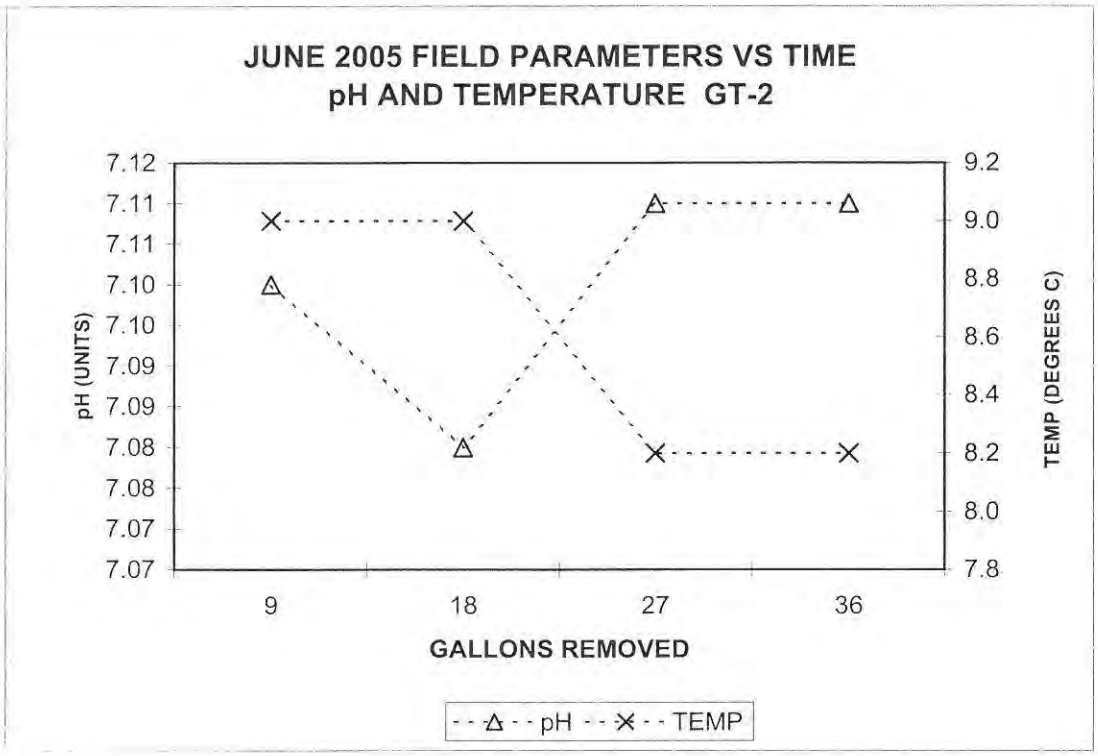

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-1
450
400
350
300
250
200
150
100
50
0
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
5
15
25
GALLONS REMOVED
COND

FIGURE A.6.40


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-2
pH (UNITS)
7.12
7.11
7.11
7.10
7.10
7.09
7.09
7.08
7.08
7.07
7.07
TEMP (DEGREES C)
9.2
9.0
8.8
8.6
8.4
8.2
8.0
7.8
9
18
27
36
GALLONS REMOVED
pH
TEMP

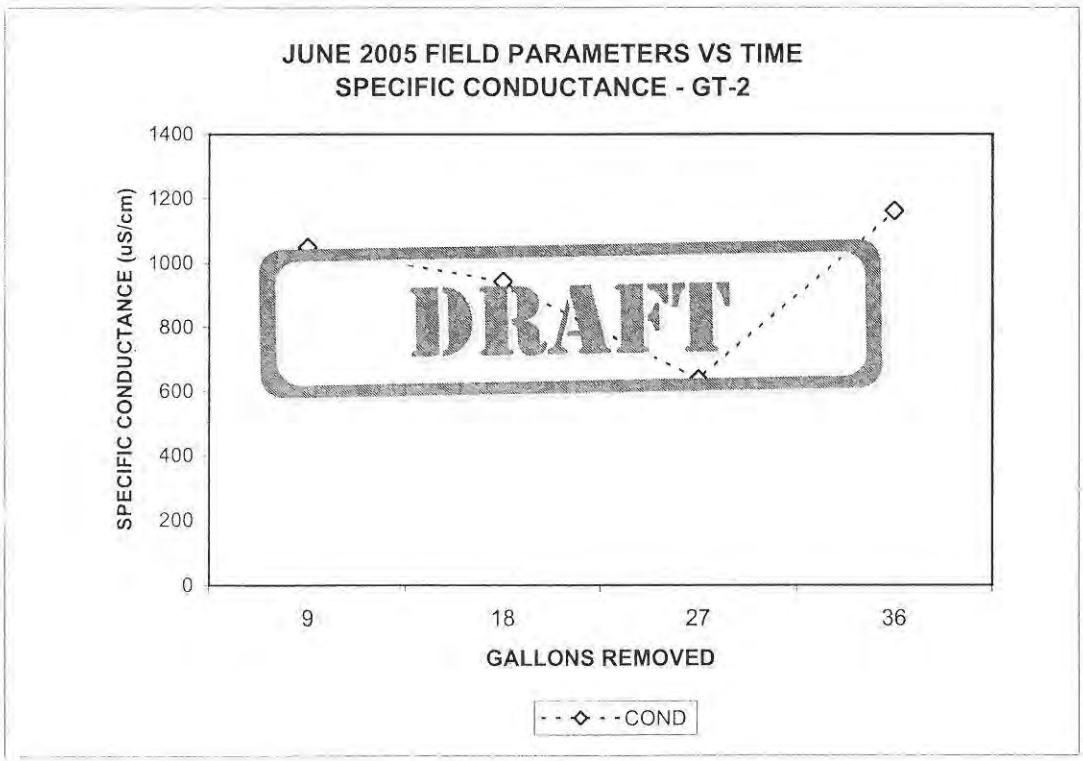
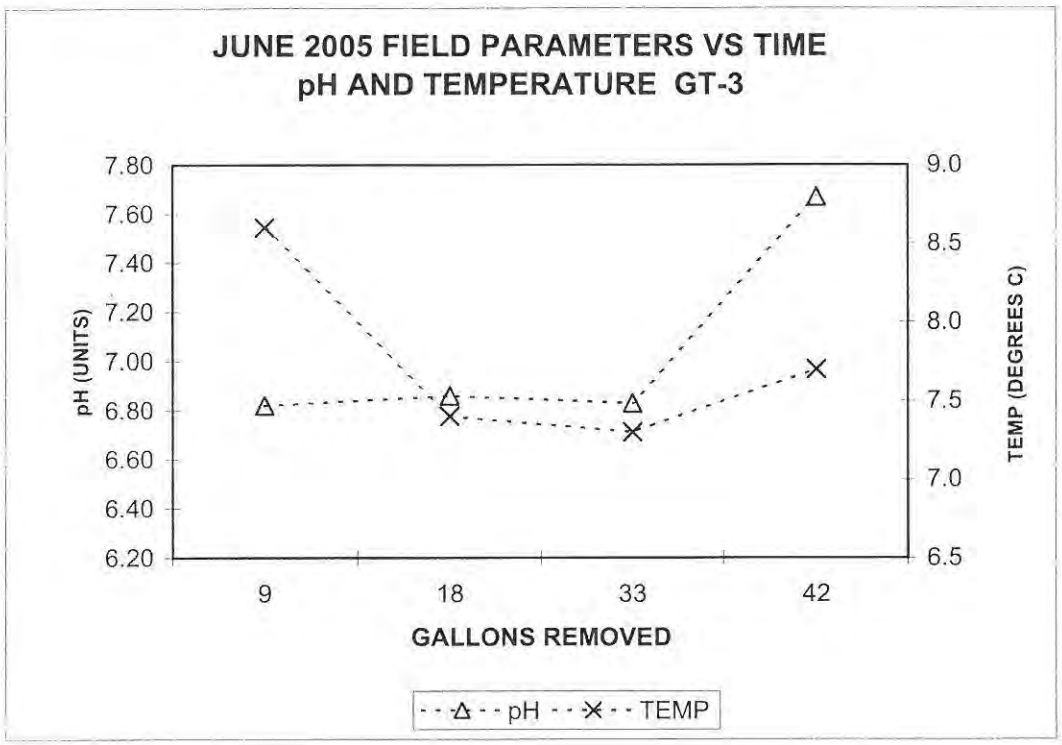

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-2
SPECIFIC CONDUCTANCE (uS/cm)
1400
1200
1000
800
600
400
200
0
9
18
27
36
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.41


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-3
7.80
7.60
7.40
7.20
7.00
6.80
6.60
6.40
6.20
pH (UNITS)
9.0
8.5
8.0
7.5
7.0
6.5
TEMP (DEGREES C)
9
18
33
42
GALLONS REMOVED
pH
TEMP

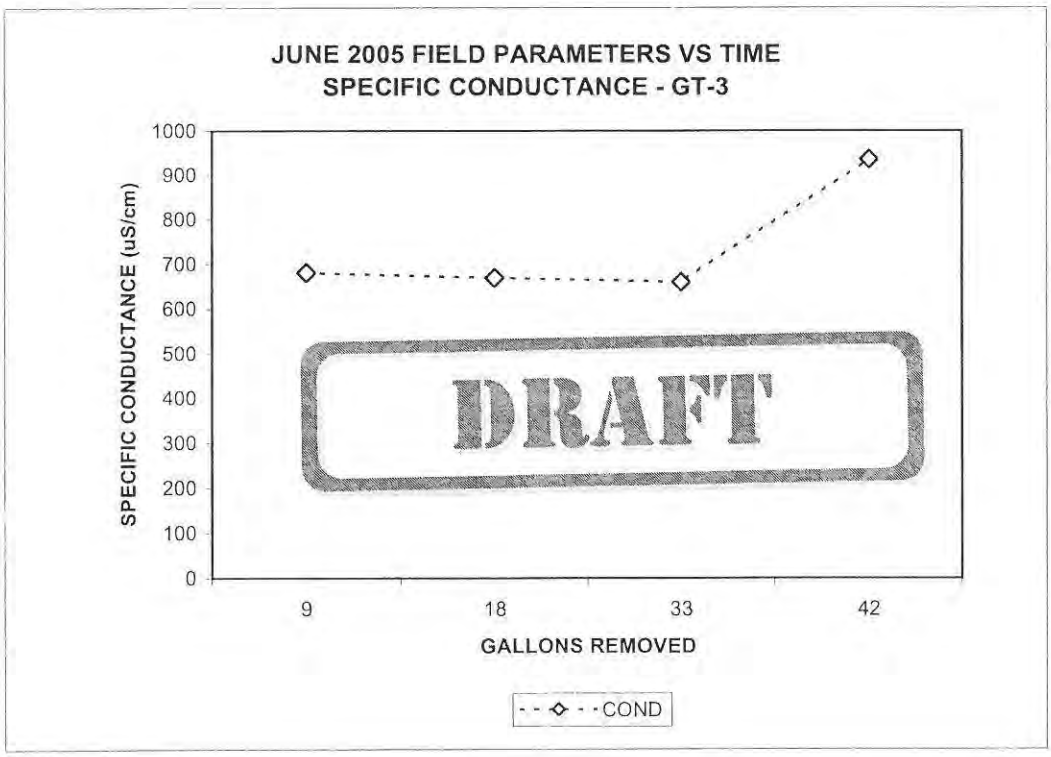
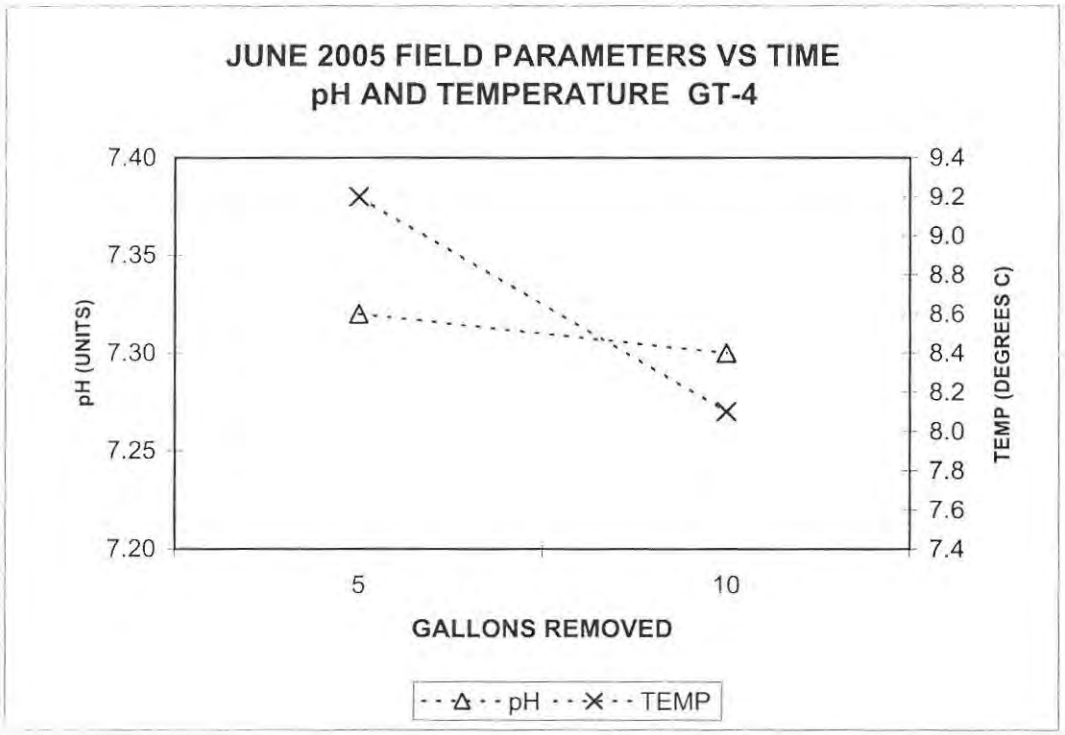

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-3
1000
900
800
700
600
500
400
300
200
100
0
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
9
18
33
42
GALLONS REMOVED
COND

FIGURE A.6.42


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-4
7.40
7.35
7.30
7.25
7.20
pH (UNITS)
9.4
9.2
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
TEMP (DEGREES C)
5
10
GALLONS REMOVED
pH
TEMP

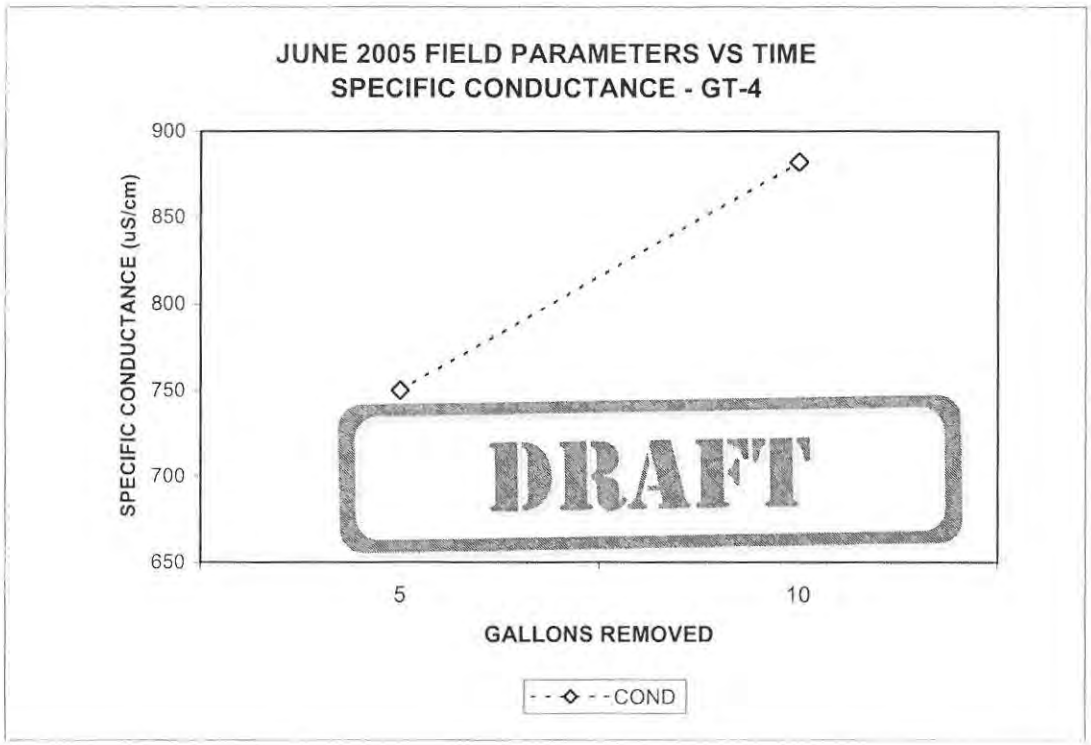
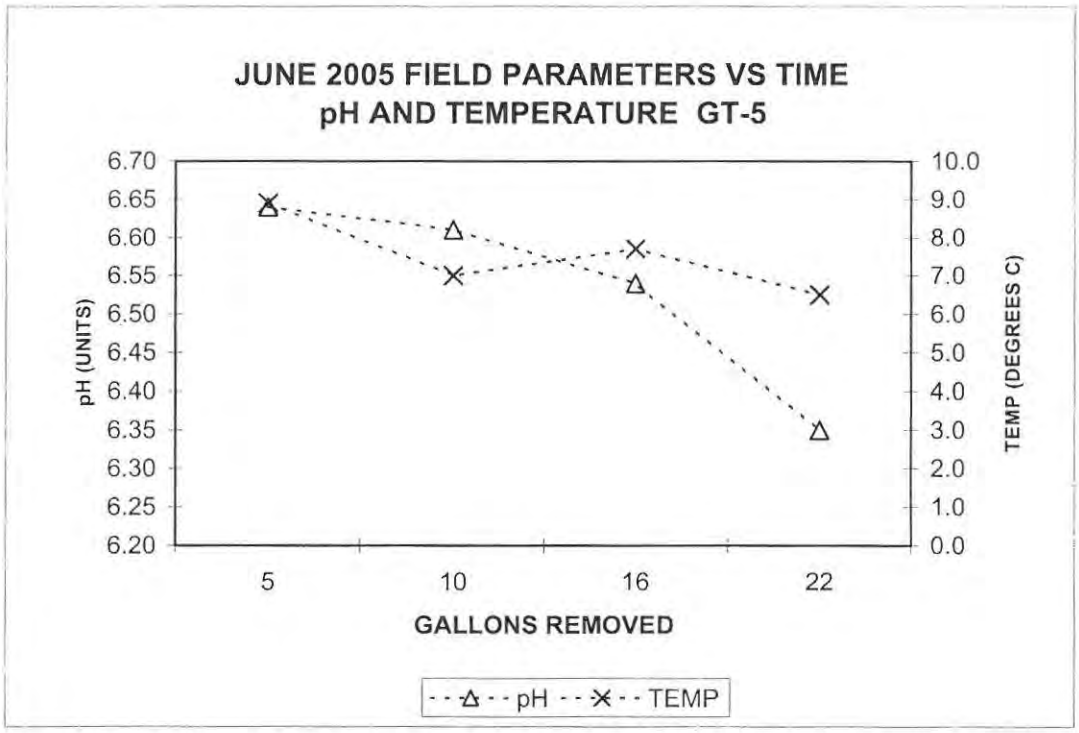

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-4
900
850
800
750
700
650
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
5
10
GALLONS REMOVED
COND

FIGURE A.6.43


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-5
pH (UNITS)
6.70
6.65
6.60
6.55
6.50
6.45
6.40
6.35
6.30
6.25
6.20
TEMP (DEGREES C)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5
10
16
22
GALLONS REMOVED
pH
TEMP

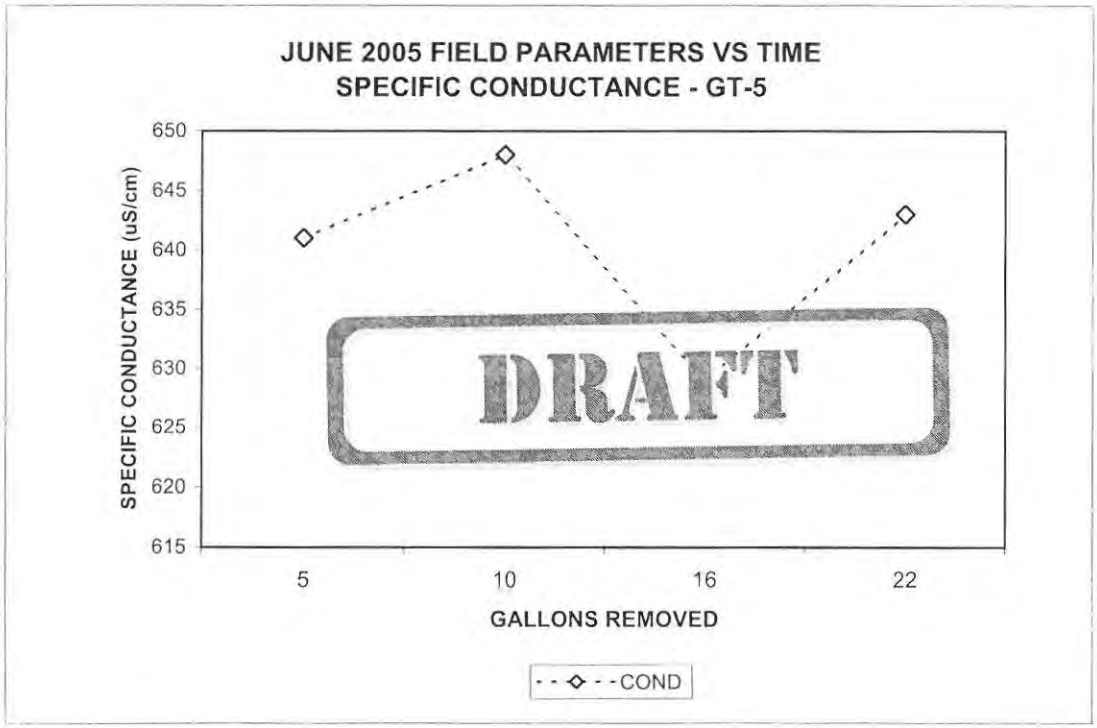
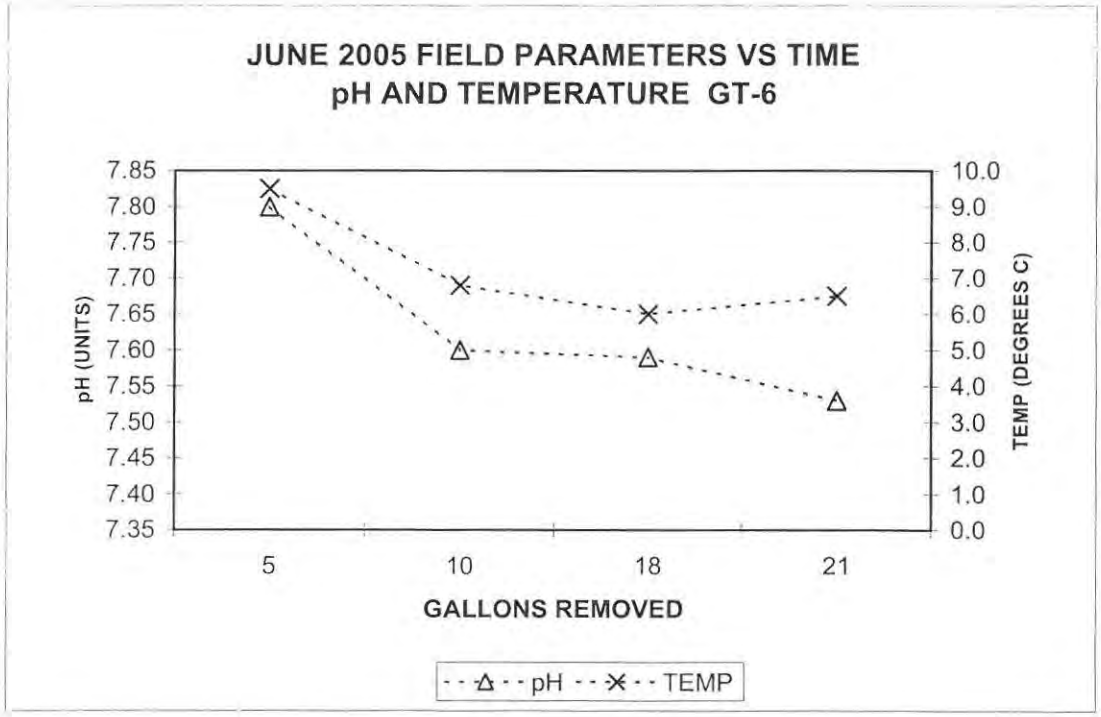

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-5
SPECIFIC CONDUCTANCE (uS/cm)
650
645
640
635
630
625
620
615
5
10
16
22
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.44


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-6
pH (UNITS)
7.85
7.80
7.75
7.70
7.65
7.60
7.55
7.50
7.45
7.40
7.35
TEMP (DEGREES C)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5
10
18
21
GALLONS REMOVED
pH
TEMP

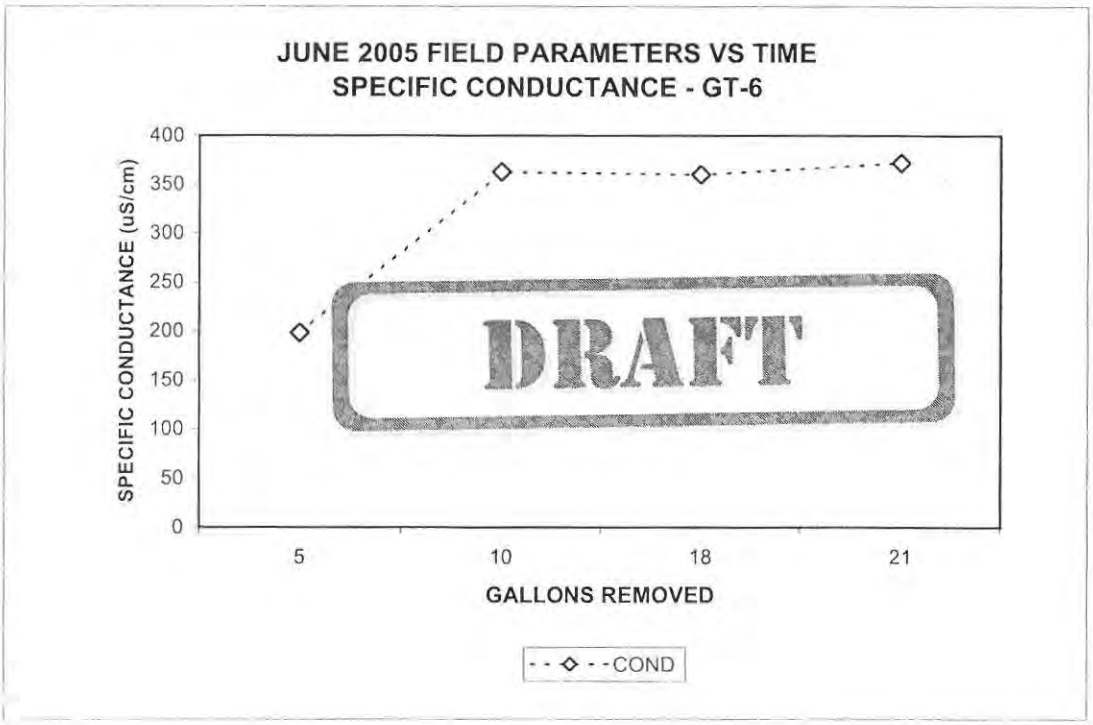
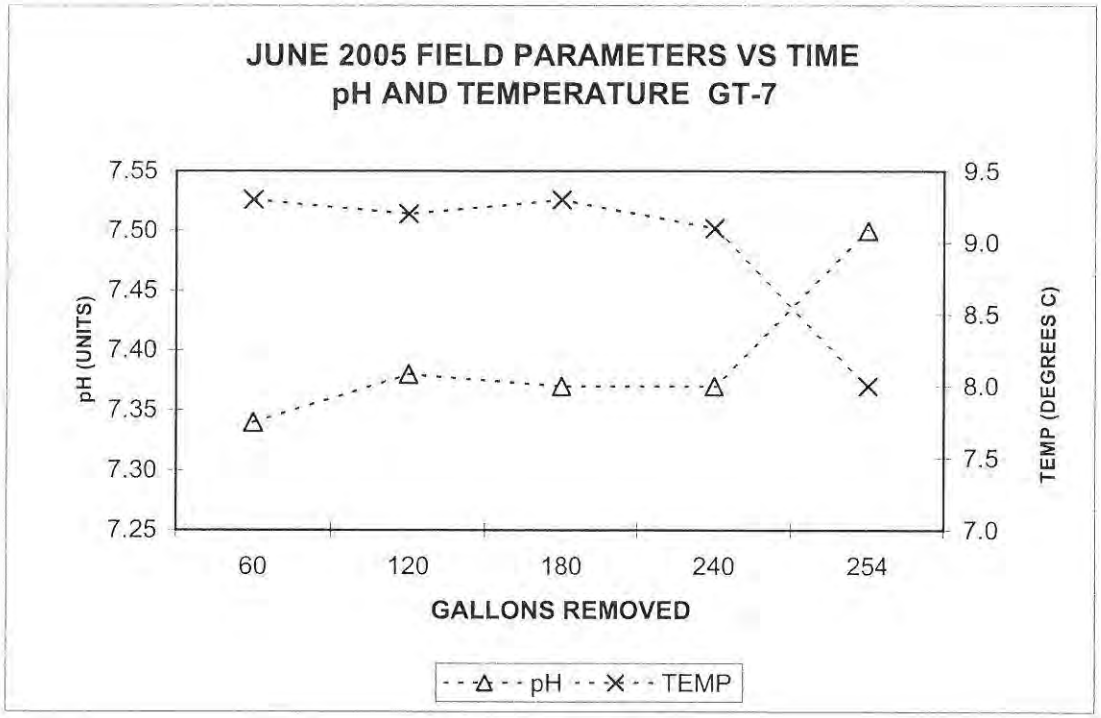

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-6
SPECIFIC CONDUCTANCE (uS/cm)
400
350
300
250
200
150
100
50
0
5
10
18
21
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.45


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-7
7.55
7.50
7.45
7.40
7.35
7.30
7.25
pH (UNITS)
9.5
9.0
8.5
8.0
7.5
7.0
TEMP (DEGREES C)
60
120
180
240
254
GALLONS REMOVED
pH
TEMP

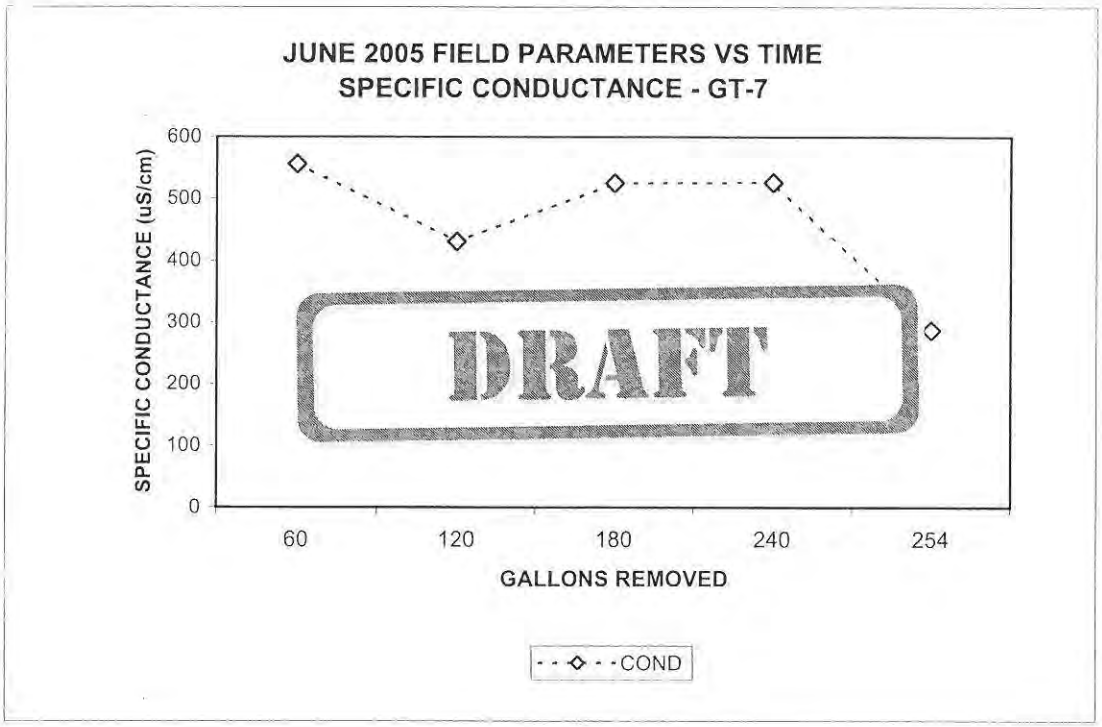
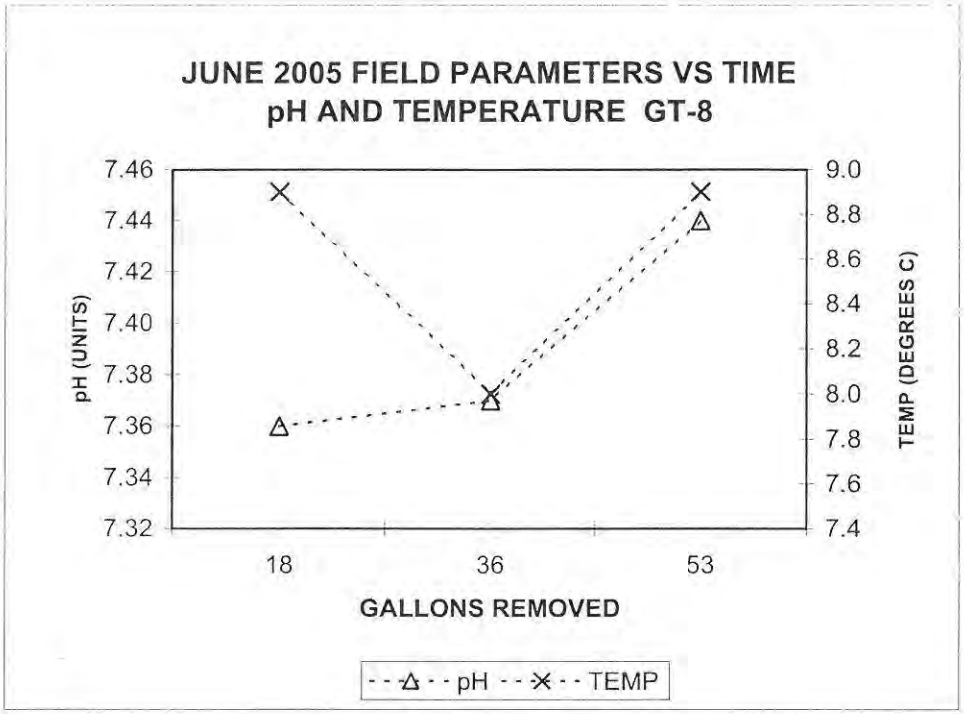

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-7
600
500
400
300
200
100
0
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
60
120
180
240
254
GALLONS REMOVED
COND

FIGURE A.6.46


JUNE 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-8
pH (UNITS)
7.46
7.44
7.42
7.40
7.38
7.36
7.34
7.32
TEMP (DEGREES C)
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
18
36
53
GALLONS REMOVED
pH
TEMP

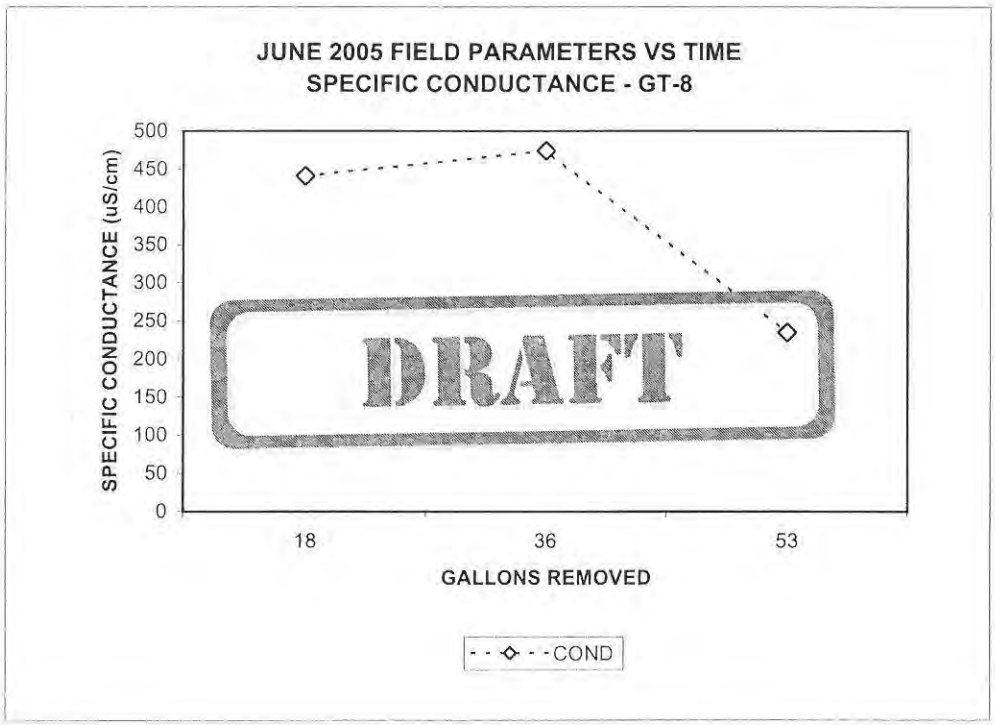
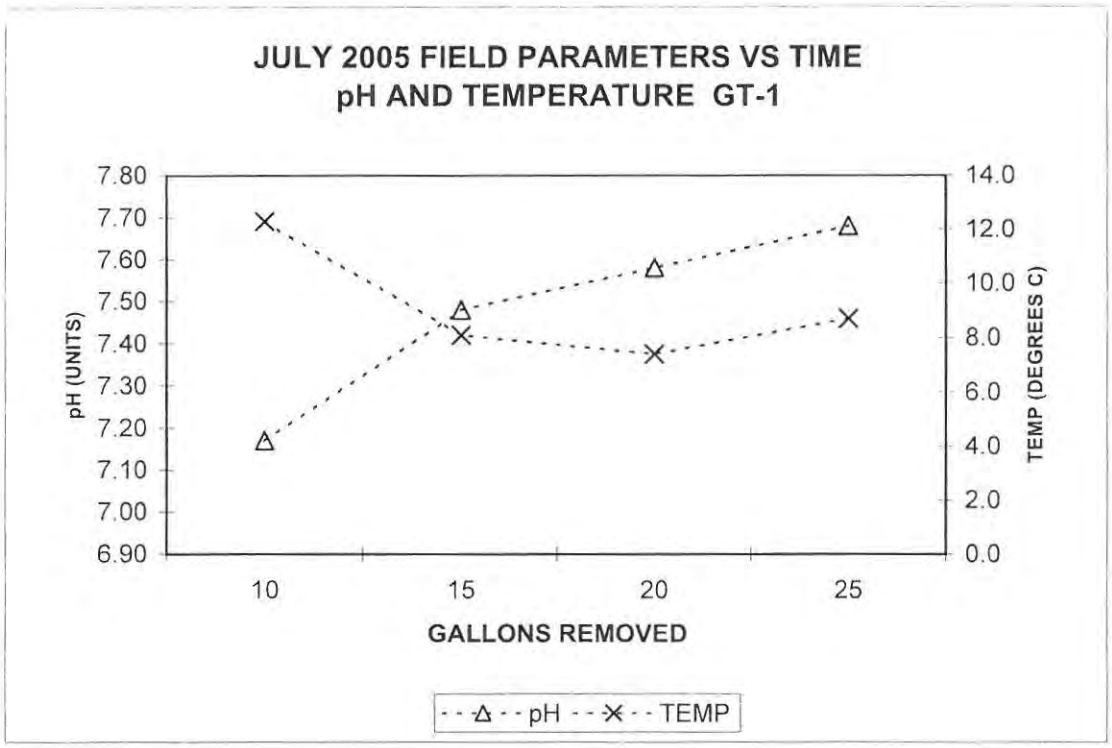

JUNE 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-8
SPECIFIC CONDUCTANCE (uS/cm)
500
450
400
350
300
250
200
150
100
50
0
18
36
53
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.47


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-1
7.80
7.70
7.60
7.50
7.40
7.30
7.20
7.10
7.00
6.90
pH (UNITS)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
10
15
20
25
GALLONS REMOVED
pH
TEMP

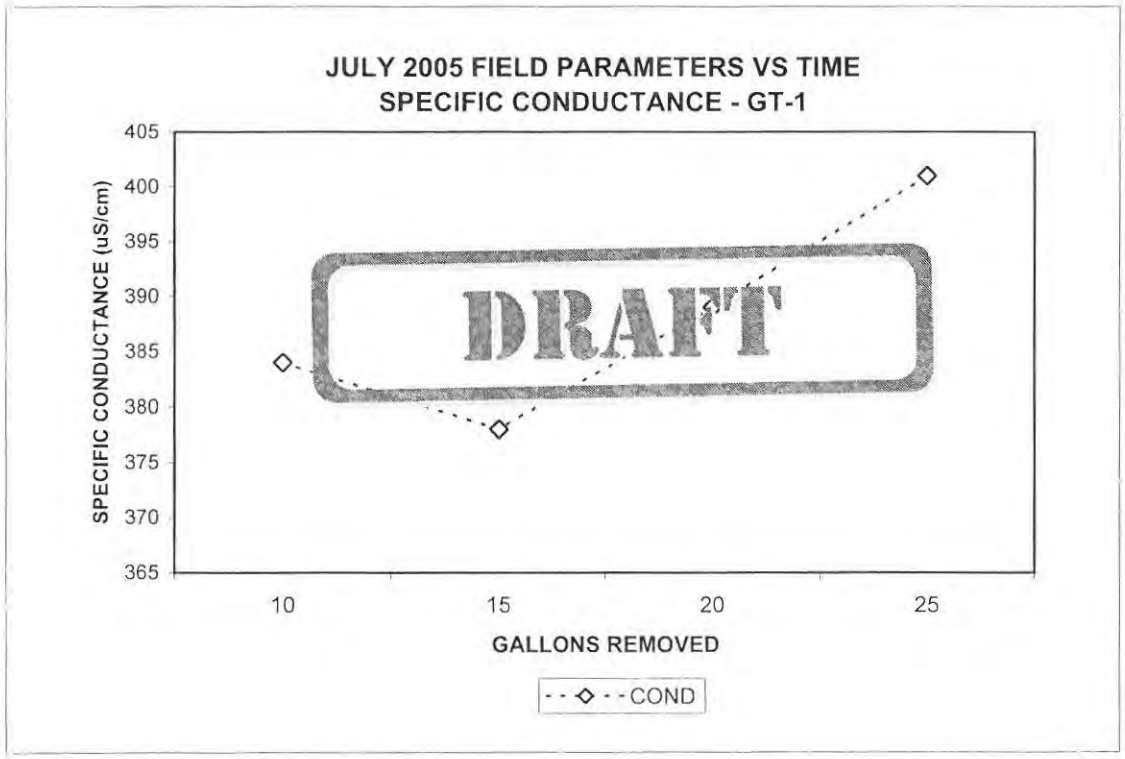
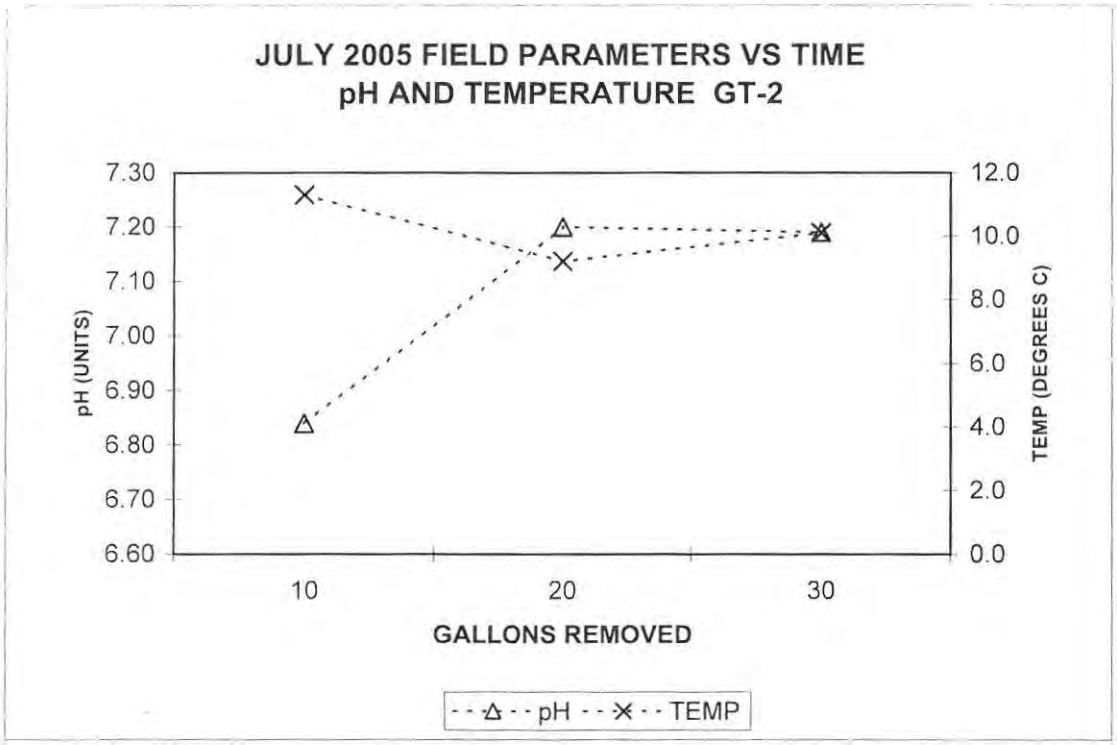

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-1
405
400
395
390
385
380
375
370
365
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
10
15
20
25
GALLONS REMOVED
COND

FIGURE A.6.48


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-2
7.30
7.20
7.10
7.00
6.90
6.80
6.70
6.60
pH (UNITS)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
10
20
30
GALLONS REMOVED
pH
TEMP

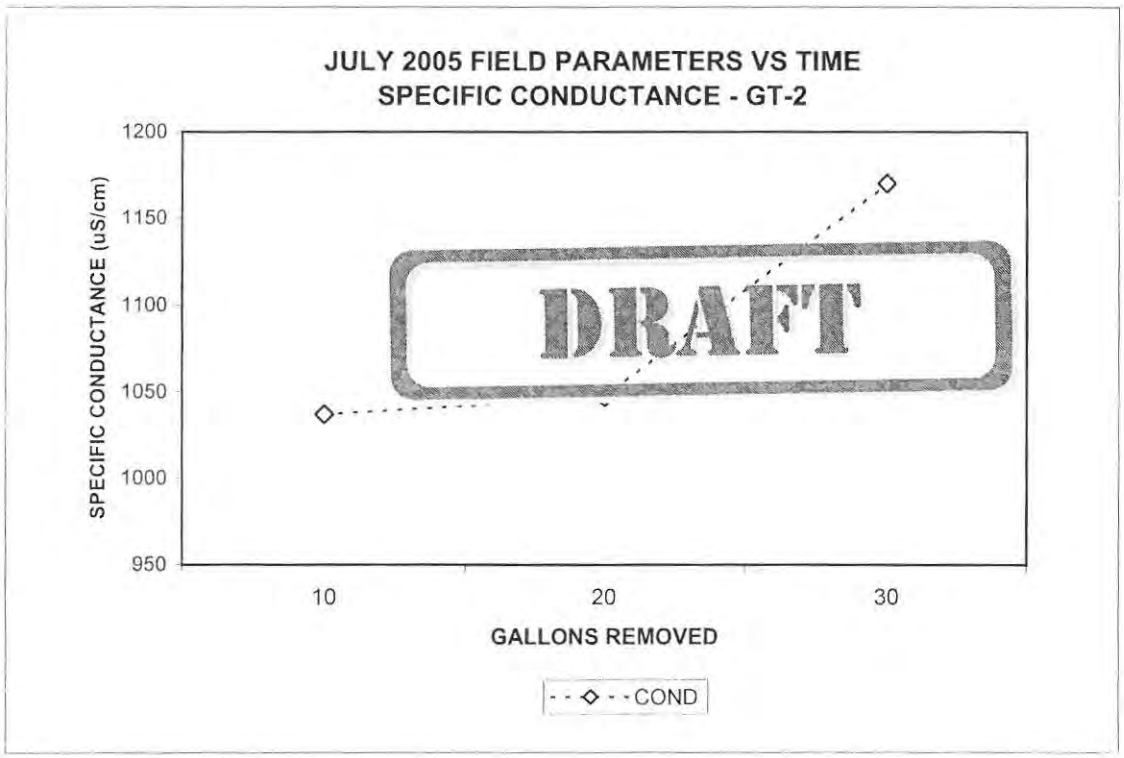
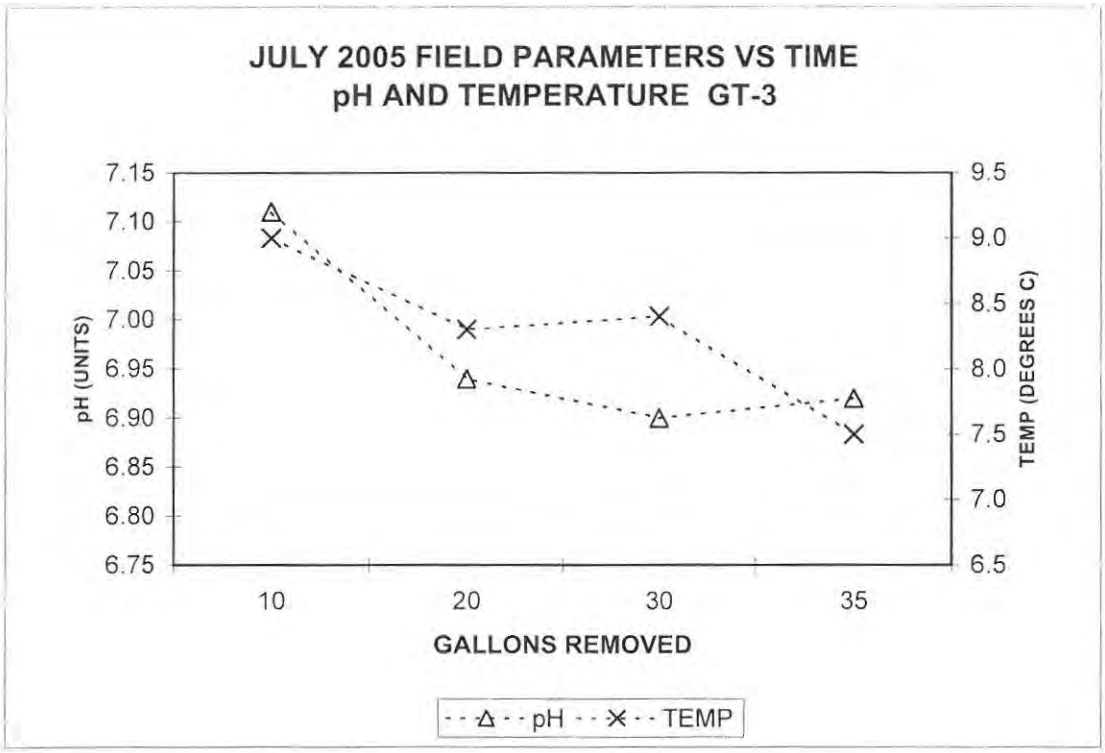

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-2
1200
1150
1100
1050
1000
950
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
10
20
30
GALLONS REMOVED
COND

FIGURE A.6.49


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-3
pH (UNITS)
7.15
7.10
7.05
7.00
6.95
6.90
6.85
6.80
6.75
TEMP (DEGREES C)
9.5
9.0
8.5
8.0
7.5
7.0
6.5
10
20
30
35
GALLONS REMOVED
pH
TEMP

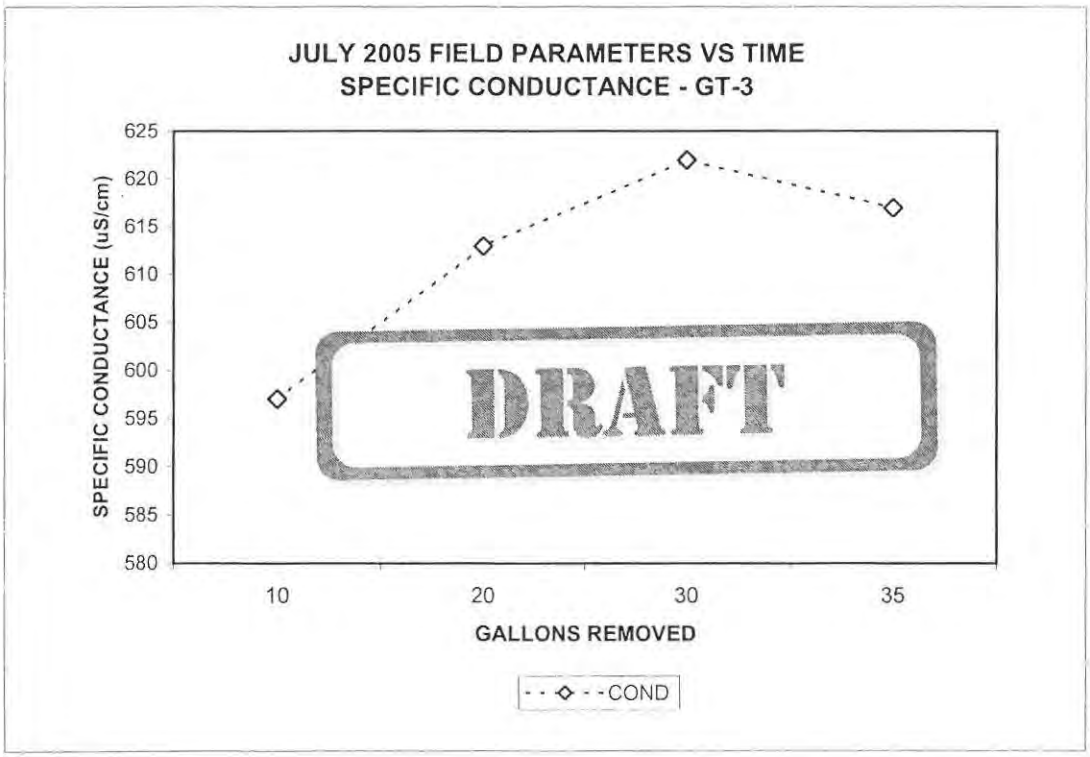
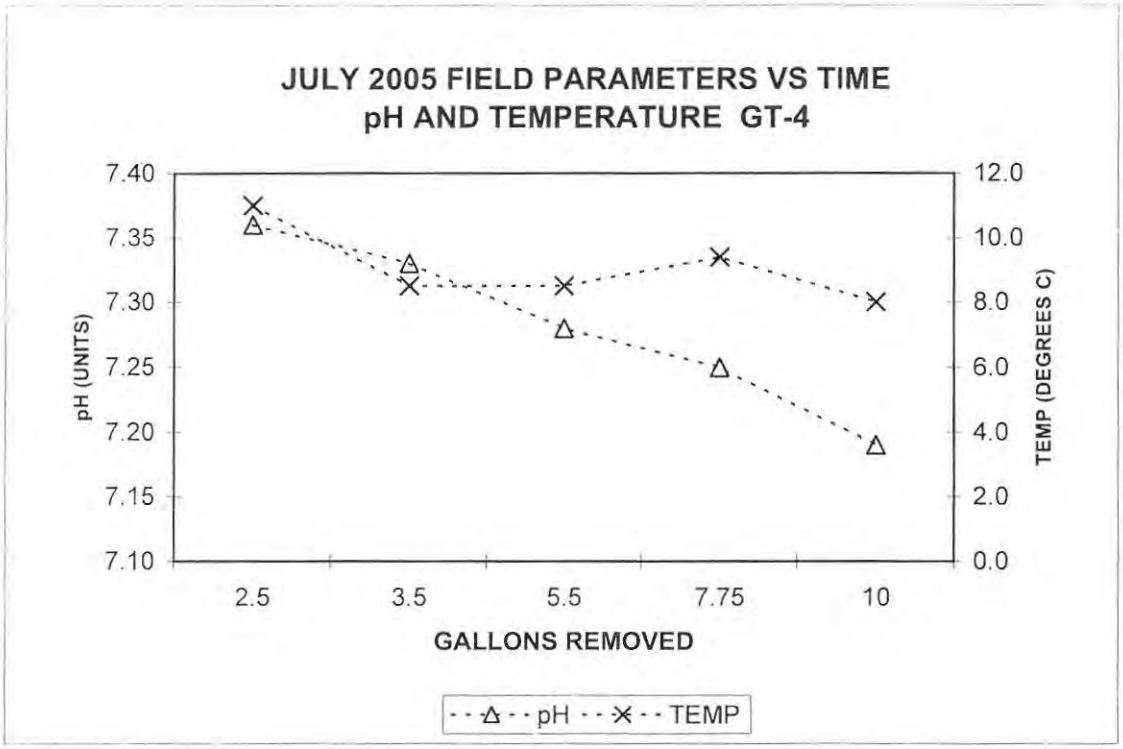

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-3
SPECIFIC CONDUCTANCE (uS/cm)
625
620
615
610
605
600
595
590
585
580
10
20
30
35
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.50


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-4
7.40
7.35
7.30
7.25
7.20
7.15
7.10
pH (UNITS)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
2.5
3.5
5.5
7.75
10
GALLONS REMOVED
pH
TEMP

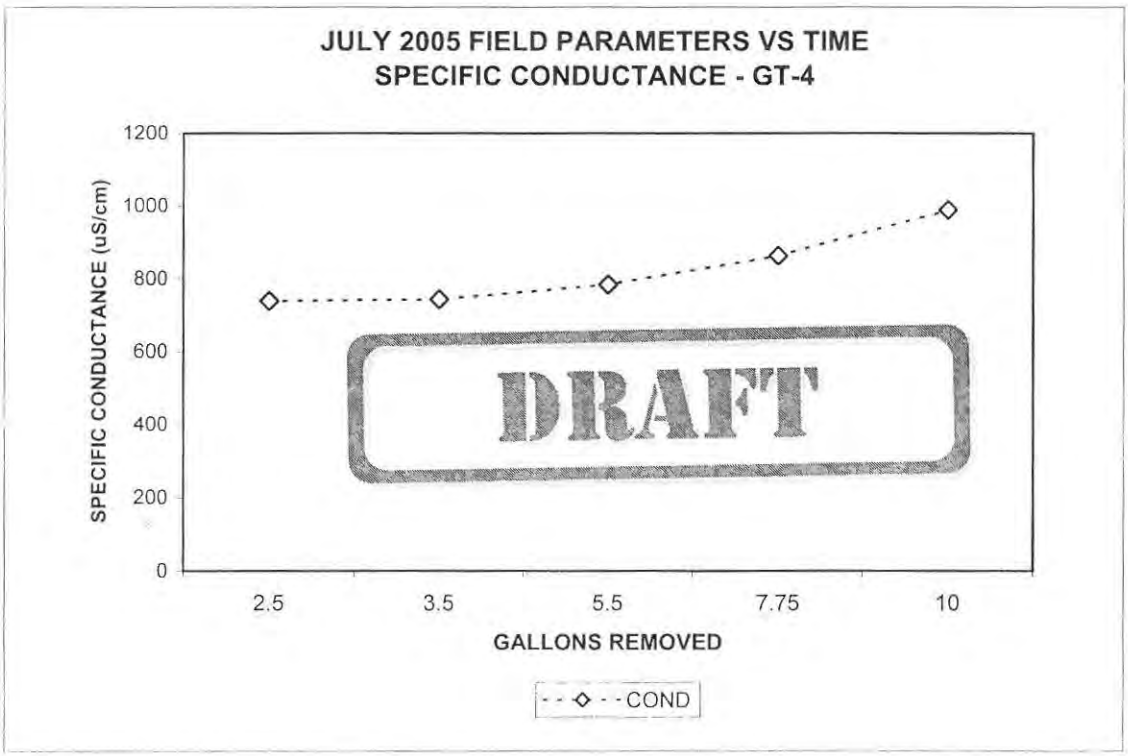
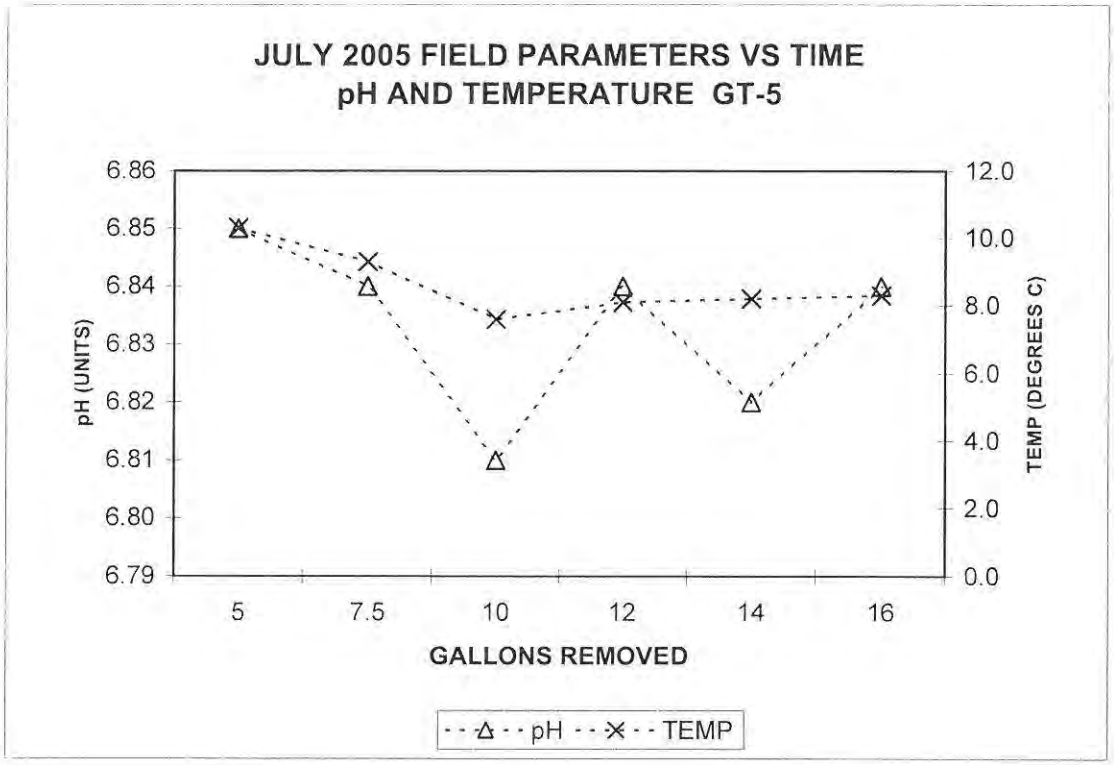

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-4
1200
1000
800
600
400
200
0
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
2.5
3.5
5.5
7.75
10
GALLONS REMOVED
COND

FIGURE A.6.51


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-5
6.86
6.85
6.84
6.83
6.82
6.81
6.80
6.79
pH (UNITS)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
5
7.5
10
12
14
16
GALLONS REMOVED
pH
TEMP

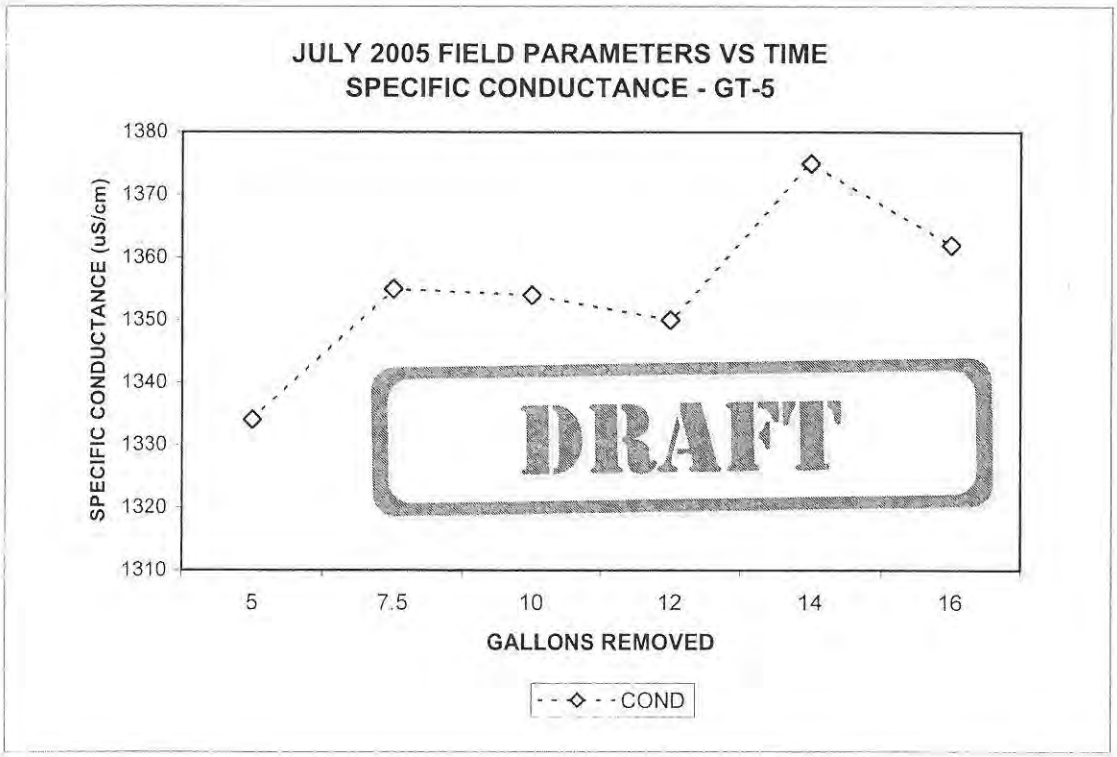
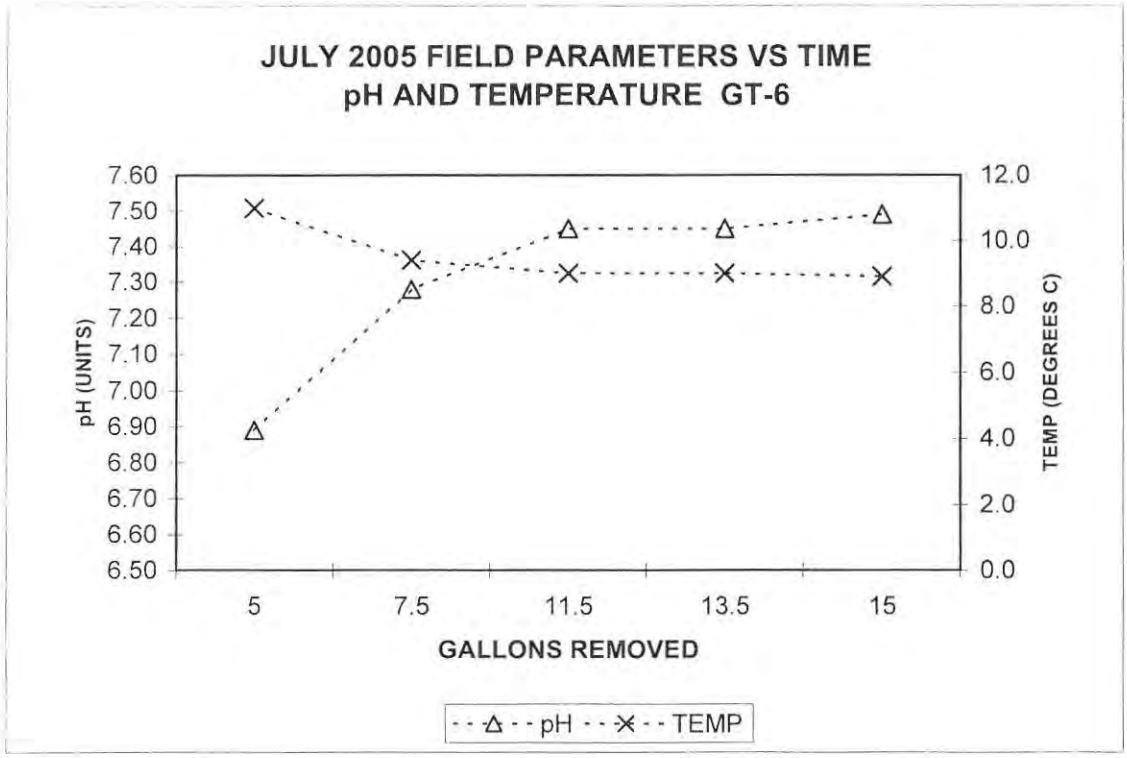

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-5
1380
1370
1360
1350
1340
1330
1320
1310
SPECIFIC CONDUCTANCE (uS/cm)
5
7.5
10
12
14
16
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.52


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-6
pH (UNITS)
7.60
7.50
7.40
7.30
7.20
7.10
7.00
6.90
6.80
6.70
6.60
6.50
TEMP (DEGREES C)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
5
7.5
11.5
13.5
15
GALLONS REMOVED
pH
TEMP

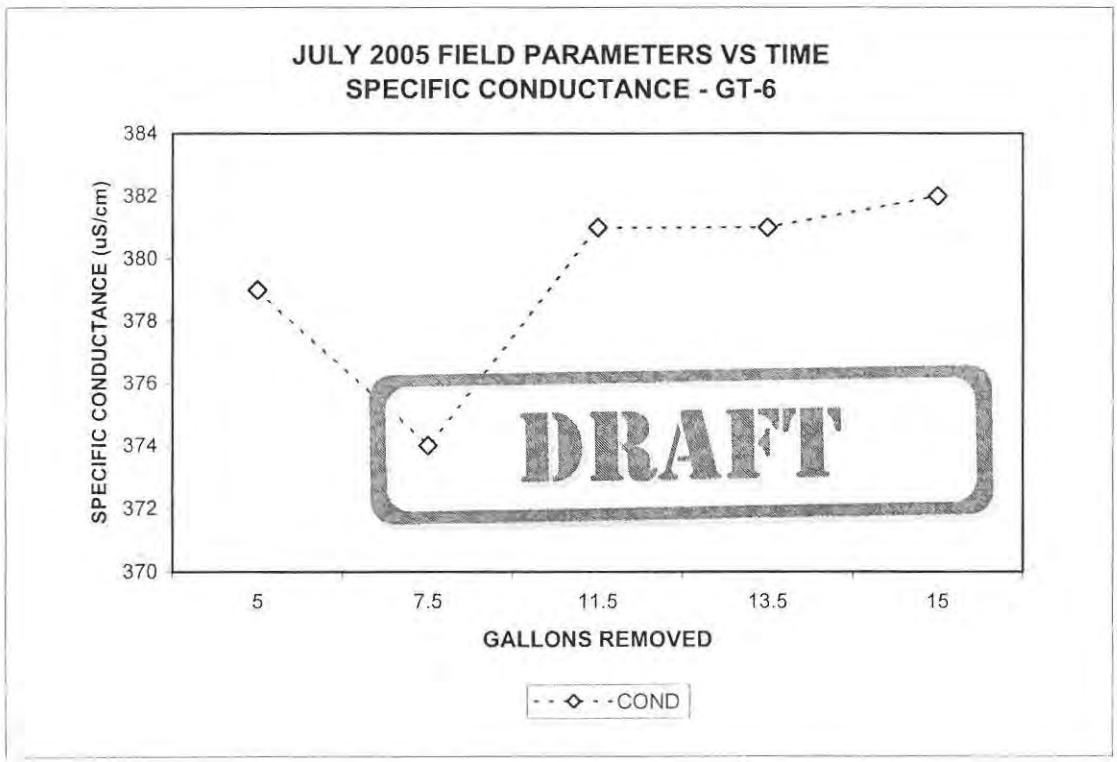
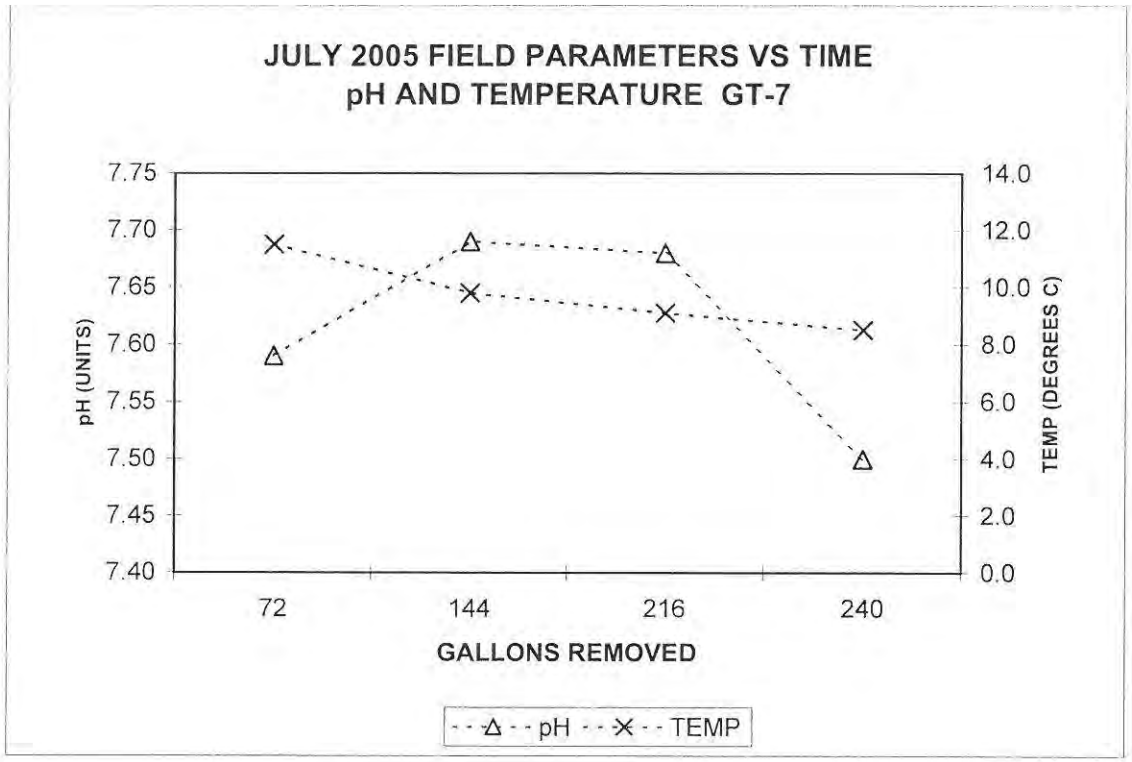

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-6
SPECIFIC CONDUCTANCE (uS/cm)
384
382
380
378
376
374
372
370
5
7.5
11.5
13.5
15
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.53


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-7
7.75
7.70
7.65
7.60
7.55
7.50
7.45
7.40
pH (UNITS)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
TEMP (DEGREES C)
72
144
216
240
GALLONS REMOVED
pH
TEMP

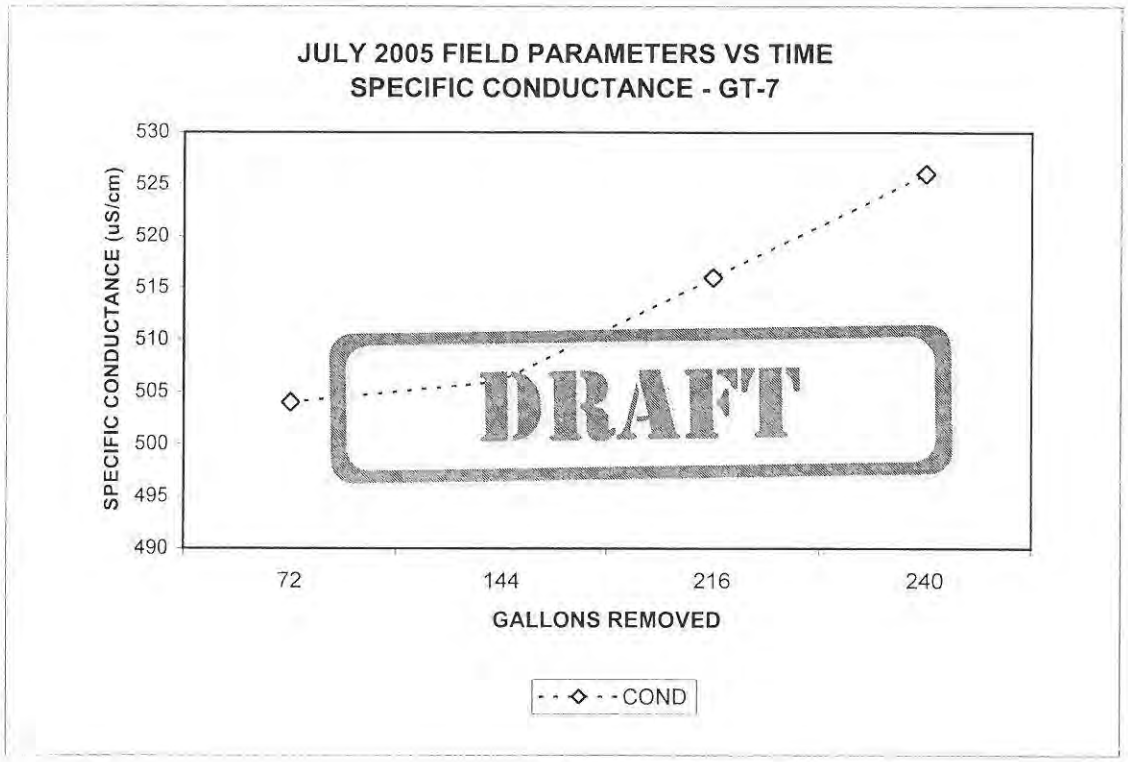
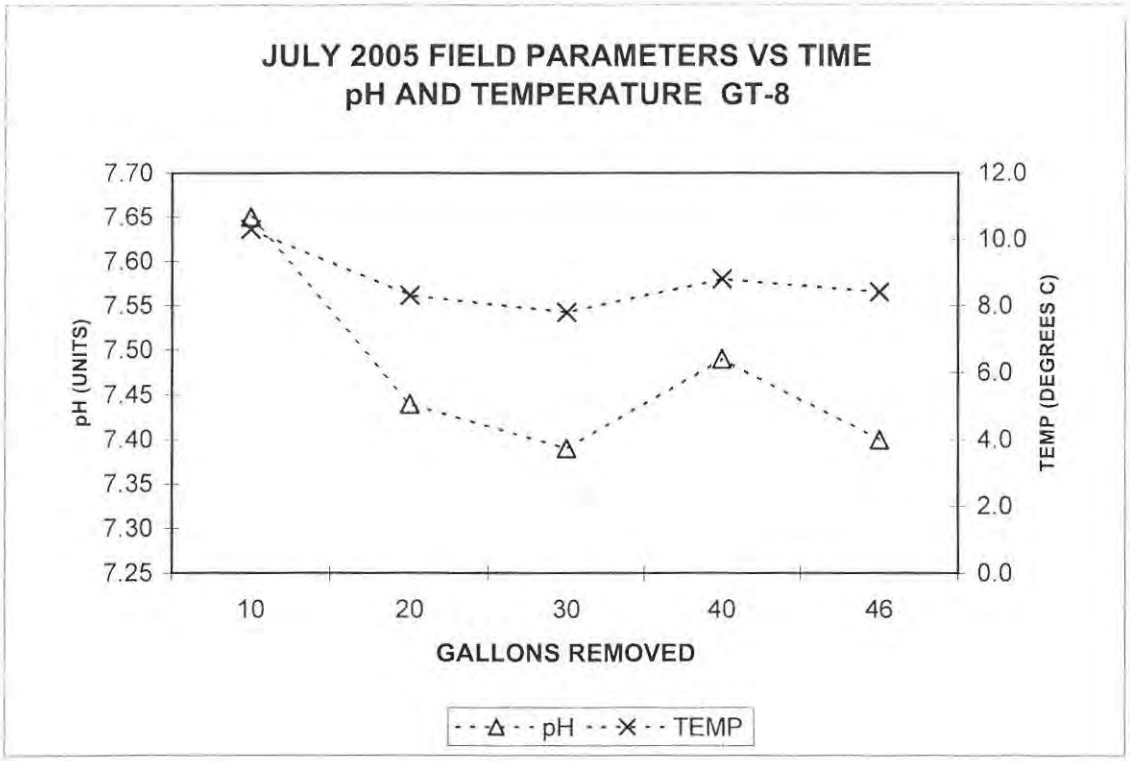

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-7
530
525
520
515
510
505
500
495
490
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
72
144
216
240
GALLONS REMOVED
COND

FIGURE A.6.54


JULY 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-8
pH (UNITS)
7.70
7.65
7.60
7.55
7.50
7.45
7.40
7.35
7.30
7.25
TEMP (DEGREES C)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
10
20
30
40
46
GALLONS REMOVED
pH
TEMP

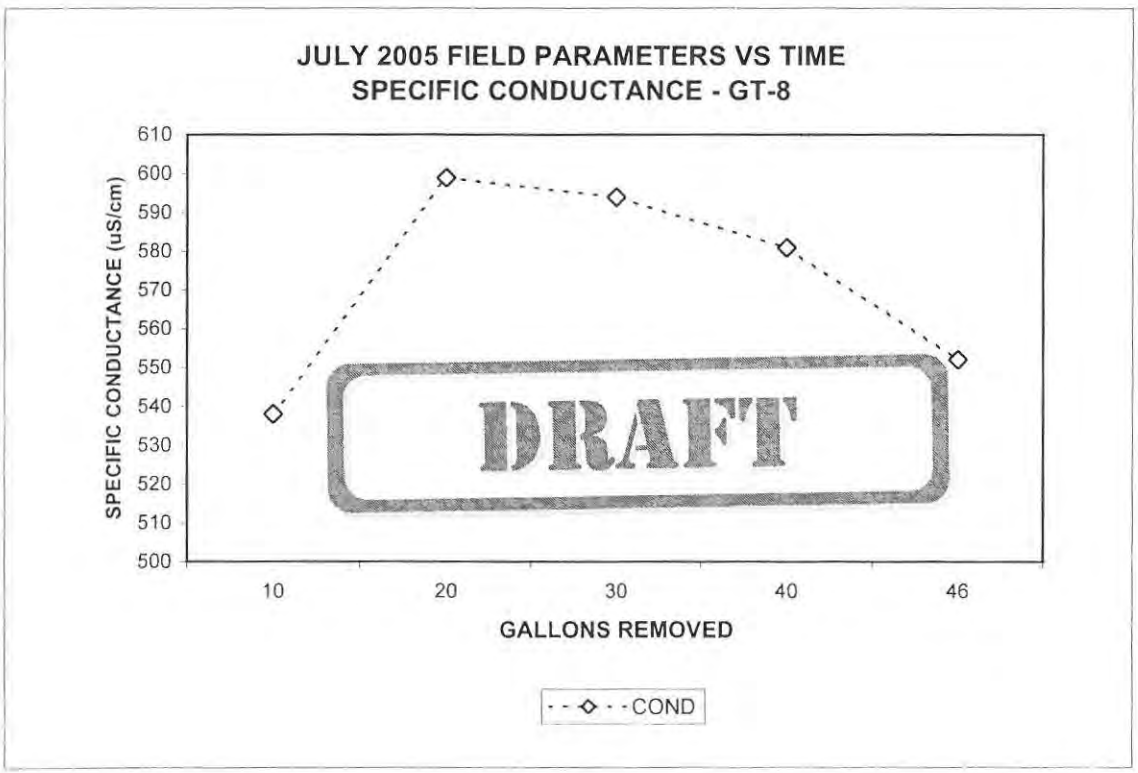
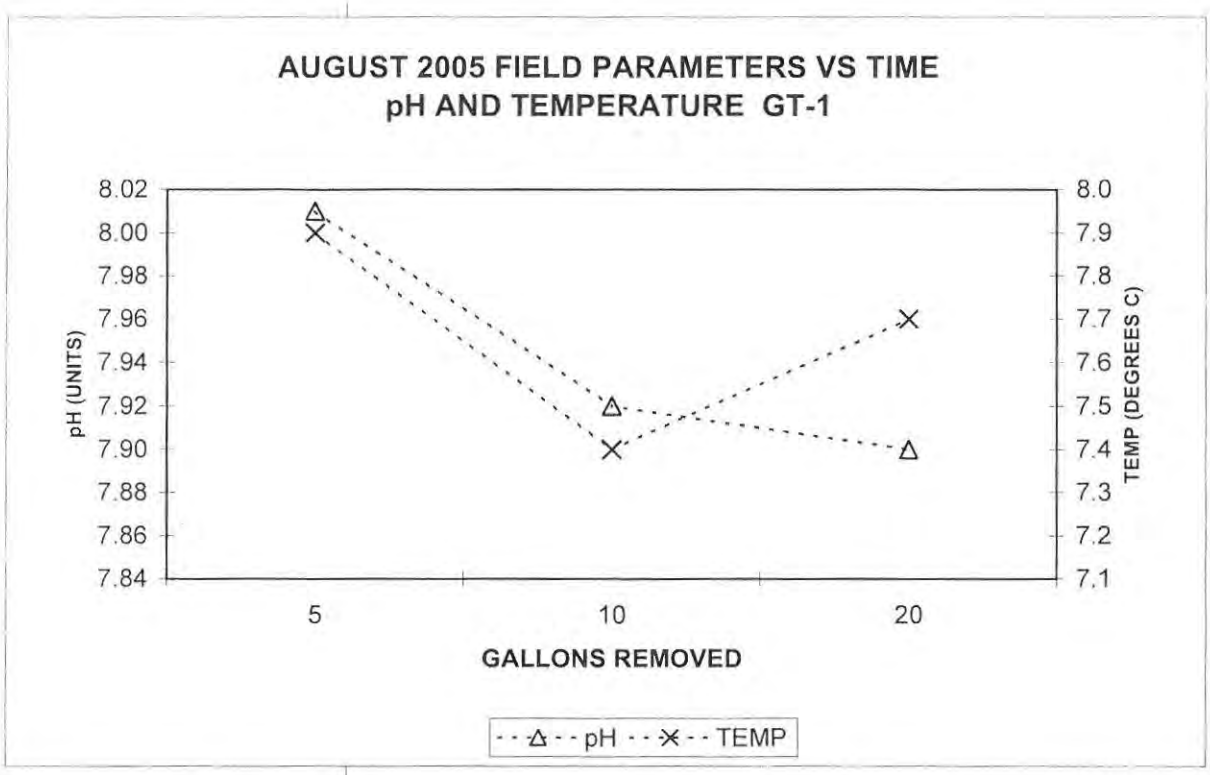

JULY 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-8
SPECIFIC CONDUCTANCE (uS/cm)
610
600
590
580
570
560
550
540
530
520
510
500
10
20
30
40
46
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.55


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-1
pH (UNITS)
8.02
8.00
7.98
7.96
7.94
7.92
7.90
7.88
7.86
7.84
TEMP (DEGREES C)
8.0
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
5
10
20
GALLONS REMOVED
pH
TEMP

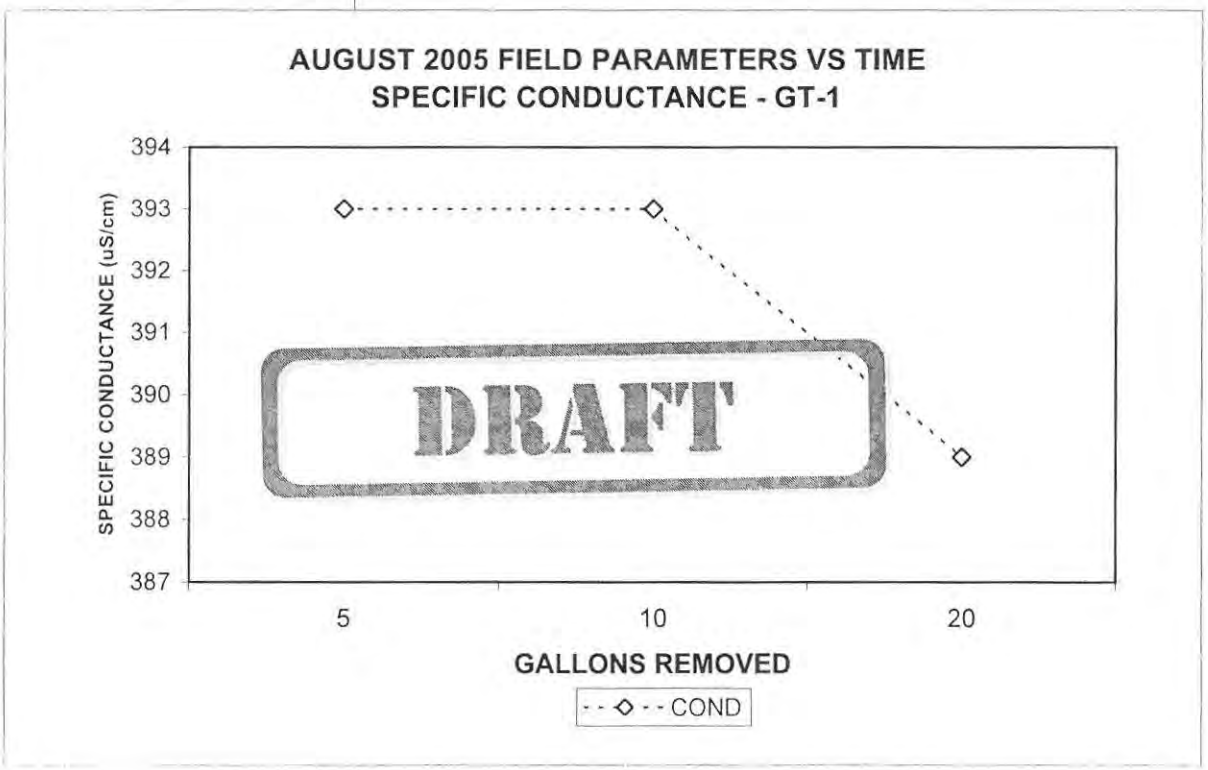
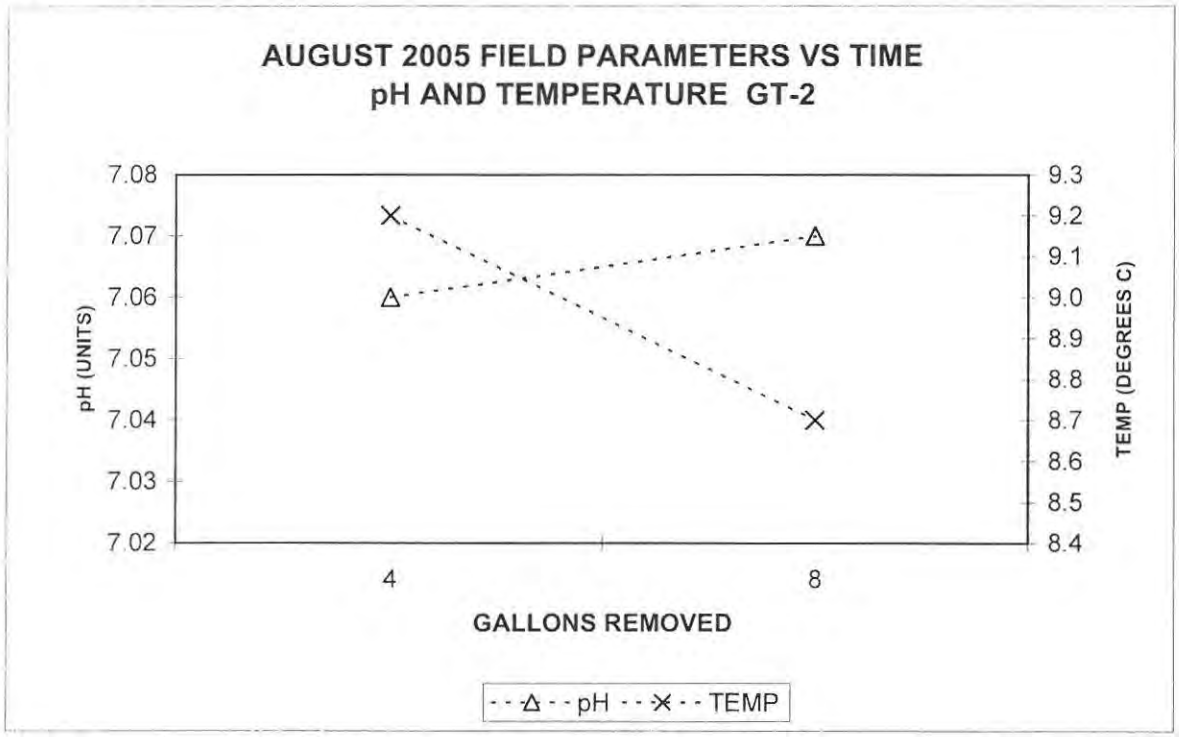

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-1
SPECIFIC CONDUCTANCE (uS/cm)
394
393
392
391
390
389
388
387
DRAFT
5
10
20
GALLONS REMOVED
COND

FIGURE A.6.56


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-2
7.08
7.07
7.06
7.05
7.04
7.03
7.02
pH (UNITS)
9.3
9.2
9.1
9.0
8.9
8.8
8.7
8.6
8.5
8.4
TEMP (DEGREES C)
4
8
GALLONS REMOVED
pH
TEMP

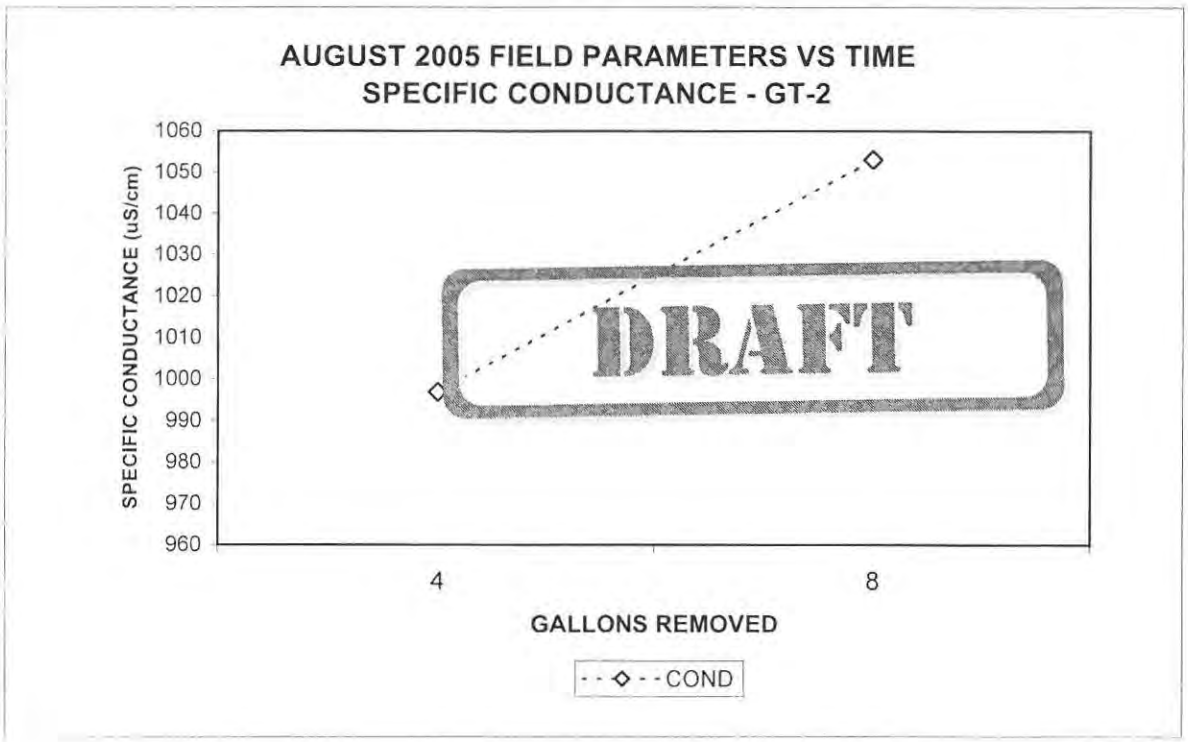
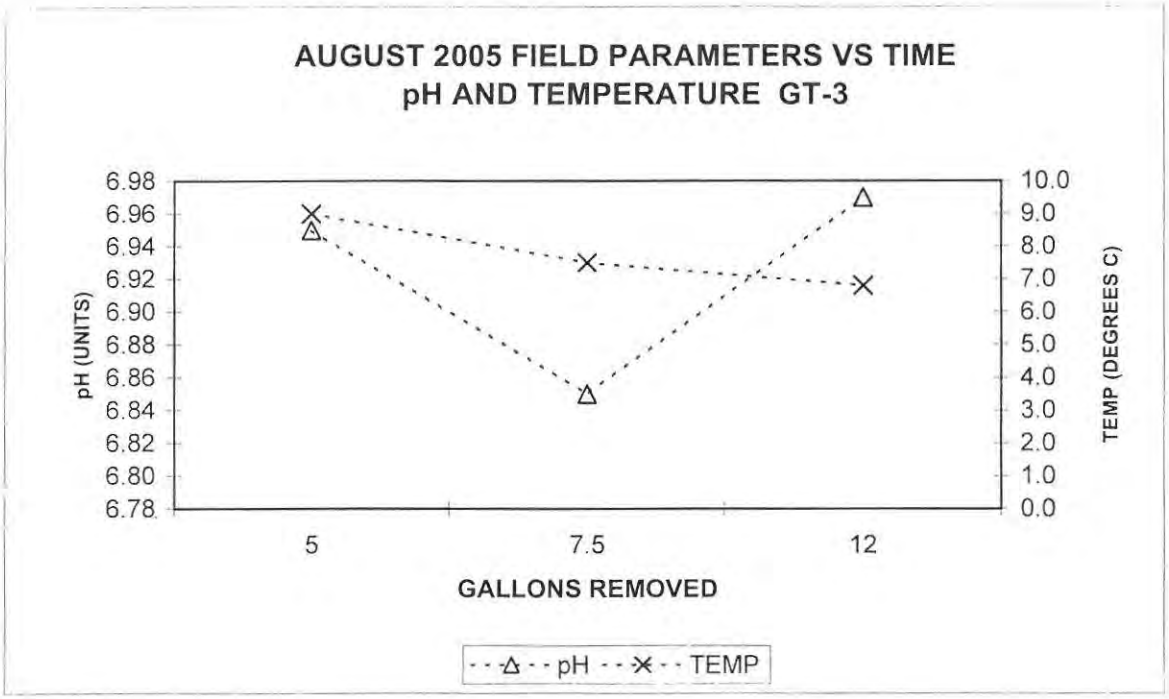

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-2
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
4
8
GALLONS REMOVED
COND

FIGURE A.6.57


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-3
pH (UNITS)
6.98
6.96
6.94
6.92
6.90
6.88
6.86
6.84
6.82
6.80
6.78
TEMP (DEGREES C)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5
7.5
12
GALLONS REMOVED
pH
TEMP

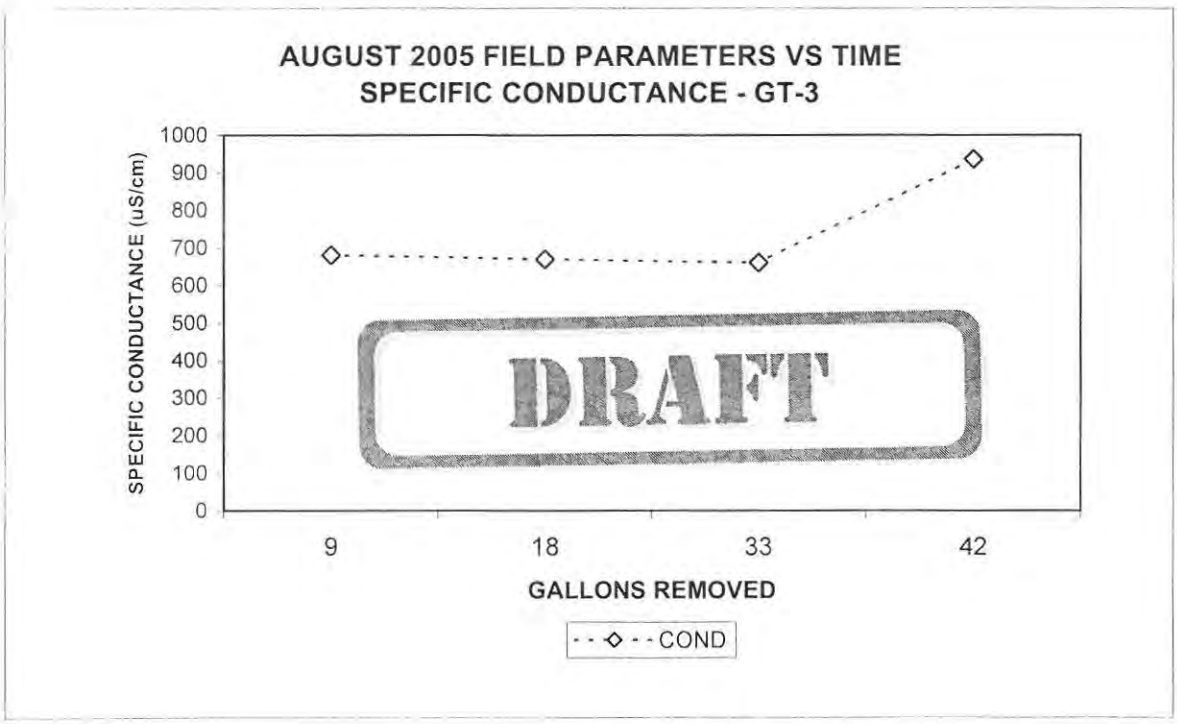
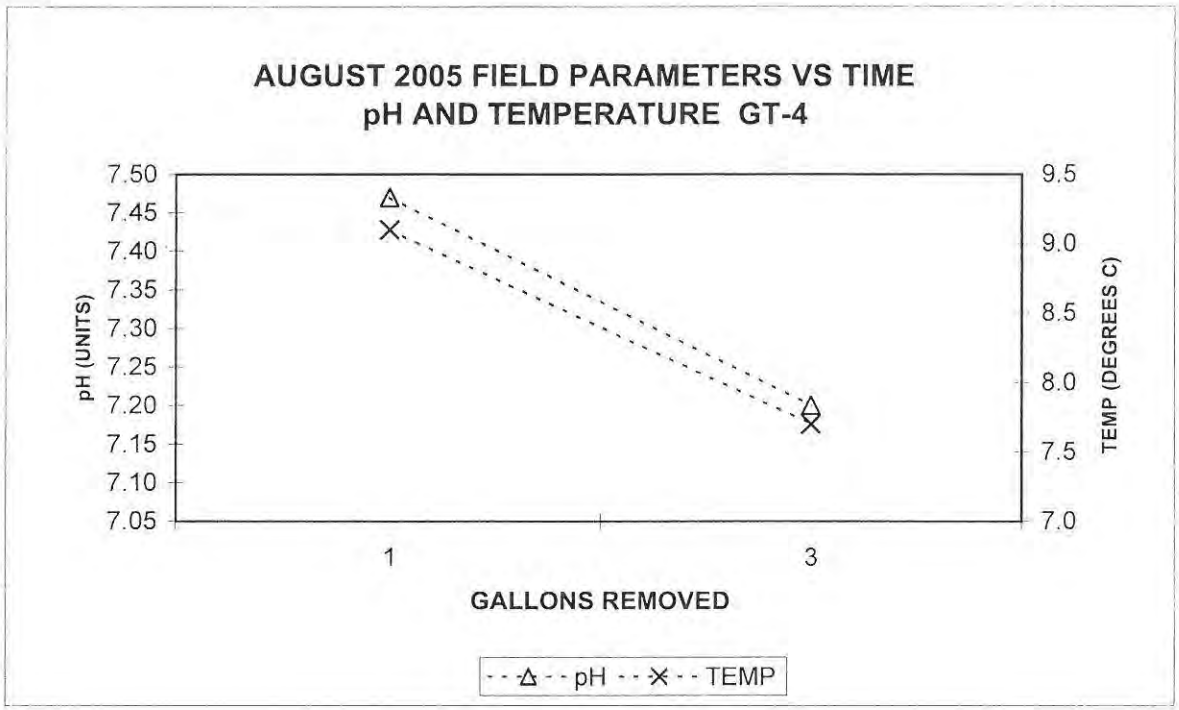

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-3
SPECIFIC CONDUCTANCE (uS/cm)
1000
900
800
700
600
500
400
300
200
100
0
9
18
33
42
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.58


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-4
pH (UNITS)
7.50
7.45
7.40
7.35
7.30
7.25
7.20
7.15
7.10
7.05
TEMP (DEGREES C)
9.5
9.0
8.5
8.0
7.5
7.0
1
3
GALLONS REMOVED
pH
TEMP

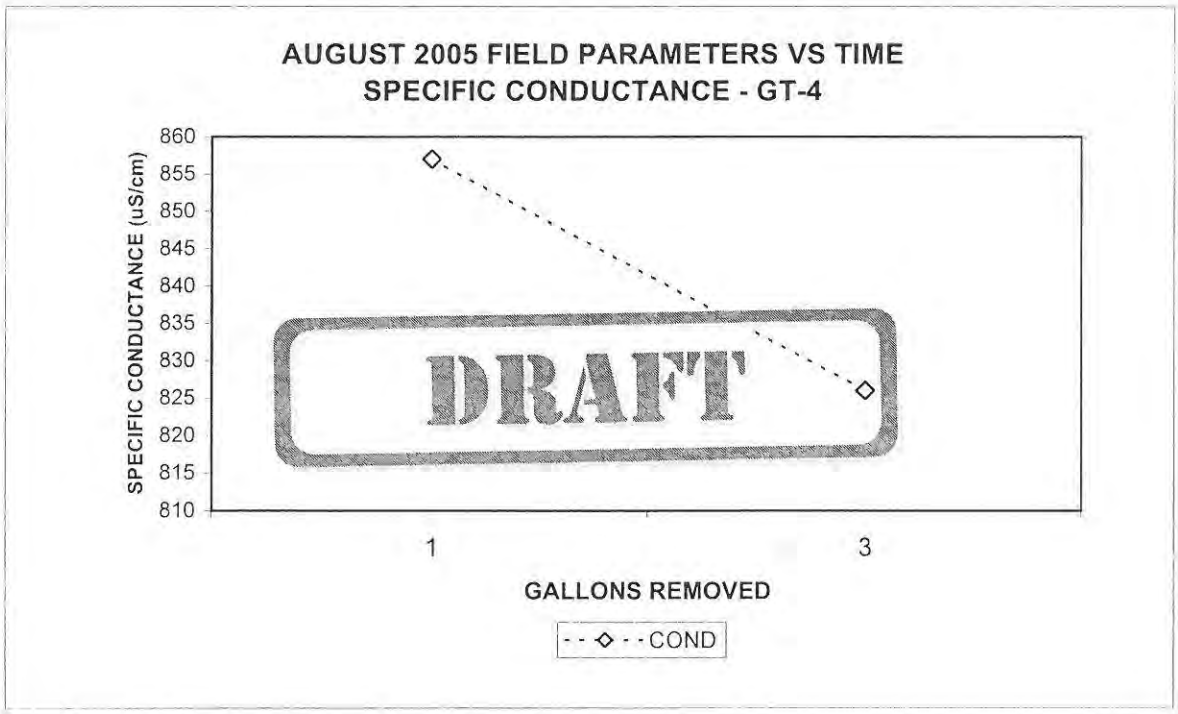
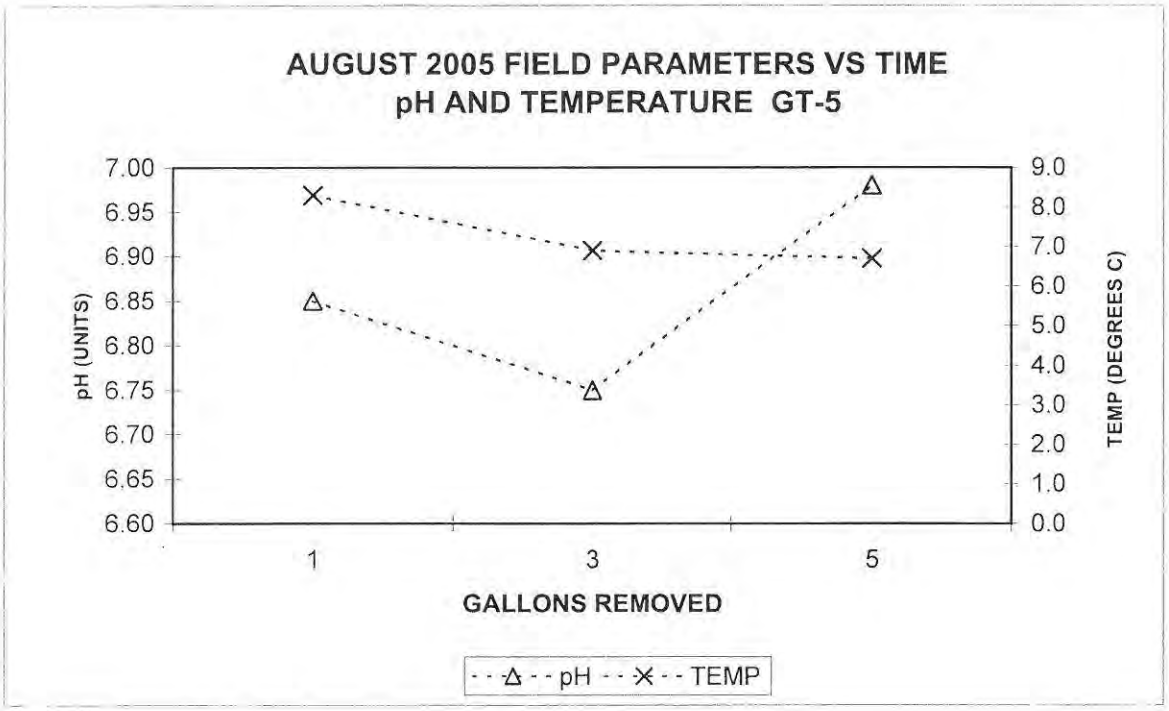

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-4
SPECIFIC CONDUCTANCE (uS/cm)
860
855
850
845
840
835
830
825
820
815
810
DRAFT
1
3
GALLONS REMOVED
COND

FIGURE A.6.59


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-5
pH (UNITS)
7.00
6.95
6.90
6.85
6.80
6.75
6.70
6.65
6.60
TEMP (DEGREES C)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
3
5
GALLONS REMOVED
pH
TEMP

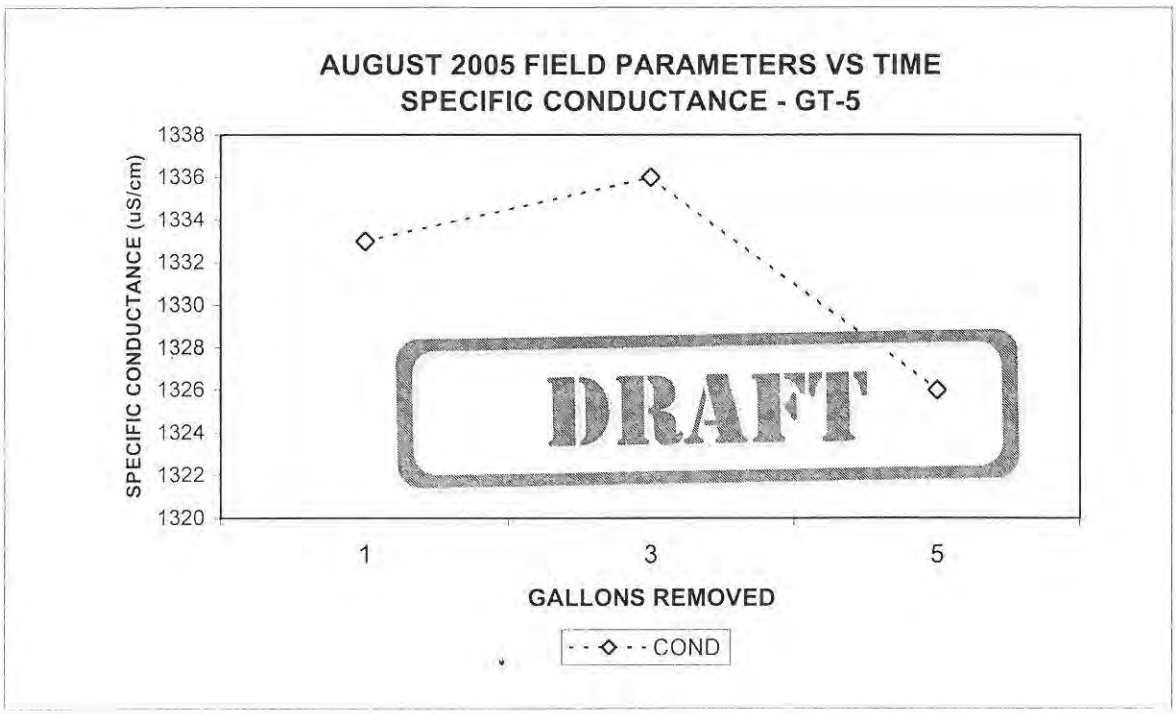
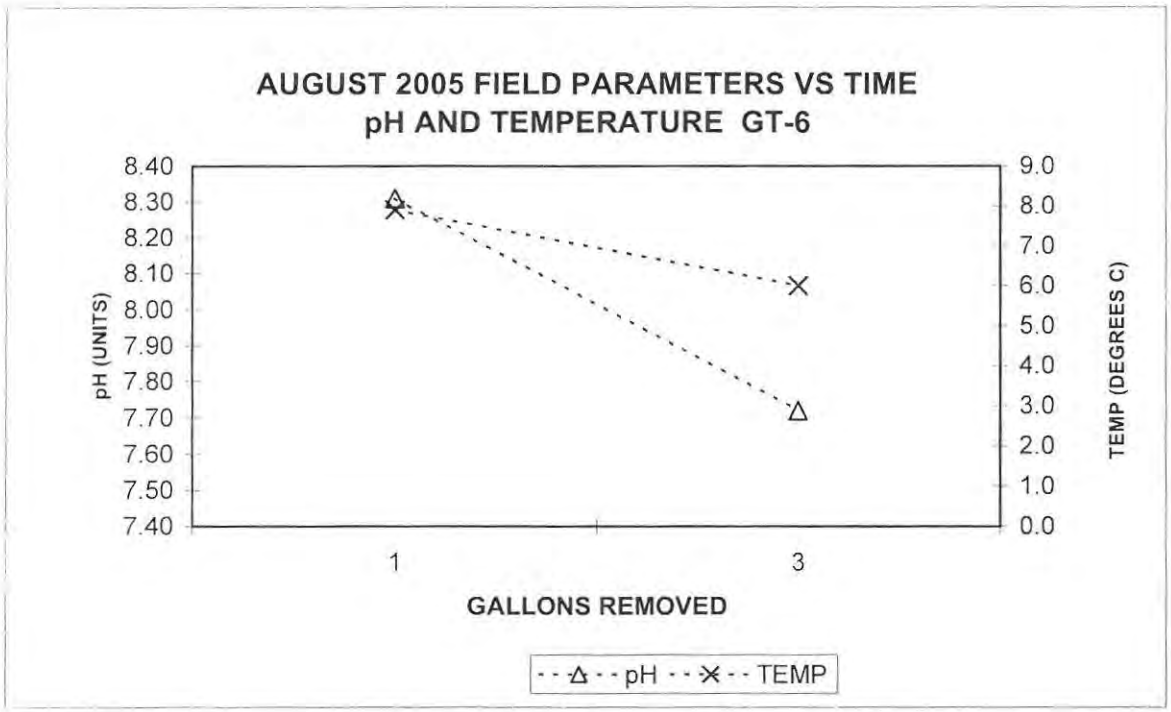

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-5
SPECIFIC CONDUCTANCE (uS/cm)
1338
1336
1334
1332
1330
1328
1326
1324
1322
1320
1
3
5
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.60


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-6
pH (UNITS)
8.40
8.30
8.20
8.10
8.00
7.90
7.80
7.70
7.60
7.50
7.40
TEMP (DEGREES C)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
3
GALLONS REMOVED
pH
TEMP

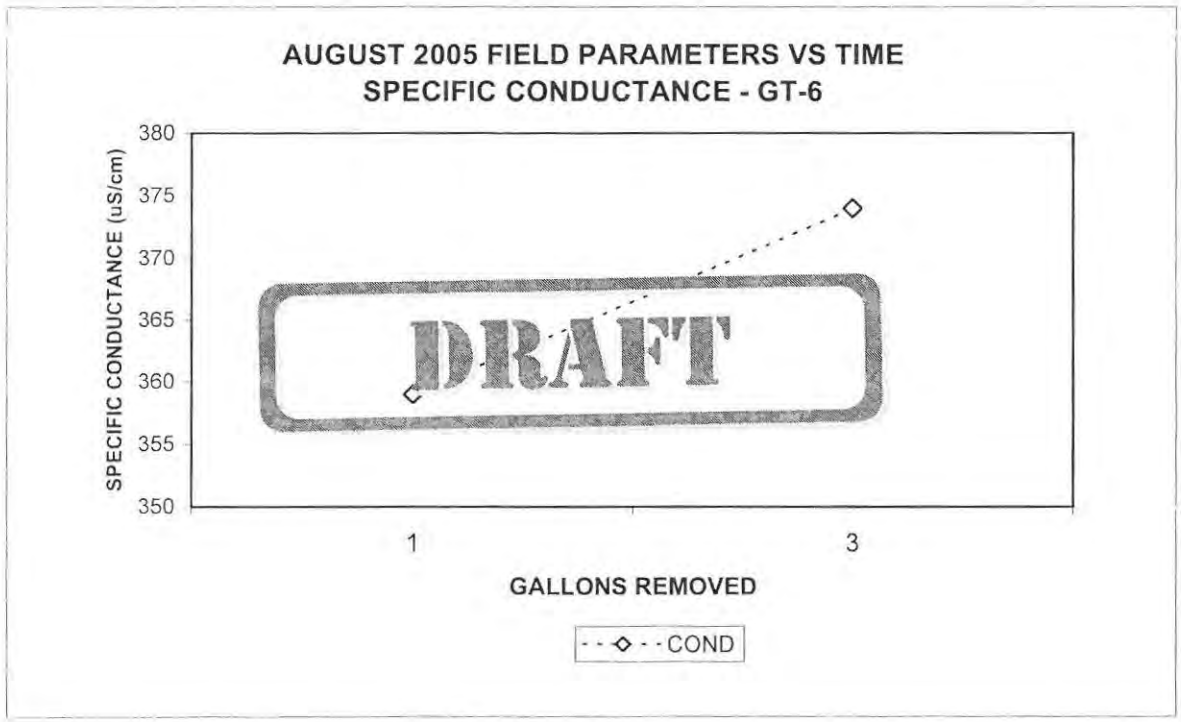
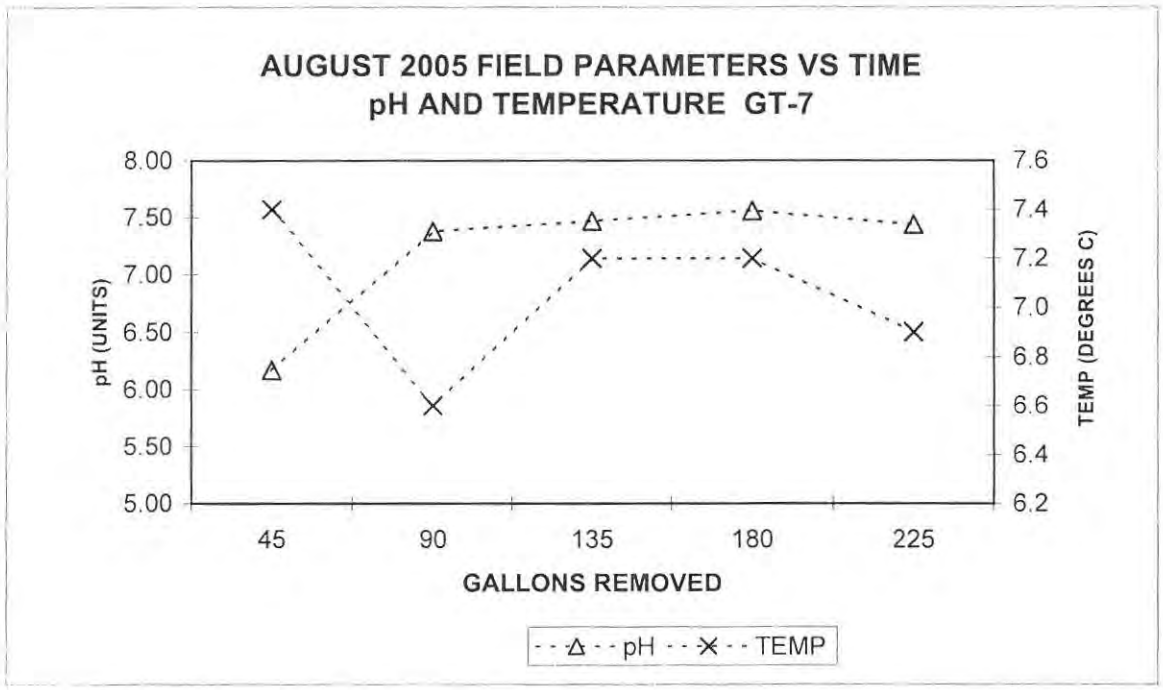

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-6
SPECIFIC CONDUCTANCE (uS/cm)
380
375
370
365
360
355
350
DRAFT
1
3
GALLONS REMOVED
COND

FIGURE A.6.61


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-7
8.00
7.50
7.00
6.50
6.00
5.50
5.00
pH (UNITS)
7.6
7.4
7.2
7.0
6.8
6.6
6.4
6.2
TEMP (DEGREES C)
45
90
135
180
225
GALLONS REMOVED
pH
TEMP

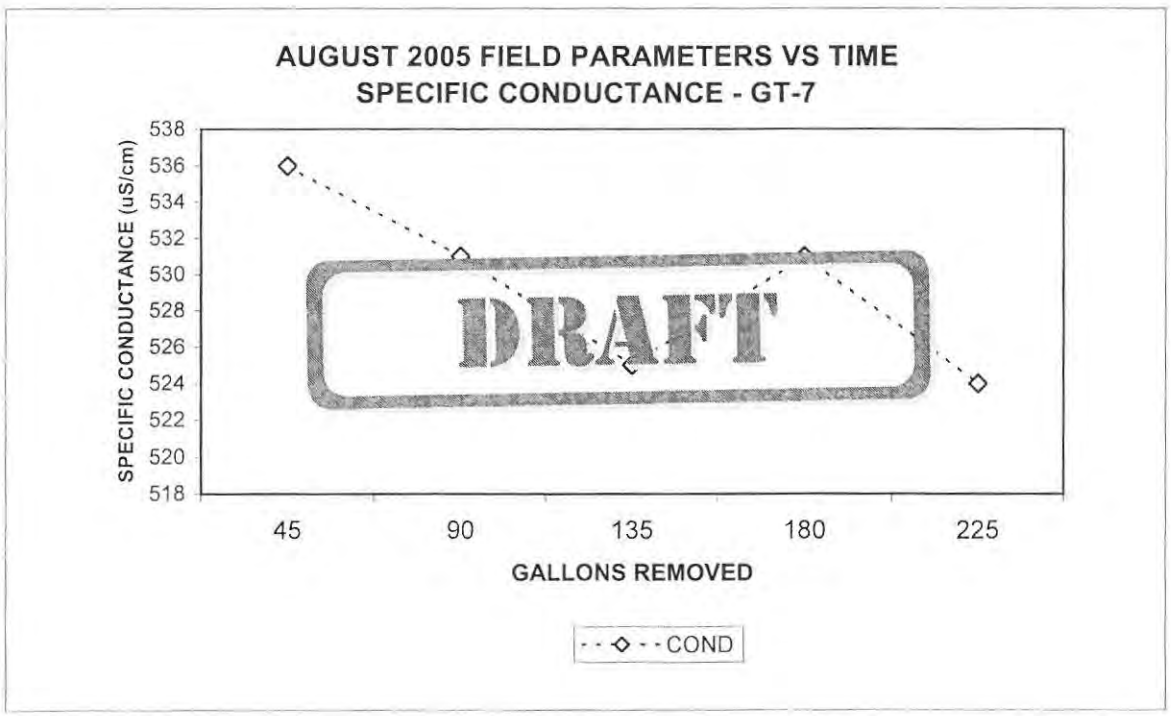
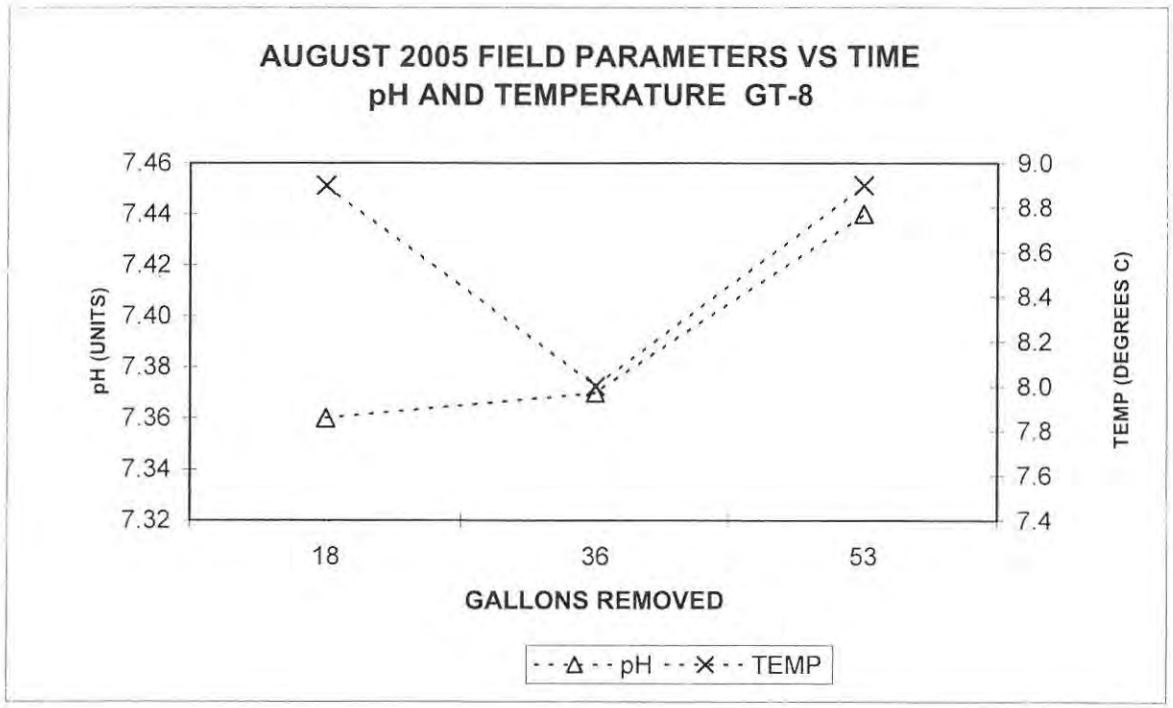

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-7
538
536
534
532
530
528
526
524
522
520
518
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
45
90
135
180
225
GALLONS REMOVED
COND

FIGURE A.6.62


AUGUST 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-8
pH (UNITS)
7.46
7.44
7.42
7.40
7.38
7.36
7.34
7.32
TEMP (DEGREES C)
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
18
36
53
GALLONS REMOVED
pH
TEMP

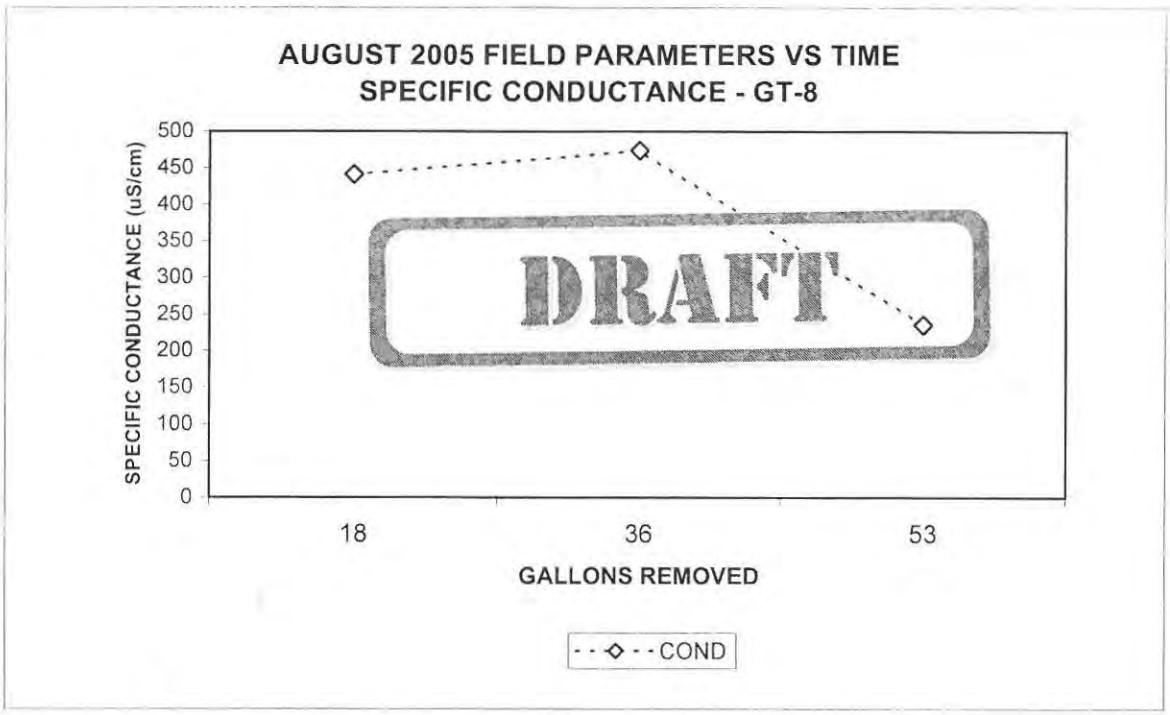
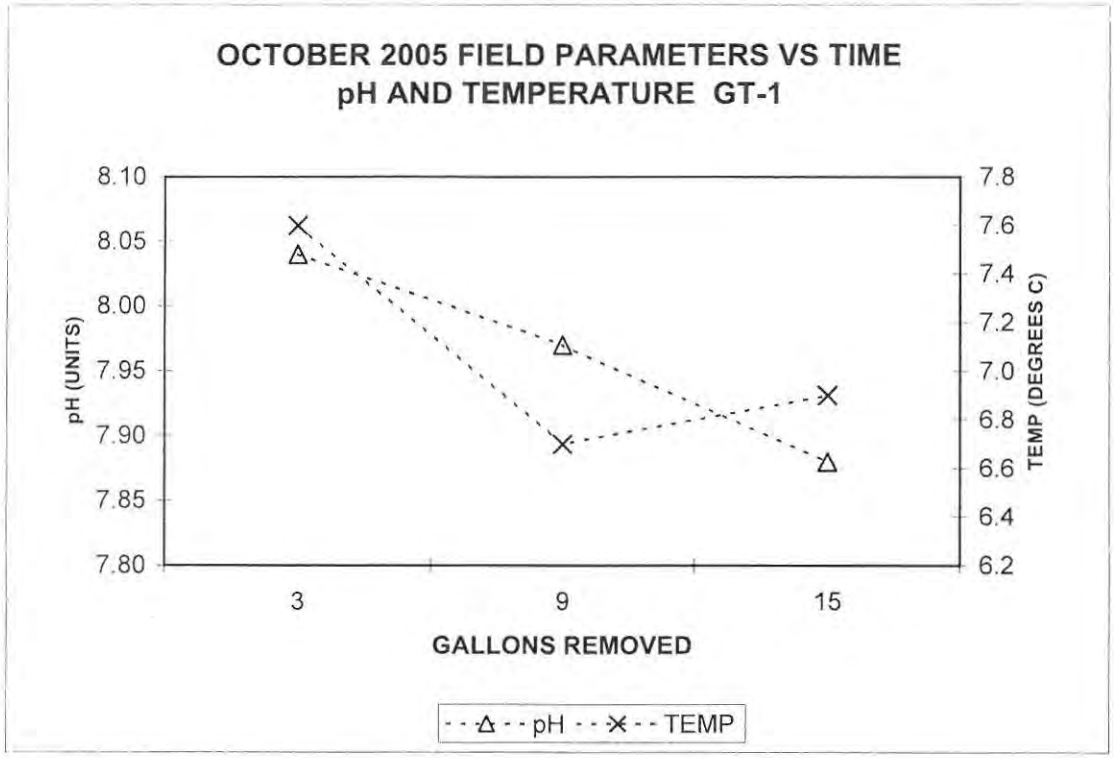

AUGUST 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-8
SPECIFIC CONDUCTANCE (uS/cm)
500
450
400
350
300
250
200
150
100
50
0
DRAFT
18
36
53
GALLONS REMOVED
COND

FIGURE A.6.63


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-1
pH (UNITS)
8.10
8.05
8.00
7.95
7.90
7.85
7.80
TEMP (DEGREES C)
7.8
7.6
7.4
7.2
7.0
6.8
6.6
6.4
6.2
3
9
15
GALLONS REMOVED
pH
TEMP

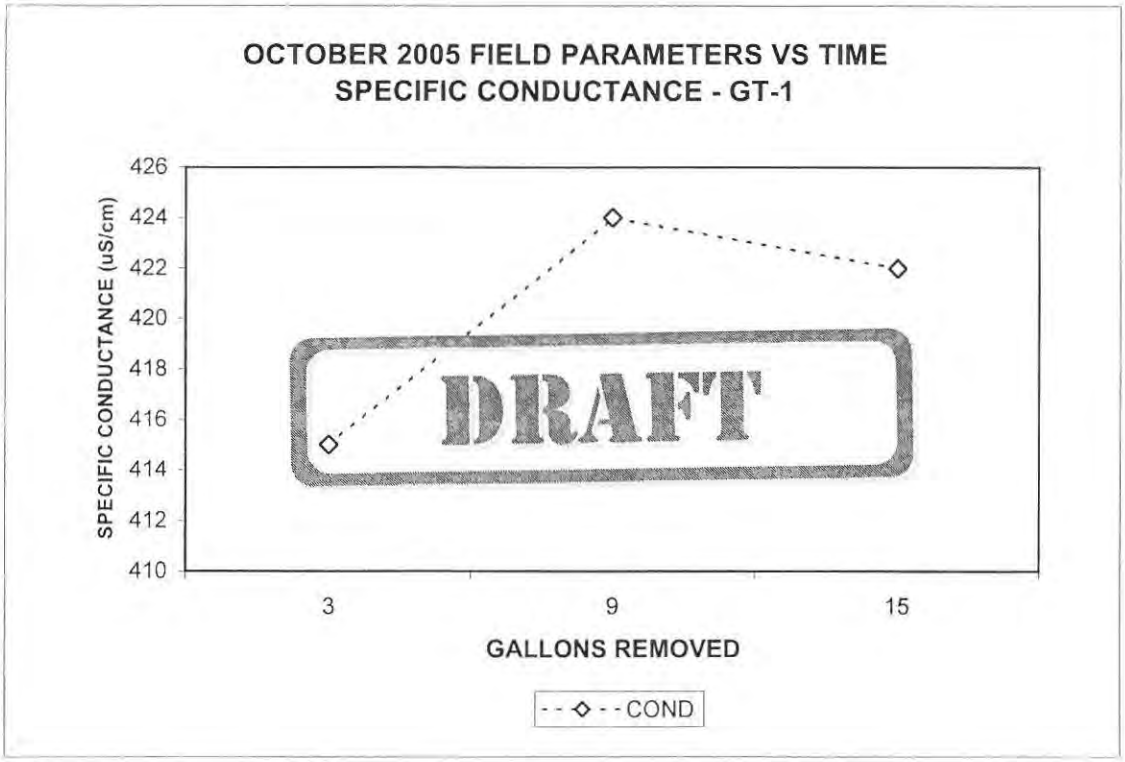
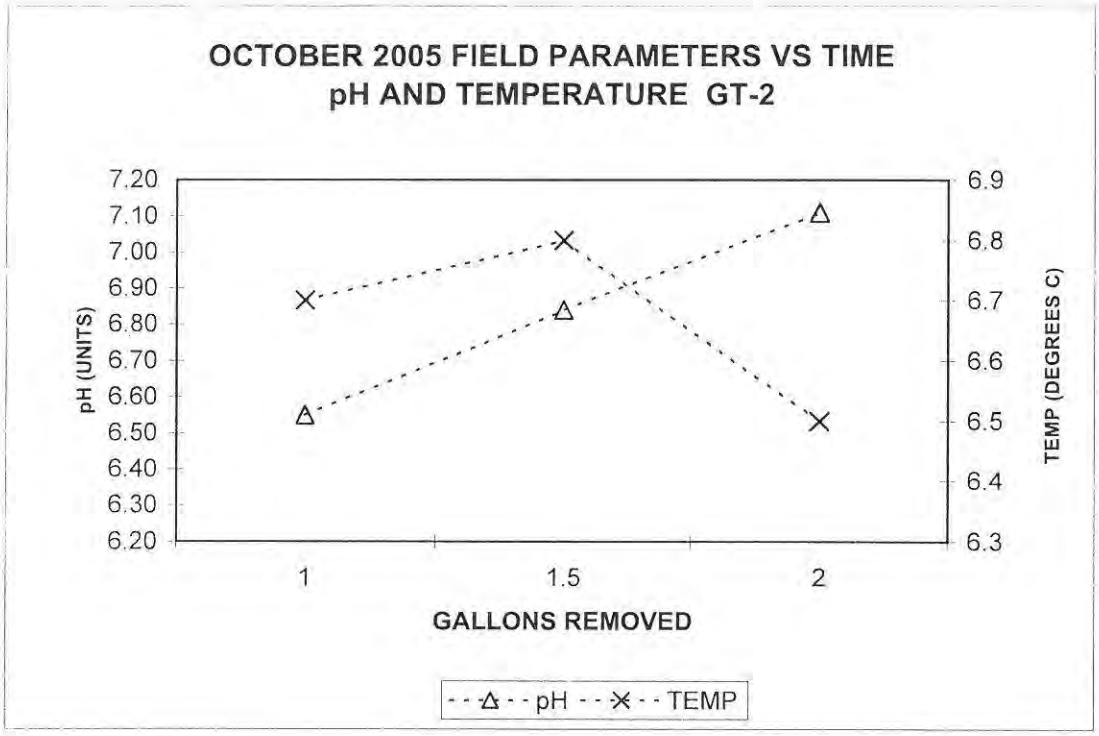

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-1
SPECIFIC CONDUCTANCE (uS/cm)
426
424
422
420
418
416
414
412
410
3
9
15
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.64


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-2
7.20
7.10
7.00
6.90
6.80
6.70
6.60
6.50
6.40
6.30
6.20
pH (UNITS)
6.9
6.8
6.7
6.6
6.5
6.4
6.3
TEMP (DEGREES C)
1
1.5
2
GALLONS REMOVED
pH
TEMP

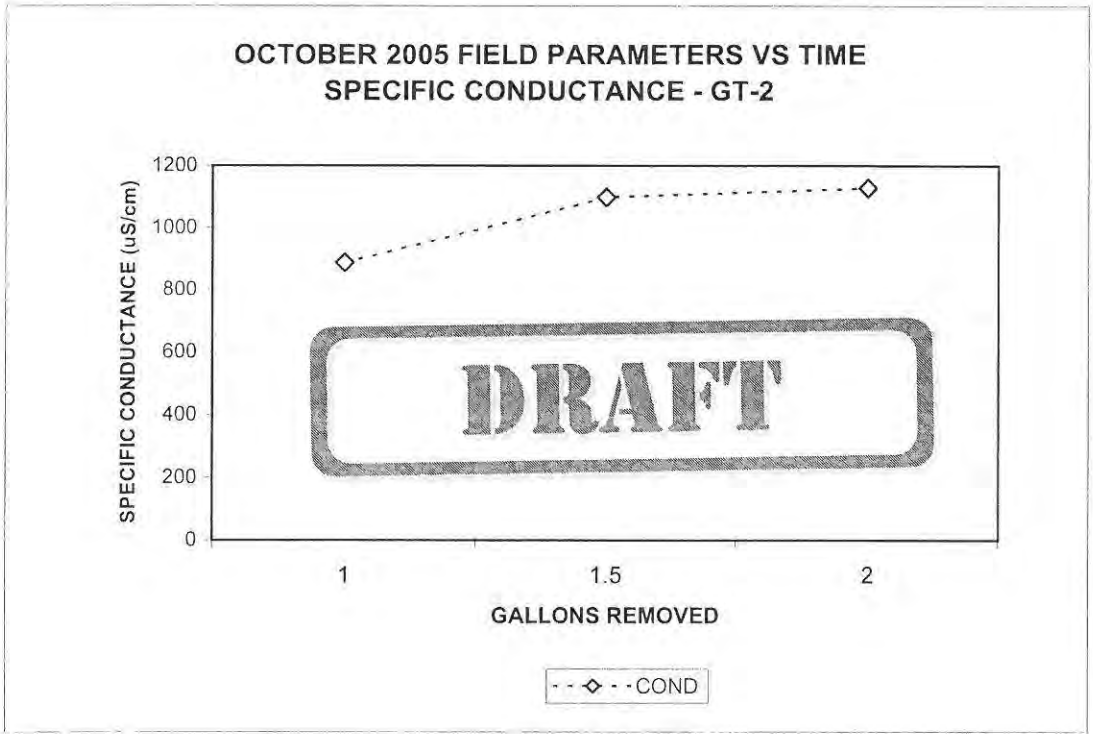
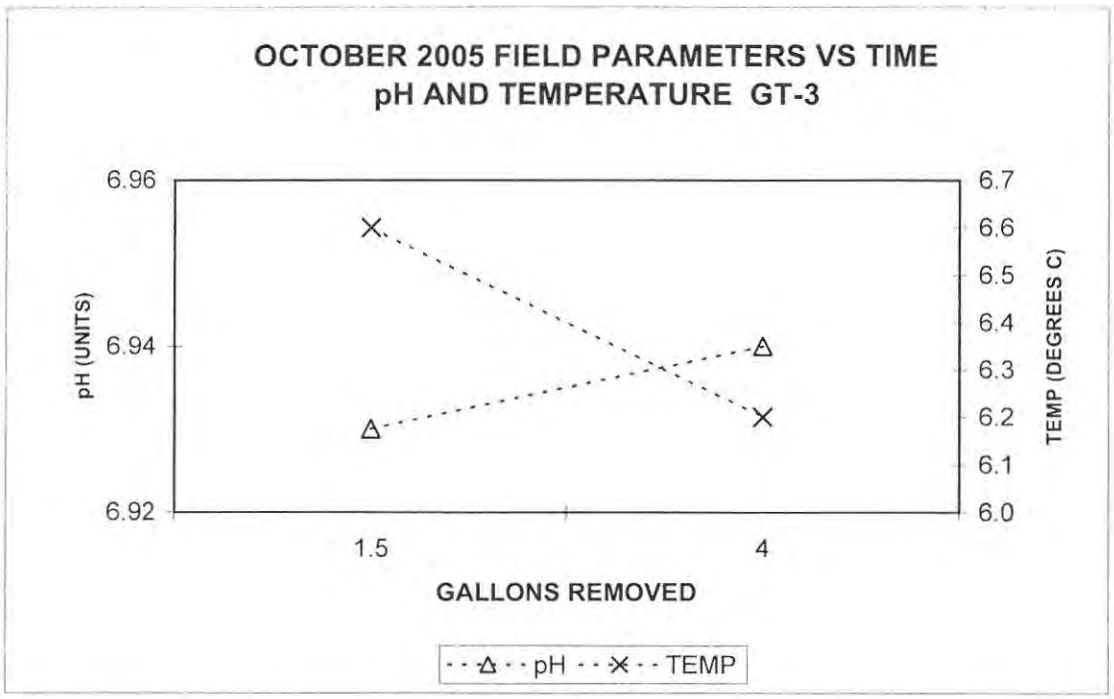

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-2
1200
1000
800
600
400
200
0
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
1
1.5
2
GALLONS REMOVED
COND

FIGURE A.6.65


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-3
6.96
6.94
6.92
pH (UNITS)
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6.0
TEMP (DEGREES C)
1.5
4
GALLONS REMOVED
pH
TEMP

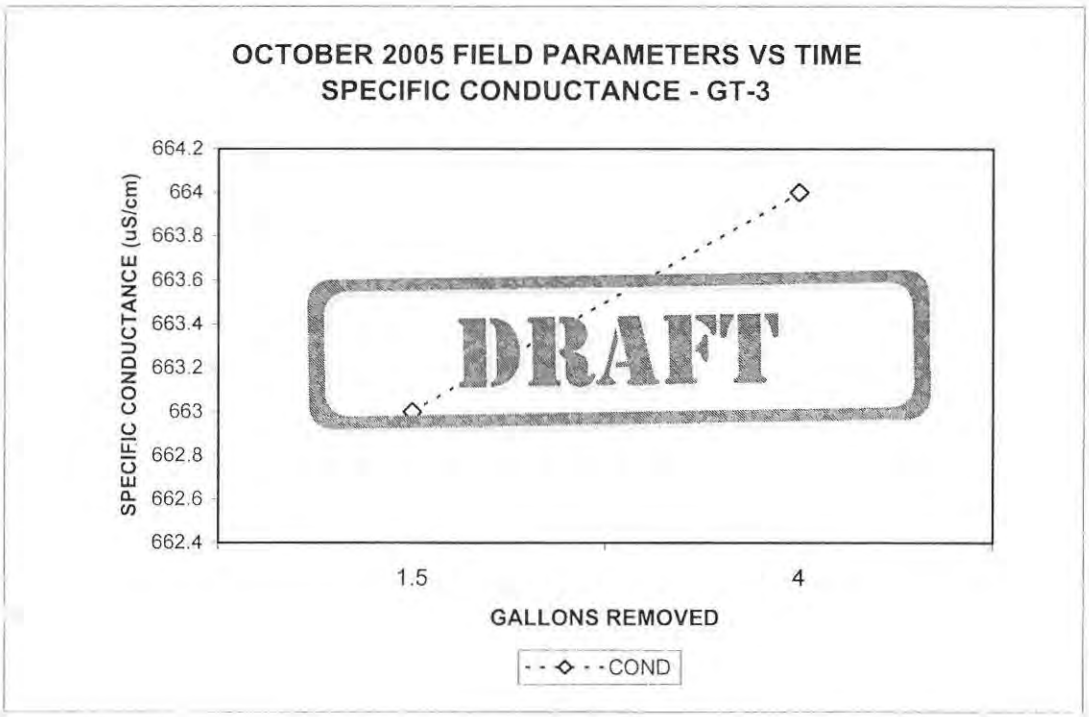
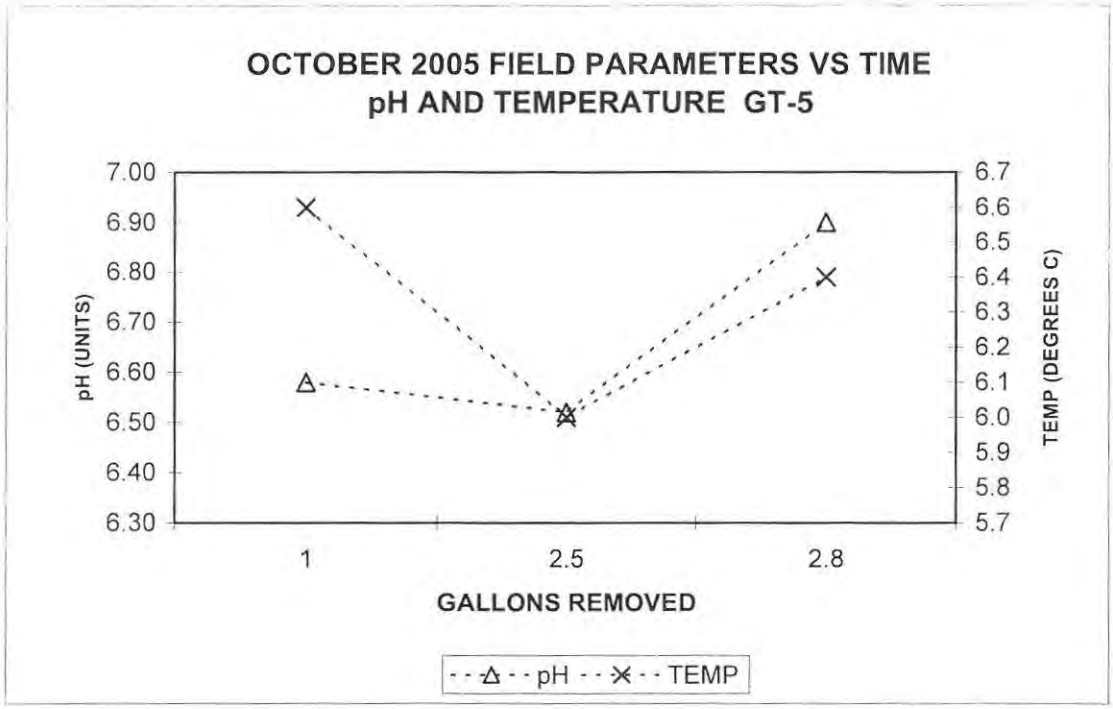

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-3
SPECIFIC CONDUCTANCE (uS/cm)
664.2
664
663.8
663.6
663.4
663.2
663
662.8
662.6
662.4
DRAFT
1.5
4
GALLONS REMOVED
COND

FIGURE A.6.66


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-5
7.00
6.90
6.80
6.70
6.60
6.50
6.40
6.30
pH (UNITS)
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6.0
5.9
5.8
5.7
TEMP (DEGREES C)
1
2.5
2.8
GALLONS REMOVED
pH
TEMP

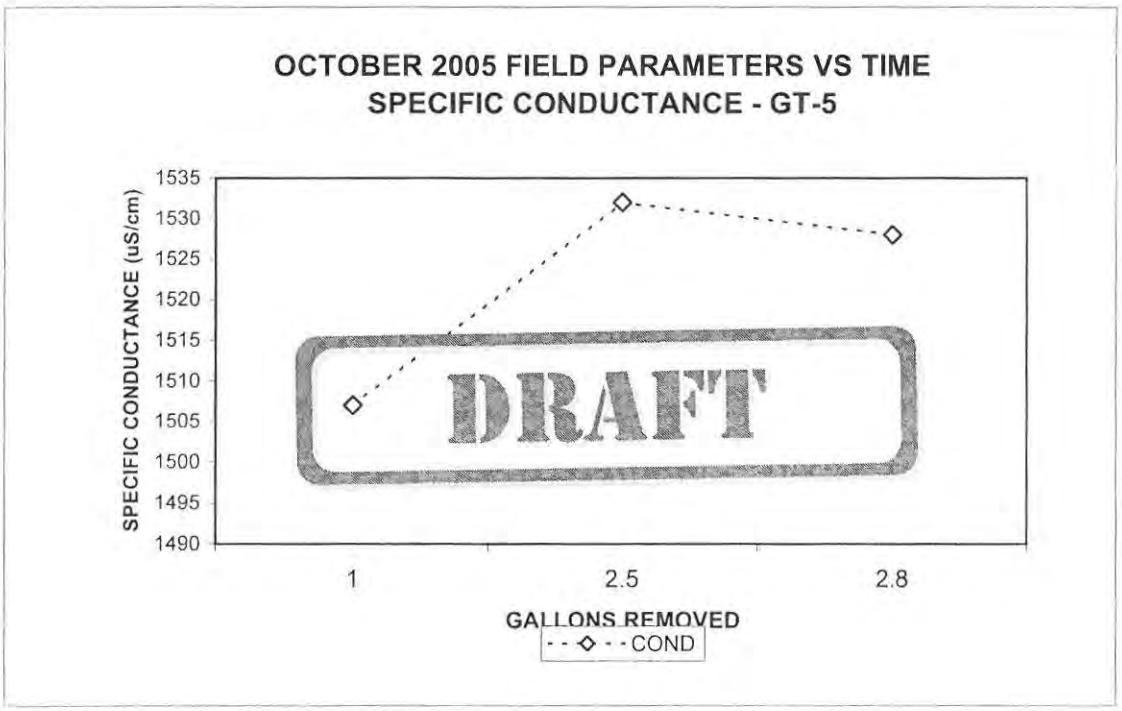
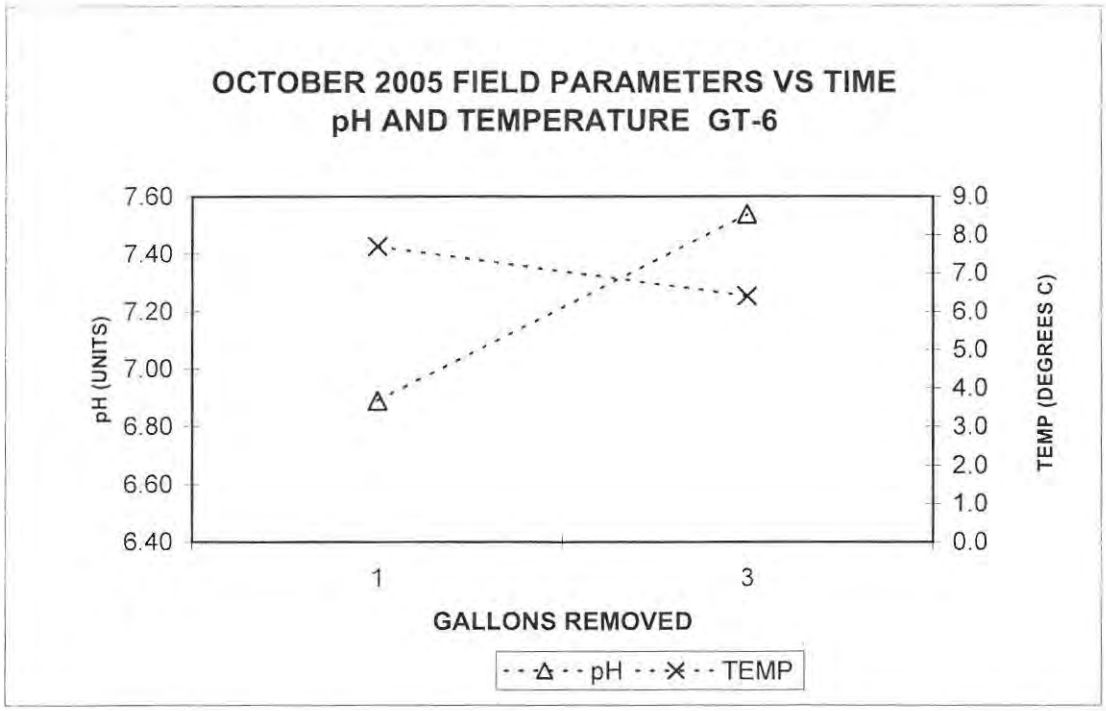

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-5
1535
1530
1525
1520
1515
1510
1505
1500
1495
1490
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
1
2.5
2.8
GALLONS REMOVED
COND

FIGURE A.6.67


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-6
pH (UNITS)
7.60
7.40
7.20
7.00
6.80
6.60
6.40
TEMP (DEGREES C)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1
3
GALLONS REMOVED
pH
TEMP

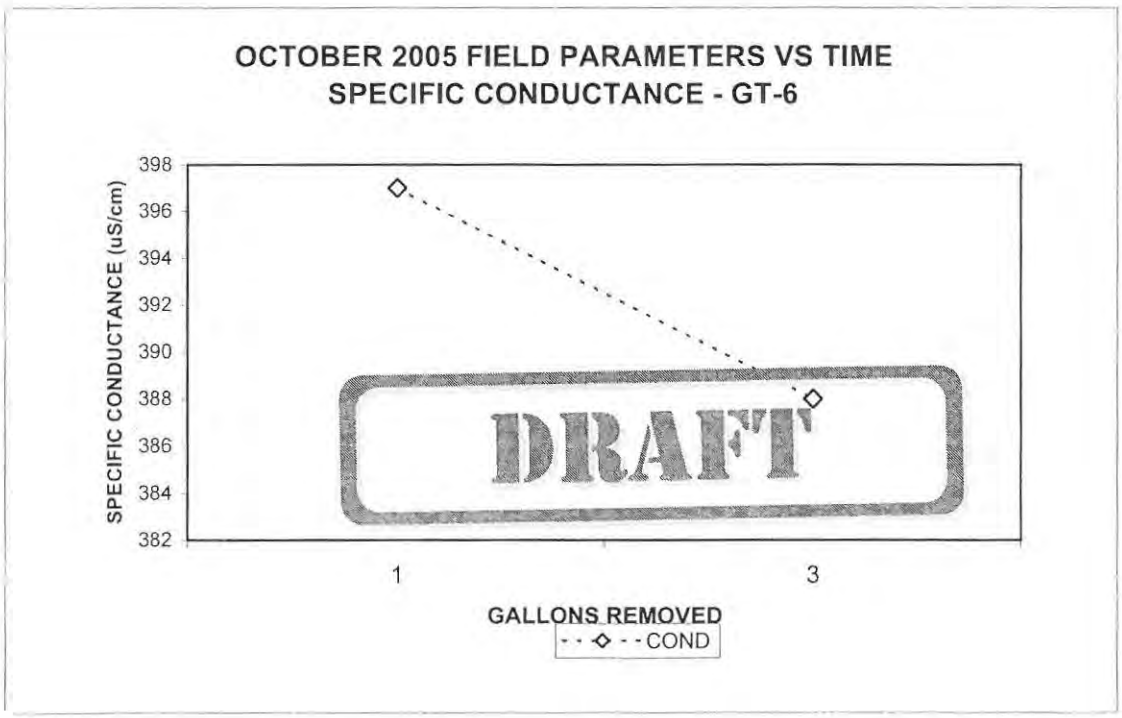
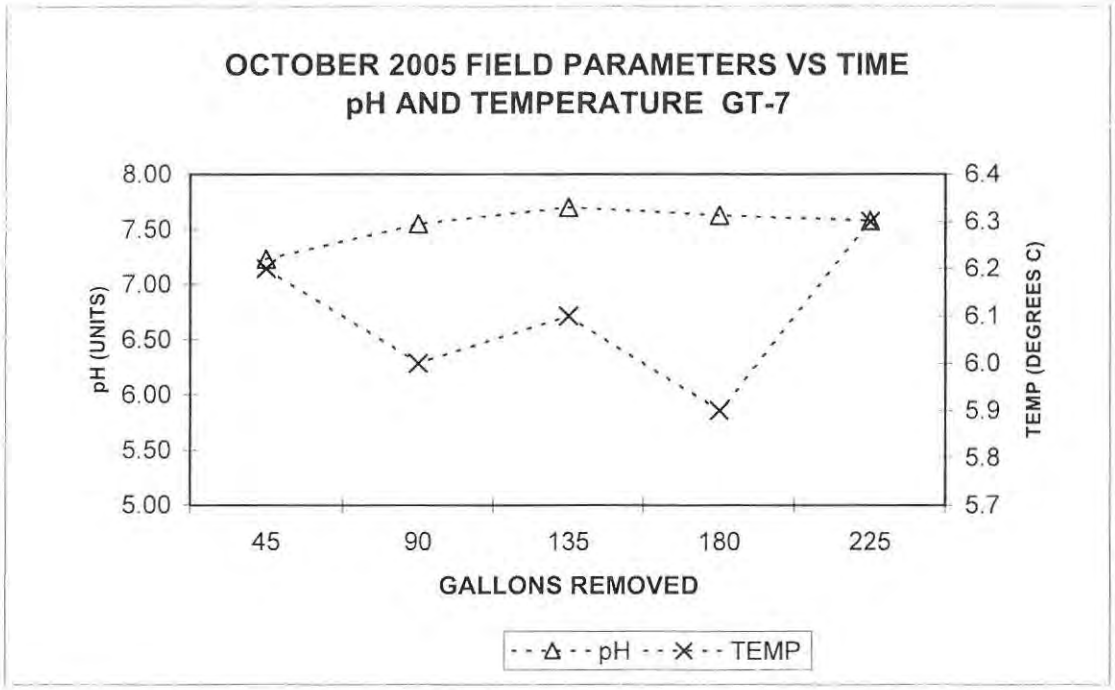

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-6
SPECIFIC CONDUCTANCE (uS/cm)
398
396
394
392
390
388
386
384
382
1
3
GALLONS REMOVED
COND
DRAFT

FIGURE A.6.68


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-7
8.00
7.50
7.00
6.50
6.00
5.50
5.00
pH (UNITS)
6.4
6.3
6.2
6.1
6.0
5.9
5.8
5.7
TEMP (DEGREES C)
45
90
135
180
225
GALLONS REMOVED
pH
TEMP

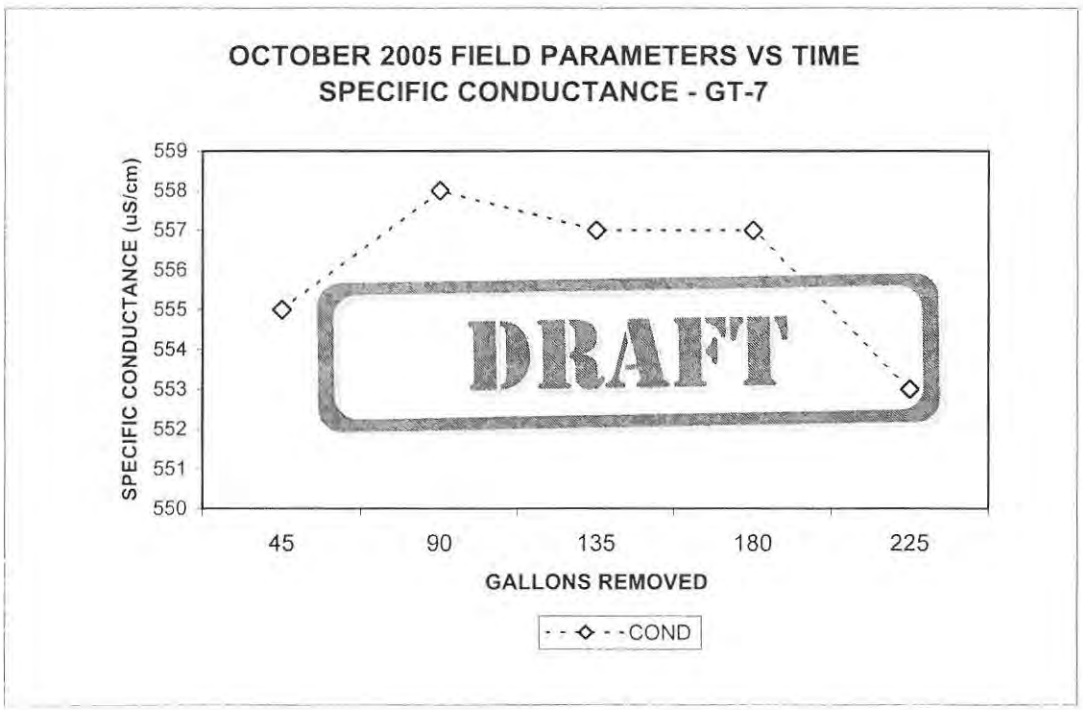
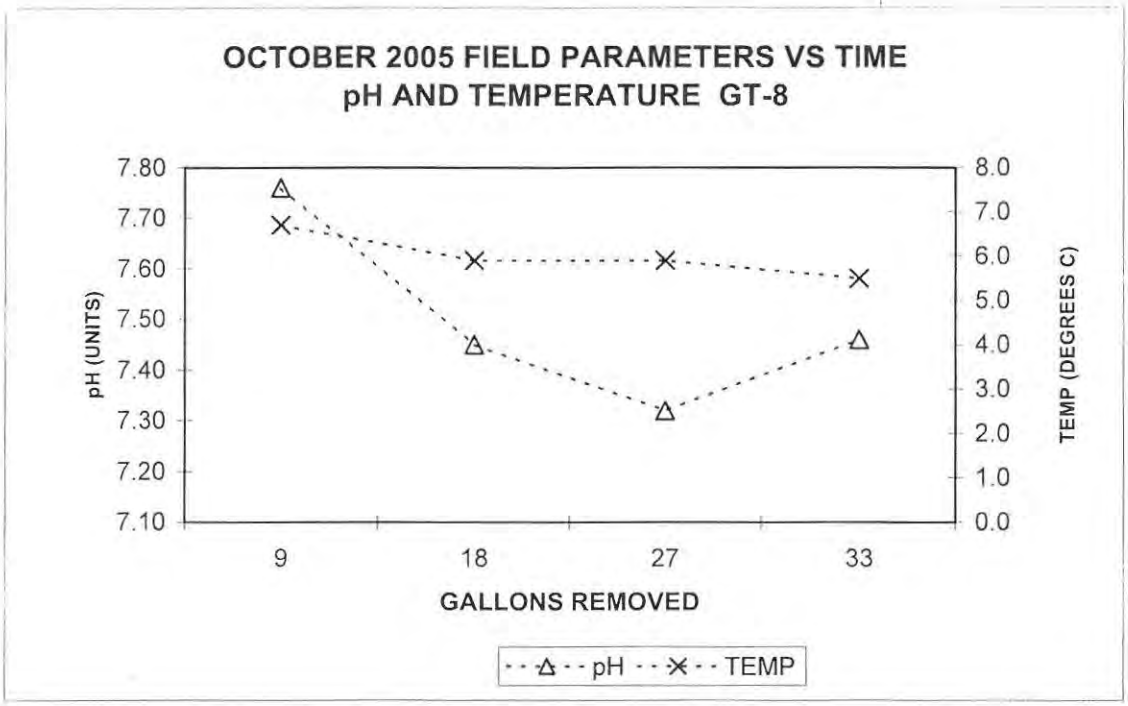

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-7
559
558
557
556
555
554
553
552
551
550
SPECIFIC CONDUCTANCE (uS/cm)
DRAFT
45
90
135
180
225
GALLONS REMOVED
COND

FIGURE A.6.69


OCTOBER 2005 FIELD PARAMETERS VS TIME
pH AND TEMPERATURE GT-8
pH (UNITS)
7.80
7.70
7.60
7.50
7.40
7.30
7.20
7.10
TEMP (DEGREES C)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
9
18
27
33
GALLONS REMOVED
pH
TEMP

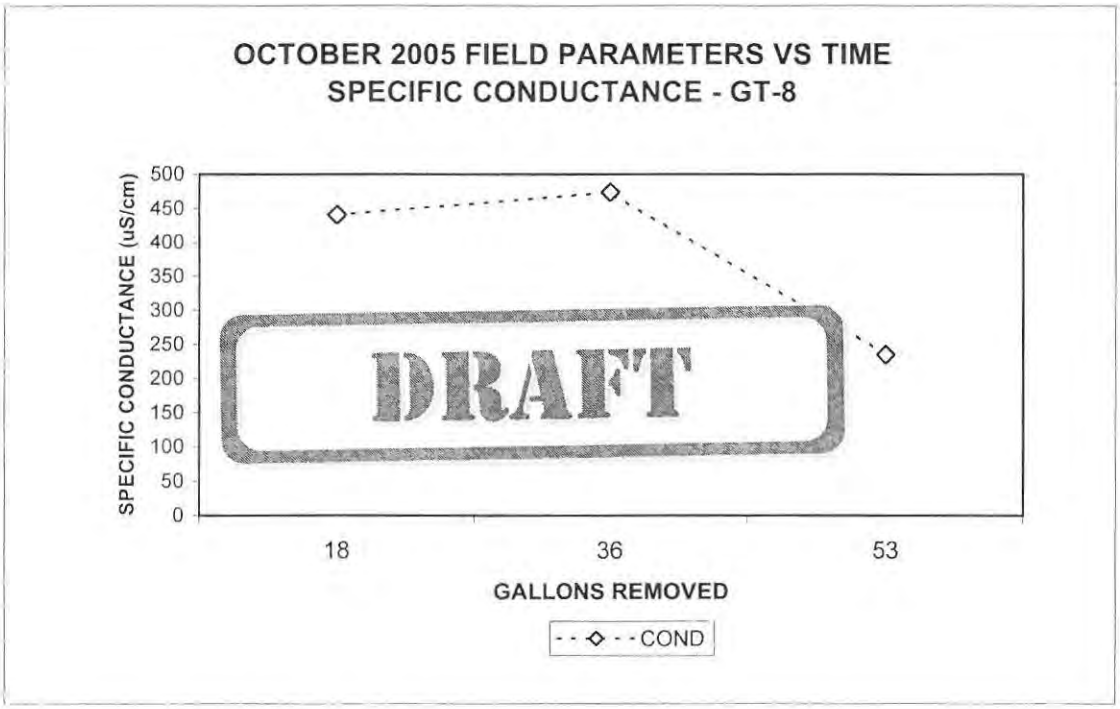
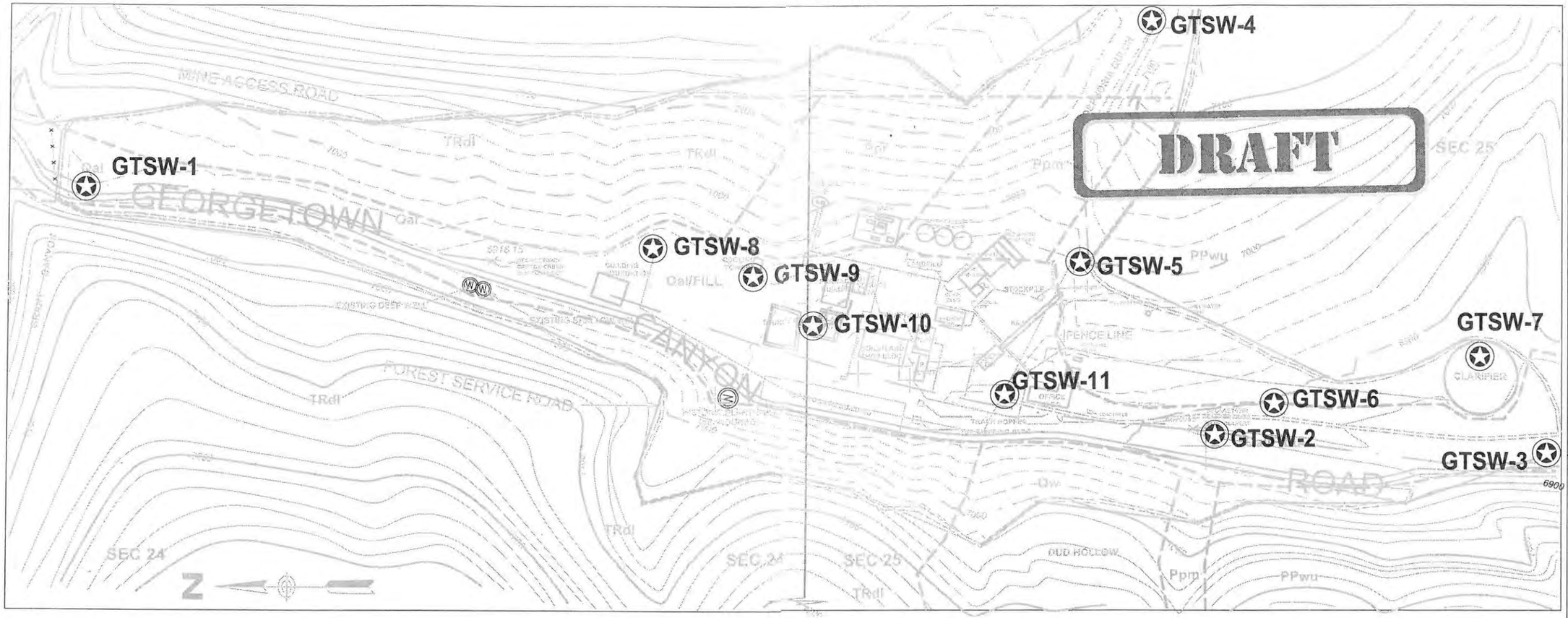

OCTOBER 2005 FIELD PARAMETERS VS TIME
SPECIFIC CONDUCTANCE - GT-8
SPECIFIC CONDUCTANCE (uS/cm)
500
450
400
350
300
250
200
150
100
50
0
DRAFT
18
36
53
GALLONS REMOVED
COND

FIGURE A.6.70



KEY

GTSW-7 — SURFACE WATER SAMPLING LOCATION AND SAMPLE ID DESIGNATION

GEOLOGIC LEGEND

Qal - QUATERNARY ALLUVIUM

Qw - QUATERNARY HILL WASH

TRdl - TRIASSIC LOWER DINWOODY FM.

Ppr - PERMIAN REX CHERT FM.

Ppm - PERMIAN PHOSPHORIA FM.

PPwu - PERMIAN-PENNSYLVANIAN UPPER WELLS FM.

MAP SCALE

0 200 400 800

CONTOUR INTERVAL = 20 FEET

REFERENCES:

U.S.G.S., HARRINGTON PEAK, IDAHO 15 MINUTE SERIES QUADRANGLE, 1970, PHOTOINSPECTED 1980.

RECORD OF SURVEY, AGRIUM U.S. INC., SEC 25, T10S., R.44 E.B.M., HARPER-LEAVITT ENGINEERS, INC, JAN 13, 2003

GEOLOGY OF THE GEORGETOWN CANYON-SNOWDRIFT MOUNTAIN AREA, SOUTHEASTERN IDAHO - USGS BULLETIN 1153, 1964, PLATE 4.

CENTRAL FARMERS FERTILIZER FACILITY
FINAL SITE INVESTIGATION REPORT

TITLE

SURFACE WATER SAMPLE SITES
CENTRAL FARMERS FERTILIZER FACILITY

12/29/05	SIZE B	CAGE CODE	DWG NO	REV
DRAWN BY J.S. BROWN	SCALE		SHEET FIGURE A.7.1	

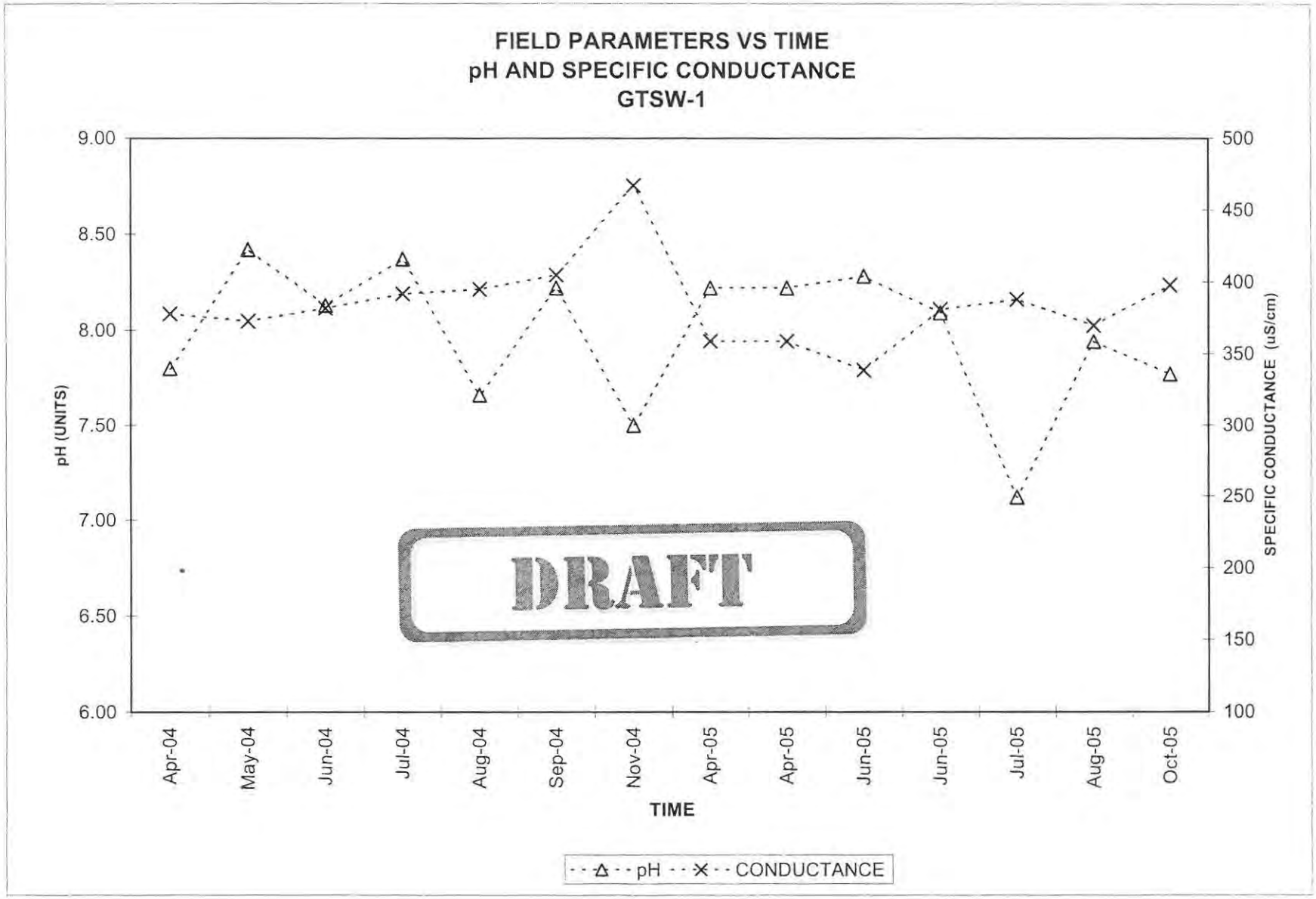

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-1
9.00
8.50
8.00
7.50
7.00
6.50
6.00
pH (UNITS)
500
450
400
350
300
250
200
150
100
SPECIFIC CONDUCTANCE (uS/cm)
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.2

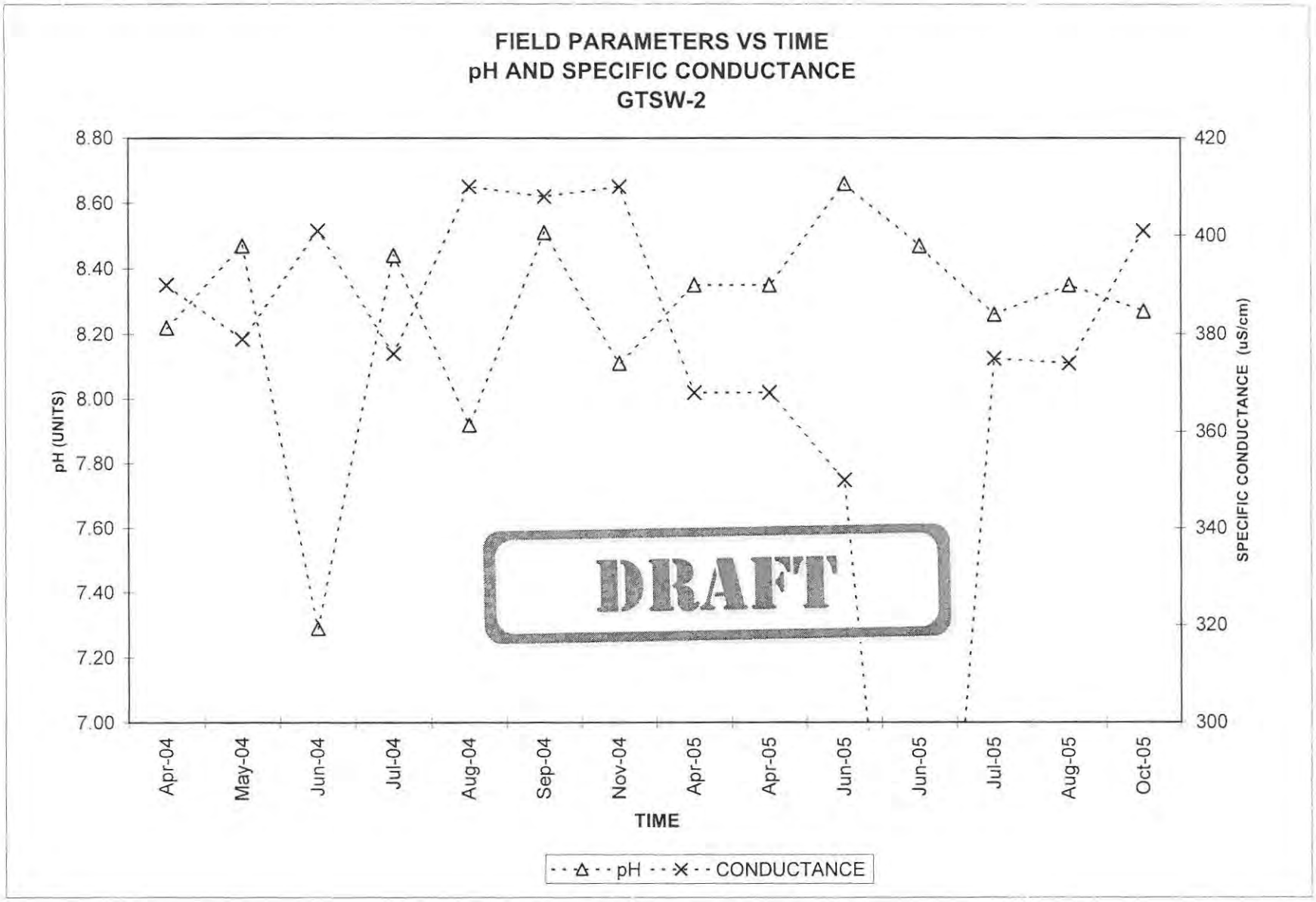

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-2
pH (UNITS)
8.80
8.60
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
SPECIFIC CONDUCTANCE (uS/cm)
420
400
380
360
340
320
300
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.3

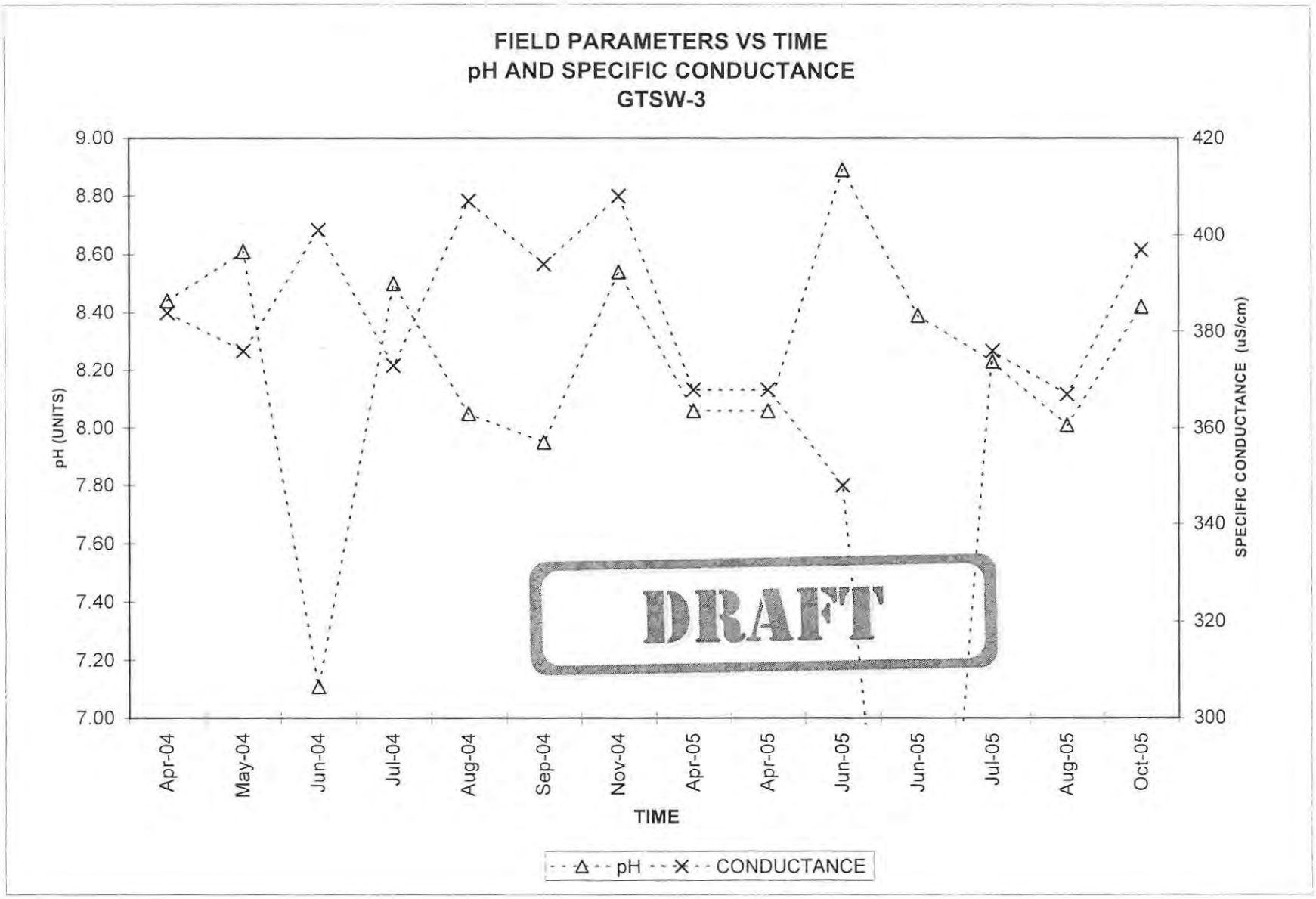

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-3
pH (UNITS)
9.00
8.80
8.60
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
SPECIFIC CONDUCTANCE (uS/cm)
420
400
380
360
340
320
300
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.4

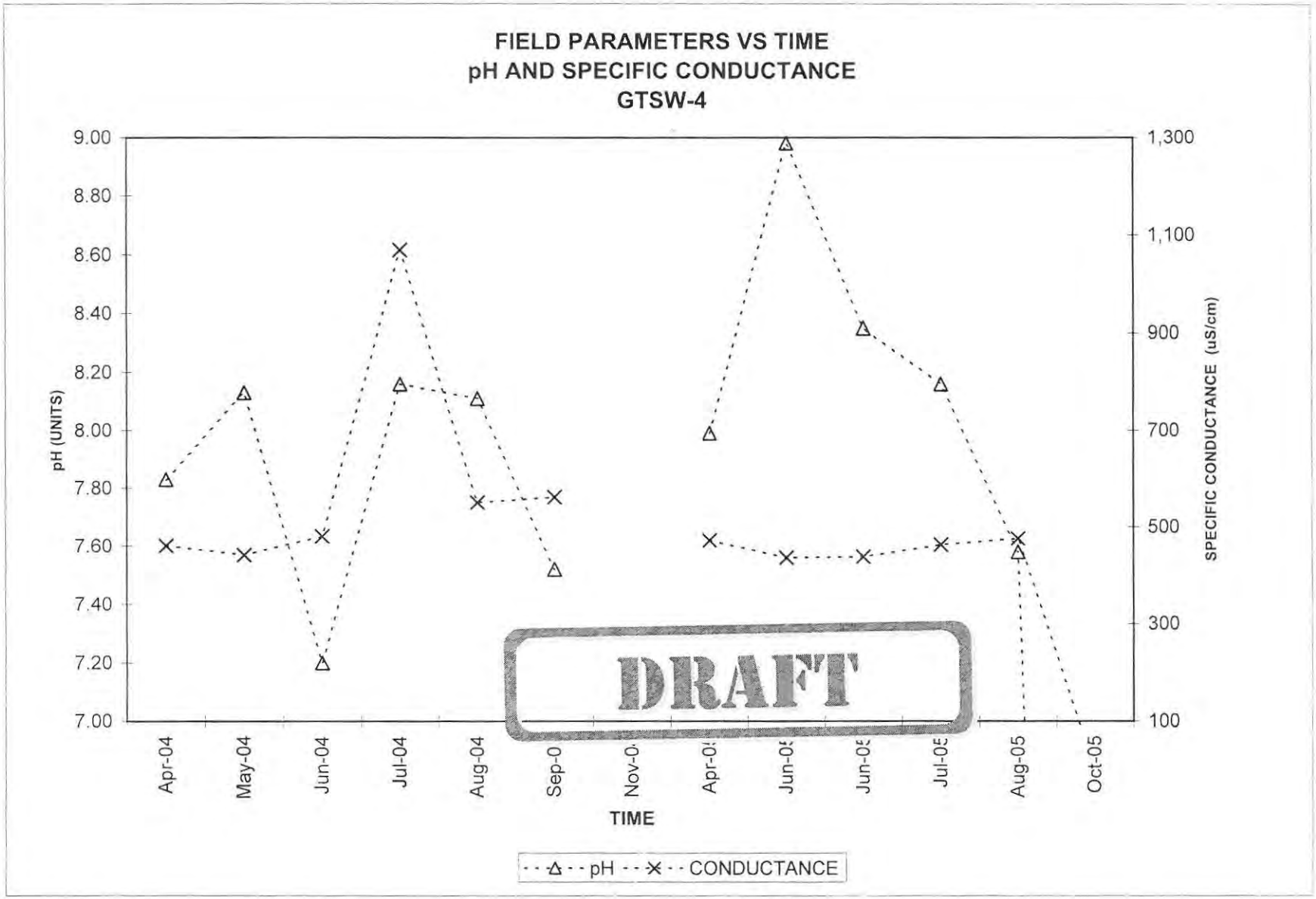

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-4
pH (UNITS)
9.00
8.80
8.60
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
SPECIFIC CONDUCTANCE (uS/cm)
1,300
1,100
900
700
500
300
100
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-0
Nov-0
Apr-0
Jun-0
Jun-0
Jul-0
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.5

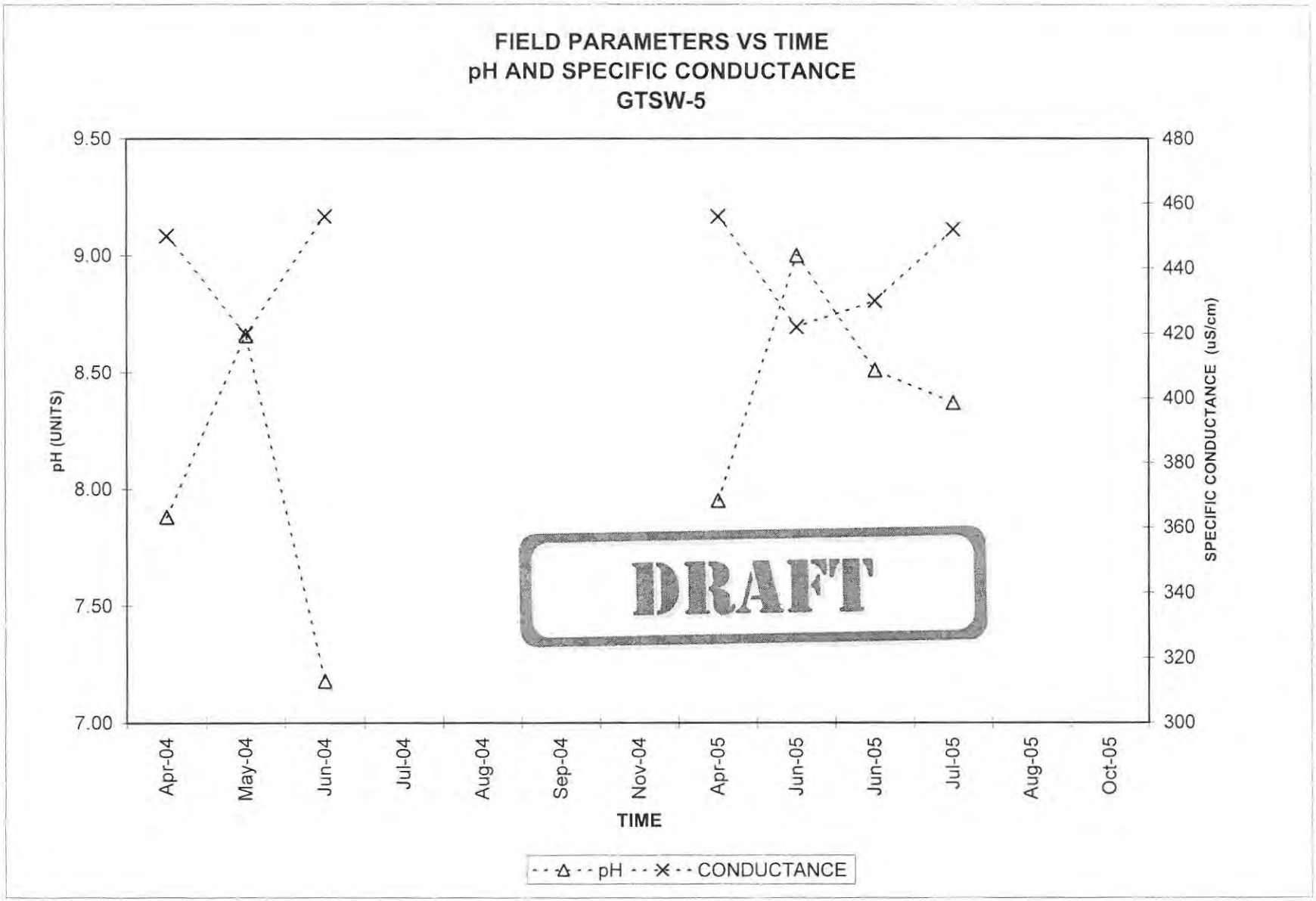

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-5
9.50
9.00
8.50
8.00
7.50
7.00
pH (UNITS)
480
460
440
420
400
380
360
340
320
300
SPECIFIC CONDUCTANCE (uS/cm)
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.6

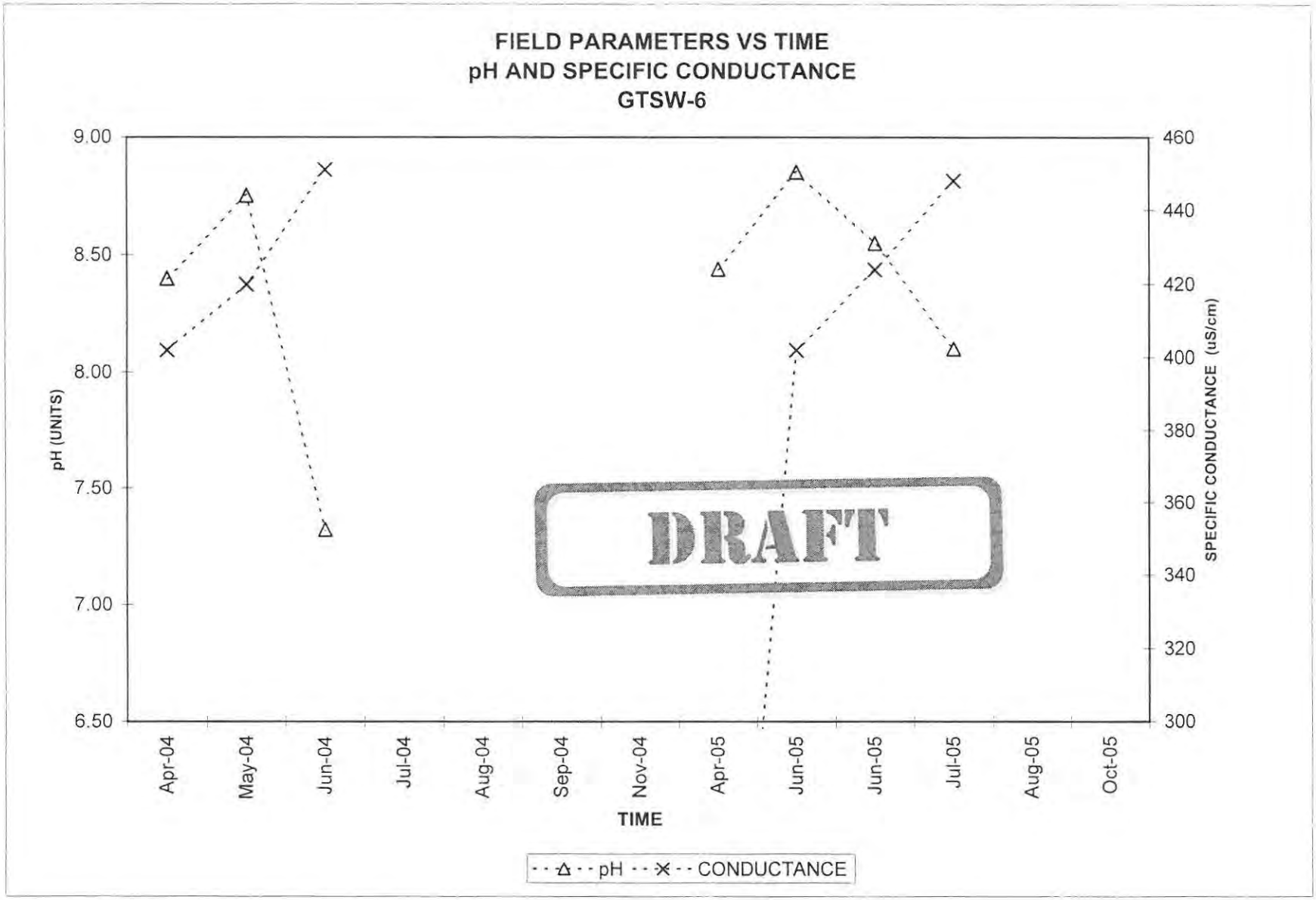

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-6
9.00
8.50
8.00
7.50
7.00
6.50
pH (UNITS)
460
440
420
400
380
360
340
320
300
SPECIFIC CONDUCTANCE (uS/cm)
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.7

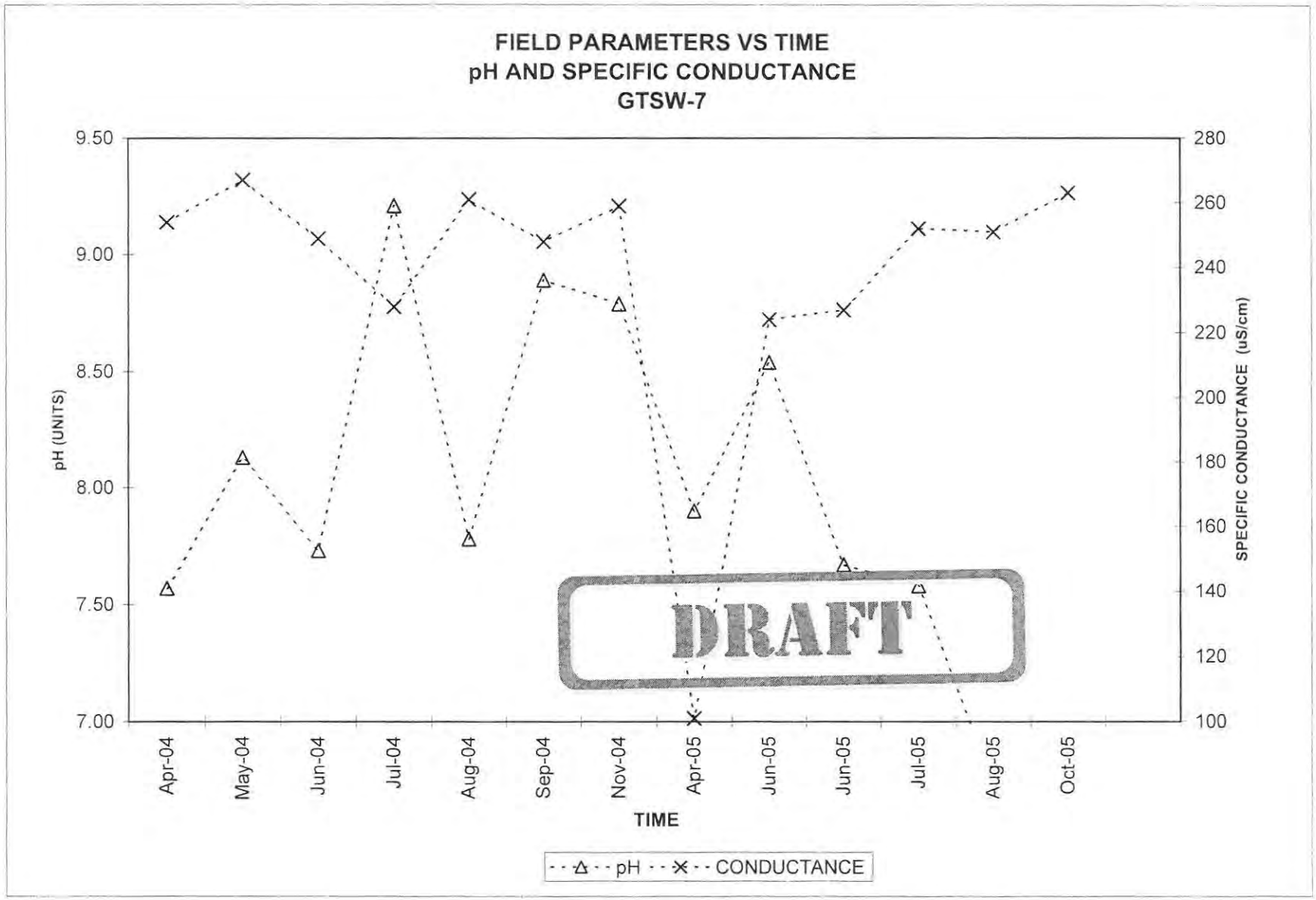

FIELD PARAMETERS VS TIME
pH AND SPECIFIC CONDUCTANCE
GTSW-7
9.50
9.00
8.50
8.00
7.50
7.00
pH (UNITS)
280
260
240
220
200
180
160
140
120
100
SPECIFIC CONDUCTANCE (uS/cm)
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Nov-04
Apr-05
Jun-05
Jun-05
Jul-05
Aug-05
Oct-05
TIME
DRAFT
pH
CONDUCTANCE

FIGURE A.7.8

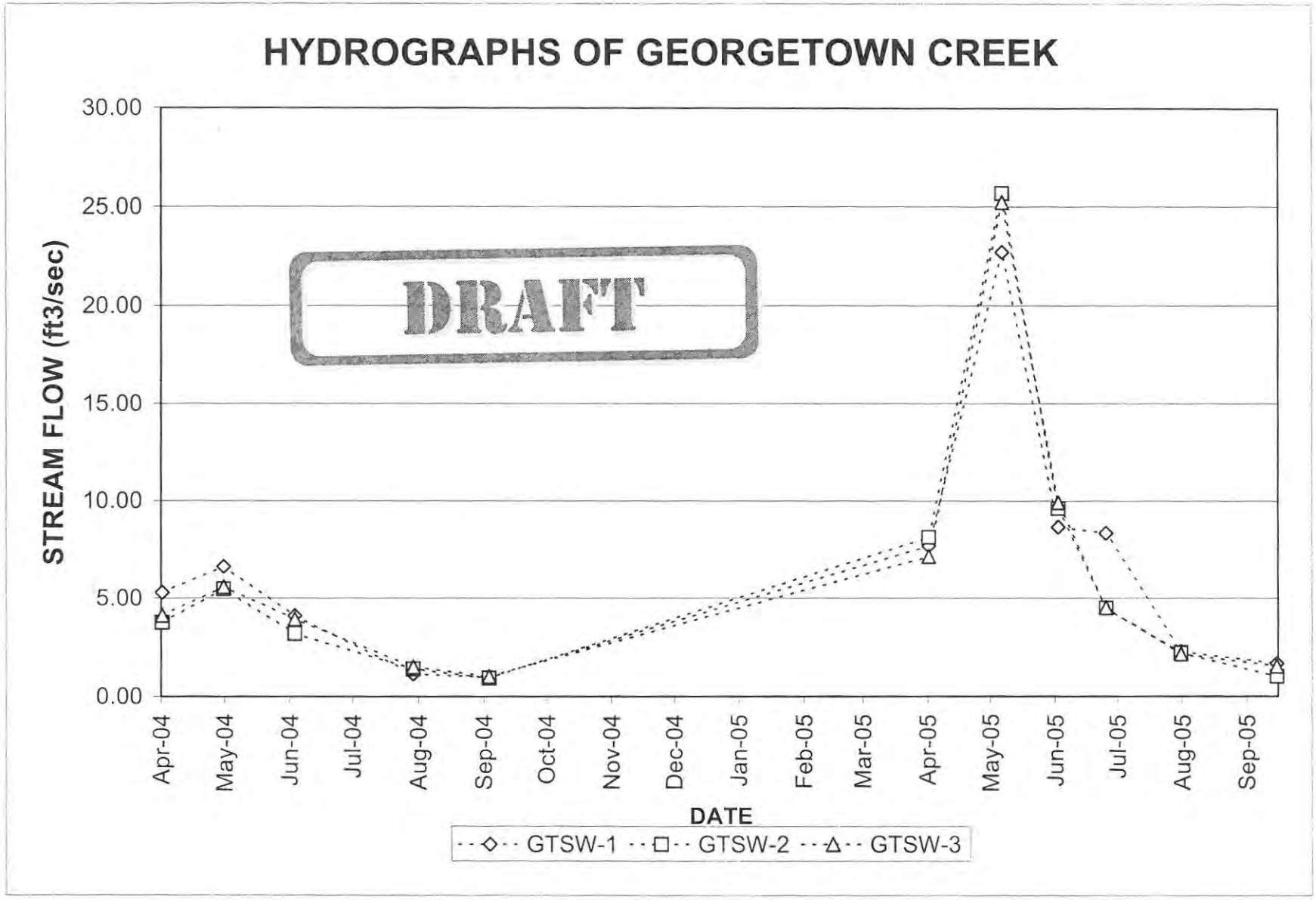
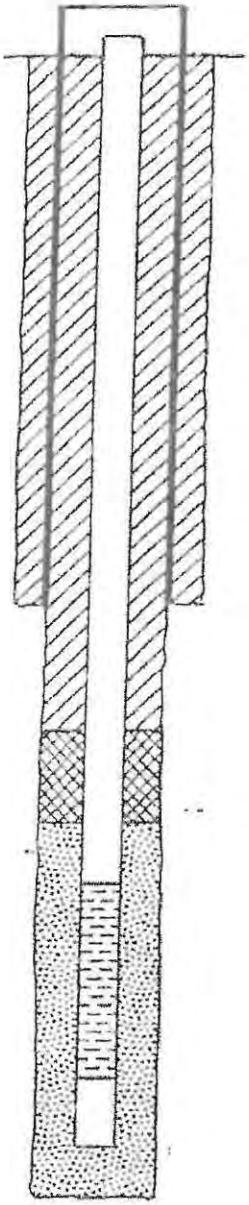

HYDROGRAPHS OF GEORGETOWN CREEK
DRAFT
STREAM FLOW (ft3/sec)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
DATE
GTSW-1
GTSW-2
GTSW-3

FIGURE A.7.9

APPENDIX A WELL COMPLETION LOGS

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS



Monitoring Well No. GT-1
Geologist J.S. Brown, P.G.
Date Started 5-26-04
Date Completed 5-27-04

SURVEY DATA:
Coordinates
TOC Elevation 6963.24
Ground Surface Elevation 6961.25
Remarks

11 Depth of 4" Diameter Casing
25.6 Depth of 10 7/8" Diameter Boring

3.0' to 8.5' Top of Bentonite Seal

8.5' to 25.6' Top of Sand Pack
Sand size 16-40

11' to 21.6' Screened Interval
Slot Size 0.015

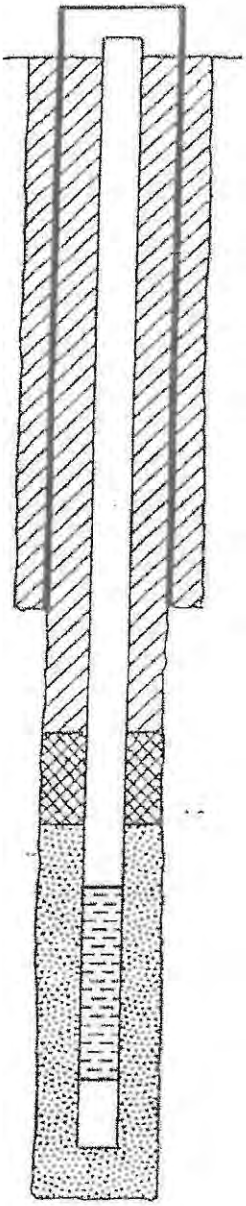
Depth of ____ Diameter Casing
Depth of ____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-2
Geologist J.S. Brown, P.G.
Date Started 6-1-04
Date Completed 6-3-04

SURVEY DATA:
Coordinates
TOC Elevation 6916.30
Ground Surface Elevation 6916.07
Remarks

32.0' ~~45.0~~ Depth of 4" Diameter Casing

45.0' Depth of 10 7/8" Diameter Boring

24.1' Top of Bentonite Seal

29.1' Top of Sand Pack
Sand size 16-40

32.0 - 42.0 Screened Interval
Slot Size 0.015"

_____ Depth of _____ Diameter Casing

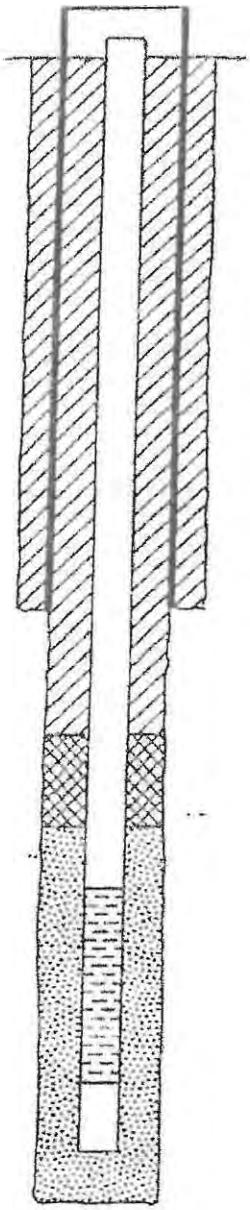
_____ Depth of _____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-3
Geologist J. S. Brown, P.G.
Date Started 6-3-04
Date Completed 6-4-04

SURVEY DATA:
Coordinates
TOC Elevation 6916.80
Ground Surface Elevation 6914.11
Remarks

34.5' Depth of 4" Diameter Casing
45.0' Depth of 10 7/8" Diameter Boring

26.2' Top of Bentonite Seal

30.8' Top of Sand Pack
Sand size 16-40

34.5'-44.5' Screened Interval
Slot Size 0.015"

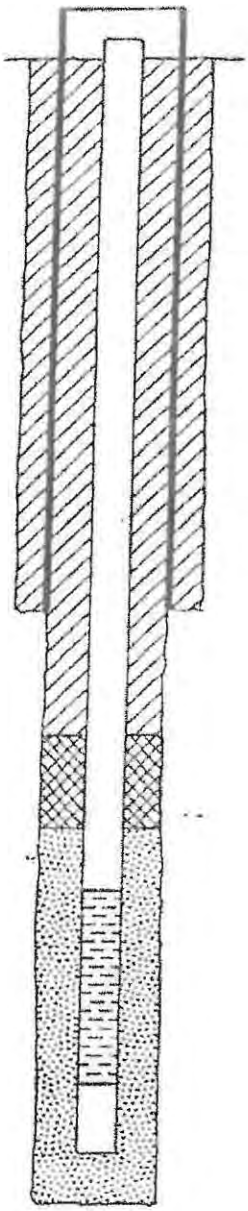
_____ Depth of _____ Diameter Casing
_____ Depth of _____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-4
Geologist J.S. Brown, P.G.
Date Started 6-5-04
Date Completed 6-6-04

SURVEY DATA:
Coordinates
TOC Elevation 6915.97
Ground Surface Elevation 6913.70
Remarks

31.5' Depth of 4" Diameter Casing
43.5' Depth of 10 7/8" Diameter Boring

23.3' Top of Bentonite Seal

28.3' Top of Sand Pack
Sand size 16-40

31.5'-41.5' Screened Interval
Slot Size 0.015"

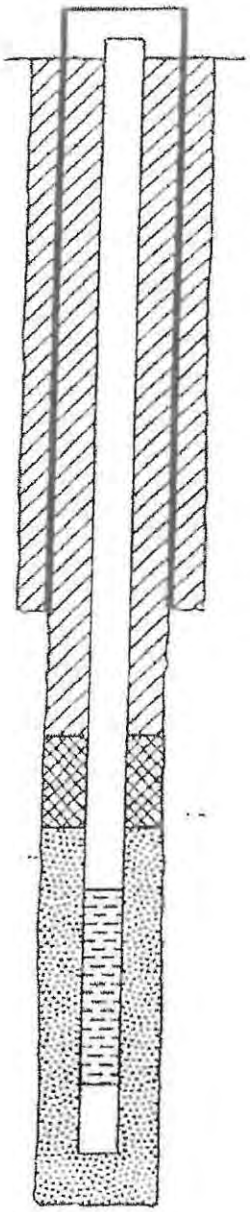
Depth of _____ Diameter Casing
Depth of _____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-5
Geologist J.S. Brown, P.G.
Date Started 6-6-04
Date Completed 6-8-04

SURVEY DATA:
Coordinates
TOC Elevation 6912.10
Ground Surface Elevation 6909.97
Remarks

17.5' Depth of 4" Diameter Casing
37.5' Depth of 10 7/8" Diameter Boring

9.4' Top of Bentonite Seal

14.5' Top of Sand Pack
Sand size 16-40

17.5'-37.5' Screened Interval
Slot Size 0.015"

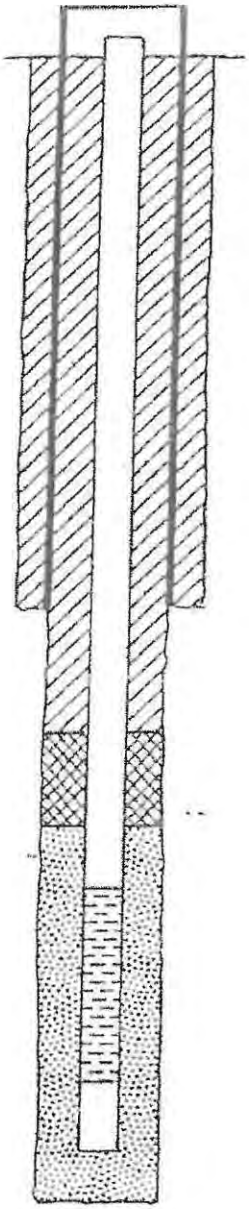
Depth of ____ Diameter Casing
Depth of ____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-6
Geologist J. S. Brown P.G.
Date Started 6-8-04
Date Completed 6-10-04

SURVEY DATA:
Coordinates
TOC Elevation 6858.28
Ground Surface Elevation 6856.0
Remarks

57.5' Depth of 4" Diameter Casing
68' Depth of 10 7/8" Diameter Boring

49.2' Top of Bentonite Seal

54.0' Top of Sand Pack
Sand size 16-40

57.5'-67.5' Screened Interval
Slot Size 0.015"

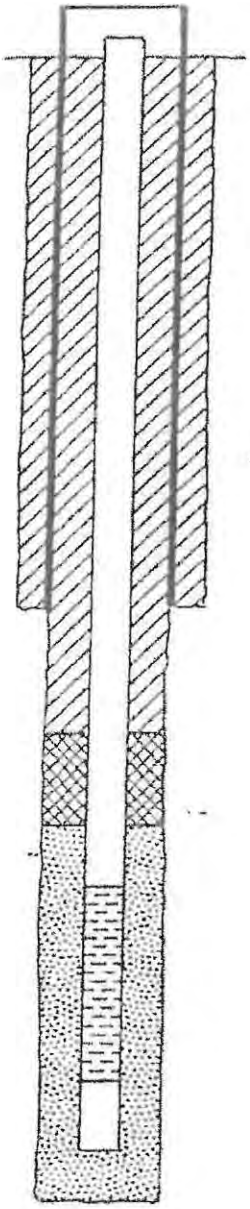
Depth of ____ Diameter Casing
Depth of ____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-7
Geologist John S. Brown, P.G.
Date Started 6-16-04
Date Completed 6-28-04

SURVEY DATA:
Coordinates
TOC Elevation 6923.95
Ground Surface Elevation 6921.22
Remarks Bentonite grout seal to 30' BG. Neat cement to surface. Original installation casing collapsed from grout hydration @ ~38' BG. No grout entered well.

140.0' Depth of 4" Diameter Casing
161.0' Depth of 7" Diameter Boring

132.0' Top of Bentonite Seal

136.5' Top of Sand Pack
Sand size 16-40

140.0-160.0 Screened Interval
Slot Size 0.015"

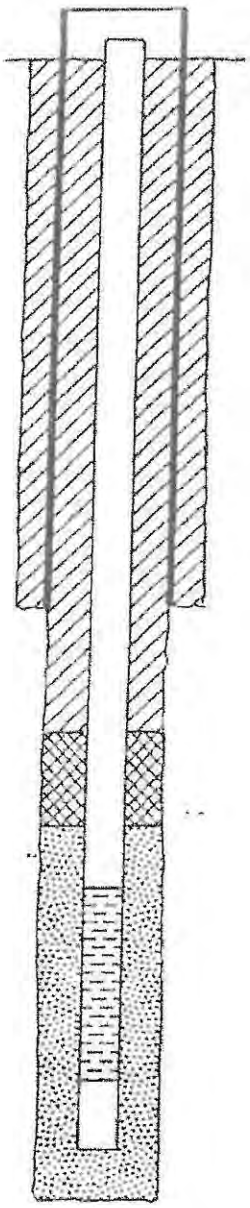
_____ Depth of _____ Diameter Casing
_____ Depth of _____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3



Monitoring Well No. GT-8
Geologist John S. Bowen, P.G.
Date Started 6-29-04
Date Completed 7-1-04

SURVEY DATA:
Coordinates
TOC Elevation 6923.23
Ground Surface Elevation 6920.77
Remarks Bentonite grout seal to 3' BG. - mud lowered to surface

30.0 Depth of 4" Diameter Casing
43.0 Depth of 10 3/4" Diameter Boring

23.2' Top of Bentonite Seal

26.8' Top of Sand Pack
Sand size 16-40

30.0'-40.0' Screened Interval
Slot Size 0.015"

Depth of _____ Diameter Casing
Depth of _____ Diameter Boring

CENTRAL FARMERS FERTILIZER FACILITY
SAMPLING AND ANALYSIS PLAN

WELL COMPLETION DIAGRAM

NU-WEST MINING AND
NU-WEST INDUSTRIES, INC.

FIGURE 3-3

APPENDIX A GEOTECHNICAL RESULTS

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS

Capillary-Moisture Relationships by Pressure-Membrane Apparaturs

(ASTM D3152)

IGES

© IGES 2004

Project: Central Farmers Fertilizer Plant
No: M00596-001
Location: Georgetown Canyon, Idaho
Date: 8/10/2004
By: DS

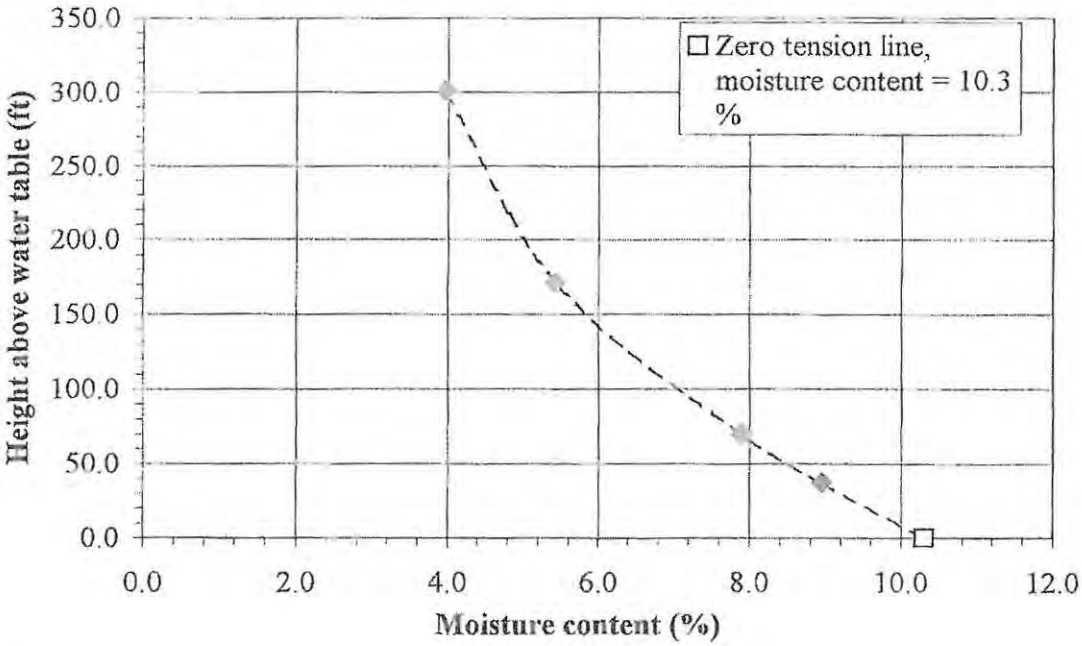
Boring No.: GT-10
Sample: _
Depth: 10
Description: _

Natural moisture content (%): 10.8

	Test No.	1	2	3	4		
	Tension (psi)	16	30	74	130		
Sample A	Wt. ring + moist soil, W_{csw} (g)	36.98	36.49	35.75	35.33		
	Wt. ring (g)	4.03	4.03	4.03	4.03		
	Dry soil + tare (g)	30.08	30.08	30.08	30.08		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	30.08	30.08	30.08	30.08		
	Moisture Content, w (%)	9.54	7.91	5.45	4.06		
Sample B	Wt. ring + moist soil, W_{csw} (g)	33.99	33.86	33.18	32.76		
	Wt. ring (g)	4.16	4.16	4.16	4.16		
	Dry soil + tare (g)	27.53	27.53	27.53	27.53		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	27.53	27.53	27.53	27.53		
	Moisture Content, w (%)	8.35	7.88	5.41	3.89		
	Average Moisture Content (%):	8.95	7.90	5.43	3.97		
	Pressure (ft. H_2O):	36.9	69.3	170.9	300.2		

Zero tension line, moisture content (%)*: **10.3**

** Estimated using Lagrangian interpolation polynomial*



Comments:

Natural moisture content = 10.8%

Entered by: D.S.
Reviewed: RP

Capillary-Moisture Relationships by Pressure-Membrane Apparaturs

(ASTM D3152)

IGES
© IGES 2004

Project: Central Farmers Fertilizer Plant
No: M00596-001
Location: Georgetown Canyon, Idaho
Date: 8/10/2004
By: DS

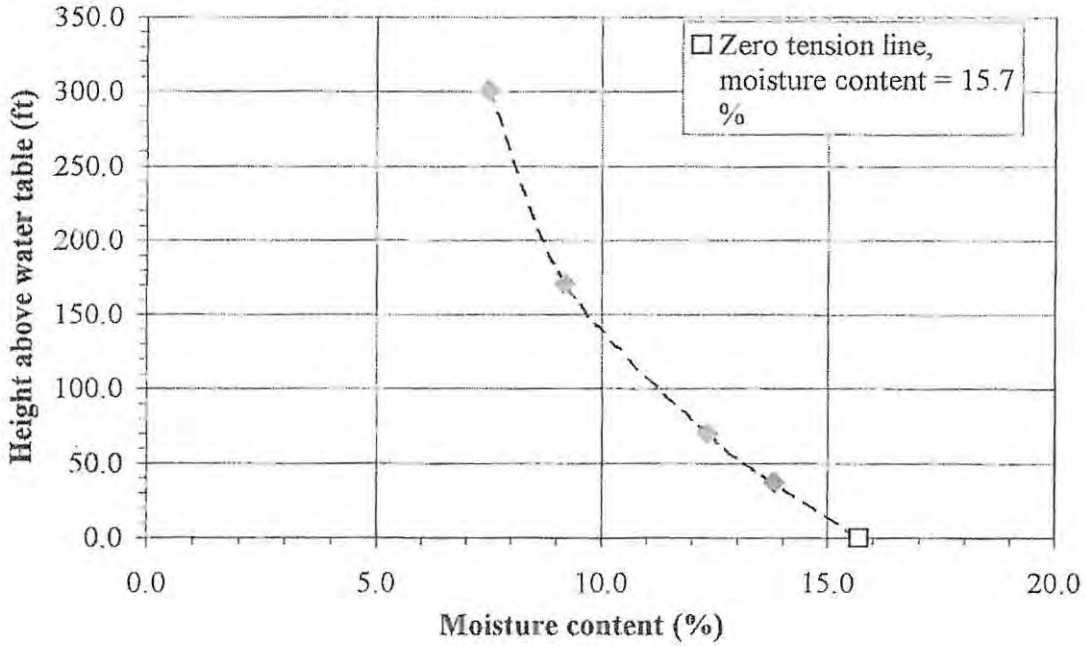
Boring No.: GT-7
Sample: _
Depth: 27
Description: _

Natural moisture content (%): 27.7

	Test No.	1	2	3	4		
	Tension (psi)	16	30	74	130		
Sample A	Wt. ring + moist soil, W_{csw} (g)	41.22	40.25	39.21	38.69		
	Wt. ring (g)	3.92	3.92	3.92	3.92		
	Dry soil + tare (g)	32.66	32.66	32.66	32.66		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	32.66	32.66	32.66	32.66		
	Moisture Content, w (%)	14.21	11.24	8.05	6.46		
Sample B	Wt. ring + moist soil, W_{csw} (g)	39.52	39.54	38.55	38.00		
	Wt. ring (g)	3.89	3.89	3.89	3.89		
	Dry soil + tare (g)	31.42	31.42	31.42	31.42		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	31.42	31.42	31.42	31.42		
	Moisture Content, w (%)	13.40	13.46	10.31	8.56		
	Average Moisture Content (%):	13.80	12.35	9.18	7.51		
	Pressure (ft. H_2O):	36.9	69.3	170.9	300.2		

Zero tension line, moisture content (%)*: **15.7**

** Estimated using Lagrangian interpolation polynomial*



Comments:
Natural moisture content = 27.7%

Entered by: D.S.
Reviewed: RR

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Capillary-Moisture Relationships by Pressure-Membrane Apparaturs

(ASTM D3152)

IGES

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Project: Central Farmers Fertilizer Plant
No: M00596-001
Location: Georgetown Canyon, Idaho
Date: 8/10/2004
By: DS

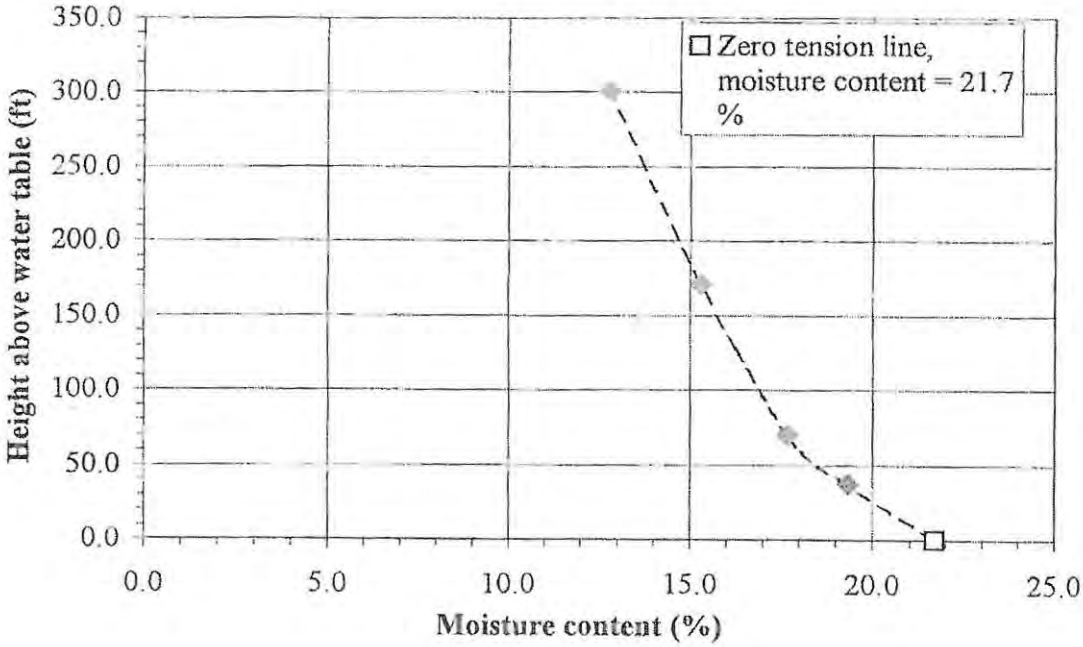
Boring No.: GT-3
Sample: _
Depth: 17
Description: _

Natural moisture content (%): 23.5

	Test No.	1	2	3	4		
	Tension (psi)	16	30	74	130		
Sample A	Wt. ring + moist soil, W_{csw} (g)	43.11	42.28	41.56	40.74		
	Wt. ring (g)	4.18	4.18	4.18	4.18		
	Dry soil + tare (g)	32.43	32.43	32.43	32.43		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	32.43	32.43	32.43	32.43		
	Moisture Content, w (%)	20.04	17.48	15.26	12.74		
Sample B	Wt. ring + moist soil, W_{csw} (g)	44.98	44.73	43.84	42.99		
	Wt. ring (g)	3.93	3.93	3.93	3.93		
	Dry soil + tare (g)	34.61	34.61	34.61	34.61		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	34.61	34.61	34.61	34.61		
	Moisture Content, w (%)	18.61	17.89	15.31	12.86		
Average Moisture Content (%):		**19.33**	**17.68**	**15.29**	**12.80**		
Pressure (ft. H_2O):		**36.9**	**69.3**	**170.9**	**300.2**		

Zero tension line, moisture content (%)*: **21.7**

** Estimated using Lagrangian interpolation polynomial*



Entered by: D.S.
Reviewed: RR

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Capillary-Moisture Relationships by Pressure-Membrane Apparaturs

(ASTM D3152)

IGES
© IGES 2004

Project: Central Farmers Fertilizer Plant
No: M00596-001
Location: Georgetown Canyon, Idaho
Date: 8/10/2004
By: DS

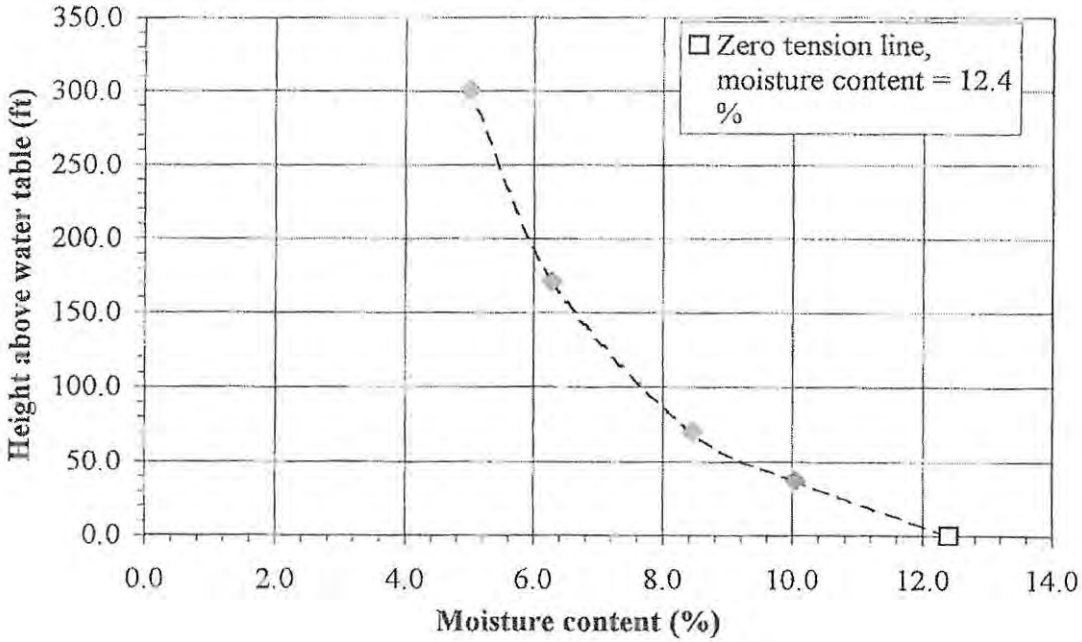
Boring No.: GT-3
Sample: --
Depth: 12
Description: --

Natural moisture content (%): 17.1

	Test No.	1	2	3	4		
	Tension (psi)	16	30	74	130		
Sample A	Wt. ring + moist soil, W_{csw} (g)	45.03	43.72	42.93	42.46		
	Wt. ring (g)	4.16	4.16	4.16	4.16		
	Dry soil + tare (g)	36.48	36.48	36.48	36.48		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	36.48	36.48	36.48	36.48		
	Moisture Content, w (%)	12.03	8.44	6.28	4.99		
Sample B	Wt. ring + moist soil, W_{csw} (g)	43.57	43.72	42.93	42.46		
	Wt. ring (g)	4.15	4.15	4.15	4.15		
	Dry soil + tare (g)	36.48	36.48	36.48	36.48		
	Tare (g)	0.00	0.00	0.00	0.00		
	Dry soil (g)	36.48	36.48	36.48	36.48		
	Moisture Content, w (%)	8.06	8.47	6.30	5.02		
	Average Moisture Content (%):	**10.05**	**8.46**	**6.29**	**5.00**		
	Pressure (ft. H_2O):	**36.9**	**69.3**	**170.9**	**300.2**		

Zero tension line, moisture content (%)*: **12.4**

** Estimated using Lagrangian interpolation polynomial*



Entered by: D-S
Reviewed: RM

Permeability Test by Back Pressure (Constant Head) ASTM D 5084

IGES

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-3
Depth: 12 ft
Description: Permeability at 720 psf

K average [a] =	1.2E-07 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

Elapsed time (min)	ΔQ (cm^3)	K [a] (cm/sec)
37.0	0.06	1.12E-07
45.0	0.08	1.22E-07
54.0	0.09	1.15E-07
31.0	0.06	1.33E-07
38.0	0.06	1.09E-07

	Initial	Final
Length of sample (cm)	7.57	7.57
Area of sample (cm^2)	28.46	24.32
Moisture content (%)	24.1	20.3
Moist unit weight (pcf)	98.8	112.0
Dry unit weight (pcf)	79.6	93.1
$B = \Delta u/\Delta\sigma_c$	0.68	0.96

Total backpressure (psf)	4968
Maximum consolidation stress (psf)	720
Minimum consolidation stress (psf)	72
Hydraulic gradient	9.26

Permeant: Deaired Water at 23 deg C

Tested by:_____

Reviewed: ZT

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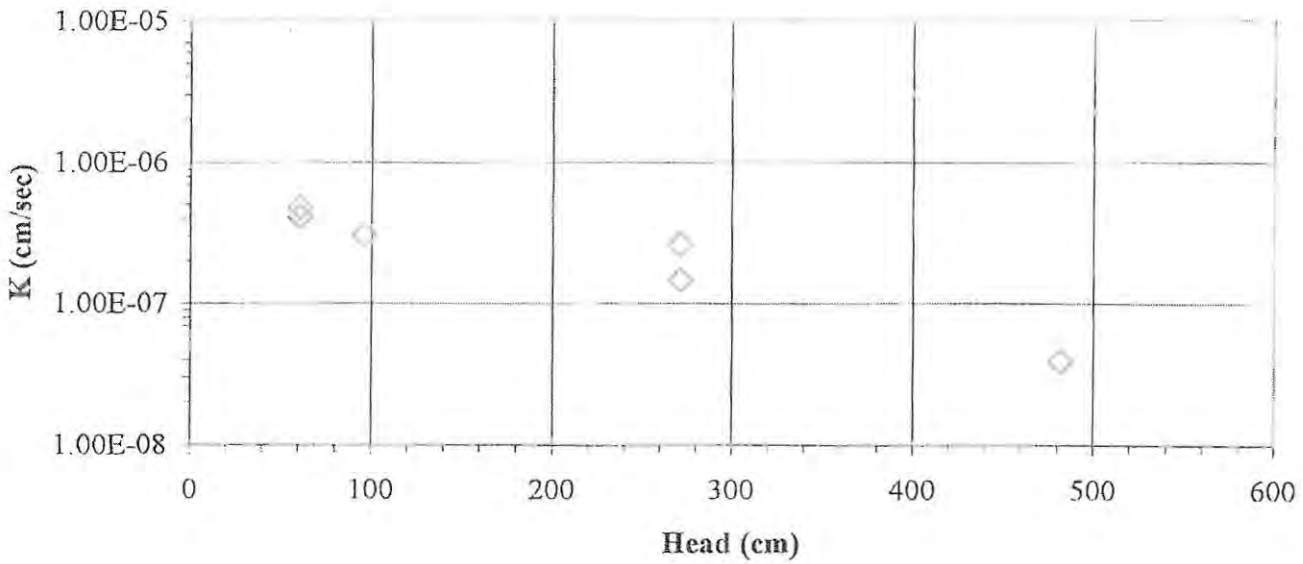
Hydraulic Conductivity of Unsaturated Soil (MOSA, 1965)

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-3
Depth: 12 ft
Description: Unsaturated Hydraulic Conductivity

Date	Time	Elapsed Time (min)	Temp (deg C)	Head (cm)	Flow (cc)	Moisture content (%)	Unsat. K (cm/sec)
7/27	16:50	7.0	23	61.0	0.06	20.5	4.02E-07
7/27	17:02	12.0	23	61.0	0.12	20.5	4.69E-07
7/28	11:10	10.0	23	96.1	0.10	21.2	2.98E-07
8/2	8:54	34 0	23	271.3	0.82	21.9	2.54E-07
8/2	9:38	44.0	23	271.3	0.60	21.9	1.44E-07
8/3	8:02	937.0	23	481.6	6.04	22.3	3.83E-08



Tested by: _____

Reviewed: RR

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Permeability Test by Back Pressure (Constant Head) ASTM D 5084

IGES

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-3
Depth: 17 ft
Description: Permeability at 720 psf

K average [a] =	9.8E-08 (cm/sec)
[a] Average hydraulic corrected to 20 deg. C	

Elapsed time (min)	ΔQ (cm^3)	K [a] (cm/sec)
37.0	0.09	9.78E-08
45.0	0.11	9.83E-08
54.0	0.14	1.04E-07
31.0	0.08	1.04E-07
38.0	0.08	8.46E-08

	Initial	Final
Length of sample (cm)	5.08	5.08
Area of sample (cm^2)	29.58	27.94
Moisture content (%)	28.1	26.2
Moist unit weight (pcf)	127.1	132.6
Dry unit weight (pcf)	99.3	105.1
$B = \Delta u/\Delta\sigma_c$	0.40	0.96

Total backpressure (psf)	9288
Maximum consolidation stress (psf)	720
Minimum consolidation stress (psf)	72
Hydraulic gradient	13.80

Permeant: Deaired Water at 23 deg C

Tested by:_____

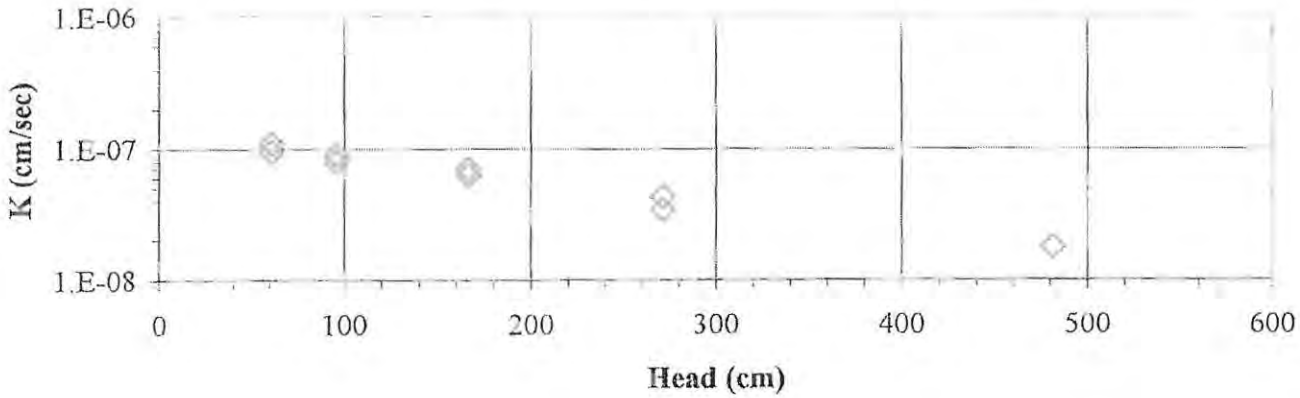
Reviewed: RT

Hydraulic Conductivity of Unsaturated Soil (MOSA, 1965)

IGES

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-3
Depth: 17 ft
Description: Unsaturated Hydraulic Conductivity

Date	Time	Elapsed Time (min)	Temp (deg C)	Head (cm)	Flow (cc)	Moisture content (%)	Unsat. K (cm/sec)
7/28	11:00	10.0	23	61.0	0.02	24.9	9.386E-08
7/28	12:10	70.0	23	61.0	0.16	24.8	1.073E-07
7/28	15:53	223.0	23	96.1	0.66	24.7	8.821E-08
7/28	16:31	38.0	23	96.1	0.10	24.7	7.843E-08
7/28	17:30	40.0	23	166.2	0.16	25.0	6.892E-08
7/28	19:10	100.0	23	166.2	0.36	25.1	6.202E-08
7/28	20:49	99.0	23	166.2	0.36	25.1	6.265E-08
8/2	15:08	374.0	23	271.3	1.50	25.8	4.232E-08
8/2	20:06	298.0	23	271.3	0.94	25.7	3.328E-08
8/2	16:25	137.0	23	481.6	0.40	26.0	1.735E-08



Tested by:_____

Reviewed: GL

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Permeability Test by Back Pressure (Constant Head) ASTM D 5084

IGES

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-7
Depth: 27 ft
Description: Permeability at 720 psf

K average [a] =	9.9E-06 (cm/sec)
[a] Average hydraulic corrected to 20 deg. C	

	Initial	Final
Length of sample (cm)	5.08	5.08
Area of sample (cm^2)	29.58	27.43
Moisture content (%)	23.6	15.6
Moist unit weight (pcf)	128.3	129.4
Dry unit weight (pcf)	103.8	111.9
$B = \Delta u/\Delta\sigma_c$	0.64	0.96

Total backpressure (psf)	7848
Maximum consolidation stress (psf)	720
Minimum consolidation stress (psf)	72
Hydraulic gradient	13.80

Permeant: Deaired Water at 22.9 deg C

Elapsed time (min)	ΔQ (cm^3)	K [a] (cm/sec)
1.0	0.24	9.85E-06
1.0	0.24	9.85E-06
1.5	0.34	9.30E-06
1.0	0.24	9.85E-06
1.0	0.24	9.85E-06
1.0	0.24	9.85E-06
1.0	0.26	1.07E-05
1.0	0.24	9.85E-06
1.5	0.36	9.85E-06
1.0	0.26	1.07E-05
1.0	0.24	9.85E-06
1.0	0.22	9.03E-06
1.0	0.26	1.07E-05
1.0	0.26	1.07E-05
1.0	0.24	9.85E-06
1.0	0.24	9.85E-06
1.0	0.22	9.03E-06

Tested by:_____

Reviewed: R.K.

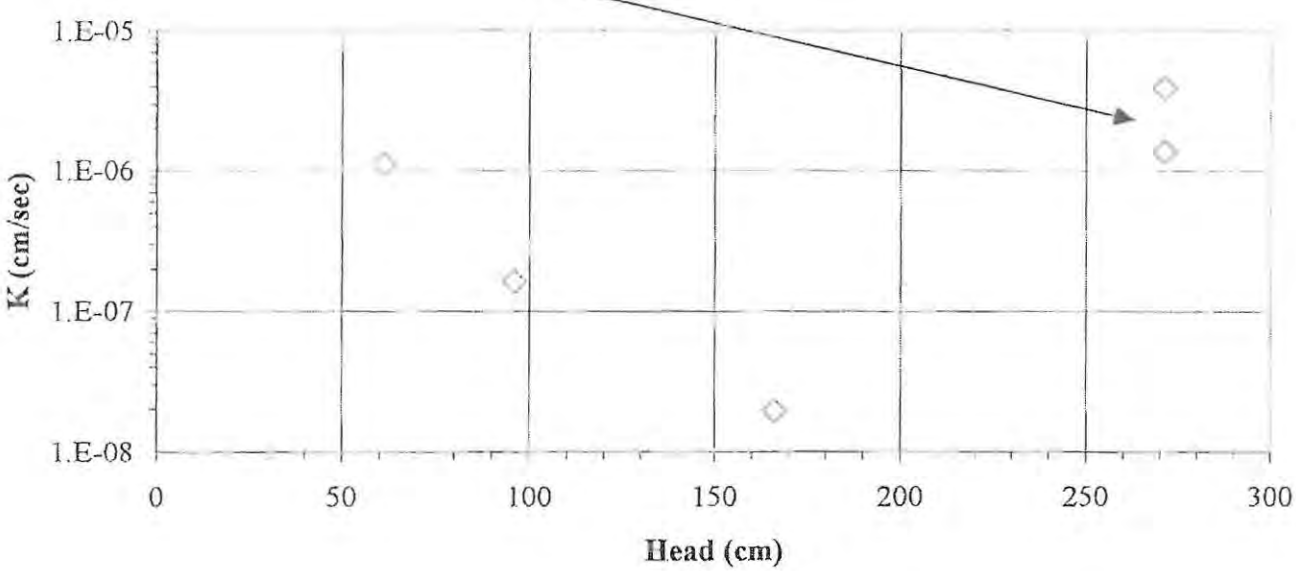
Hydraulic Conductivity of Unsaturated Soil (MOSA, 1965)

IGES

Project: Central Farmers Fertilizer Plant
Number: M00596-001
Sample: GT-7
Depth: 27 ft
Description: Unsaturated Hydraulic Conductivity

Date	Time	Elapsed Time (min)	Temp (deg C)	Head (cm)	Flow (cc)	Moisture content (%)	Unsat. K (cm/sec)	
7/27	19:39	42.0	23	61.0	0.98	18.9	1.095E-06	
7/28	12:10	70.0	23	96.1	0.38	20.3	1.618E-07	
7/28	16:50	18.0	23	166.2	0.02	20.2	1.914E-08	
8/2	8:28	3.0	23	271.3	0.38	21.7	1.337E-06	*
8/2	8:54	26.0	23	271.3	9.42	21.5	3.823E-06	*

* Sample piped



Tested by:_____

Reviewed: RSL

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Moisture and Density Determination (ASTM's D2937 & D2216)

Project: Central Farmers Fertilizer Plant

Number: M-00596-001

IGES

Drill Hole / Sample:	GTB-4	GTB-8	GTB-13	GTB-13	GTB-14	GTB-14	GTB-15	GTB-10
Sample No:								
Depth (ft)	10	18.5	13	17.5	8.5	18.5-19	10-12.5	10
Sample height (in)					6			1
Sample diameter (in)					2.416			2.416
Wt. of sample (g)					885.81			161.13
Moist unit weight (pcf)					122.6			133.8
Dry unit weight (pcf)					96.3			125.2
Moisture content (%)	13.5	18.6	11.3	7.7	27.3	12.5	8.7	6.8

Tested by: BRP

Reviewed: RTL

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Moisture and Density Determination (ASTM's D2937 & D2216)

Project: Central Farmers Fertilizer Plant

Number: M-00596-001

IGES

Drill Hole / Sample:	GTB-15	GTB-11	GTB-12	GTB-4	GTB-3	GTB-7	GTB-3	
Sample No:								
Depth (ft)	25-26.5	8.5	12.5	20	12	27	17	
Sample height (in)	2			2	2	2	2	
Sample diameter (in)	2.416			2.416	2.416	2.416	2.416	
Wt. of sample (g)	319.53			322.16	319.22	320	308.32	
Moist unit weight (pcf)	132.6			133.7	132.5	132.8	128.0	
Dry unit weight (pcf)	124.7			122.2	115.9	114.1	104.3	
Moisture content (%)	6.4	13.0	19.4	9.4	14.3	16.4	22.8	

Tested by: BPP

Reviewed: [illegible]

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Specific Gravity of Soils (ASTM D854)

IGES

Project: Central Farmers Fetilizer Plant

Project Number: M-00596-001

Drill hole / Sample:	GTB-3	GTB-3	GTB-7	GTB-10	GTB-4	
Sample No:						
Depth (ft)	12	17	27	10	20	
Flask No.	8	7	2	1	5	
Wt. flask + water + soil, W_1 (g)	756.94	730.66	725.62	710.13	683.57	
Temp, T (deg C)	21.5	21.5	21	21.5	21.5	
Wt. flask + water, W_2 (g)	687.52	682.97	683.15	660.78	657.77	
Wt. dish + dry soil, Ws (g)	572.04	614.26	460.2	544.4	502.98	
Wt. dish (g)	463.07	539.33	393.18	467.13	463.13	
Wt. soil, Ws (g)	108.97	74.93	67.02	77.27	39.85	
Specific gravity of water at T, G_{wT}	0.99791	0.99791	0.99802	0.99791	0.99791	
Specific gravity of soil, Gs	**2.749**	**2.745**	**2.725**	**2.762**	**2.830**	

Tested by: BPP

Reviewed: RTR

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-3
Depth: 12

K average [a] =	1.7E-07 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	20.3	20.5
Moist unit weight (pcf)	132.5	132.5
Dry unit weight (pcf)	110.1	110.0

Surcharge (psf):	300
Length of sample, L (cm):	5.09
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.72

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
1067.0	51.2	1.41E-07
260.0	51.0	8.36E-08
1116.0	48.9	1.82E-07
430.0	48.3	1.34E-07
992.0	46.0	2.40E-07
295.0	45.7	1.25E-07
163.0	45.4	1.50E-07
925.0	43.1	2.75E-07
1788.0	39.8	2.12E-07
1126.0	38.0	2.05E-07

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: BRH
Reviewed: RGL

Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: **Central Farmers Fertilizer Plant**
Number: **M-00596-001**
Sample: **GTB-3**
Depth: **17**

K average [a] =	2.3E-07 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	24.1	24.0
Moist unit weight (pcf)	128.0	128.3
Dry unit weight (pcf)	103.1	103.5

Surcharge (psf):	300
Length of sample, L (cm):	5.06
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.98

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
1067.0	51.4	2.00E-07
260.0	50.9	2.08E-07
1116.0	47.9	2.94E-07
430.0	47.1	2.19E-07
992.0	44.7	2.94E-07
295.0	44.3	1.73E-07
163.0	44.0	2.31E-07
925.0	42.0	2.81E-07
1788.0	38.9	2.32E-07
1126.0	37.4	1.96E-07

Tested by: BPP

Reviewed: DSD

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-4
Depth: 20

K average [a] =	4.7E-04 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	14.6	14.2
Moist unit weight (pcf)	133.7	133.8
Dry unit weight (pcf)	116.7	117.1

Surcharge (psf):	300
Length of sample, L (cm):	5.06
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.72

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
4.0	38.8	4.92E-04
2.0	29.4	6.68E-04
1.0	27.3	3.55E-04
0.0	67.8	
5.0	37.9	5.60E-04
2.0	31.5	4.45E-04
2.0	26.1	4.47E-04
0.0	64.5	
3.0	47.5	4.89E-04
2.0	40.4	3.88E-04
2.0	34.3	3.97E-04

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: BH
Reviewed: RR

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-7
Depth: 27

K average [a] = 5.3E-06 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	19.3	19.3
Moist unit weight (pcf)	132.8	133.7
Dry unit weight (pcf)	111.3	112.1

Surcharge (psf):	300
Length of sample, L (cm):	5.05
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	0.96

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
51.0	47.9	6.23E-06
54.0	42.4	6.07E-06
67.0	36.8	5.68E-06
30.0	34.7	5.20E-06
34.0	32.6	4.87E-06
25.0	31.1	4.91E-06
24.0	29.9	4.57E-06
13.0	29.1	5.80E-06
22.0	28.1	4.00E-06

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: BRK
Reviewed: BR

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-11
Depth: 8.5

K average [a] =	2.2E-05 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	11.2	9.4
Moist unit weight (pcf)	120.2	171.6
Dry unit weight (pcf)	108.0	156.9

Surcharge (psf):	300
Length of sample, L (cm):	3.50
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.98

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
8.0	56.1	2.51E-05
7.0	53.5	2.62E-05
3.0	52.5	2.43E-05
4.0	51.2	2.42E-05
10.0	48.3	2.18E-05
4.0	47.0	2.63E-05
15.0	43.7	1.87E-05
5.0	42.1	2.89E-05
13.0	39.5	1.83E-05
11.0	37.5	1.82E-05
10.0	35.9	1.68E-05
21.0	32.7	1.72E-05

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: BRP
Reviewed: RTL

Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-12
Depth: 12.5

K average [a] = 1.7E-07 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	24.3	24.1
Moist unit weight (pcf)	119.7	119.1
Dry unit weight (pcf)	96.3	96.0

Surcharge (psf):	300
Length of sample, L (cm):	5.10
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	0.96

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
1217.0	55.3	3.58E-07
308.0	53.9	2.17E-07
93.0	53.6	1.68E-07
3181.0	63.3	1.69E-07
2140.0	57.4	1.24E-07
455.0	56.7	6.46E-08
1036.0	54.5	1.07E-07

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: PKP
Reviewed: RG

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-15
Depth: 25-26.5

K average [a] = 3.1E-03 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	10.8	6.4
Moist unit weight (pcf)	132.6	127.3
Dry unit weight (pcf)	119.7	119.7

Surcharge (psf):	300
Length of sample, L (cm):	5.08
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.72

Permeant: distilled water at 21 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
0.2	48.4	3.52E-03
0.2	42.9	3.54E-03
0.2	37.8	3.68E-03
0.2	33.3	3.61E-03
0.2	29.9	3.19E-03
0.2	25.6	4.50E-03
0.2	47.3	2.06E-03
0.2	43.3	2.53E-03
0.2	39.5	2.69E-03
0.2	36.8	2.03E-03
0.2	33.9	2.38E-03

Comments:
Sample was partially remolded due to +3/4 inch gravel.

Tested by: BRR
Reviewed: RJC

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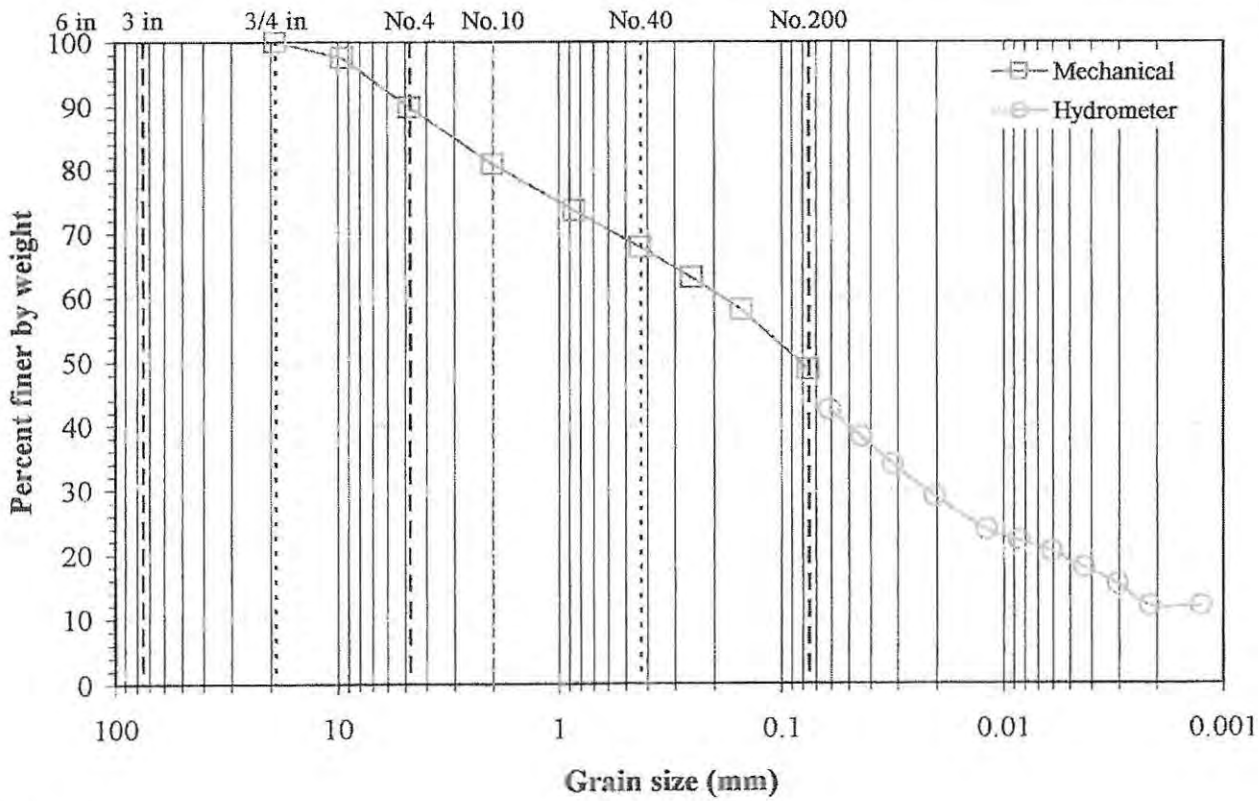
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers
Number: M-00596-001
Sample: GTB-3
Depth: 12

Mechanical analysis			Hydrometer analysis	
Sieve name	Sieve size (mm)	Percent finer	Particle size (mm)	Soil in suspension (%)
-	-	-		
-	-	-		
-	-	-		
-	-	-		
-	-	-	0.0606	42.5
-	-	-	0.0436	38.3
3/4"	19	100.0	0.0314	34.0
3/8"	9.5	97.5	0.0202	28.9
No.4	4.75	89.8	0.0119	23.8
No.10	2	80.8	0.0085	22.1
No.20	0.85	73.5	0.0060	20.4
No.40	0.425	67.7	0.0043	17.9
No.60	0.25	63.0	0.0030	15.3
No.100	0.15	58.0	0.0022	11.9
No.200	0.075	48.8	0.0013	11.9

Gs = 2.749 Determined



Tested by: BRP
Reviewed: RCR

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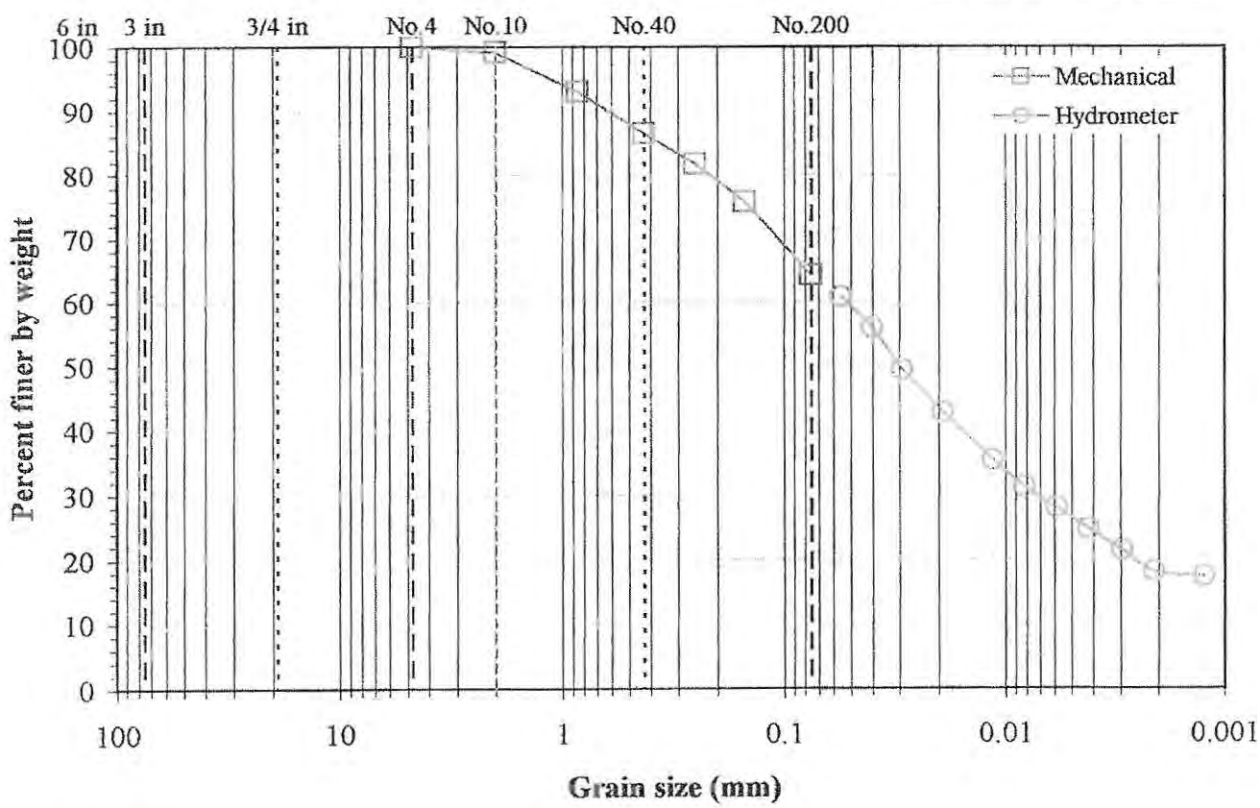
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers
Number: M-00596-001
Sample: GTB-3
Depth: 17

Mechanical analysis			Hydrometer analysis	
Sieve name	Sieve size (mm)	Percent finer	Particle size (mm)	Soil in suspension (%)
-	-	-		
-	-	-		
-	-	-		
-	-	-		
-	-	-	0.0551	60.9
-	-	-	0.0400	55.9
-	-	-	0.0292	49.3
-	-	-	0.0190	42.8
No.4	4.75	100.0	0.0114	35.4
No.10	2	99.2	0.0082	31.3
No.20	0.85	93.0	0.0059	28.0
No.40	0.425	86.5	0.0042	24.7
No.60	0.25	81.8	0.0029	21.4
No.100	0.15	75.8	0.0021	18.1
No.200	0.075	64.2	0.0012	17.3

Gs = 2.745 Determined



Tested by: BRR

Reviewed: RR

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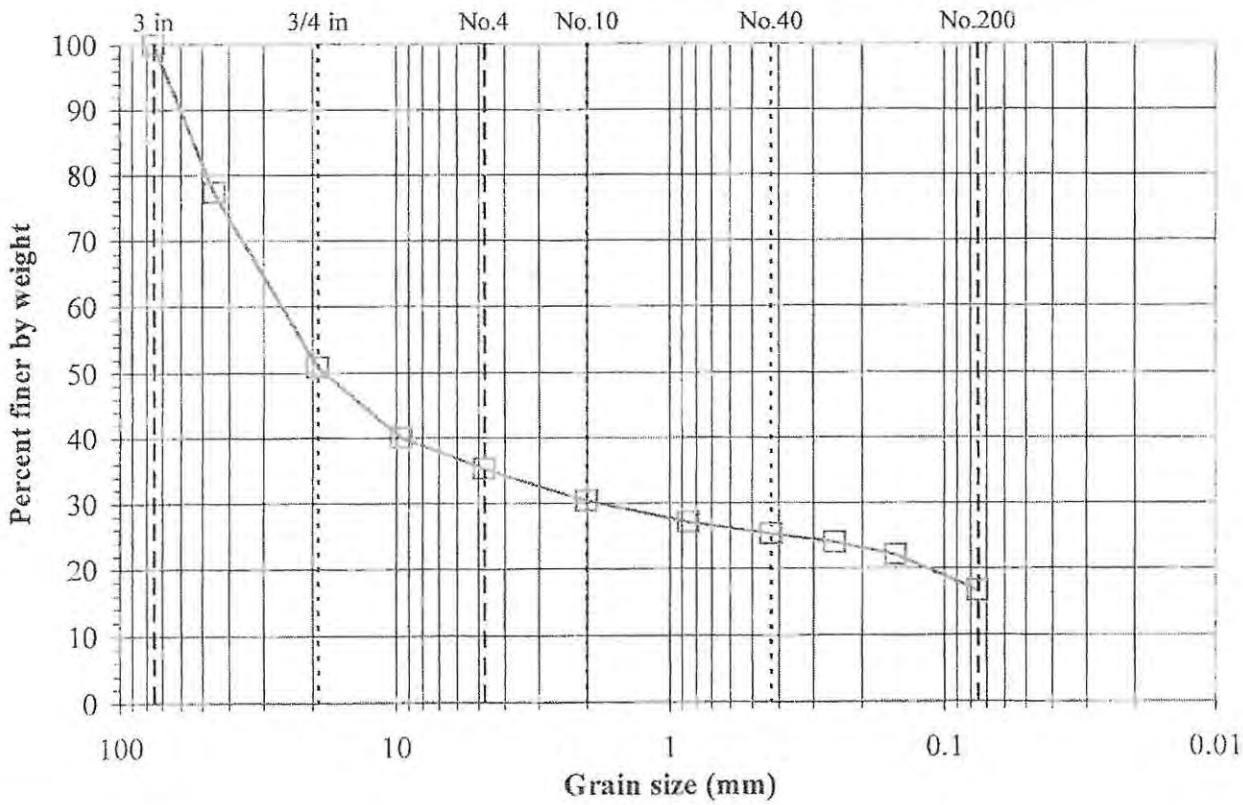
Particle-Size Analysis of Soils (ASTM D 422)

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-4
Depth: 20

Moisture content (%) 9.4

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
3"	75	100.0
1.5"	45	77.2
3/4"	19	50.8
3/8"	9.5	39.9
No.4	4.75	35.2
No.10	2	30.3
No.20	0.85	27.0
No.40	0.425	25.2
No.60	0.25	23.9
No.100	0.15	22.0
No.200	0.075	16.5



Tested by: BRF

Reviewed: RJR

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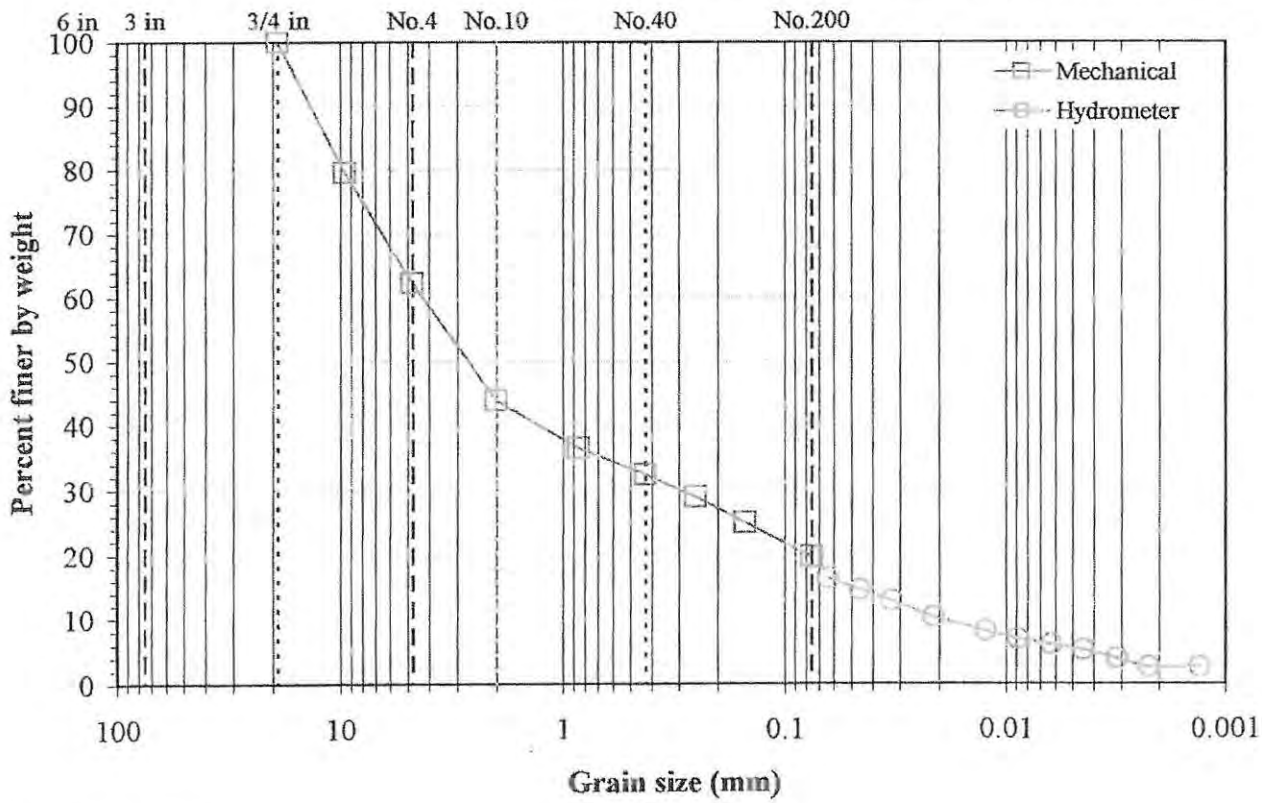
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers
Number: M-00596-001
Sample: GTB-7
Depth: 27

Mechanical analysis			Hydrometer analysis	
Sieve name	Sieve size (mm)	Percent finer	Particle size (mm)	Soil in suspension (%)
-	-	-		
-	-	-		
-	-	-		
-	-	-		
-	-	-	0.0636	16.3
-	-	-	0.0456	14.6
3/4"	19	100.0	0.0326	12.9
3/8"	9.5	79.6	0.0210	10.3
No.4	4.75	62.3	0.0123	8.2
No.10	2	43.8	0.0088	6.9
No.20	0.85	36.4	0.0063	6.0
No.40	0.425	32.4	0.0045	5.2
No.60	0.25	28.9	0.0031	3.9
No.100	0.15	25.0	0.0022	2.6
No.200	0.075	19.7	0.0013	2.6

Gs = 2.725 Determined



Tested by: PPP

Reviewed: RP

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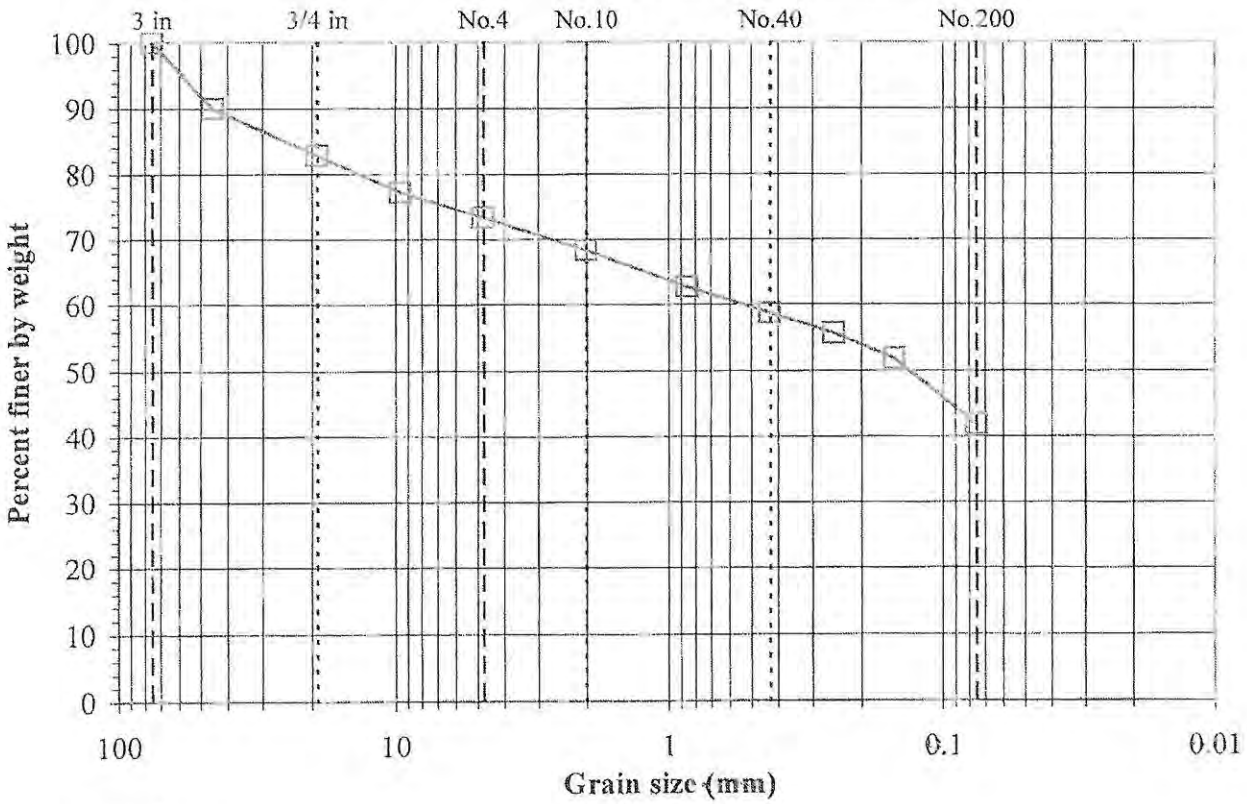
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-8
Depth: 18.5

Moisture content (%) 18.6

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
3"	75	100.0
1.5"	45	89.9
3/4"	19	82.7
3/8"	9.5	77.1
No.4	4.75	73.2
No.10	2	68.2
No.20	0.85	62.6
No.40	0.425	58.6
No.60	0.25	55.6
No.100	0.15	51.7
No.200	0.075	41.8



Tested by: BRP

Reviewed: RR

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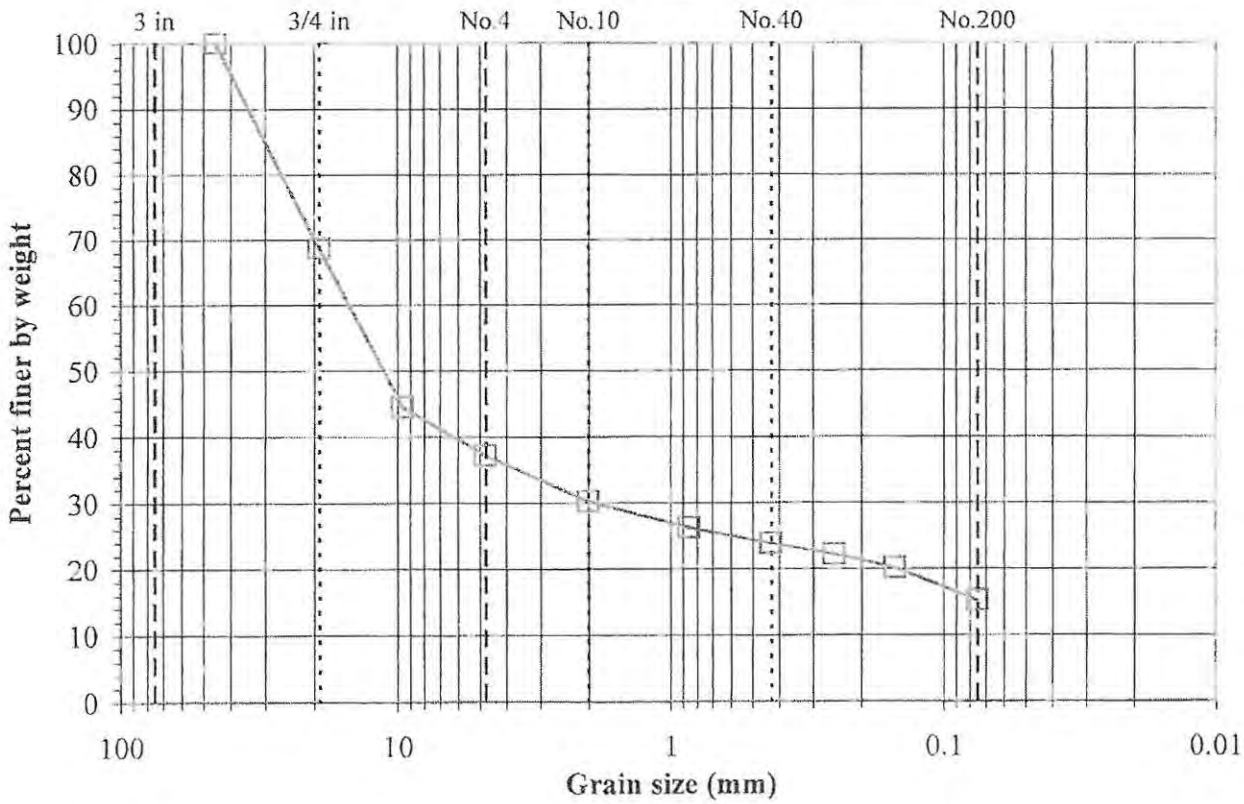
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-10
Depth: 10

Moisture content (%) 6.8

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
1.5"	45	100.0
3/4"	19	68.6
3/8"	9.5	44.4
No.4	4.75	37.1
No.10	2	30.2
No.20	0.85	26.2
No.40	0.425	23.8
No.60	0.25	22.2
No.100	0.15	20.1
No.200	0.075	15.2



Tested by: DFP
Reviewed: RR

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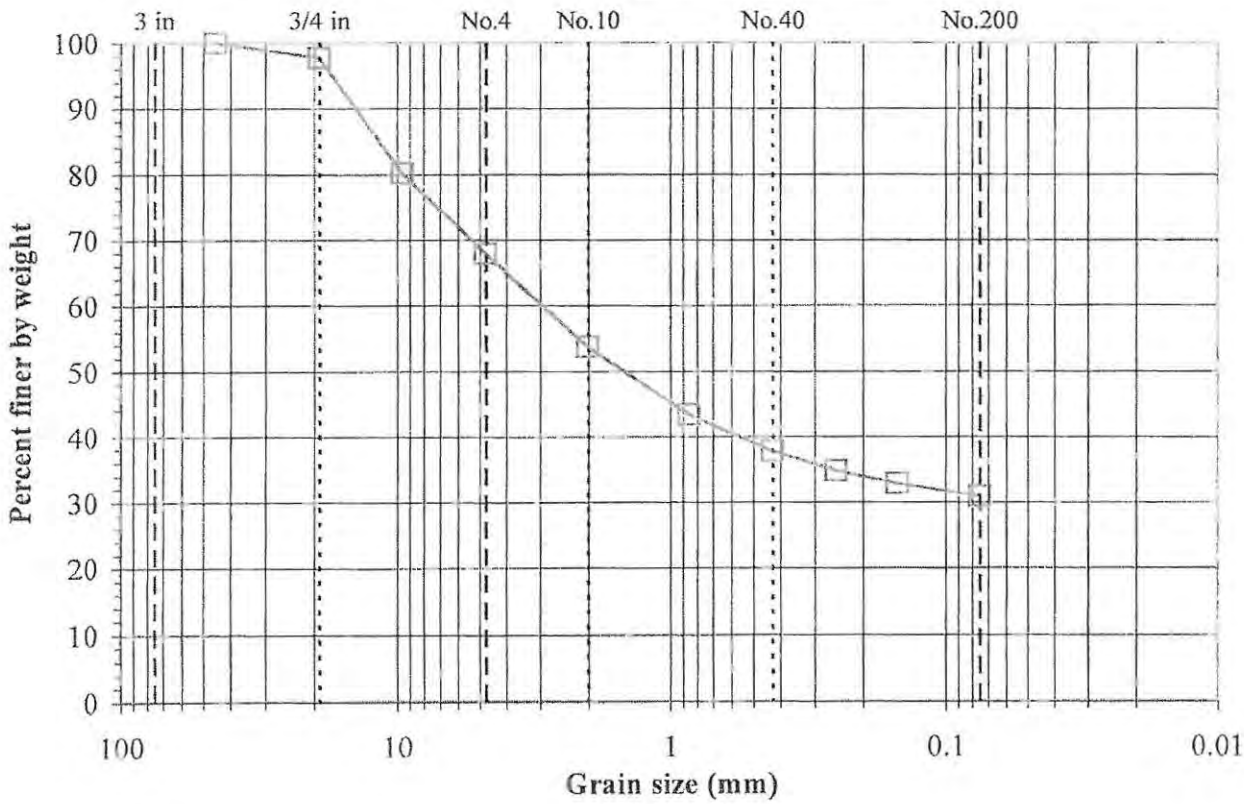
Particle-Size Analysis of Soils (ASTM D 422)

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-13
Depth: 13

Moisture content (%) 11.3

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
1.5"	45	100.0
3/4"	19	97.7
3/8"	9.5	80.1
No.4	4.75	67.9
No.10	2	53.6
No.20	0.85	43.3
No.40	0.425	37.6
No.60	0.25	34.7
No.100	0.15	32.8
No.200	0.075	30.8



Tested by: BPR
Reviewed: RR

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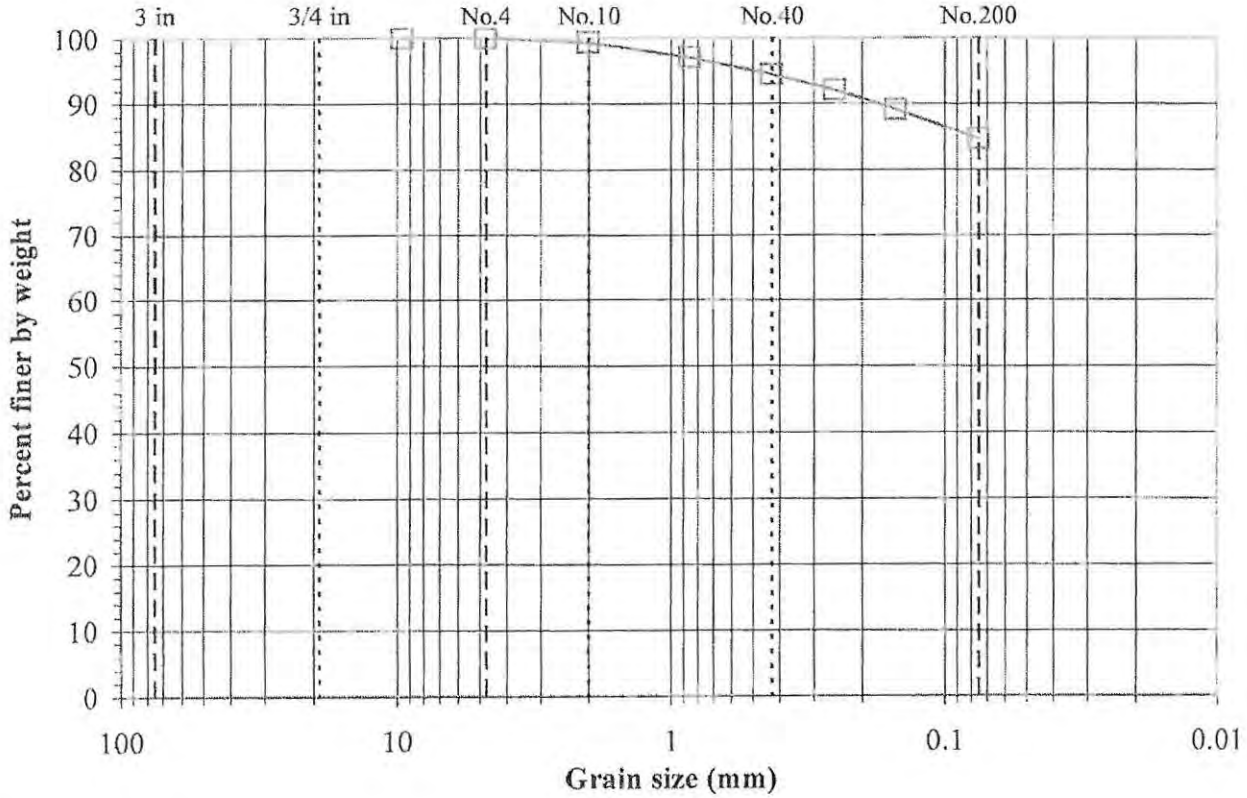
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: Central Farmers Fertilizer Plant
Number: M-00596-001
Sample: GTB-14
Depth: 8.5

Moisture content (%) 27.3

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
3/8"	9.5	100.0
No.4	4.75	100.0
No.10	2	99.3
No.20	0.85	97.0
No.40	0.425	94.5
No.60	0.25	92.0
No.100	0.15	89.1
No.200	0.075	84.6



Tested by: BR
Reviewed: RR

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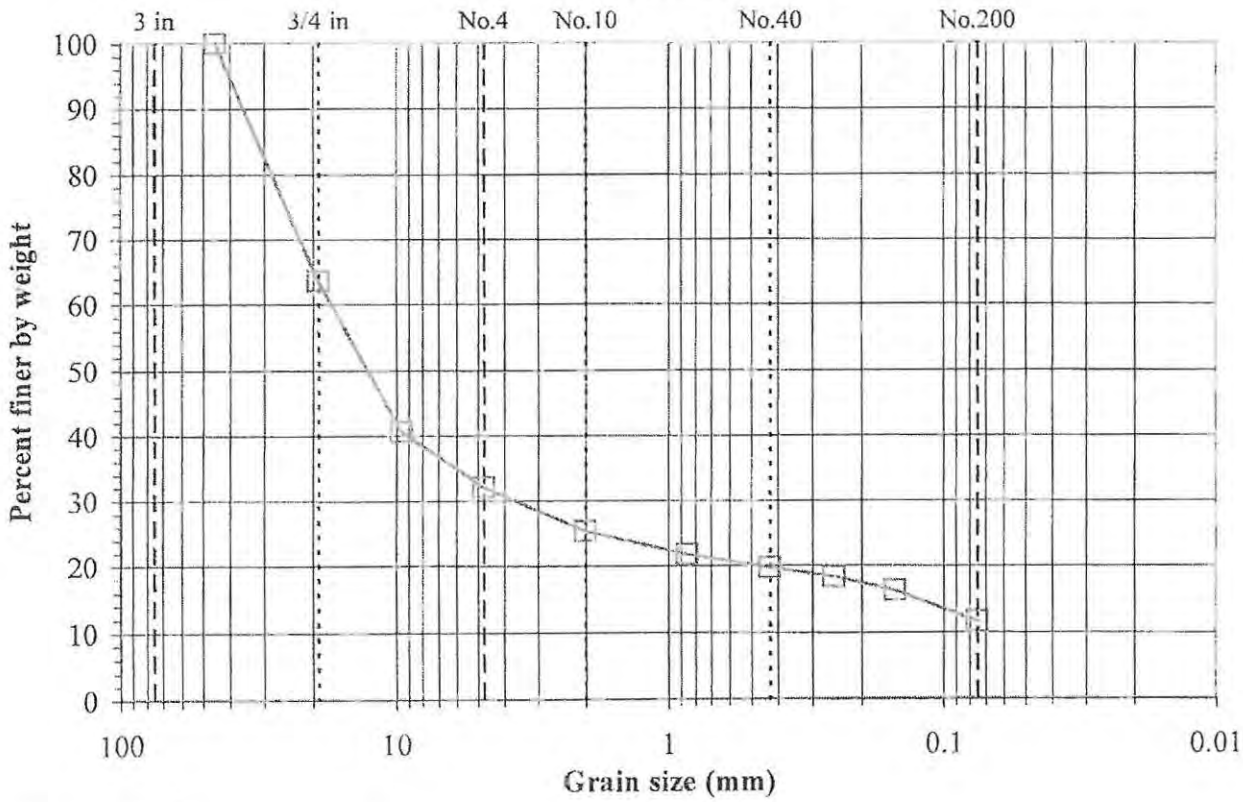
Particle-Size Analysis of Soils (ASTM D 422)

IGES

Project: **Central Farmers Fertilizer Plant**
Number: **M-00596-001**
Sample: **GTB-15**
Depth: **25-26.5**

Moisture content (%) 6.4

Mechanical analysis		
Sieve name	Sieve size (mm)	Percent finer
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
1.5"	45	100.0
3/4"	19	63.5
3/8"	9.5	40.6
No.4	4.75	32.0
No.10	2	25.3
No.20	0.85	21.7
No.40	0.425	19.6
No.60	0.25	18.2
No.100	0.15	16.2
No.200	0.075	11.6



Tested by: VPP

Reviewed: RTE

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: **JB Brown Global Engineering**
Number: **M00596-003**
Sample: **CVM-1**
Depth: _

K average [a] = 4.5E-06 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	15.7	17.5
Moist unit weight (pcf)	131.8	133.8
Dry unit weight (pcf)	113.9	113.9

Surcharge (psf):	500
Length of sample, L (cm):	5.08
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.81

Permeant: distilled water at 18.7 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
305.0	125.3	5.06E-06
415.0	124.6	4.36E-06
474.0	124.2	2.19E-06
687.0	122.6	6.48E-06

Comments:
Dark brown clay

Tested by: DS
Reviewed: RR

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Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: **JB Brown Global Engineering**
Number: **M00896-003**
Sample: **CVM-2**
Depth: _

K average [a] = 2.7E-06 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	14.4	14.4
Moist unit weight (pcf)	135.7	135.6
Dry unit weight (pcf)	118.7	118.5

Surcharge (psf):	500
Length of sample, L (cm):	5.09
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.85

Permeant: distilled water at 18.7 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
228.0	127.2	2.28E-06
416.0	125.4	3.17E-06
575.0	125.1	1.38E-06
688.0	124.1	3.86E-06

Comments:
Brown clay

Tested by: DS
Reviewed: [illegible]

Permeability Test by Falling Head *(Department of Army, Earth Manual, EM-1110-2-1906)*

IGES

Project: **JB Brown Global Engineering**
Number: **M00596-003**
Sample: **CVM-3**
Depth: _

K average [a] =	3.7E-05 (cm/sec)

[a] Average hydraulic corrected to 20 deg. C

	Initial	Final
Moisture content (%)	26.1	30.3
Moist unit weight (pcf)	111.2	114.9
Dry unit weight (pcf)	88.2	88.2

Surcharge (psf):	500
Length of sample, L (cm):	5.08
Area of sample, A (cm^2):	29.58
Area of standpipe, a (cm^2):	1.83

Permeant: distilled water at 18.7 deg C

Incremental time (min)	Head (cm)	K [a] (cm/sec)
230.0	118.7	9.50E-05
309.0	115.9	2.53E-05
419.0	112.3	2.46E-05
478.0	110.3	1.23E-05
691.0	103.6	2.96E-05

Comments:
Tan sand with clay

Tested by: 105.
Reviewed: [illegible]

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Particle-Size Analysis of Soils

(ASTM D422)

IGES
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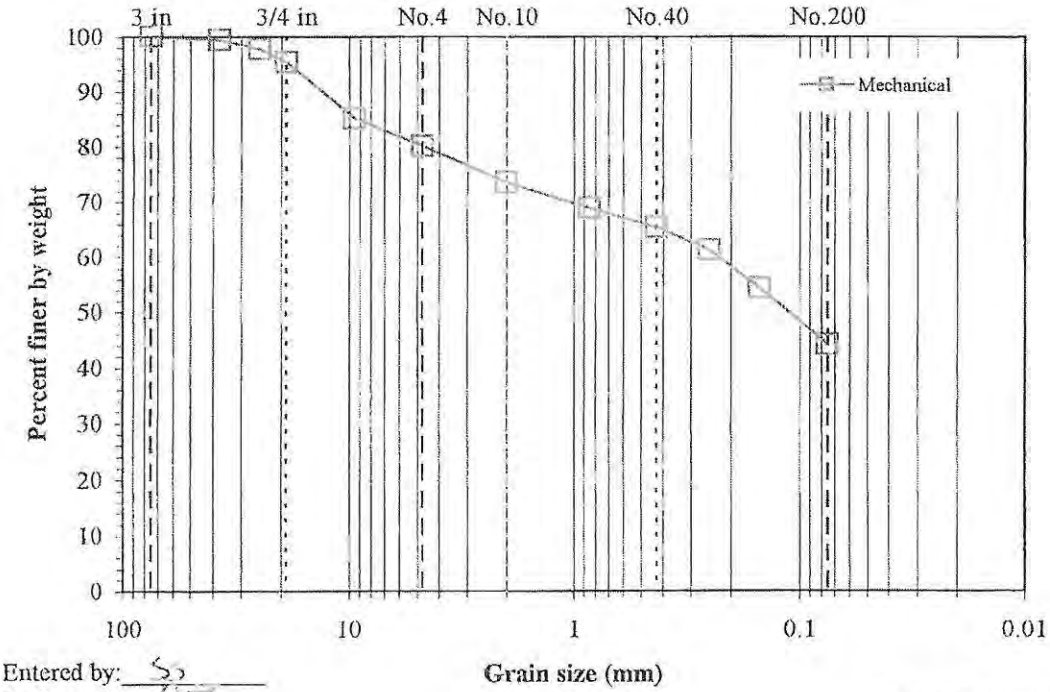
Project: Global Engineering
No: M00596-003
Location: _
Date: 11/10/2005
By: SS

Boring No.: _
Sample: CVM-1
Depth: _
Description: Not requested

Split:	Yes	
Split sieve:	3/8"	
	Moist	Dry
Total sample wt. (g):	22790.6	19972.7
+3/8" Coarse fraction (g):	3267.4	2985.4
-3/8" Split fraction (g):	1779.2	1548.10
Split fraction:	0.851	

Moisture data	C.F.(+3/8")	S.F.(-3/8")
Moist soil + tare (g):	691.50	2188.40
Dry soil + tare (g):	645.00	1957.30
Tare (g):	152.80	409.20
Moisture content (%):	9.4	14.9

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
12"	-	300	-	
8"	-	200	-	
6"	-	150	-	
3"	-	75	100.0	
1.5"	139.40	37.5	99.3	
1"	449.73	25	97.7	
3/4"	950.09	19	95.2	
3/8"	2986.65	9.5	85.0	<=Split
No.4	92.20	4.75	80.0	
No.10	211.30	2	73.4	
No.20	296.10	0.85	68.8	
No.40	360.10	0.425	65.3	
No.60	437.60	0.25	61.2	
No.100	559.70	0.15	54.3	
No.200	745.90	0.075	44.1	



Entered by: SS
Reviewed: DS

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Particle-Size Analysis of Soils

(ASTM D422)

IGES
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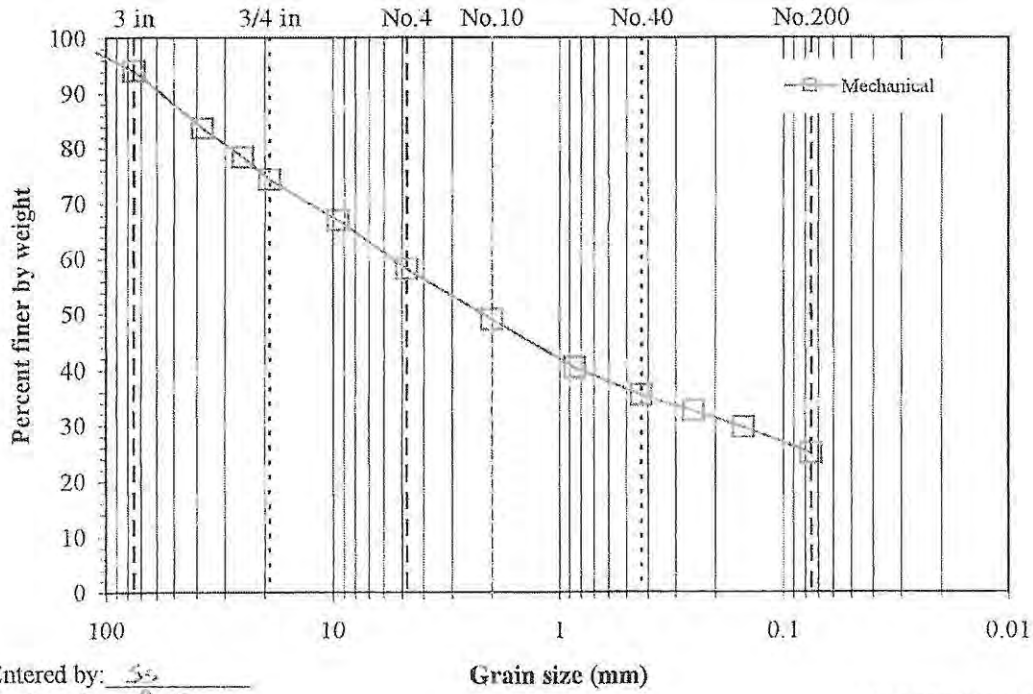
Project: Global Engineering
No: M00596-003
Location: _
Date: 11/10/2005
By: SS

Boring No.: _
Sample: CVM-2
Depth: _
Description: Not requested

Split:	Yes	
Split sieve:	3/4"	
	Moist	Dry
Total sample wt. (g):	53484.5	50143.0
+3/4" Coarse fraction (g):	13199.8	12956.9
-3/4" Split fraction (g):	1582.2	1460.50
Split fraction:	0.742	

Moisture data	C.F.(+3/4")	S.F.(-3/4")
Moist soil + tare (g):	625.20	1991.10
Dry soil + tare (g):	616.28	1869.40
Tare (g):	140.40	408.90
Moisture content (%):	1.9	8.3

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
12"	-	300	-	
8"	-	200	-	
6"	-	150	100.0	
3"	3006.28	75	94.0	
1.5"	8282.14	37.5	83.5	
1"	10921.39	25	78.2	
3/4"	12953.68	19	74.2	<=Split
3/8"	143.60	9.5	66.9	
No.4	316.80	4.75	58.1	
No.10	496.30	2	49.0	
No.20	666.30	0.85	40.3	
No.40	763.50	0.425	35.4	
No.60	820.20	0.25	32.5	
No.100	878.40	0.15	29.6	
No.200	970.30	0.075	24.9	



Entered by: SS
Reviewed: DS

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Particle-Size Analysis of Soils

(ASTM D422)

IGES
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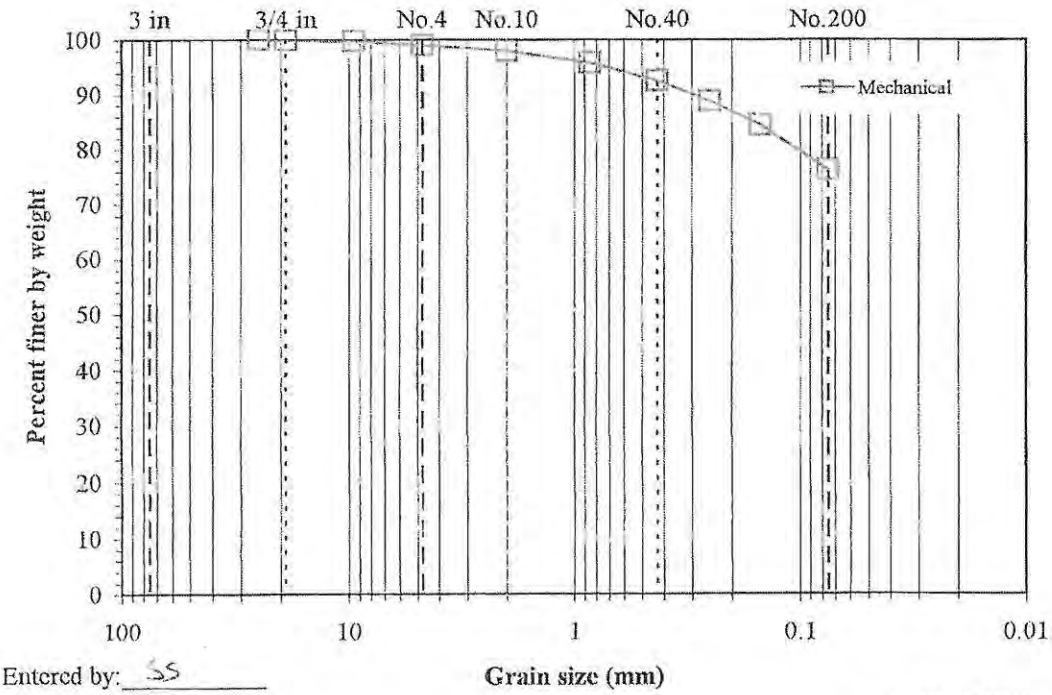
Project: Global Engineering
No: M00596-003
Location: _
Date: 11/10/2005
By: SS

Boring No.: _
Sample: CVM-3
Depth: _
Description: Not requested

Split:	Yes	
Split sieve:	3/8"	
	Moist	Dry
Total sample wt. (g):	16925.4	14903.1
+3/8" Coarse fraction (g):	53.8	53.0
-3/8" Split fraction (g):	1227.7	1080.60
Split fraction:	0.996	

Moisture data	C.F.(+3/8")	S.F.(-3/8")
Moist soil + tare (g):	194.20	1695.80
Dry soil + tare (g):	193.38	1548.70
Tare (g):	140.60	468.10
Moisture content (%):	1.6	13.6

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
12"	-	300	-	
8"	-	200	-	
6"	-	150	-	
3"	-	75	-	
1.5"	-	37.5	-	
1"	-	25	100.0	
3/4"	9.84	19	99.9	
3/8"	52.95	9.5	99.6	<=Split
No.4	8.50	4.75	98.9	
No.10	18.90	2	97.9	
No.20	42.30	0.85	95.7	
No.40	78.40	0.425	92.4	
No.60	118.60	0.25	88.7	
No.100	166.90	0.15	84.3	
No.200	254.10	0.075	76.2	



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Reviewed: [illegible]

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Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES

© IGES 2004

Project: Global Engineering
No: M00596-003
Location: _
Date: 11/8/2005
By: SS

Method: ASTM D698 B
Mold volume (ft^3): 0.0333

Boring No.: _
Sample: CVM-1
Depth: _
Sample Description: Not requested
Engineering Classification: Not requested
As-received moisture content (%): Not requested
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: Yes * See results below

Optimum moisture content (%): 15.8
Maximum dry unit weight (pcf): 115

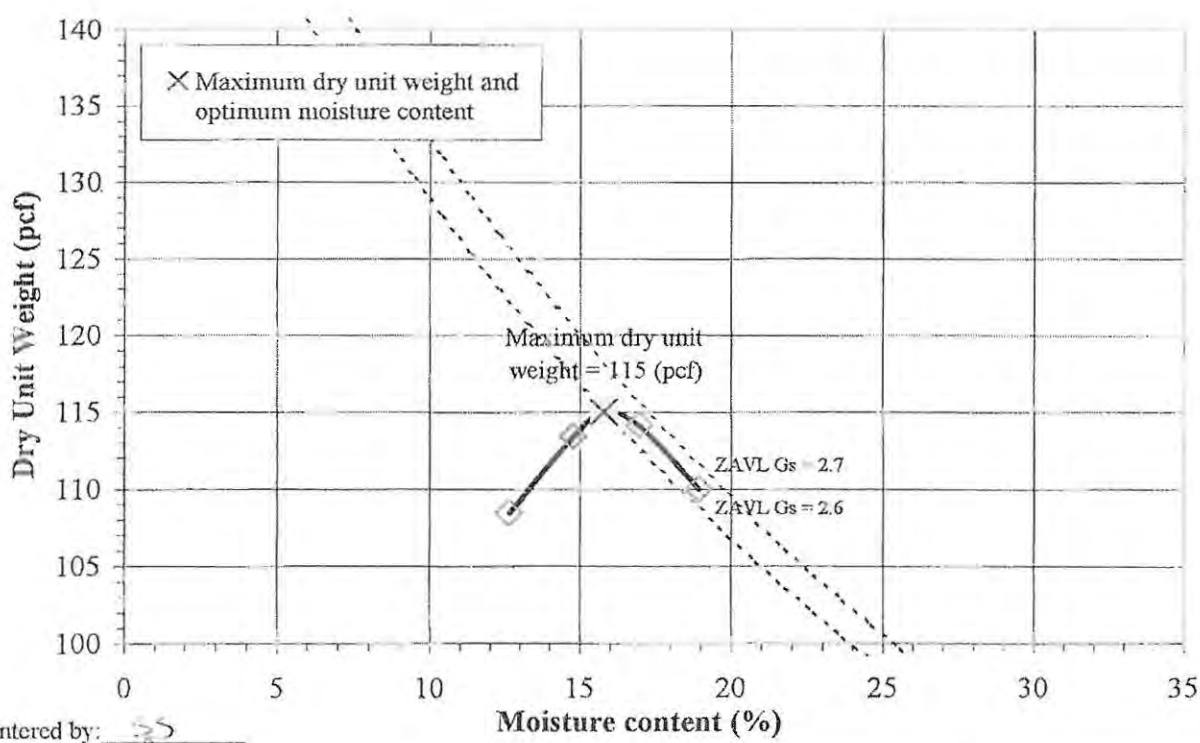
Point Number	As is	+2%	+4%	-2%				
Wt. Sample + Mold (g)	6151.5	6201.8	6161.8	6029.9				
Wt. of Mold (g)	4184	4184	4184	4184				
Wet Unit Wt., γ_m (pcf)	130.1	133.5	130.8	122.1				
Wet Soil + Tare (g)	726.8	796.8	600.8	750.8				
Dry Soil + Tare (g)	651.29	703.24	527.6	683.6				
Tare (g)	140.2	151.9	140.9	151.7				
Moisture Content, w (%)	14.8	17.0	18.9	12.6				
Dry Unit Wt., γ_d (pcf)	113.4	114.1	110.0	108.4				

*Correction of Unit Weight and Water Content for Soils Containing Oversize Particles

(ASTM D4718)

Corrected moisture content (%): 14.7
Corrected dry unit weight (pcf): 121.1

Oversized fraction, +3/8-in. (%): 16.6
Moisture content, +3/8-in. (%): 9.4
Sieve for oversized fraction: 3/8-in.
Bulk specific gravity, Gs: 2.65 Assumed



Entered by: SS
Reviewed: AJS

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Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES
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Project: Global Engineering
No: M00596-003
Location: _
Date: 11/8/2005
By: SS

Boring No.: _
Sample: CVM-2
Depth: _
Sample Description: Not requested
Engineering Classification: Not requested
As-received moisture content (%): Not requested
Preparation method: Moist
Rammer: Mechanical-sector face
Rock Correction: Yes * See results below

Method: ASTM D698 C
Mold volume (ft^3): 0.0750

Optimum moisture content (%): 12.7
Maximum dry unit weight (pcf): 121.8

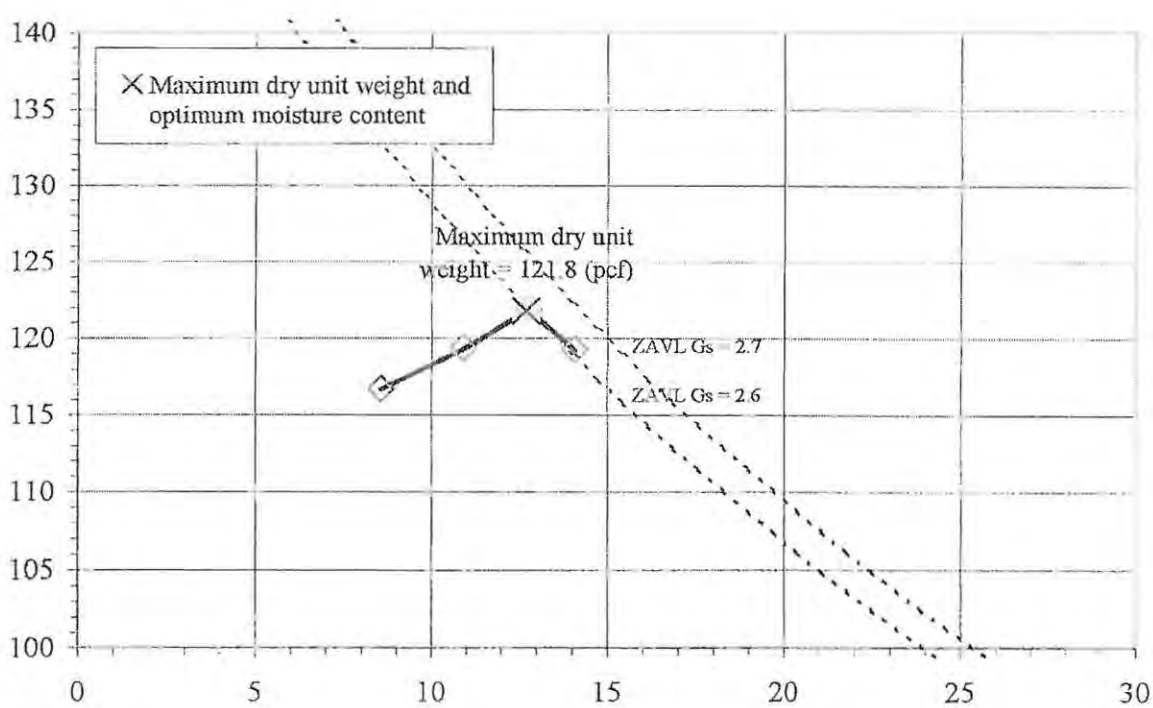
Point Number	As is	+2%	+4%	+6%				
Wt. Sample + Mold (g)	10890	11083	11252	11206				
Wt. of Mold (g)	6578.8	6578.8	6578.8	6578.8				
Wet Unit Wt., γ_m (pcf)	126.7	132.4	137.3	136.0				
Wet Soil + Tare (g)	692.5	950.1	859.6	806.1				
Dry Soil + Tare (g)	649.83	871.71	778.43	725.54				
Tare (g)	151.8	153.4	141.4	153				
Moisture Content, w (%)	8.6	10.9	12.7	14.1				
Dry Unit Wt., γ_d (pcf)	116.7	119.3	121.8	119.2				

*Correction of Unit Weight and Water Content for Soils Containing Oversize Particles

(ASTM D4718)

Corrected moisture content (%): 9.9
Corrected dry unit weight (pcf): 130.7

Oversized fraction, +3/4-in. (%): 25.8
Moisture content, +3/4-in. (%): 1.9
Sieve for oversized fraction: 3/4-in.
Bulk specific gravity, Gs: 2.65 Assumed



Entered by: SS
Reviewed: AJS

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Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

IGES

© IGES 2004

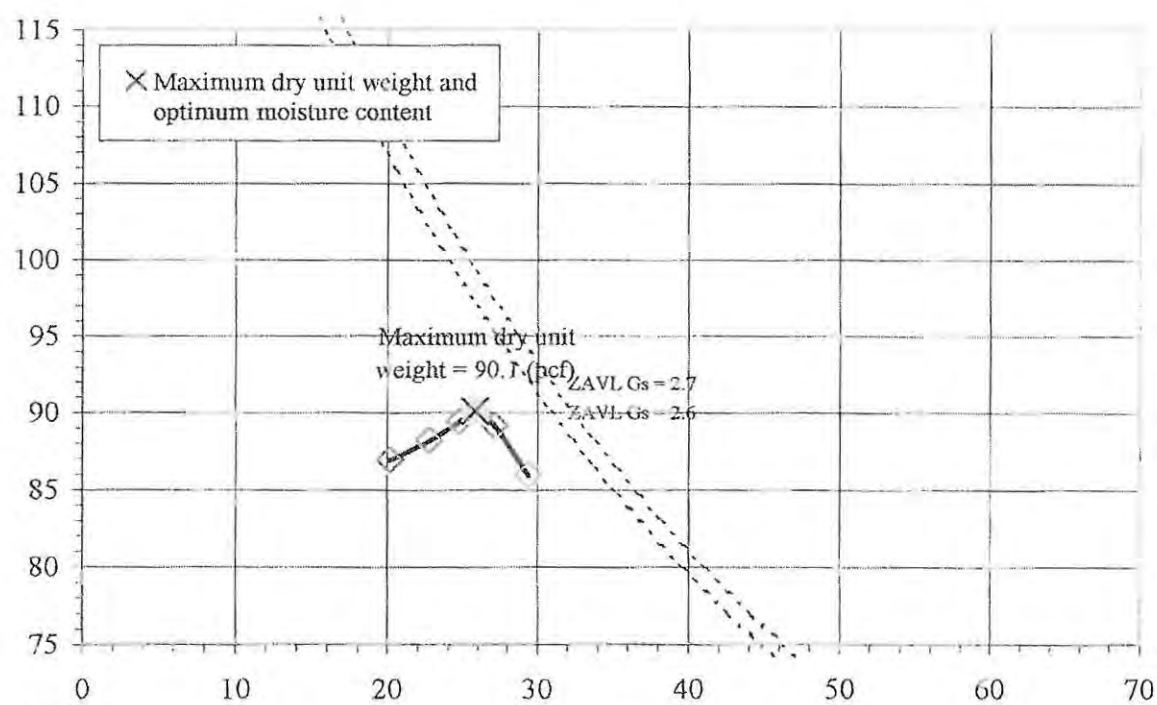
Project: Global Engineering
No: M00596-003
Location: _
Date: 11/10/2005
By: SS

Boring No.: _
Sample: CVM-3
Depth: _
Sample Description: Sandy SILT with gravel - lt. brown
Engineering Classification: Not requested
As-received moisture content (%): Not requested
Preparation method: Moist
Rammer: Mechanical-circular face
Rock Correction: No

Method: ASTM D698 B
Mold volume (ft^3): 0.0333

Optimum moisture content (%): 25.8
Maximum dry unit weight (pcf): 90.1

Point Number	+6%	+8%	+10%	+12%	+14%			
Wt. Sample + Mold (g)	5762.8	5819.2	5870.6	5896.8	5864.3			
Wt. of Mold (g)	4184	4184	4184	4184	4184			
Wet Unit Wt., γ_m (pcf)	104.4	108.1	111.5	113.3	111.1			
Wet Soil + Tare (g)	607.3	672.4	667.1	536.6	540.4			
Dry Soil + Tare (g)	535.55	576.87	562.92	451.99	449.79			
Tare (g)	179.7	156.3	141.8	140	141.5			
Moisture Content, w (%)	20.2	22.7	24.7	27.1	29.4			
Dry Unit Wt., γ_d (pcf)	86.9	88.1	89.4	89.1	85.9			



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Reviewed: DS

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APPENDIX A FIELD GROUND WATER SAMPLING FORMS

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SB Sprague JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	____ uS/cm		
Other:				

GENERAL

Date: Jul 8, 04	Location: GT-1
Time: 1603	

SAMPLING CONDITIONS

Sampling Method: pump - low flow	Depth Sample Taken: 18.5
Water Level BTC (ft): 12.61	Well Depth BTC (ft): 21.0 from grade
Water Appearance: clear	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)	1558	1558	1558 SB3	1600	1602:30		
Depth to Water (ft)	12.81	12.82	12.83	12.83	12.83		
Flow Rate (gpm)							
Temperature (°C or °F)	8.6	8.0	7.5	7.3	7.4		
Conductivity (uS/cm)	428	424	424	424	425		
pH	7.36	7.47	7.54	7.55	7.61		
Turbidity (ntu)	—						
Evacuation (gal)	4.0	5.0	5.0	5.0	5.0		
Cumulative Evac. (gal)	4.0	9.0	14.0	19.0	24.0		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

1603

Sampler's Signature: [signature] Date: Jul 8, 04

KA 7.0 pH std reads as 7.02

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SB Sprague JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	___ uS/cm		
Other:				

GENERAL

Date: Jul 8, 04	Location: GT-2
Time:	

SAMPLING CONDITIONS

Sampling Method: Bailer / Pump-low flow	Depth Sample Taken:
Water Level BTC (ft): 35.96 (35.33 with pump)	Well Depth BTC (ft): 42.0 from grade
Water Appearance: very turbid - brown	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s) (1649:30)	1st Bailer	2nd Bailer	3rd Bailer	Sample			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	11.2	9.4	8.1	10.0			
Conductivity (uS/cm)	1309	1293	1273	1363			
pH	7.00	7.03	7.12	7.07			
Turbidity (ntu)	~~1306~~ 583	~~1285~~					
Evacuation (gal)	2.5	5.0	6.0				
Cumulative Evac. (gal)	2.5	7.5	11.0 — Dry				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: [signature] Date: Jul 8, 04

Blind Dup GW Jul 04 1430

Low flow sampling did not work - drawdown to great at lowest flow pumped dry

3/16 5.33

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SB Sprague JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	___ uS/cm		
Other:				

GENERAL

Date: Jul 8, 04	Location: GT-3
Time: 1815	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 36.34	Well Depth BTC (ft): 44.5 below grade
Water Appearance:	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)					Sample		
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	8.9	7.3	7.3	7.1	7.4		
Conductivity (uS/cm)	739	737	749	752	753		
pH	6.94	7.01	7.03	7.06	7.03		
Turbidity (ntu)							
Evacuation (gal)	5	5	5	2.5	2.5		
Cumulative Evac. (gal)	5	10	15	17.5	20.0		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: [signature] Date: _____

organic sample with disposable bailer

~~3x.67 = 2x3 =~~
8 x .67 = 4 x 3 = 12

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBSprague / JSBrown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	____ uS/cm		
Other:				

GENERAL

Date: Jul 9, 04	Location: GT-4
Time: 845	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 41.5
Water Level BTC (ft): 38.00	Well Depth BTC (ft):
Water Appearance: cloudy organic smell	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)					Sample		
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.4	7.0	6.9	7.0	7.0		
Conductivity (uS/cm)	1081	1041	969	965	941 SBS		
pH	6.52	6.94	7.00	7.05	7.04		
Turbidity (ntu)	—						
Evacuation (gal)	2.5	3.5	5.5	2.5	2.0		
Cumulative Evac. (gal)	2.5	6.0	11.5	14.0	16.0		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Y	Raw / Filtered

Sampler's Signature: [signature] Date: Jul 9, 04

7+2=9 x.67=6x3=18 gal

use disposable bailer for organic sampling

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SR250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	____ uS/cm		
Other:				

GENERAL

Date: Jul 9, 2004	Location: GT-5
Time: 930	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 30.69	Well Depth BTC (ft): 37.5
Water Appearance: cloudy - no organic smell	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)						Sample	
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.5	7.1	6.8	6.8	7.0	7.0	
Conductivity (uS/cm)	1235	1306	1278	1312	1383	1442	
pH	6.89	6.92	6.92	6.94	7.03	7.15	
Turbidity (ntu)							
Evacuation (gal)	2.5	4.5	4.0	4.5	2.5		
Cumulative Evac. (gal)	2.5	7.0	11.0	15.5	18.0		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	✓	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	✓	Raw / Filtered
Total Suspended Solids – Unpreserved:	✓	Raw / Filtered
Organics – Unpreserved:	✓	Raw / Filtered
Organics – Sulfuric Acid Preserved:	✓	Raw / Filtered

Sampler's Signature: [signature] Date: Jul 9, 04

1+2 = 3 · 2/3 = 2 × 3 = 6 gal

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC – Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	___ uS/cm		
Other:				

GENERAL	
Date: Jul 9, 04	Location: GT-6
Time: 1105	
SAMPLING CONDITIONS	
Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): SBS 66.54	Well Depth BTC (ft): 67.5 from grade
Water Appearance: cloudy no odor	
Stream Flow: —	

FIELD MEASUREMENTS							
TIME: (h:m:s)				Sample			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.1	6.1	5.9	6.9			
Conductivity (uS/cm)	383	381	377	388			
pH	7.25	7.34	7.38	7.50			
Turbidity (ntu)							
Evacuation (gal)	1.0	1.5	1.5				
Cumulative Evac. (gal)	1.0	2.5	3.0	5.0+			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: [signature] Date: Jul 9, 04

Day at Sgl
Evac. recovers @ Sample

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	____ uS/cm		
Other:				

GENERAL

Date: Jul 9, 04	Location: GT-7
Time: 1130	

SAMPLING CONDITIONS

Sampling Method: Pump - low flow	Depth Sample Taken:
Water Level BTC (ft): 45.90	Well Depth BTC (ft): 162.5 top PVC
Water Appearance: clear odorless	
Stream Flow: —	

FIELD MEASUREMENTS

1117

TIME: (h:m:s)	1120	1123	1125	1127			
Depth to Water (ft)	46.45	46.38	46.42	46.42			
Flow Rate (gpm)							
Temperature (°C or °F)	9.0	9.5	9.5	10.2			
Conductivity (uS/cm)	591	604	611	609			
pH	7.17	7.24	7.26	7.26			
Turbidity (ntu)							
Evacuation (gal)	7.7	2.1	2.0	2.7			
Cumulative Evac. (gal)	7.7	9.8	11.8	14.5			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: [signature] Date: Jul 9, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA-250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	____ uS/cm		
Other:				

GENERAL

Date: Jul 9, 04	Location: GT-8
Time: 1220	

SAMPLING CONDITIONS

Sampling Method: Pump low flow	Depth Sample Taken:
Water Level BTC (ft): 24.16	Well Depth BTC (ft):
Water Appearance: clear odorless	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)	1217	1220	1222	1224			
Depth to Water (ft)	24.57	24.54	24.52	24.53			
Flow Rate (gpm)							
Temperature (°C or °F)	11.4	11.5	11.6	11.6			
Conductivity (uS/cm)	661	640	639	640			
pH	7.02	~~7.15~~ 7.15	7.19	7.17			
Turbidity (ntu)							
Evacuation (gal)	1.8	1.5	.9	.3			
Cumulative Evac. (gal)	1.8	3.3	4.2	4.5			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

25.02 24.99 24.97

Sampler's Signature: [signature] Date: Jul 9, 04

1214 on
1215 on

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS/JB		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0		
Conductivity	Orion 124	pH 7.0		
Temperature	Orion 124	___ uS/cm		
Other:				

GENERAL

Date: Jul 9, 2004	Location: North Well
Time: 1320	

SAMPLING CONDITIONS

Sampling Method: Pump	Depth Sample Taken:
Water Level BTC (ft): 57.02	Well Depth BTC (ft):
Water Appearance: clear no odor	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)	1323	1325	1327	1329	1331		
Depth to Water (ft)	57.39	57.41	57.46	57.37	57.25		
Flow Rate (gpm)							
Temperature (°C or °F)	11.9	9.1	8.6	9.2	9.2		
Conductivity (uS/cm)	513	514	521	522	520		
pH	7.30	7.43	7.45	7.44	7.43		
Turbidity (ntu)							
Evacuation (gal)	2.5	6.0	4.0	2.0	1.5		
Cumulative Evac. (gal)	2.5	8.5	12.5	14.5	16.0		

1324 start

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

3.5

Sampler's Signature: [signature] Date: Jul 9, 04

North Well 61.81
South Well 15.19

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: JB Brown SB Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250	pH 4.0 / 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2211273	Nov 04
Temperature	Orion 124	2070 uS/cm	2310020	Sep 04
Other:				

GENERAL

Date: Aug 23, 2004	Location: GT-1
Time: 1445	

SAMPLING CONDITIONS

Sampling Method: bailer	Depth Sample Taken:
Water Level BTC (ft): 13.59	Well Depth BTC (ft): 21.0
Water Appearance: cloudy	
Stream Flow: —	

8
16 gr

FIELD MEASUREMENTS

TIME: (h:m:s)							
Depth to Water (ft)	—	—					
Flow Rate (gpm)	—	—					
Temperature (°C or °F)	7.7	6.7	6.5	6.4			
Conductivity (uS/cm)	440	440	440	441			
pH	7.52	7.57	7.81	7.74			
Turbidity (ntu)	~~>440~~ 50	>100	>100	>100			
Evacuation (gal)	9.	3	3	3			
Cumulative Evac. (gal)	9	12	15	18			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:		Raw / Filtered
Organics – Sulfuric Acid Preserved:		Raw / Filtered

Nitrate

Raw

Sampler's Signature: [signature] Date: Aug 23, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: JB Bowman, SB Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250A	pH ~~4.0~~ 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2211273	Nov 04
Temperature	Orion 124	2070 uS/cm	2310020	Sep 04
Other:				

GENERAL

Date: Aug 23, 04	Location: GT-2
Time: 1900	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 42.45	Well Depth BTC (ft): 44.5
Water Appearance:	
Stream Flow: —	

4/gal

FIELD MEASUREMENTS

TIME: (h:m:s)				Sample			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	8.1	7.5	7.4	7.6			
Conductivity (uS/cm)	946	995	1059	1101			
pH	7.13	7.09	7.14	7.22			
Turbidity (ntu)	>100	>100	>100	>100			
Evacuation (gal)	1	1	1	2.2			
Cumulative Evac. (gal)	1	2	3	5.2			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Nitrate (B)

Sampler's Signature: [signature] Date: Aug 23, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SB Springer, SB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250 A	pH ~~4.0~~ 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2211273	Nov 04
Temperature	Orion 124	2020 uS/cm	2310020	Sep 04
Other:				

GENERAL

Date: Aug 23, 2004	Location: GT-3
Time: 1330	Blind dup AUG 04 @1330 hr

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 42.94	Well Depth BTC (ft): 45
Water Appearance:	
Stream Flow: —	6 gal

FIELD MEASUREMENTS

TIME: (h:m:s)			Sample				
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.2	7.0	6.8				
Conductivity (uS/cm)	670	664	664				
pH	7.35	7.32	7.28				
Turbidity (ntu)	>100	>100	>100				
Evacuation (gal)	2.5	2.5	2				
Cumulative Evac. (gal)	2.5	5	7				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	(Raw) / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	(Raw) / Filtered
Total Suspended Solids – Unpreserved:	Y	(Raw) / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Nitrate (R)

Sampler's Signature: [signature] Date: Aug 23, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: JB Sprague, JB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250A	pH 4.0 / 10.0	231 0079	Mar 05
Conductivity	Orion 124	pH 7.0	221 1273	Nov 04
Temperature	Orion 124	2070 uS/cm	231 0020	Sep 04
Other:				

GENERAL

Date: Aug 24, 04	Location: GT-4
Time: 1025	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 42.03	Well Depth BTC (ft): 44.0
Water Appearance:	
Stream Flow: —	

(2)(3/4)(1/2) = 4

FIELD MEASUREMENTS

TIME: (h:m:s)							
Depth to Water (ft)	42.03	—	—		Sump		
Flow Rate (gpm)	—	—	—				
Temperature (°C or °F)	9.2	7.6	7.6	7.9	8.3		
Conductivity (uS/cm)	1200	1172	997	949	938		
pH	7.07	7.23	7.18	7.18	7.16		
Turbidity (ntu)	>100	>100	>100	>100	>100		
Evacuation (gal)	.8	1.8	.7	.5	.3		
Cumulative Evac. (gal)	0.8	2.6	3.3	3.8	4.1		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Y	Raw / Filtered
Nitrate		Raw

Sampler's Signature: [signature] Date: Aug 24, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SB Springer, JB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion 5A250A	pH 4.0 / 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2211273	Nov 04
Temperature	Orion 124	2070 uS/cm	2310020	Sep 04
Other:				

GENERAL

Date: Aug 24, 04	Location: GT-5
Time: 1130	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 33.80	Well Depth BTC (ft): 40
Water Appearance: Cloudy	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)							
Depth to Water (ft)					Dry		
Flow Rate (gpm)	—						
Temperature (°C or °F)	8.8	8.6	8.4	8.3	8.4		
Conductivity (uS/cm)	1771	1621	1585	1675	1696		
pH	7.08	7.07	7.05	7.04	7.06		
Turbidity (ntu)	>100	>100	>100	>100	>100		
Evacuation (gal)	2.5	3.3	2.0	1.2	1.4		
Cumulative Evac. (gal)	2.5	5.8	7.8	9.0	10.4		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
Nitrate	Y	Raw

Sampler's Signature: [signature] Date: Aug 24, 2004

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: JB Brown, SB Sorenge		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250A	pH 4.0 / 10.0	231007 9	Mar 05
Conductivity	Orion 124	pH 7.0	221273	Nov 04
Temperature	Orion 124	2070 uS/cm	231002 0	Sep 04
Other:				

GENERAL

Date: Aug 23, 2004	Location: GT-6
Time: 1315	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 46.68	Well Depth BTC (ft):
Water Appearance: cloudy	
Stream Flow: —	

70
44
128 gal

FIELD MEASUREMENTS

TIME: (h:m:s)							
Depth to Water (ft)			well dry	Sample			
Flow Rate (gpm)	—	—		—			
Temperature (°C or °F)	7.6	7.1	6.0	6.5			
Conductivity (uS/cm)	416	415	405	410			
pH	7.86	7.71	7.59	7.51			
Turbidity (ntu)	>100	>100	>100	>100			
Evacuation (gal)	.5	2.2	1.4	1.0			
Cumulative Evac. (gal)	.5	2.7	4.1	5.1			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Nitrate (B)

Sampler's Signature: [signature] Date: Aug 23, 04

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC – Plant		Personnel: JB Brown, SB Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA250A	pH 4.0 / 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2211273	Nov 04
Temperature	Orion 124	2070 µS/cm	2310020	Sep 04
Other:				

GENERAL

Date: Aug 23, 2004	Location: GT-7
Time: 1630	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 59.98	Well Depth BTC (ft): 160
Water Appearance: clear	
Stream Flow: —	

110
220 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	—				Sample		
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	7.0	6.5	6.4	6.4	6.3		
Conductivity (uS/cm)	758	598	571	571	572		
pH	7.55	7.77	7.62	7.56	7.55		
Turbidity (ntu)							
Evacuation (gal)	30	60	60	60			
Cumulative Evac. (gal)	30	90	150	210	220		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Nitrate (R)

Sampler's Signature: [signature] Date: Aug 23 2004

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: JB Brown SB Spragu		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 20 A	pH 4 8/10.0	231 0079	Mar 05
Conductivity	Orion 124	pH 7.0	221 1273	Nov 04
Temperature	Orion 124	2070 uS/cm	281 0020	Sep 04
Other:				

GENERAL

Date: Aug 23, 04	Location: GT-8
Time: ~~1500~~ 1730	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 28.79	Well Depth BTC (ft): 40
Water Appearance: cloudy	
Stream Flow: —	

24 gal

FIELD MEASUREMENTS

TIME: (h:m:s)				Sample			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.2	6.6	6.5	6.5			
Conductivity (uS/cm)	683	675	676	680			
pH	7.47	7.39	7.35	7.39			
Turbidity (ntu)	>100	>100	>100	>100			
Evacuation (gal)	9	4	6	3			
Cumulative Evac. (gal)	9	15	21	24			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Nitrate

R

Sampler's Signature: [signature] Date: Aug 23, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ / 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05
GENERAL				
Date: Sep 28, 04		Location: GT-1		
Time: 1445				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 13.74+		
Water Level BTC (ft): 13.74		Well Depth BTC (ft): 21		
Water Appearance: very turbid				
Stream Flow: —				

(8)(4½)(2) = 16 52

FIELD MEASUREMENTS				Sample	
Temperature (°C or °F)	9.6	7.4	7.2	7.2	
Conductivity (uS/cm)	401	412	413	414	
pH	6.95	7.40	7.58	7.69	
Evacuation (gal)	6.0	6.0	3.0	3.0	
Cumulative Evac. (gal)	6.0	12.0	15.0	18.0	

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

NO_3 NO_2 Raw

Sampler's Signature: [signature] Date:

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05
GENERAL				
Date: Sep 28, 04		Location: GT-3		
Time: 1745				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 45.03 +		
Water Level BTC (ft): 45.03		Well Depth BTC (ft): 47.5		
Water Appearance: muddy - chocolate milk				
Stream Flow: —				
FIELD MEASUREMENTS				Sample next bailer
Temperature (°C or °F)	7.6	7.0	6.9	6.9
Conductivity (uS/cm)	664	650	648	654
pH	7.11	7.21	7.20	7.17
Evacuation (gal)	.8	1.6	1.5	1.0
Cumulative Evac. (gal)	.8	2.4	3.9	4.9
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
NO_3+NO_2		Yes	Raw	

Sampler's Signature: [signature] Date: Sep 28, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr-06
Conductivity	"	pH 7.0	4AD020	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-05
GENERAL				
Date: Sep 29, 04		Location: GT-4		
Time: 1000				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 43.29 +		
Water Level BTC (ft): 43.29		Well Depth BTC (ft): 44.5		
Water Appearance: Cloudy				
Stream Flow: —				

FIELD MEASUREMENTS					
Temperature (°C or °F)	7.5	7.2			
Conductivity (uS/cm)	1102 SBS	1117			
pH	6.85	6.93			
Evacuation (gal)	SBS ~~1.0~~ .5	.25	well dry		
Cumulative Evac. (gal)	SBS ~~1.0~~ .5	.75			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	~~Raw~~ / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Y	Raw / Filtered
NO_3 + NO_2	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05
GENERAL				
Date: Sep 29, 04		Location: ~~0900~~ GT-5		
Time: 900				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 35.28+		
Water Level BTC (ft): 35.28		Well Depth BTC (ft): 40		
Water Appearance: cloudy				
Stream Flow: —				

FIELD MEASUREMENTS				Dry	
Temperature (°C or °F)	6.4	6.3	6.1	6.1	
Conductivity (uS/cm)	1778	1781	1780	1751	
pH	6.84	6.98	7.00	6.99	
Evacuation (gal)	2.5	2.0	1.5	1.0	
Cumulative Evac. (gal)	2.5	4.5	6.0	7.0	

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Y	Raw / Filtered
NH_3 + NO_2	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSR		
Instruments:		Standards	Lot No.	Expiration
pH	GesTech	pH ~~4.0~~ 10.0	4AD034	Apr-06
Conductivity	"	pH 7.0	4AD030	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-05
GENERAL				
Date: Sep 29, 04		Location: GT-6		
Time: 1115				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 66.61+		
Water Level BTC (ft): 66.61		Well Depth BTC (ft): 70		
Water Appearance: cloudy - chocolate milk				
Stream Flow: —				
FIELD MEASUREMENTS				
Temperature (°C or °F)	7.6	6.1	6.4	
Conductivity (uS/cm)	406	407	405	
pH	8.17 ~~8.5~~ SBS	8.03	7.88	
Evacuation (gal)	2.5	1.5	1.0	
Cumulative Evac. (gal)	2.5	4.0	5.0	Bailed Dry / Sampled after recovery

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	24U429	Apr 05
GENERAL				
Date: 29 Sep		Location: GT-7		
Time: 1600				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 53.18		
Water Level BTC (ft): 53.18		Well Depth BTC (ft): 160		
Water Appearance: ~~very turbid~~ clear				
Stream Flow: —				

FIELD MEASUREMENTS					sample
Temperature (°C or °F)	7.5	7.6	7.2	7.4	7.3
Conductivity (uS/cm)	559	530	525	536	532
pH	7.75	7.56	7.60	7.53	7.56
Evacuation (gal)	45	45	45	45	36
Cumulative Evac. (gal)	45	90	135	180	216

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

$NO_3 + NO_2$ Raw

Sampler's Signature: [signature] Date: Sep 29, 01

FIELD WATER QUALITY SAMPLING FORM

Project: GFC - Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05

GENERAL	
Date: Sep 28, 04	Location: GT-E
Time: 1700	Blind dup SEP04 @ 1630 hrs
SAMPLING CONDITIONS	
Sampling Method: Bailer	Depth Sample Taken: 30.01+
Water Level BTC (ft): 30.01	Well Depth BTC (ft): 42.5
Water Appearance: cloudy	
Stream Flow: —	

FIELD MEASUREMENTS — Sample w/out bailer

Temperature (°C or °F)	7.8	7.1	7.1	7.1	
Conductivity (uS/cm)	650	665	662	661	
pH	7.47	7.31	7.35	7.46	
Evacuation (gal)	6	6	6	6	
Cumulative Evac. (gal)	6	12	18	24	

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_3 + NO_2	Y	Raw

Sampler's Signature: [signature] Date: Sep 28, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Pilot		Personnel: JSB SBS		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404279	Apr 05
GENERAL				
Date: Nov 5, 04		Location: GT-1		
Time: ~915				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 13.92+		
Water Level BTC (ft): 13.92		Well Depth BTC (ft): 24		
Water Appearance: brown turbid				
Stream Flow: —				

FIELD MEASUREMENTS				Sample	
Temperature (°C or °F)	5.1	5.1	5.4	5.2	
Conductivity (uS/cm)	448	448	449	446	
pH	7.06	7.21	7.39	7.47	
Evacuation (gal)	7.5	5.0	5.0	2.5	
Cumulative Evac. (gal)	7.5	12.5	17.5	20.0	

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Nov 5, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant			Personnel: JSBS SBS		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"		pH 7.0	4AD020	Apr 06
Temperature	"		1413 uS/cm	240299	Apr 05
GENERAL					
Date: Nov 4, 04			Location: GT-3		
Time: 1610					
SAMPLING CONDITIONS					
Sampling Method: Bailer			Depth Sample Taken: 44.35+		
Water Level BTC (ft): 44.35			Well Depth BTC (ft): 47.50		
Water Appearance:					
Stream Flow: —			Sample		
FIELD MEASUREMENTS					
Temperature (°C or °F)	5.6	5.3	5.6		
Conductivity (uS/cm)	699	697	691		
pH	7.28	7.26	7.20		
Evacuation (gal)	3.0	2.0	1.0		
Cumulative Evac. (gal)	3.0	5.0	6.0		
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	
NO_3 + NO_2			Y	Raw	

Sampler's Signature: [signature] Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SB Sprague		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity		pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 07
GENERAL				
Date: Nov 4, 04		Location: GT-5		
Time: 1315				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 37.06+		
Water Level BTC (ft): 37.06		Well Depth BTC (ft): 39.50		
Water Appearance: tan clear				
Stream Flow: —				
FIELD MEASUREMENTS				
Temperature (°C or °F)	6.8			
Conductivity (uS/cm)	~~1683~~ 1683			
pH	6.90			
Evacuation (gal)	4 gal			
Cumulative Evac. (gal)	4 gal			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered		
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered		
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered		
Organics – Unpreserved:	N	Raw / Filtered		
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered		
$NO_3 + NO_2$	Y	Raw		

39.5
37
2.5
5 gal

Sampler's Signature: [signature] Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: JSB SBS		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0	4AD054	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 07
GENERAL				
Date: Nov 5, 04		Location: GT-6		
Time: 945				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 66.91+		
Water Level BTC (ft): 66.91		Well Depth BTC (ft): 69.68		
Water Appearance: brown turbid				
Stream Flow: —				
FIELD MEASUREMENTS				
Temperature (°C or °F)	6.3	5.9	6.4	
Conductivity (uS/cm)	409	409	406	
pH	7.77	7.84	7.99	
Evacuation (gal)	2.5	1.2	2.8	
Cumulative Evac. (gal)	2.5	3.7	6.5	

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Nov 5, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: JSBrown SB Sprague		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr-06
Conductivity	"	pH 7.0	4AD020	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-05
GENERAL				
Date: Nov 4, 04		Location: GT-7		
Time: 1410				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 54.94+		
Water Level BTC (ft): 54.94		Well Depth BTC (ft): 162.5		
Water Appearance: clear				
Stream Flow: —				
FIELD MEASUREMENTS				Sample
Temperature (°C or °F)	6.3	5.5	5.5	5.7	5.6
Conductivity (uS/cm)	554	560	557	560	559
pH	7.30	7.55	7.51	7.56	7.53
Evacuation (gal)	50	50	50	50	20
Cumulative Evac. (gal)	50	~~50~~/100	150	200	220
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	
NO_3 + NO_2			Y	Raw	

162.5
54
108.5

217

Sampler's Signature: [signature] Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant			Personnel: JS Brown, SB Sprague		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH 4.0	4AD034	Apr-06
Conductivity			pH 7.0	4AD020	Apr-06
Temperature	"		1413 uS/cm	240299	Apr-06
GENERAL					
Date: Nov 4, 04			Location: GT-9		
Time: 1530					
SAMPLING CONDITIONS					
Sampling Method: Bailer			Depth Sample Taken: 30.034		
Water Level BTC (ft): 30.02			Well Depth BTC (ft): 40.5		20 gal
Water Appearance:					
Stream Flow: —					
FIELD MEASUREMENTS					
Temperature (°C or °F)	5.9	5.5	6.0		
Conductivity (uS/cm)	696	702	697		
pH	7.48	7.48	7.34		
Evacuation (gal)	7.5	5.0	7.5		
Cumulative Evac. (gal)	7.5	12.5	20		
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	
$NO_3 + NO_2$			Y	Raw	

Sampler's Signature:_____ Date:_____

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC		Personnel: JB & AL		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECHNICA	pH 4.0	JAA002	1/07
Conductivity		pH 7.0 / 10	HAK055	11/06
Temperature		1413 uS/cm	JAB050	2/06
Other:	HACH TURBIDITY			
GENERAL				
Date: 5/11/05		Location: GT-1		
Time:				
SAMPLING CONDITIONS				
Sampling Method: BAIL		Depth Sample Taken: GRAB		
Water Level BTC (ft): 9.02		Well Depth BTC (ft):		
Water Appearance: CLOUDY/TURBID				
Stream Flow:				

FIELD MEASUREMENTS

TIME: (h:m:s)	1:05	1:08	1:10	1:14	1:16		
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	11	11.7	11.2	11.2	9.2		
Conductivity (uS/cm)	421	405	402	337	391		
pH	8.18	7.97	7.36	7.40	7.82		
Turbidity (ntu)	319	249	733	9.45	391		
Evacuation (gal)	6						
Cumulative Evac. (gal)		17	25	35	38		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	N Raw / Filtered
Organics – Sulfuric Acid Preserved:	N Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: CFC PLANT		Personnel: J B, AL		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	1/07
Conductivity		pH 7.0/10	4AK055	11/06
Temperature		1413 uS/cm	5AB050	2/06
Other:	HACH TURBIDITY			
GENERAL				
Date: 5/11/05		Location: CFC-2		
Time:				
SAMPLING CONDITIONS				
Sampling Method: BAILER		Depth Sample Taken: GRAB		
Water Level BTC (ft): 22.81		Well Depth BTC (ft):		
Water Appearance: FAIRLY CLEAR				
Stream Flow: START 8AM 3:20				

FIELD MEASUREMENTS

TIME: (h:m:s)	3:22	3:26		3:41			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	12.5	10.2	9.1	9.5			
Conductivity (uS/cm)	1045	1210	1220	1379			
pH	7.06	7.04	7.02	6.99			
Turbidity (ntu)	80.5	54	—	115			
Evacuation (gal)	10						
Cumulative Evac. (gal)		22	35	40			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

BLIND DUP = MAT-05

Sampler's Signature: Al Hoch Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: CFC PLANT		Personnel: DB & AR		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	1/07
Conductivity		pH 10	4AK055	11/06
Temperature		1413 uS/cm	5AB050	2/06
Other:	HACH TURBIDITY			
GENERAL				
Date: 5/11/05		Location: GT - 3		
Time:				
SAMPLING CONDITIONS				
Sampling Method: BAILING		Depth Sample Taken: GRAB		
Water Level BTC (ft): 23.11		Well Depth BTC (ft):		
Water Appearance: TURBID				
Stream Flow:				

START BAILING 4:22 SAMPLE

FIELD MEASUREMENTS							
TIME: (h:m:s)	4:24	4:29	4:32	4:36			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	8.2	7.8	7.5	7.3			
Conductivity (uS/cm)	920	926	940	936			
pH	6.87	6.82	6.71	6.6			
Turbidity (ntu)	248	909	NR	NR			
Evacuation (gal)	10						
Cumulative Evac. (gal)		20	30	40			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	N Raw / Filtered
Organics – Sulfuric Acid Preserved:	N Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GFC Plant		Personnel: JB & AL		
Instruments:		Standards	Lot No.	Expiration
PH	Beotech	pH 4.0	5AA002	1/07
Conductivity		pH 7.0	4AK055	11/06
Temperature		1413 uS/cm	5AB050	2/06
Other:	Hach Turbidity			
GENERAL				
Date: 5/11/05		Location: GT-4		
Time: Began 5:22 hr				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: Grab		
Water Level BTC (ft): 32.89		Well Depth BTC (ft):		
Water Appearance: Cloudy				
Stream Flow:				

FIELD MEASUREMENTS

TIME: (h:m:s)	5:23		~~5:29~~	~~5:29~~			
Depth to Water (ft)			5:29	Sample			
Flow Rate (gpm)							
Temperature (°C or °F)	9.0	8.2	8.1				
Conductivity (uS/cm)	792	807	790				
pH	7.27	7.13	7.15				
Turbidity (ntu)	—	42.2	141				
Evacuation (gal)	5						
Cumulative Evac. (gal)		10	20	~~23~~			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC PLANT		Personnel:		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	V 07
Conductivity		pH 7.0 / 10	4AK055	11/06
Temperature		1413 uS/cm	5AB050	2/06
Other:	HACH TURBIDITY			
GENERAL				
Date: 5/11/05		Location: GT-5		
Time:				
SAMPLING CONDITIONS				
Sampling Method: BAIL		Depth Sample Taken:		
Water Level BTC (ft): 17.73		Well Depth BTC (ft):		
Water Appearance: CLEAR				
Stream Flow:				

FIELD MEASUREMENTS

TIME: (h:m:s)	6:06		6:14	6:18			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.1	6.4	6.1	5.7			
Conductivity (uS/cm)	588	572	576	579			
pH	6.68	6.66	6.66	6.66			
Turbidity (ntu)	870	993	—	993			
Evacuation (gal)	10						
Cumulative Evac. (gal)		20	30	43			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC PLANT		Personnel: SB & A		
Instruments:		Standards	Lot No.	Expiration
PH	GRATECH	pH 4.0	5AA002	1/07
Conductivity		pH 7.0	4AK055	11/06
Temperature		1413 uS/cm	5AB050	2/06
Other:	GRAB TURBIDITY			

GENERAL	
Date: 5/11	Location: GT - 6
Time:	
SAMPLING CONDITIONS	
Sampling Method: Bail	Depth Sample Taken: Grab
Water Level BTC (ft): 58.34	Well Depth BTC (ft):
Water Appearance: CLOUDY / TURBID	
Stream Flow:	

FIELD MEASUREMENTS Sample

TIME: (h:m:s)	1:52	1:55	1:58	2:01			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	11	9.4	9.0	8.9			
Conductivity (uS/cm)	379	374	381	382			
pH	7.6	7.67	7.76	7.70			
Turbidity (ntu)	NR	NR	NR	NR			
Evacuation (gal)	10						
Cumulative Evac. (gal)		20	30	35			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	N Raw / Filtered
Organics – Sulfuric Acid Preserved:	N Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: JB & AL		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	[illegible]/07
Conductivity	"	pH 10	4AK055	11/06
Temperature	"	1413 uS/cm	5AB050	2/06
Other:	HACH Turbidity			

GENERAL

Date: 5/11/05	Location: GT-7
Time: 9:30 Am	

SAMPLING CONDITIONS

Sampling Method: Pump	Depth Sample Taken: Pump @ 55'
Water Level BTC (ft): 36.06	Well Depth BTC (ft):
Water Appearance: CLEAR	
~~Stream Flow:~~	

55 gal Pump 10:03 AM

FIELD MEASUREMENTS

TIME: (h:m:s)	10:03	10:09	10:16	10:20			
Depth to Water (ft)							
Flow Rate (gpm)	20						
Temperature (°C or °F)	6.7	6.5	6.0	5.8			
Conductivity (uS/cm)	572	546	548	536			
pH	7.28	7.52	7.49	7.52			
Turbidity (ntu)	3.71	1.89	1.10	1.74			
Evacuation (gal)	60	180	320	400			
Cumulative Evac. (gal)		↓	↓	↓400	CONTINUOUS TOTAL WATER SAMPLE TAKEN		

SAMPLES COLLECTED

General indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	N Raw / Filtered
Organics – Sulfuric Acid Preserved:	N Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC PLANT		Personnel: JB & AL		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	1/07
Conductivity	"	~~pH 7.00~~	4AK055	11/06
Temperature	"	1413 uS/cm	5AD050	2/06
Other:	HACH TURBIDITY			
GENERAL				
Date: 5/11		Location: GT 8		
Time:				
SAMPLING CONDITIONS				
Sampling Method: ~~PUMP~~ BAIL		Depth Sample Taken: GRAB		
Water Level BTC (ft): 12.98		Well Depth BTC (ft):		
Water Appearance: CLOUDY / TURBID				
Stream Flow:				

START BAIL @ 11:10 — SAMPLE

FIELD MEASUREMENTS

TIME: (h:m:s)	11:16	11:20	11:25	11:24			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	5.7	6.2	6.1	5.8			
Conductivity (µS/cm)	484	474	481	484			
pH	7.67	7.48	7.53	7.45			
Turbidity (ntu)	143	150	110	128			
Evacuation (gal)	15						
Cumulative Evac. (gal)		30	50	53			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:		Raw / Filtered
Metals & Cations – Nitric Acid Preserved:		Raw / Filtered
Total Suspended Solids – Unpreserved:		Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: [signature] Date: 5/11/05

TABLE 4-1
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC PLANT		Personnel: JB & AL		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0	5AA002	1/07
Conductivity	"	pH ~~7.0~~ 10	4AK035	11/06
Temperature	"	1413 uS/cm	5AB050	2/06
Other:	HACH TURBIDITY			

GENERAL

Date: 5/11/05	Location: GT-DEEP
Time:	

SAMPLING CONDITIONS

Sampling Method: PUMP	Depth Sample Taken: PUMP INTAKE @ 78'
Water Level BTC (ft): 46.41	Well Depth BTC (ft):
Water Appearance: CLEAR	START PUMP @ 12:35
Stream Flow: 20 GPM PUMP	

FIELD MEASUREMENTS

TIME: (h:m:s)	12:39	2:23	4:58	7:10	PUMPED @ 20 GPM		
Depth to Water (ft)					FOR 6 HRS & 35 MIN		
Flow Rate (gpm)							360
Temperature (°C or °F)	9.2	10.5	7.7	6.7			+35
Conductivity (uS/cm)	464	488	515	520			395
pH	7.21	7.54	7.25	6.99			520
Turbidity (ntu)	5.74	26.8	12.2	3.97			7900 GALS
Evacuation (gal)	40						
Cumulative Evac. (gal)		2160	5260	7900			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	N Raw / Filtered
Organics – Sulfuric Acid Preserved:	N Raw / Filtered

☆ TOOK MS & MSD SAMPLES ☆

Sampler's Signature: [signature] Date: 5/11/05

GT - Deep ▼ 45.90
GT - Shallow ▼ 15.94

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS JSB		
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556MPS	pH 4.0/10.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidity			
GENERAL				
Date: Jun 21, 05		Location: GT-1		
Time: 1505				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken:		
Water Level BTC (ft): 9.74		Well Depth BTC (ft): 25.6		
Water Appearance: Turbid				
Stream Flow: —				

~~25.6 - 9.7 = 15.9~~

FIELD MEASUREMENTS

TIME: (h:m:s)	1445	1457	1505				
Depth to Water (ft)	9.74	9.74	9.74				
Flow Rate (gpm)							
Temperature (°C or °F)	9.13	6.4	6.6				
Conductivity (uS/cm)	392	354	208				
pH	7.72	7.68	7.76				
Turbidity (ntu)	68.7	190	693				
Evacuation (gal)	5	10	10				
Cumulative Evac. (gal)	5	15	25				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

$NO_2 + NO_3$ Raw

Sampler's Signature: [signature] Date: Jun 21, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	45I 556 MPS	pH 4.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date: Jan 22, 2005	Location: GT-2
Time: 900	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 23.80	Well Depth BTC (ft): 42
Water Appearance: turbid	
Stream Flow: —	

42
24
18

FIELD MEASUREMENTS

TIME: (h:m:s)	849	851	854	900			
Depth to Water (ft)	23.80	—	—				
Flow Rate (gpm)	—	—	—				
Temperature (°C or °F)	9.0	9.0	8.2	8.2			
Conductivity (uS/cm)	1049	942	633	1162			
pH	7.10	7.05	7.11	7.11			
Turbidity (ntu)	17.9	401	214	206			
Evacuation (gal)	9	9	9	9			
Cumulative Evac. (gal)	9	18	27	36			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved: TPH/SVOC	Y	Raw / Filtered
Organics – ~~Sulfuric Acid Preserved:~~ HCL	Y	Raw / Filtered
NO_2 + NH_3	Y	Raw

Sampler's Signature: [signature] Date: Jan 22, 2005

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date: Jan 22, 05	Location: GT-3
Time: 945	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 23.99	Well Depth BTC (ft): 44.5
Water Appearance: turbid	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)	935	936	939	945			
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	8.4	7.4	7.3	7.7			
Conductivity (uS/cm)	691	670	660	655			
pH	6.82	6.86	6.83	7.49			
Turbidity (ntu)	233	555	462	410			
Evacuation (gal)	~~9~~ 9	9	15	9			
Cumulative Evac. (gal)	~~9~~ 9	10	33	42			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	4	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	4	Raw / Filtered
Total Suspended Solids – Unpreserved:	4	Raw / Filtered
Organics – Unpreserved:	4	Raw / Filtered
Organics – ~~Sulfuric Acid Preserved:~~ HCl	4	Raw / Filtered

$NO_2 + NO_3$ Raw

Sampler's Signature: [signature] Date: Jan 22, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC Plant	Personnel:	SBS/JSB	
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4.0	4AKC55	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date:	Jan 22, 05	Location:	GT-4
Time:	1030		

SAMPLING CONDITIONS

Sampling Method:	Bailer	Depth Sample Taken:	
Water Level BTC (ft):	36.07	Well Depth BTC (ft):	41.5
Water Appearance:	turbid		
Stream Flow:	—		

FIELD MEASUREMENTS

TIME: (h:m:s)	1022						
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	9.2	8.1					
Conductivity (uS/cm)	750	842					
pH	7.32	7.30					
Turbidity (ntu)	410	863					
Evacuation (gal)	5	5					
Cumulative Evac. (gal)	5	10					

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – ~~Sulfuric Acid~~ HCl Preserved:	Y	Raw / Filtered

$NO_2 + NO_3$ Raw

Sampler's Signature: [signature] Date: Jan 22, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC Plant	Personnel:	SBS / JSB	
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date:	Jun 22, 05	Location:	GT-5
Time:	1110		

SAMPLING CONDITIONS

Sampling Method:	Bailer	Depth Sample Taken:	
Water Level BTC (ft):	24.64	Well Depth BTC (ft):	37.5
Water Appearance:			
Stream Flow:			

32.5
24.5
110

FIELD MEASUREMENTS

TIME: (h:m:s)	1056	1058	1100	1104			
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	8.9	7.0	7.7	6.5			
Conductivity (uS/cm)	641	648	629	643			
pH	6.64	6.61	6.54	6.35			
Turbidity (ntu)	506	O/R	O/R	O/R			
Evacuation (gal)	5	5	6	4			
Cumulative Evac. (gal)	5	10	16	22			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – ~~Sulfuric Acid~~ HCl Preserved:	Y	Raw / Filtered
$NO_2 + NO_3$		Raw

Sampler's Signature: [signature] Date: Jun 22, 05

O/R out of range

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date: Jan 22, 05	Location: GT-6
Time: 1155	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: "
Water Level BTC (ft): 54.63	Well Depth BTC (ft): 67.5
Water Appearance:	
Stream Flow: —	

64
54
10

FIELD MEASUREMENTS

TIME: (h:m:s)	1148	1150	1153	1155			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	9.5	6.8	6.0	6.5			
Conductivity (uS/cm)	198	363	360	372			
pH	7.80	7.60	7.59	7.53			
Turbidity (ntu)	878	>1000	>1000	>1000			
Evacuation (gal)	5	5	3	3			
Cumulative Evac. (gal)	5	10	18	21			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Jan 22, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4/7/10.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date: ~~Aug~~ SBS Jun 21, 05	Location: GT-7
Time:	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 35.75	Well Depth BTC (ft):
Water Appearance: clear	
Stream Flow: —	

160
35
125

FIELD MEASUREMENTS Sample

TIME: (h:m:s)	1605	1623	1639	1654	1700		
Depth to Water (ft)	35.75	35.75	35.75	35.75	35.75		
Flow Rate (gpm)	—						
Temperature (°C or °F)	9.3	9.2	9.3	9.1	9.0		
Conductivity (uS/cm)	556	431	525	526	287		
pH	7.34	7.38	7.37	7.37	7.50		
Turbidity (ntu)	3.52	7.51	7.40	5.15	3.95		
Evacuation (gal)	60	60	60	60	12		
Cumulative Evac. (gal)	60	120	180	240	254		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

NO_2 + NO_3 Kam

Sampler's Signature: [signature] Date: Jun 21, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
PH	YSI 556 MPS	pH 4.0	4AK055	Nov 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidity			

GENERAL

Date: Jun 21, 05	Location: GT-8
Time:	Blind dup GW JUN 05 Hrs

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken:
Water Level BTC (ft): 13.62	Well Depth BTC (ft): 40
Water Appearance:	
Stream Flow: —	Sample

40
13
27

FIELD MEASUREMENTS

TIME: (h:m:s)	1724	1728	1735				
Depth to Water (ft)	13.62	13.62	13.62				
Flow Rate (gpm)	—						
Temperature (°C or °F)	8.7	8.0	8.10				
Conductivity (uS/cm)	441	474	235				
pH	7.36	7.37	7.44				
Turbidity (ntu)	109	68.4	55.1				
Evacuation (gal)	18	19	18				
Cumulative Evac. (gal)	19	36	54				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

NO_2 + NO_3 Raw

Sampler's Signature: [signature] Date: Jun 21, 05

.66/FT

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC GW		Personnel: J WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AA002	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4 AD034	APR. 06
Temperature	"	1413 uS/cm	5 AB050	FEB. 06
Other:				

GENERAL

Date: 07/19/05	Location: GT-1
Time: 15:35	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 12.12 +
Water Level BTC (ft): 12.12	Well Depth BTC (ft): 23
Water Appearance: MODERATELY TURBID	
Stream Flow:	

FIELD MEASUREMENTS

TIME: (h:m:s)	15:43	15:45	15:50	15:55			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	12.3	8.1	7.4	8.7			
Conductivity (uS/cm)	384	378	389	401			
pH	7.17	7.48	7.58	7.68			
Turbidity (ntu)							
Evacuation (gal)	10	5	5	5			
Cumulative Evac. (gal)	10	15	20	25			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y 2	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y 2	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y 1	(Raw) / Filtered
Organics – Unpreserved:	N	Raw / Filtered
~~Organics~~ NUTRIENTS – Sulfuric Acid Preserved:	Y 1	(Raw) / Filtered

Sampler's Signature: J. B. Williams Date: 07/19/05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC – GW		Personnel: J. WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AMC02	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4AD034	APR. 06
Temperature	"	1413 uS/cm	5AB050	FEB. 06
Other:				

GENERAL

Date: 07/20/05	Location: GT-2
Time: 08:30	BLIND DUP HERE GW-JUL-05 09:15

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 30.47 +
Water Level BTC (ft): 30.47	Well Depth BTC (ft):
Water Appearance: MODERATELY TURBID - SOME ODOR AT FIRST BAIL	
Stream Flow:	

FIELD MEASUREMENTS

TIME: (h:m:s)	08:55	08:59	09:05				
Depth to Water (ft)			SAMPLED				
Flow Rate (gpm)							
Temperature (°C or °F)	11.3	9.2	10.1				
Conductivity (uS/cm)	1037	1047	1170				
pH	6.84	7.20	7.19				
Turbidity (ntu)							
Evacuation (gal)	10	10	10				
Cumulative Evac. (gal)	10	20	30				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	2	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	2	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	1	Raw / Filtered
Organics – Unpreserved:	N		Raw / Filtered
~~Organics~~ – Sulfuric Acid Preserved: NUTRIENTS	Y	1	Raw / Filtered

Sampler's Signature: James B Williams Date: 07/20/05

HH 1

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - GW		Personnel: J WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AA002	JAN-07
Conductivity	"	pH ~~7.0~~ 10.0	4AD034	APR-06
Temperature	"	1413 uS/cm	5AB050	FEB-06
Other:				

GENERAL

Date: 07/20/05	Location: GT-3
Time: 09:30	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 30.68 ft
Water Level BTC (ft): 30.68	Well Depth BTC (ft):
Water Appearance: MODERATELY TURBID	
Stream Flow:	(31.3)

FIELD MEASUREMENTS

TIME: (h:m:s)	09:35	09:39	09:42	09:45			
Depth to Water (ft)							
Flow Rate (gpm)				Sampled			
Temperature (°C or °F)	9.0	8.3	8.4	7.5			
Conductivity (uS/cm)	597	613	622	617			
pH	7.11	6.94	6.90	6.92			
Turbidity (ntu)							
Evacuation (gal)	10	10	10	5			
Cumulative Evac. (gal)	10	20	30	35			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y 2	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y 2	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y 1	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
~~Organics~~ NUTRIENTS – Sulfuric Acid Preserved:	Y 1	Raw / Filtered

Sampler's Signature: James B. Williams Date: 07/20/05

JAN 11

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - GW		Personnel: J. WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5 AA002	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4 AD034	APR. 06
Temperature	"	1413 uS/cm	5 AB050	FEB. 06
Other:				

GENERAL

Date: 07/20/05	Location: GT-4
Time: 10:10	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 38.78 +
Water Level BTC (ft): 38.78	Well Depth BTC (ft):
Water Appearance: SLIGHTLY TURBID - SOME FUEL ODOR	
Stream Flow:	(9.4)

JBW FIELD MEASUREMENTS

TIME: (h:m:s)	10:13	10:14	10:15	10:17	10:20		
Depth to Water (ft)							
Flow Rate (gpm)					SAMPLED		
Temperature (°C or °F)	11.0	8.5	8.5	9.4	8.0		
Conductivity (uS/cm)	739	743	784	862	988		
pH	7.36	7.33	7.28	7.25	7.19		
Turbidity (ntu)							
Evacuation (gal)	2.5 ~~2.8~~	1.0 ~~2.8~~	2.0 ~~2.8~~	2.25 ~~2.8~~	2.25 ~~2.8~~	JBW	
Cumulative Evac. (gal)	2.85	~~5.6~~ 3.5	~~8.4~~ 5.5	7.75 ~~11.2~~	10.0 ~~14.0~~	JBW	

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y 2	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y 2	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y 1	(Raw) / Filtered
Organics – Unpreserved:	N	JBW ~~Raw~~ / Filtered
Organics – Sulfuric Acid Preserved: NUTRIENTS	Y 1	(Raw) / Filtered

Sampler's Signature: [signature] Date: 07/20/05

6 AMBER TPH & SVOC 1 VOA BNA

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-GW		Personnel: J. WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	EAA002	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4AD034	APR. 06
Temperature	"	1413 uS/cm	5AB050	FEB. 06
Other:				

GENERAL

Date: 07/20/05	Location: GT-5
Time: 10:35	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 31.1 +
Water Level BTC (ft): 31.1	Well Depth BTC (ft):

Water Appearance: MODERATELY TURBID

~~Stream Flow:~~ DRY AT 15.0 GAL - LET RECOVER - THEN SAMPLED (16.6).

FIELD MEASUREMENTS

TIME: (h:m:s)	10:37	10:39	10:41	10:43	10:47	10:50	
Depth to Water (ft)							
Flow Rate (gpm)						SAMPLED	
Temperature (°C or °F)	10.3	9.3	7.6	8.1	8.2	8.3	
Conductivity (uS/cm)	1334	1355	1354	1350	1375	1362	
pH	6.85	6.84	6.81	6.84	6.82	6.84	
Turbidity (ntu)							
Evacuation (gal)							
Cumulative Evac. (gal)	5.0	7.5	10.0	12.0	14.0	16.0	

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y 2	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y 2	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y 1	(Raw) / Filtered
Organics – Unpreserved:	N	Raw / Filtered
~~Organics~~ NUTRIENTS – Sulfuric Acid Preserved:	Y 1	(Raw) / Filtered

Sampler's Signature: James B. Williams Date: 07/20/05

6 AMBER TPH & SVOC 1 VOA BNA

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC-GW		Personnel: J. WILLIAMS / JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AA002	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4AD034	APR. 06
Temperature	"	1413 uS/cm	5AB050	FEB. 06
Other:				

GENERAL

Date: 07/20/05	Location: GT-6
Time: 11:20	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 62.42+
Water Level BTC (ft): 62.42	Well Depth BTC (ft):
Water Appearance: TURBID	
Stream Flow:	(14.0)

FIELD MEASUREMENTS

TIME: (h:m:s)	11:32	11:34	11:37	11:40	11:45		
Depth to Water (ft)							
Flow Rate (gpm)					SAMPLED		
Temperature (°C or °F)	10.7	7.2	7.1	6.9	9.8		
Conductivity (uS/cm)	364	374	371	374	373		
pH	6.89	7.28	7.45	7.49	7.56		
Turbidity (ntu)							
Evacuation (gal)	5.0	2.5	4.0	2.0	1.5		
Cumulative Evac. (gal)	5.0	7.5	11.5	13.5	15.0		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	(Raw) / Filtered
~~Organics~~ NUTRIENTS – Sulfuric Acid Preserved:	Y	(Raw) / Filtered

Sampler's Signature: Jean B. Will Date: 07/20/05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - GW		Personnel: J. WILLIAMS JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AAC02	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	4AD034	APR. 06
Temperature	"	1413 uS/cm	5AB050	FEB 06
Other:				

GENERAL

Date: 07/19/05	Location: GT-7
Time: 16:20	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 41.77 +
Water Level BTC (ft): 41.77	Well Depth BTC (ft): 162
Water Appearance: CLEAR	
Stream Flow:	(230) 40

FIELD MEASUREMENTS

TIME: (h:m:s)	~~16~~ 15:35 JBW	16:50	17:06	17:15			
Depth to Water (ft)							
Flow Rate (gpm)				SAMPLED			
Temperature (°C or °F)	11.5	9.8	9.1	8.5			
Conductivity (uS/cm)	504	506	516	526			
pH	7.59	7.69	7.68	7.50			
Turbidity (ntu)							
Evacuation (gal)	~~60~~ 72 JBW	~~60~~ 72 JBW	72	24			
Cumulative Evac. (gal)	~~60~~ 72	~~120~~ 144	216	240			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	2	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y	2	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y	1	(Raw) / Filtered
Organics – Unpreserved:	N		Raw / Filtered
~~Organics~~ NUTRIENTS – Sulfuric Acid Preserved:	Y	1	(Raw) Filtered

Sampler's Signature: James B. Willi Date: 07/19/05

HH HH HH HH HH HH HH HH
05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC - GW		Personnel: J. WILLIAMS JB BROWN		
Instruments:	GEOTECH	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AA002	JAN. 07
Conductivity	"	pH ~~7.0~~ 10.0	A AD034	APR. 06
Temperature	"	1413 uS/cm	5 AB050	FEB. 06
Other:				

GENERAL

Date: 07/19/05	Location: GT-8
Time: 17:25	

SAMPLING CONDITIONS

Sampling Method: BAIL	Depth Sample Taken: 18.87+
Water Level BTC (ft): 18.87	Well Depth BTC (ft): 42
Water Appearance: MODERATELY TURBID	
Stream Flow:	(46)

FIELD MEASUREMENTS

	17	17	17	17	17 JBW		
TIME: (h:m:s)	~~15~~:32	~~15~~:35	~~15~~:37	~~15~~:40	~~15~~:42		
Depth to Water (ft)							
Flow Rate (gpm)					SAMPLED		
Temperature (°C or °F)	10.3	8.3	7.8	8.8	8.4		
Conductivity (uS/cm)	538	599	594	581	552		
pH	7.65	7.44	7.39	7.49	7.40		
Turbidity (ntu)							
Evacuation (gal)	10	10	10	10	6		
Cumulative Evac. (gal)	10	20	30	40	46		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y 2	(Raw) / (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y 2	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y 1	(Raw) / Filtered
Organics – Unpreserved:	N	Raw / Filtered
~~Organics~~ – Sulfuric Acid Preserved: NUTRIENTS	Y 1	(Raw) / Filtered

Sampler's Signature: [signature] Date: 07/19/05

HTT 11

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sprague / JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	GroTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL066	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			

GENERAL

Date: Aug 25, 05	Location: GT-1
Time: 1045	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 14.13 +
Water Level BTC (ft): 14.13	Well Depth BTC (ft): 21
Water Appearance: turbid	
Stream Flow: —	

14 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	1047	1049	1052				
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.9	7.4	7.7				
Conductivity (uS/cm)	393	393	389				
pH	8.01	7.92	7.90				
Turbidity (ntu)	91.3	62.1	57.3				
Evacuation (gal)	5.0	5.0	10.0				
Cumulative Evac. (gal)	5.0	10.0	20.0				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC Plant	Personnel:	SBS JSB	
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL066	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			

GENERAL

Date:	Aug 25, 05	Location:	GT-2
Time:	1470		

SAMPLING CONDITIONS

Sampling Method:	Bailer	Depth Sample Taken:	37.98 1
Water Level BTC (ft):	37.98	Well Depth BTC (ft):	42
Water Appearance:			
Stream Flow:	—		

8 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	1354	1401					
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	9.2	8.7					
Conductivity (uS/cm)	997	1055					
pH	7.06	7.07					
Turbidity (ntu)	0/R	307					
Evacuation (gal)	4	4					
Cumulative Evac. (gal)	4	8					

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – ~~Sulfuric Acid Preserved:~~	Y	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC Plant	Personnel:	SB Sprague / SB Torres	
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL066	Dec 06
Temperature	"	413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			

GENERAL

Date:	Aug 25, 05	Location:	GT-3
Time:	1500		

SAMPLING CONDITIONS

Sampling Method:		Depth Sample Taken:	39.04
Water Level BTC (ft):	39.04	Well Depth BTC (ft):	44.5
Water Appearance:	Turbid		
Stream Flow:	–		

FIELD MEASUREMENTS

TIME: (h:m:s)	1445	1448	1450				
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	9.0	7.5	6.8				
Conductivity (uS/cm)	677	722	676				
pH	6.95	6.85	6.97				
Turbidity (ntu)	453	867	709				
Evacuation (gal)	5	2.5	4.5				
Cumulative Evac. (gal)	5	7.5	12				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – ~~Sulfuric Acid Preserved:~~ HCl	Y	Raw / Filtered
NH_4 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC Plant	Personnel:	SBS / JSB	
Instruments:		Standards	Lot No.	Expiration
PH	GreenTech	pH 4.0	5AA012	Jan 07
Conductivity	"	pH 7.0	4AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			
GENERAL				
Date:	Aug 25, 05	Location:	GT-4	
Time:	1550			
SAMPLING CONDITIONS				
Sampling Method:	Bailer	Depth Sample Taken:	42.44	
Water Level BTC (ft):	42.44	Well Depth BTC (ft):	43.5	
Water Appearance:	turbid			
Stream Flow:	—			

FIELD MEASUREMENTS

TIME: (h:m:s)	1537						
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	21	21					
Conductivity (uS/cm)	857	826					
pH	7.47	7.20					
Turbidity (ntu)	325	123					
Evacuation (gal)	1	2					
Cumulative Evac. (gal)	1	3					

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Y	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSA		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100P Turbidimeter				
GENERAL				
Date: Aug 26, 05		Location: GT-5		
Time: 1045				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 35.12+		
Water Level BTC (ft): 35.12		Well Depth BTC (ft): 37.5		
Water Appearance:				
Stream Flow: —				

FIELD MEASUREMENTS

TIME: (h:m:s)	1020	1025	1030				
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	8.3	6.9	6.7				
Conductivity (uS/cm)	1333	1336	1326				
pH	6.55	6.75	6.98				
Turbidity (ntu)	103	199	>1000				
Evacuation (gal)	1	2	2				
Cumulative Evac. (gal)	1	3	5				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	Y	Raw / Filtered
Organics – ~~Sulfuric Acid Preserved:~~ HCl	Y	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Aug 26, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GreenTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL060	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100P Turbidimeter				
GENERAL				
Date: Aug 26, 05		Location: GT-6		
Time: 1145				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 66.64 ft		
Water Level BTC (ft): 66.64		Well Depth BTC (ft): 67.5		
Water Appearance: turbid				
Stream Flow: —				

2 gal

FIELD MEASUREMENTS							
TIME: (h:m:s)	1139	1142					
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.9	6.0					
Conductivity (uS/cm)	359	374					
pH	8.31	7.72					
Turbidity (ntu)	43.6	>1000					
Evacuation (gal)	1	2					
Cumulative Evac. (gal)	1	3					

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature:_____ Date:_____

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sponcel, JB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL063	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			

GENERAL

Date: Aug 25, 2005	Location: GT-7
Time: 1225	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 48.38 +
Water Level BTC (ft): 48.38	Well Depth BTC (ft): 160
Water Appearance: clear	
Stream Flow: —	

FIELD MEASUREMENTS

TIME: (h:m:s)	1133	1145	1156	1216	1225		
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	7.4	6.6	7.2	7.2	6.9		
Conductivity (uS/cm)	536	531	525	531	524		
pH	6.17	7.38	7.47	7.56	7.44		
Turbidity (ntu)	14.0	14.0	5.37	4.79	4.35		
Evacuation (gal)	~~45~~	45	45	45	45		
Cumulative Evac. (gal)	~~45~~	90	~~90~~ 135	180	225		

160
48
112
224

75
3 | 224
21
14

13
6
0

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project:	GTC-Plant	Personnel:	SB Sprague JSBaum	
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100P Turbidimeter			

GENERAL

Date:	Aug 25, 05	Location:	GT-8
Time:	1325		

SAMPLING CONDITIONS

Sampling Method:	Bailer	Depth Sample Taken:	24.35+
Water Level BTC (ft):	24.35	Well Depth BTC (ft):	40
Water Appearance:			
Stream Flow:	—		

40
24
16

32 gal
11 liters

FIELD MEASUREMENTS

TIME: (h:m:s)	1316	1318	1320	1322			
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	8.4	7.3	7.2	7.0			
Conductivity (uS/cm)	573	636	652	645			
pH	7.09	7.31	7.33	7.34			
Turbidity (ntu)	78.3	106	52.9	111			
Evacuation (gal)	9	9	9	9			
Cumulative Evac. (gal)	9	18	27	36			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA00C	Jun 07
Conductivity	"	pH 7.0	4AL060	Dec 06
Temperature	"	14B uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidimeter			
GENERAL				
Date: Oct 11, 05		Location: GT-1		
Time: 1230				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken:		
Water Level BTC (ft): 13.63		Well Depth BTC (ft): 21.0		
Water Appearance:				
Stream Flow: —				

21
13
8
16 gal

FIELD MEASUREMENTS							
TIME: (h:m:s)	1229	1231	1233				
Depth to Water (ft)	–			← Sample			
Flow Rate (gpm)	–						
Temperature (°C or °F)	7.6	6.7	6.9				
Conductivity (uS/cm)	415	424	422				
pH	8.04	7.97	7.84				
Turbidity (ntu)	4.31	173	311				
Evacuation (gal)	3.0	6.0	6.0				
Cumulative Evac. (gal)	3.0	9.0	15.0				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSG		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL069	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100 Turbidimeter				
GENERAL				
Date: Oct 12, 2005		Location: GT-2		
Time: 1005				
SAMPLING CONDITIONS				
Sampling Method: Bailer		Depth Sample Taken: 43.17+		
Water Level BTC (ft): 43.17		Well Depth BTC (ft): 45		
Water Appearance: cloudy				
Stream Flow: —				

FIELD MEASUREMENTS

TIME: (h:m:s)	950	953	1005	Sample			
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	6.7	6.5	6.5				
Conductivity (uS/cm)	997	1099	1125				
pH	6.55	6.94	7.11				
Turbidity (ntu)	209	>1000	215				
Evacuation (gal)	1	1	dry	3.5 gal	evacuation		
Cumulative Evac. (gal)	1	2	2				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 12, 2005

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	SAA002	Jan 07
Conductivity	"	pH 7.0	SAL069	Dec 06
Temperature	"	1413 uS/cm	SAB050	Feb 06
Other: Hach 2100 Turbidimeter				

GENERAL	
Date: Oct 12, 05	Location: GT-3
Time:	
SAMPLING CONDITIONS	
Sampling Method: Bailer	Depth Sample Taken: 43.65 +
Water Level BTC (ft): 43.65	Well Depth BTC (ft): 44.75
Water Appearance:	
Stream Flow: —	

2 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	1044	1049					
Depth to Water (ft)	—	—					
Flow Rate (gpm)	—	—					
Temperature (°C or °F)	6.6	6.2					
Conductivity (uS/cm)	663	664					
pH	6.93	6.94					
Turbidity (ntu)	>1000	>1000					
Evacuation (gal)	1.5	2.5					
Cumulative Evac. (gal)	1.5	4					

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 12, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5-AA002	Jun 07
Conductivity	"	pH 7.0	5-AL069	Dec 06
Temperature	"	1413 uS/cm	5-AB050	Feb 06
Other: Hach 2100 Turbidimeter				

GENERAL

Date: Oct 12, 05	Location: GT-5
Time: 1130	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 34.62+
Water Level BTC (ft): 36.62	Well Depth BTC (ft): 40
Water Appearance: cloudy	
Stream Flow: —	

7 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	~~1044~~	1106	1109	1130			
Depth to Water (ft)		—	—	sample			
Flow Rate (gpm)		—	—				
Temperature (°C or °F)		6.6	6.0	6.4			
Conductivity (uS/cm)		1507	1532	1529			
pH		6.59	6.52	6.90			
Turbidity (ntu)	~~>1000~~	231	597	>1000			
Evacuation (gal)	~~1.5~~	1	1.5				
Cumulative Evac. (gal)	~~1.5~~	1	2.5	dry at 4 gal			

Not enough water for organics

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Oct 12, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL066	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100 Turbidimeter				

GENERAL

Date: Oct 11, 05	Location: GT-6
Time: 1500	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 67.19+
Water Level BTC (ft): 67.19	Well Depth BTC (ft): 70'
Water Appearance: Turbid	
Stream Flow: —	

70
67
3
6

FIELD MEASUREMENTS

TIME: (h:m:s)	1457	1501					
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	7.7	6.4					
Conductivity (uS/cm)	397	388					
pH	6.99	7.54					
Turbidity (ntu)	>1000	>1000					
Evacuation (gal)	1.0	2.0					
Cumulative Evac. (gal)	1.0	3.0	← Dry let recover and take sample				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jun 07
Conductivity	"	pH 7.0	5AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100 Turbidimeter				

GENERAL

Date: Oct 11, 05	Location: GT-7
Time: 1640	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 52.01+
Water Level BTC (ft): 52.01	Well Depth BTC (ft): 162
Water Appearance: clear	
Stream Flow: —	

162
52
110
220 gal

FIELD MEASUREMENTS

TIME: (h:m:s)	1540	1550	1610	1622	1634		
Depth to Water (ft)	—	—	—	—	—		
Flow Rate (gpm)	—	—	—	—	—		
Temperature (°C or °F)	6.2	6.0	6.1	5.9	6.3		
Conductivity (uS/cm)	555	559	557	557	553		
pH	7.23	7.55	7.70	7.63	7.59		
Turbidity (ntu)	1.20	4.37	3.97	3.70	3.33		
Evacuation (gal)	45	45	45	45	45		
Cumulative Evac. (gal)	45	90	135	180	225		

2.

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE
FIELD GROUND WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jun 07
Conductivity	"	pH 7.0	5AL063	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100 Turbidimeter				

GENERAL

Date: Oct 11, 05	Location: GT-5
Time:	

SAMPLING CONDITIONS

Sampling Method: Bailer	Depth Sample Taken: 26.95+
Water Level BTC (ft): 24.95	Well Depth BTC (ft): 42
Water Appearance:	
Stream Flow: —	

42
26
16
32

FIELD MEASUREMENTS

TIME: (h:m:s)	1702	1705	1708	1710			
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	6.7	5.9	5.9	5.5			
Conductivity (uS/cm)	670	701	705	711			
pH	7.76	7.45	7.32	7.46			
Turbidity (ntu)	59.8	104	52.6	192			
Evacuation (gal)	9	9	9	6			
Cumulative Evac. (gal)	9	18	27	33			

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_2 + NO_3$	Y	Raw

Sampler's Signature: [signature] Date: Oct 11, 2005

APPENDIX A FIELD SURFACE WATER SAMPLING FORMS

DRAFT SITE INVESTIGATION REPORT
CENTRAL FARMERS FERTILIZER FACILITY
IN GEORGETOWN CANYON, IDAHO
FIELD INVESTIGATIONS AND RESULTS

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gas Plant Site Investig.		Personnel: JB Brown / S Sprague			
Instruments: Eutech pH/Cond meter		Standards	Lot No.	Expiration	Pre
PH	7/10 "	pH 10.0	02J613077	9-04	
Conductivity	"	pH 7.0	02J613078	9-04	
Temperature	"	1413 uS/cm	2304087	5-05	1413 uS/cm
Other:					

GENERAL	
Date: 4-27-04	Location: GTSW-1
Time: 1530	

SAMPLING CONDITIONS	
Sampling Method: Grab	Depth Sample Taken: Surface
Water Appearance: Clear	
Stream Flow: TBD	

FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	7.6				
Conductivity (uS/cm)	378				
pH	7.80				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved: ✓	Raw / Filtered
Metals & Cations – Nitric Acid Preserved: ✓	Raw / Filtered
Total Suspended Solids – Unpreserved: ✓	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 4-27-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gas Plant Site			Personnel: JB Brown / Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech pH/Cond meter		pH 4.0	02J613077	9-04
Conductivity	"		pH 7.0	02J613078	9-04
Temperature	"		1413 uS/cm	2304087	5-05
Other:	None				
GENERAL					
Date: 4-27-04			Location: GTSW-2		
Time:					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear					
Stream Flow: Measured					
FIELD MEASUREMENTS					
TIME:	1496				
Temperature (°C or °F)	8.7				
Conductivity (uS/cm)	390				
pH	8.22				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			✓	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			✓	Raw / Filtered	
Total Suspended Solids – Unpreserved:			✓	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gin Plant Site			Personnel: JB Brown / S. Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech pH/Cond meter		pH 4.0 10	02J613015	9-04
Conductivity	"		pH 7.0	02J613078	9-04
Temperature	"		1413 uS/cm	2304087	5-05
Other:	None				
GENERAL					
Date: 4-27-04			Location: ~~GZSW-3~~ Blind Dup SWAF1204 16:05 *		
Time: 15:20					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken:		
Water Appearance: Clear					
Stream Flow: Measured					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)		9.5			
Conductivity (uS/cm)		584			
pH		8.44			
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved: ✓				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓				Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓				Raw / Filtered	
Organics – Unpreserved: N				Raw / Filtered	
Organics – Sulfuric Acid Preserved: N				Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gen Plant Site			Personnel: JB Brown / S. Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Corning pH/Conductivity		pH 4.0	03J1308T	9-04
Conductivity	"		pH 7.0	03J1307B	9-04
Temperature	"		1413 uS/cm	2304007	5-05
Other:	none				
GENERAL					
Date: 4-28-04			Location: GTSW-4		
Time: 915					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear sample obtain from above ore pile -					
Stream Flow: 30-50 GPM - can't measure due to small width of stream and excessive brush					
FIELD MEASUREMENTS					
TIME:	915				
Temperature (°C or °F)	4.0				
Conductivity (uS/cm)	461				
pH	7.03				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved: ✓				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓				Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: [signature] Date: 4-28-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gr Plant Site			Personnel: JB Brown / S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech pH/Cond meter		pH 4.0 10	2J3 3055	9-04
Conductivity	"		pH 7.0	2J10 3076	9-04
Temperature	"		1413 uS/cm	2304087	5-05
Other:	none				
GENERAL					
Date: 4-28-04			Location: GT SW-5		
Time: 9 30					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear					
Stream Flow: ~ 1 foot wide x 1" deep - could measure flow.					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	5.0				
Conductivity (uS/cm)	450				
pH	7.88				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved: ✓				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓				Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: [signature] Date: 4-28-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Conservation Gin Plant Site		Personnel: B Brown / S Gaugin		
Instruments:		Standards	Lot No.	Expiration
PH	Cole-Parmer pH/Conductivity	pH 4.0	02J13071	9-04
Conductivity	"	pH 7.0	03J16078	9-04
Temperature	"	1413 uS/cm	2364257	5-05
Other:	none			
GENERAL				
Date: 4-28-04		Location: GTSW-6		
Time: 945				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Brownish - cloudy				
Stream Flow: in seed pond - no flow				
FIELD MEASUREMENTS				
TIME:	945			
Temperature (°C or °F)	5.9			
Conductivity (uS/cm)	402			
pH	8.04			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved: ✓			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓			Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: [signature] Date: 4-28-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Conestoga Plant Site		Personnel: JB Brown / S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Hach pH/cond meter	pH 4.0 / 10	2311277	9-04
Conductivity	"	pH 7.0	2311500	9-04
Temperature	"	1413 uS/cm	2304087	5-05
Other:	None			
GENERAL				
Date: 4-28-01		Location: GTSW-7		
Time: 10:00				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: slightly cloudy				
Stream Flow: None - taken in channel				
FIELD MEASUREMENTS				
TIME:	10:00			
Temperature (°C or °F)	8.6			
Conductivity (uS/cm)	354			
pH	7.57			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved: ✓			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓			Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J. B. Brown Date: 4-28-01

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gas Plant		Personnel: JB Brown S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Cole-Parmer	pH ~~4.0~~ 10	02J63075	9-04
Conductivity	"	pH 7.0	02J63078	9-04
Temperature	"	1413 uS/cm	2404056	3-05
Other:				
GENERAL				
Date: 5-26-04		Location: GTSW-1		
Time: 1100				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: Surface grab		
Water Appearance: Clear - odorless				
Stream Flow: measured w/ pygmy meter				
FIELD MEASUREMENTS				
TIME:	1005			
Temperature (°C or °F)	6.1C			
Conductivity (uS/cm)	575			
pH	8.42			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved: ✓			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓			Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J. B. Brown Date: 5-26-04

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FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gr. Plant		Personnel: JB Brown S Springer		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH ~~4.0~~ 10	025613077	9-04
Conductivity	"	pH 7.0	025613078	9-04
Temperature	"	1413 uS/cm	2404056	3-05
Other:				

GENERAL	
Date: 5-26-04	Location: GTSW-2
Time:	
SAMPLING CONDITIONS	
Sampling Method: Grab	Depth Sample Taken: surf.
Water Appearance: Clear/odorless	
Stream Flow: Measured w/ pygmy meter	

FIELD MEASUREMENTS					
TIME:	12:15				
Temperature (°C or °F)	5.3°C				
Conductivity (uS/cm)	579				
pH	8.47				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved: ✓	Raw / Filtered
Metals & Cations – Nitric Acid Preserved: ✓	Raw / Filtered
Total Suspended Solids – Unpreserved: ✓	Raw / Filtered
Organics – Unpreserved: ✓	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. S. Klein Date: 5-26-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gas Plant		Personnel: JB, Scott Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH ~~4.0~~ 10	02J613077	9-04
Conductivity	"	pH 7.0	02J613078	9-04
Temperature	"	1413 uS/cm	2304087	5-05
Other:				
GENERAL				
Date: 5-26-04		Location: GTSW-3		
Time: 1332				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken:		
Water Appearance: Clear/odorless				
Stream Flow: See sheet (Pygmy meter)				
FIELD MEASUREMENTS				
TIME:	1355			
Temperature (°C or °F)	4.9			
Conductivity (uS/cm)	376			
pH	8.61			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved: ✓			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓			Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J. [illegible] Date: 5-26-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GEORGETOWN CMM PLANT		Personnel: SCOTT SPRAGUE, AL HASLAM		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0 10	02J613077	9-04
Conductivity	"	pH 7.0	02J613078	9-04
Temperature	"	1413 uS/cm	2304087	5-05
Other:	N/A			
GENERAL				
Date: 5/26/04		Location: GTSW-4		
Time: 14:55				
SAMPLING CONDITIONS				
Sampling Method: GRAB		Depth Sample Taken: — surf.		
Water Appearance: CLEAR / ODERLESS				
Stream Flow: N/D				
FIELD MEASUREMENTS				
TIME:	14:55			
Temperature (°C or °F)	5.2			
Conductivity (uS/cm)	442			
pH	8.13			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	

Sampler's Signature: Al Haslam Date: 5/26/04

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FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GEORGETOWN CAVE PLANT		Personnel: SCOTT SPRAGUE JB BROWN AL HASLAM		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH 4.0 TO	0206130TT	9-04
Conductivity	"	pH 7.0	0206130TT	9-04
Temperature	"	1413 uS/cm	230-107	5-05
Other:	NONE			

GENERAL	
Date: 5/26/04	Location: GTSW-5
Time: 15:30	

SAMPLING CONDITIONS	
Sampling Method: GRAB	Depth Sample Taken: — surf.
Water Appearance: CLEAR/ODERLESS	
Stream Flow: N/D	

FIELD MEASUREMENTS					
TIME:	15:30				
Temperature (°C or °F)	6.9				
Conductivity (uS/cm)	420				
pH	8.66				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered

Sampler's Signature: Al Haslam Date: 5/26/04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GEORGETOWN CYN PLANT		Personnel: SCOTT SPRAGUE AL HASLAM		
Instruments:		Standards	Lot No.	Expiration
PH	GEOTECH	pH ~~4.0~~ 10	02J613077	9-04
Conductivity	"	pH 7.0	02J613078	9-04
Temperature	"	443 uS/cm	2304087	5-05
Other:	NONE			
GENERAL				
Date: 5/26/04		Location: GTSW-6		
Time: 14:40				
SAMPLING CONDITIONS				
Sampling Method: GRAB		Depth Sample Taken: TOP 6"		
Water Appearance: Turbid TAN ODORLESS				
Stream Flow: N/A				
FIELD MEASUREMENTS				
TIME:	14:40			
Temperature (°C or °F)	6.9			
Conductivity (uS/cm)	420			
pH	8.75			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	

Sampler's Signature: Al Haslam Date: 5/26/04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Conklin Gas Plant		Personnel: JB Jones, Sprague, R. Hartlem		
Instruments:		Standards	Lot No.	Expiration
PH	Corning	pH ~~4.0~~ 10	02J613077	9-04
Conductivity	"	pH 7.0	02J613078	9-04
Temperature	"	~~1413~~ uS/cm	2304087	5-05
Other:	None			
GENERAL				
Date: 5-26-04		Location: GTS~~W~~-7		
Time:				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Top 6"		
Water Appearance: clear - odorless				
Stream Flow: No flow measured ~ 20 gpm				
FIELD MEASUREMENTS				
TIME:	1432			
Temperature (°C or °F)	8.5°C			
Conductivity (uS/cm)	207			
pH	8.13			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved: ✓			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved: ✓			Raw / Filtered	
Total Suspended Solids – Unpreserved: ✓			Raw / Filtered	
Organics – Unpreserved: ✓			Raw / Filtered	
Organics – Sulfuric Acid Preserved: ✓			Raw / Filtered	

Sampler's Signature: J. Jones Date: 5-26-04

Take GTSCR-4 from chamber 1430

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Fert.		Personnel: JB Brown / S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH 4.0/10	2310079	3-05
Conductivity	Orion 124	pH 7.0	2371273	11-04
Temperature	"	2070 uS/cm	2310020	9-04
Other:				
GENERAL				
Date: 6-29-04		Location: GTSW-1		
Time: 1540				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: Surface		
Water Appearance: Clear - odorless				
Stream Flow: See sheet				
FIELD MEASUREMENTS				
TIME:				
Temperature (°C or °F)	11.6°C			
Conductivity (uS/cm)	382			
pH	8.13			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: [signature] Date: 6-29-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Ferti. Plant			Personnel: J. Brown S. Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SA 250		pH 4.0 7.0	2510079	3-05
Conductivity	Orion 124		pH 7.0	2371273	11-04
Temperature	"		141 uS/cm	2404056	3-05
Other:	—				
GENERAL					
Date: 6-29-04			Location: GT SW-2		
Time: 16 30					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf.		
Water Appearance: Clear/odorless					
Stream Flow: see sheet					
FIELD MEASUREMENTS					
TIME:	16 30				
Temperature (°C or °F)	9.6°C				
Conductivity (uS/cm)	401				
pH	7.29				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J. Brown Date: 6-29-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Conagra Fert Plant.			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SR 250		pH ~~4.0~~ 10	2310079	3-05
Conductivity	"		pH 7.0	2378273	11-04
Temperature	"		~~1413~~ uS/cm	2404056	3-05
Other:					
GENERAL					
Date: 6-29-04			Location: GTSW-3		
Time: 1705					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf		
Water Appearance: Clear/odorless					
Stream Flow: See Sheet					
FIELD MEASUREMENTS					
TIME:	1705				
Temperature (°C or °F)	9.5				
Conductivity (uS/cm)	401				
pH	7.11				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. L. Fr Date: 6-29-4

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Fert Plant		Personnel: JB Brown S Spurgin		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH ~~4.0~~ 10	2310079	3-05
Conductivity	Orion 128	pH 7.0	2371273	11-04
Temperature	"	1413 uS/cm	2404856	3-05
Other:	—			

GENERAL

Date: 6-29-04	Location: GTSW-04
Time: 18:05	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: Surf.
Water Appearance: Clear	
Stream Flow: NA	

FIELD MEASUREMENTS

TIME:					
Temperature (°C or °F)	9.8				
Conductivity (uS/cm)	421				
pH	7.20				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 6-29-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Ford Plant			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SA 250		pH 4.0 / 10	2310079	3-05
Conductivity	Orion 128		pH 7.0	2371273	11-04
Temperature	"		1413 uS/cm	2404056	3-05
Other:	—				
GENERAL					
Date: 6-27-04			Location: GTSW-5		
Time: 1830					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf		
Water Appearance: Clear/odorless					
Stream Flow: ~20 GPM					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	7.2				
Conductivity (uS/cm)	456				
pH	7.11				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J. Brown Date: 6-28-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Feed Plant			Personnel: JB Brown / S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SA 250		pH ~~4.0~~ 10	2310579	3-05
Conductivity	Orion 124		pH 7.0	2371273	11-04
Temperature	"		1413 uS/cm	2404056	3-05
Other:					
GENERAL					
Date: 6-29-04			Location: GTSW-6		
Time: 1750					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf		
Water Appearance: slightly cloudy					
Stream Flow: NA - Sed pond					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	19.2				
Conductivity (uS/cm)	451				
pH	7.32				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 6-29-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Fert Plant			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SA 250		pH 4.0	2310079	3-05
Conductivity	Orion W124		pH 7.0	2571273	11-04
Temperature	"		1413 uS/cm	2404056	3-05
Other:	/				
GENERAL					
Date: 6-29-04			Location: GTSW-7		
Time: 1735			GTSW JUN 04 1305 Blind dup		
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: surf.		
Water Appearance: Clear					
Stream Flow: Channel - no flow					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	18.1°C				
Conductivity (uS/cm)	249				
pH	7.73				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	x2
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	x2
Total Suspended Solids – Unpreserved:				Raw / Filtered	x2
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J. J. [illegible] Date: 6-29-04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBSprague / JSBrown		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	02J1307T	Sep 04
Conductivity	"	pH 7.0	02J1307S	Sep 04
Temperature	"	1413 uS/cm	2404056	Mar 05
GENERAL				
Date: Jul 27, 04		Location: GTSW-1		
Time: 1450				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow: not determined - pygmy meter broken				
FIELD MEASUREMENTS				
Temperature (°C or °F)	13.7			
Conductivity (uS/cm)	392			
pH	8.37			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered		
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered		
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered		
Organics – Unpreserved:	N	Raw / Filtered		
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered		

Nitrate + Nitrite (Raw)

Sampler's Signature: [signature] Date: Jul 27, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant			Personnel: SB Sprague / JSBrown		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	02J1307T	Sep 04
Conductivity	"		pH 7.0	02J1307S	Sep 04
Temperature	"		1413 uS/cm	2404056	Mar 05
GENERAL					
Date: Jul 27, 04			Location: GTSW-2		
Time: 1510					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: —		
Water Level BTC (ft): —			Well Depth BTC (ft): —		
Water Appearance: Clear					
Stream Flow: not determined - pygmy meter broken					
FIELD MEASUREMENTS					
Temperature (°C or °F)	12.1				
Conductivity (uS/cm)	376				
pH	8.44				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	

Nitrate + Nitrite (Raw)

Sampler's Signature: [signature] Date: Jul 27, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBSpragin / JSBrown		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	0311307T	Sep 04
Conductivity	"	pH 7.0	0311307S	Sep 04
Temperature	"	1413 uS/cm	2404056	Mar 05
GENERAL				
Date: Jul 27, 04		Location: SBS ~~1525~~ GTSW-3		
Time: 1525				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow: ~~clear~~ not determined				
FIELD MEASUREMENTS				
Temperature (°C or °F)	13.4			
Conductivity (uS/cm)	373			
pH	8.50			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered		
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered		
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered		
Organics – Unpreserved:	N	Raw / Filtered		
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered		

Nitrite + Nitrate (Raw)

Sampler's Signature: [signature] Date: Jul 27, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sprague / JS Brown		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0 / 10.0	02J13077	Sep 04
Conductivity	"	pH 7.0	03J13078	Sep 04
Temperature	"	1413 uS/cm	24U4056	Mar 05
GENERAL				
Date: Jul 27, 04		Location: GTSW-4		
Time: 1420				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow: not determined				
FIELD MEASUREMENTS				
Temperature (°C or °F)	15.8			
Conductivity (uS/cm)	1070			
pH	8.16 SBS ~~8.03~~			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Nitrate + Nitrite Raw

Sampler's Signature: [signature] Date: Jul 27, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBSprague / JSBrown		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0 / 10.0	02J1307T	Sep 04
Conductivity	"	pH 7.0	02J1307S	Sep 04
Temperature	n/	1413 uS/cm	240 4056	Mar 05
GENERAL				
Date: Jul 27, 2004		Location: GTSW-7		
Time: 1545				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: light brown - mass on surface of pond				
Stream Flow: —				
FIELD MEASUREMENTS				
Temperature (°C or °F)	24.1			
Conductivity (uS/cm)	226			
pH	9.21			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	

Nitrate + Nitrite — Raw

Sampler's Signature: [signature] Date: Jul 27, 04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown GVN			Personnel: JB Brown S Sprugeon		
Instruments:			Standards	Lot No.	Expiration
PH	Orion SA 250		pH 4.010	2310079	3-05
Conductivity	Orion 124		pH 7.0	2211273	11-04
Temperature	"		2070 uS/cm	2310020	9-04
Other:	NA				
GENERAL					
Date: 8-24-04			Location: GTSW-1		
Time: 1500					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf.		
Water Appearance: Clear - odorless					
Stream Flow: See meas sheet					
FIELD MEASUREMENTS					
TIME:	1500				
Temperature (°C or °F)	8.3				
Conductivity (uS/cm)	395				
pH	7.66				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:			ND	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			ND	Raw / Filtered	

Sampler's Signature: [signature] Date: 8-24-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gn		Personnel: S Sprague JB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH 4.0/7.0	23/10079	3-05
Conductivity	Orion 124	pH 7.0	2211273	11-04
Temperature	"	2000uS/cm	23/10020	9-04
Other:	NA			

GENERAL

Date: 8-24-04	Location: GTSW-2
Time: 1420	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: surf
Water Appearance: Clear/odorless	
Stream Flow: See meas sheet	

FIELD MEASUREMENTS

TIME:	1420				
Temperature (°C or °F)	9.0				
Conductivity (uS/cm)	410				
pH	7.92				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved: NA	Raw / Filtered
Organics – Sulfuric Acid Preserved: NA	Raw / Filtered

Sampler's Signature: J. J. [illegible] Date: 8-24-04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gn		Personnel: S Sprague JB Brown		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH ~~4.0~~ 10	2310079	3-05
Conductivity	Orion 124	pH 7.0	2211273	11-04
Temperature	"	1000 uS/cm	2310020	9-04
Other:	None			
GENERAL				
Date: 8-24-04		Location: GT SW-3		
Time: 13.30				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf		
Water Appearance: Clear - odorless				
Stream Flow: See measurements				
FIELD MEASUREMENTS				
TIME:				
Temperature (°C or °F)	9.6			
Conductivity (uS/cm)	407			
pH	8.05			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. B. Brown Date: 8-24-04

Surface ~~TABLE 4-1~~
~~FIELD GROUND~~ WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sprague JB Bowen		
Instruments:		Standards	Lot No.	Expiration
PH	Orion 5A250A	pH ~~4.0~~ 10.0	2310079	Mar 05
Conductivity	Orion 124	pH 7.0	2271273	Nov 04
Temperature	Orion 124	2070 uS/cm	2310020	Sep 04
Other:				

GENERAL	
Date: Aug 24, 04	Location: GTSW-4
Time: 1245	
SAMPLING CONDITIONS	
Sampling Method: Grab	Depth Sample Taken: —
Water Level BTC (ft): —	Well Depth BTC (ft): —
Water Appearance: Clear	
Stream Flow: ~~No~~	

FIELD MEASUREMENTS

TIME: (h:m:s)							
Depth to Water (ft)	—						
Flow Rate (gpm)	—						
Temperature (°C or °F)	11.1						
Conductivity (uS/cm)	551						
pH	8.11						
Turbidity (ntu)	—						
Evacuation (gal)	—						
Cumulative Evac. (gal)	—						

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids -- Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
Nitrate	Y	Raw

Sampler's Signature: [signature] Date: Aug 24, 04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gm		Personnel: JB Brown/S. Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Orion SA 250	pH ~~4.0~~ 10.0	2310079	3-05
Conductivity	Orion 124	pH 7.0	2211273	11-04
Temperature	"	2070 uS/cm	2310020	9-04
Other:	NA			

GENERAL	
Date: 8-24-04	Location: GT SW-7 (clarifier)
Time: 1315	
SAMPLING CONDITIONS	
Sampling Method: grab	Depth Sample Taken: surface
Water Appearance: ~~[illegible]~~ slight greenish cast - cloudy - slight odor	
Stream Flow: NA	

FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	17.1				
Conductivity (uS/cm)	261				
pH	7.78				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	NA	Raw / Filtered
Organics – Sulfuric Acid Preserved:	NA	Raw / Filtered

Sampler's Signature: [signature] Date: Aug 24, 2004

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0 / 10.0	4AD 034	Apr 06
Conductivity	"	pH 7.0	4AD 020	Apr 06
Temperature	"	1413 uS/cm	24c 4299	Apr 05
GENERAL				
Date: Sep 29, 04		Location: GTSW - 1		
Time: 1305				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow: Measured				
FIELD MEASUREMENTS				
Temperature (°C or °F)	7.9°C			
Conductivity (uS/cm)	405			
pH	8.22			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered		
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered		
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered		
Organics – Unpreserved:	N	Raw / Filtered		
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered		
$NO_3 + NO_2$	Y	Raw		

1305

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4170034	Apr-06
Conductivity	"	pH 7.0	4AD020	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-07
GENERAL				
Date: Sep 29, 04		Location: GTSW-2		
Time: 1230				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow:				
FIELD MEASUREMENTS				
Temperature (°C or °F)	9.2			
Conductivity (uS/cm)	408			
pH	8.51			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant			Personnel: SBS / JSB		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"		pH 7.0	4AD020	Apr 06
Temperature	"		1413 uS/cm	240429	Apr 05
GENERAL					
Date: Sep 29, 04			Location: GTSW-3		
Time: 1205					
SAMPLING CONDITIONS					
Sampling Method: grab			Depth Sample Taken: —		
Water Level BTC (ft): —			Well Depth BTC (ft): —		
Water Appearance: clear					
Stream Flow:					
FIELD MEASUREMENTS					
Temperature (°C or °F)	8.3				
Conductivity (uS/cm)	394				
pH	7.95				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NH_3 + NO_2	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project:	GTC-Plant		Personnel:	SBS/JSB	
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH 4.0/10.0	4AD034	Apr-06
Conductivity	"		pH 7.0	4AD020	Apr-06
Temperature	"		1413 uS/cm	2404299	Apr-05
GENERAL					
Date:	Sep 29, 04		Location:	GTSW-4	
Time:	1015				
SAMPLING CONDITIONS					
Sampling Method:	Grab		Depth Sample Taken:	—	
Water Level BTC (ft):	—		Well Depth BTC (ft):	—	
Water Appearance:	clear				
Stream Flow:	not determined				
FIELD MEASUREMENTS					
Temperature (°C or °F)	7.8				
Conductivity (uS/cm)	562				
pH	7.52				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NH_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GasTech	pH ~~4.0~~ / 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2604299	Apr 05
GENERAL				
Date: Sep 29, 04		Location: GTSW-7		
Time: 1045				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear light brown color				
Stream Flow: — none				
FIELD MEASUREMENTS				
Temperature (°C or °F)	11.0			
Conductivity (uS/cm)	245			
pH	8.89			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plants			Personnel: SBS / JSB		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	4AD 034	Apr 06
Conductivity	"		pH 7.0	4AD 020	Apr 06
Temperature	"		1413 uS/cm	2404299	Apr 05
GENERAL					
Date: Sep 29, 04			Location: GTSW-1		
Time: 1305					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: —		
Water Level BTC (ft): —			Well Depth BTC (ft): —		
Water Appearance: clear					
Stream Flow: Measured					
FIELD MEASUREMENTS					
Temperature (°C or °F)	7.9°C				
Conductivity (uS/cm)	405				
pH	8.22				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	
$NO_3 + NO_2$			Y	Raw	

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS / JSD		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr-06
Conductivity	"	pH 7.0	4AD020	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-07
GENERAL				
Date: Sep 29, 04		Location: GTSW-2		
Time: 1230				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow:				
FIELD MEASUREMENTS				
Temperature (°C or °F)	9.2			
Conductivity (uS/cm)	408			
pH	8.51			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
$NO_3 + NO_2$		Y	Raw	

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	Geo Tech	pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	240429	Apr 05
GENERAL				
Date: Sep 29, 04		Location: GTSW-3		
Time: 1205				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow:				

FIELD MEASUREMENTS					
Temperature (°C or °F)	8.3				
Conductivity (uS/cm)	394				
pH	7.95				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NH_3 + NH_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr-06
Conductivity	"	pH 7.0	4AD020	Apr-06
Temperature	"	1413 uS/cm	2404299	Apr-05
GENERAL				
Date: Sep 29, 04		Location: GTSW-4		
Time: 1015				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow: not determined				
FIELD MEASUREMENTS				
Temperature (°C or °F)	7.8			
Conductivity (uS/cm)	562			
pH	7.52			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NH_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC - Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ / 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2604299	Apr 05
GENERAL				
Date: Sep 29, 04		Location: GTSW-7		
Time: 1045				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear light brown color				
Stream Flow: — none				
FIELD MEASUREMENTS				
Temperature (°C or °F)	11.0			
Conductivity (uS/cm)	249			
pH	8.89			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
$NO_3 + NO_2$		Y	Raw	

Sampler's Signature: [signature] Date: Sep 29, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant			Personnel: SB Spencer		
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"		pH 7.0	4AD024	Apr 06
Temperature	"		1413 uS/cm	3464299	Apr 07
GENERAL					
Date: Nov 4, 04			Location: GTSW-1		
Time: 900					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: —		
Water Level BTC (ft): —			Well Depth BTC (ft): —		
Water Appearance: clear					
Stream Flow:					
FIELD MEASUREMENTS					
Temperature (°C or °F)	2.3				
Conductivity (uS/cm)	467				
pH	7.05				
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:			Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:			Y	Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	
$NO_3 + NO_2$			Y	Raw	

Sampler's Signature: SB Spencer Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sprague		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05
GENERAL				
Date: Nov 4, 04		Location: GTSW-2		
Time: 930				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: clear				
Stream Flow:				
FIELD MEASUREMENTS				
Temperature (°C or °F)	3.0			
Conductivity (uS/cm)	410			
pH	3.11			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	✓		Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:	✓		Raw / Filtered	
Total Suspended Solids – Unpreserved:	✓		Raw / Filtered	
Organics – Unpreserved:	✓		Raw / Filtered	
Organics – Sulfuric Acid Preserved:	✓		Raw / Filtered	
NO_3 NO_2	✓		Raw	

Sampler's Signature: [signature] Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Spring		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 07
GENERAL				
Date: Nov 4, 04		Location: GTSW-3		
Time: 1000				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: Clear				
Stream Flow:				
FIELD MEASUREMENTS				
Temperature (°C or °F)	24			
Conductivity (uS/cm)	400			
pH	8.54			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
$NO_3 + NO_2$	Y	Raw

Sampler's Signature: [signature] Date: Nov 4, 04

FIELD WATER QUALITY SAMPLING FORM

Project:	~~SMC~~ SBS GTC - Plant		Personnel:	SBSprague	
Instruments:			Standards	Lot No.	Expiration
pH	GeoTech		pH ~~4.0~~ 10.0	4AD034	Apr 06
Conductivity	"		pH 7.0	4AD020	Apr 06
Temperature	"		1413 uS/cm	2404299	Apr 05
GENERAL					
Date:	Nov 4, 04		Location:	GTSW-4	
Time:	1045				
SAMPLING CONDITIONS					
Sampling Method:	Grab		Depth Sample Taken:	—	
Water Level BTC (ft):	—		Well Depth BTC (ft):	—	
Water Appearance:	light tan, clear,				
Stream Flow:	not determined				
FIELD MEASUREMENTS					
Temperature (°C or °F)					
Conductivity (uS/cm)					
pH					
Evacuation (gal)	—				
Cumulative Evac. (gal)	—				

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_3 + NO_2	Y	Raw

Sampler's Signature: [signature] Date: ~~Dec~~ Nov 4, 04 SBS

FIELD WATER QUALITY SAMPLING FORM

Project: GTC-Plant		Personnel: SB Sprague		
Instruments:		Standards	Lot No.	Expiration
pH	GeoTech	pH 4.0/10.0	4AD034	Apr 06
Conductivity	"	pH 7.0	4AD020	Apr 06
Temperature	"	1413 uS/cm	2404299	Apr 05
GENERAL				
Date: Nov 4, 04		Location: GTSW-7		
Time: 1020		Blind Dup NOV04 @ 800 here		
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: —		
Water Level BTC (ft): —		Well Depth BTC (ft): —		
Water Appearance: ~~clear~~ very turbid - brown				
Stream Flow: — sampled below 6" ice				
FIELD MEASUREMENTS				
Temperature (°C or °F)	1.3			
Conductivity (uS/cm)	259			
pH	8.79			
Evacuation (gal)	—			
Cumulative Evac. (gal)	—			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered		
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered		
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered		
Organics – Unpreserved:	N	Raw / Filtered		
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered		
$NO_3 + NO_2$	Y	Raw		

Sampler's Signature: [signature] Date: Nov 4, 04

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GT Canyon Fert Plant			Personnel: S Sprague JB Brown		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech Waterproof		pH 4.0	5AA002	6-07
Conductivity	"		pH 7.0	4AK055	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	—				
GENERAL					
Date: 4-27-05			Location: ~~GT SW-2~~ / GT SW-1		
Time: 1115					
SAMPLING CONDITIONS					
Sampling Method: ~~Flow~~ Grab			Depth Sample Taken: surface		
Water Appearance: Clear - odorless					
Stream Flow: See measurement					
FIELD MEASUREMENTS					
TIME:	1115				
Temperature (°C or °F)	4.4				
Conductivity (uS/cm)	359				
pH	8.12				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J. Brown Date: 4-27-05

Take MS - MSD

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Gangplank Cyn			Personnel: JB Brown S Sponger		
Instruments:			Standards	Lot No.	Expiration
PH	Cole-Parmer Multi Meter		pH 4.0	5AA002	6-07
Conductivity	"		pH 7.0	4AK055	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:					
GENERAL					
Date: 4-27-05			Location: GTSW-2		
Time: 1230					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken:		
Water Appearance: Clear odorless					
Stream Flow: See measurements					
FIELD MEASUREMENTS					
TIME:	1230				
Temperature (°C or °F)	5.6				
Conductivity (uS/cm)	368				
pH	8.35				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-05 1230

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Cyn		Personnel: JB Brown S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Cole-Parmer Mult. Meter	pH 4.0	4AA002	6-07
Conductivity	"	pH 7.0	4AK057	11-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 4-27-05		Location: GTSW-3		
Time: 1400				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear				
Stream Flow: See sheet				
FIELD MEASUREMENTS				
TIME:				
Temperature (°C or °F)	4.3			
Conductivity (uS/cm)	368			
pH	8.06			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-05

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GT Cityan			Personnel: J. Sprague, JB Brown		
Instruments:	Cutech Multi		Standards	Lot No.	Expiration
PH	"		pH 4.0	~~[illegible]~~ SA002	~~[illegible]~~ 6-07
Conductivity	"		pH 7.0	4AK055	11-06
Temperature	"		146 uS/cm	SA8050	2-06
Other:	—				
GENERAL					
Date: 4-27-05			Location: GTSW-4		
Time: 1015					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear - no odor					
Stream Flow: N/CFS					
FIELD MEASUREMENTS					
TIME:	1015				
Temperature (°C or °F)	4.4				
Conductivity (uS/cm)	472				
pH	7.99				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:			N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:			N	Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-05

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GT Canyon		Personnel: S Sprague JB Brown		
Instruments:	Geotech Workpro	Standards	Lot No.	Expiration
PH	"	pH 4.0	5AA007	6-07
Conductivity	"	pH 7.0	9AK055	11-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	None			
GENERAL				
Date: 4-27-05		Location: GTSW-5		
Time: 10 25				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: – brown / silty				
Stream Flow: ~ 1 cfs.				
FIELD MEASUREMENTS				
TIME:				
Temperature (°C or °F)	4.5			
Conductivity (uS/cm)	456			
pH	7.97			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~ 0 bottles	

Sampler's Signature: _____ Date: 4-27-05

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gym		Personnel: JB Brown, S Sprague		
Instruments:	Geotech	Standards	Lot No.	Expiration
PH	Mult. Meter	pH 4.0	5A0002	6-07
Conductivity	"	pH 7.0	4A1005	11-06
Temperature	"	1413 uS/cm	5AE050	2-06
Other:				
GENERAL				
Date: 4-27-05		Location: GTSW-6		
Time: 1515				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: surface		
Water Appearance: turbid - brown				
Stream Flow: none - pond				
FIELD MEASUREMENTS				
TIME:	1515			
Temperature (°C or °F)	4.7			
Conductivity (uS/cm)	163			
pH	8.44			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: [signature] Date: 4-27-05 1515

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown			Personnel: JB Brown, S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech Multi. Meter		pH 4.0	4AB002	6-07
Conductivity	"		pH 7.0	4AK015	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	—				
GENERAL					
Date: 4-27-05			Location: GTSW-7		
Time: 1320					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf		
Water Appearance: slight greenish cast					
Stream Flow: None ~~Seep pond~~ Flowing					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	4.6				
Conductivity (uS/cm)	101				
pH	7.90				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

1320

Sampler's Signature: [signature] Date: 4-27-05

Blind dup
GTSW-APR05 1415

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Fertilizer		Personnel: JB Brown S Spragin		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH 4.0	5AA002	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	A4-06
Temperature	"	~~141~~ uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 6-1-05		Location: GTSW-1		
Time: 10 05				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: surface		
Water Appearance: clear - odorless				
Stream Flow: See rate measurements				
FIELD MEASUREMENTS				
TIME:	10 30			
Temperature (°C or °F)	6.8			
Conductivity (uS/cm)	339			
pH	8.28			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			~~Raw / Filtered~~	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw~~ / Filtered	

Sampler's Signature: [signature] Date: 6-1-05

1030

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Fertilizer		Personnel: JB Brown S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	~~Orion~~ YSI	pH 4.0	5AA005	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 6-1-05		Location: GTSW-2		
Time:				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Turbid - overflow from settling pond flowing from Phosphorus into Georgetown Cr.				
Stream Flow: See sheet				
FIELD MEASUREMENTS				
TIME:	11 30			
Temperature (°C or °F)	6.80			
Conductivity (uS/cm)	350			
pH	8.66			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: [signature] Date: 6-1-05 1130

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gulch		Personnel: JB Brown, S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	~~Geotech~~ VSI	pH 4.0	5AA002	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	4-06
Temperature	"	~~1413~~ uS/cm	5AB050	2-06
Other:	"			

GENERAL	
Date: 6-1-05	Location: GTSW-3
Time: 12 10	
SAMPLING CONDITIONS	
Sampling Method: Grab	Depth Sample Taken: Surface
Water Appearance: Cloudy - turbid.	
Stream Flow: See flow meter readings	

FIELD MEASUREMENTS					
TIME:	12 30				
Temperature (°C or °F)	7.50				
Conductivity (uS/cm)	348				
pH	8.89				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	~~Raw / Filtered~~
Organics – Sulfuric Acid Preserved:	~~Raw / Filtered~~

Sampler's Signature: [signature] Date: 6-1-05 12 30

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gn Ferr		Personnel: JB Brown J Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	~~[illegible]~~ YSI	pH 4.0	5AA02	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	4-06
Temperature	"	~~1413~~ uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 6-1-05		Location: GTSW-4		
Time: 1415				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: surf		
Water Appearance: cloudy - turbid				
Stream Flow: ~ 1 cfs (not measured)				
FIELD MEASUREMENTS				
TIME:				
Temperature (°C or °F)	7.80			
Conductivity (uS/cm)	436			
pH	8.98			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. S. Brown Date: 6-1-05

1415

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gn		Personnel: JB Brown S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	YSI	pH 4.0	5AA002	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 6-1-05		Location: GTSW-5		
Time: 1430				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: surf		
Water Appearance: cloudy to turbid - picking up sediment from ore pile				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1430			
Temperature (°C or °F)	8.45			
Conductivity (uS/cm)	422			
pH	9.00			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. S. Sprague Date: 6-1-05

1430

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gin Fert Plant			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	~~Geotech~~ YSI		pH 4.0	5AA002	1-07
Conductivity	"		pH ~~7.0~~ 10	4D034	4-06
Temperature	"		~~1413~~ uS/cm	5AB050	2-06
Other:	"				
GENERAL					
Date: 6-1-05			Location: GTSW-6		
Time: 1345					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Chocolate Brown - overflowing through overflow into Georgetown Cr.					
Stream Flow:					
FIELD MEASUREMENTS					
TIME:	1345				
Temperature (°C or °F)	10.06				
Conductivity (uS/cm)	402				
pH	8.85				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 6-1-05

1345

Blind Dup
GTSW-JUN05
930

FIGURE 5-2
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gp		Personnel: B [illegible]		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech 151	pH 4.0	5AA002	1-07
Conductivity	"	pH ~~7.0~~ 10	4D034	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 6-1-05		Location: GTSW-7		
Time: 1315				
SAMPLING CONDITIONS				
Sampling Method: grab		Depth Sample Taken: Surface		
Water Appearance: slight greenish cast				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1315			
Temperature (°C or °F)	14.09			
Conductivity (uS/cm)	224			
pH	8.59			

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 1315

MS/MSD

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GT Canyon CF Ford Site		Personnel: JB Brown / S Sprague		
Instruments:	YSI 556 / MPS	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 10	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	~~Abbottlab~~ 2100P Turbidity meter			
GENERAL				
Date: 6-28-05		Location: GTSW-1		
Time: 10 20				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: surface		
Water Appearance: Clear - odorless				
Stream Flow: See measurement				
FIELD MEASUREMENTS				
TIME:	10 20			
Temperature (°C or °F)	8.11		Turb =	0.96 NTU
Conductivity (uS/cm)	381			
pH	8.09			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: J. Brown Date: 6-28-05 10 20

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site		Personnel: JB Brown/S Sprague		
Instruments:	YSI 556 MPS	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	Hach 2100P Turbidity Meter			
GENERAL				
Date: 6-28-05		Location: GTSW-2		
Time: 11 05				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf.		
Water Appearance: Clear / odorless				
Stream Flow: See meas sheet				
FIELD MEASUREMENTS				
TIME:	11 15			
Temperature (°C or °F)	5.09			
Conductivity (uS/cm)	186			
pH	8.47	Turb = 0.62		
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: J. A. Brown Date: 6-28-05 11 15

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site – GT Canyon			Personnel: JB Brown / S Sprague		
Instruments:	YSI 556 MPS		Standards	Lot No.	Expiration
PH	"		pH ~~4.0~~ 10	4AK055	11-06
Conductivity	"		pH 7.0	4AB020	9-06
Temperature	"		1413 uS/cm	5AB056	2-06
Other:	Hach Turbidity Meter 2100P				
GENERAL					
Date: 6-28-05			Location: GT SW-3		
Time: 11:47					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf.		
Water Appearance: Clear / odorless					
Stream Flow: See meas. Sheet					
FIELD MEASUREMENTS					
TIME:	1225				
Temperature (°C or °F)	9.55				
Conductivity (uS/cm)	184				
pH	8.54		0.50	NTU	

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	~~Raw~~ / Filtered
Organics – Sulfuric Acid Preserved:	~~Raw~~ / Filtered

Sampler's Signature: J. S. Sprague Date: 6-28-05

1215

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers Fert Site		Personnel: JB Brown S Sprague		
Instruments:	YSI 556 MPS	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 10	4A1055	11-06
Conductivity	"	pH 7.0	4A8020	4-06
Temperature	"	1413 uS/cm	5A8050	2-06
Other:	Hach Turbidity Meter 2100P			
GENERAL				
Date: 6-28-05		Location: GTSW-4		
Time: 15 00				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear / odorless				
Stream Flow: ~ 1 cfs				
FIELD MEASUREMENTS				
TIME:	15 00			
Temperature (°C or °F)	10.04			
Conductivity (uS/cm)	458			
pH	8.35		0.98 NTU	
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			~~Raw / Filtered~~	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / ~~Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: [signature] Date: 6-28-05

15 00

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers fert Site		Personnel: JB Brown S Sprague		
Instruments:	YSI 556 MPM	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 10	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	14B uS/cm	5AB050	2-06
Other:	Hach 2100P Turbidity Meter			
GENERAL				
Date: 6-28-05		Location: GTSW-5		
Time: 15 20				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear				
Stream Flow: ~ 1 cfs - just above fence.				
FIELD MEASUREMENTS				
TIME:	15 20			
Temperature (°C or °F)	12.10			
Conductivity (uS/cm)	430			
pH	8.51		4.53	
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: [signature] Date: 6-28-05

15 20

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site Georgetown Gun		Personnel: JB Brown / S Sprague		
Instruments: YSI 556 / MPS		Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 10	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	Hach 2100P Turbidity Meter			
GENERAL				
Date: 6-28-05		Location: GTSW-6 (Sed pond)		
Time: 1300				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf		
Water Appearance: Slightly turbid				
Stream Flow: None — Sed pond				
FIELD MEASUREMENTS				
TIME:	1500			
Temperature (°C or °F)	12.44			
Conductivity (uS/cm)	424			
pH	8.55	6.64 NTU		
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: [signature] Date: 6-28-05

1500

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site – GT Canyon			Personnel: JB Brown / S Sprague		
Instruments:	YSI 556	MPS	Standards	Lot No.	Expiration
PH	"		pH ~~4.0~~ 10	4A1055	11-06
Conductivity	"		pH 7.0	4AB020	4-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	Hach 2100P Turb. Meter				

GENERAL

Date: 6-28-05	Location: GTSW-7
Time: 12 30	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: Surf.
Water Appearance: slight greenish cast / slight swampy odor	
Stream Flow: No flow – clarity	

FIELD MEASUREMENTS

TIME:	12 30				
Temperature (°C or °F)	18.08				
Conductivity (uS/cm)	227				
pH	7.67		8.61 NTU		

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	~~Raw / Filtered~~
Organics – Sulfuric Acid Preserved:	~~Raw / Filtered~~

Sampler's Signature: J. S. [illegible] Date: 6-28-05

12 30

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Ferd Site			Personnel: JB Brown		
Instruments:	YSI 556	MPS	Standards	Lot No.	Expiration
PH	"		pH ~~4.0~~ 10	5AK055	11-06
Conductivity	"		pH 7.0	4AB020	4-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	Hach 2100P Turbidity meter				
GENERAL					
Date: 6-28-05			Location: GTSW-8		
Time: 1335					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf.		
Water Appearance: Clear - no odor					
Stream Flow: ~2-3 GPM flow onto site from east side of canyon - split sample					
FIELD MEASUREMENTS					
TIME:	1340				
Temperature (°C or °F)	11.80				
Conductivity (uS/cm)	216				
pH	8.25		1.77 NTU		
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J Brown Date: 6-28-05

~~STSW JUN02~~ GTSW JUN02 (9 oz) Blind Dup. (1340) Sample

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site		Personnel: JB Brown		
Instruments:	YSI 556 / MPS	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 10	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	Hach 2100P Turbidity meter			
GENERAL				
Date: 6-28-05		Location: GTSW-8		
Time: 1335				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf.		
Water Appearance: Clear – no odor				
Stream Flow: ~2-3 GPM flow onto site from each side of canyon - split sample				
FIELD MEASUREMENTS				
TIME:	1340			
Temperature (°C or °F)	11.80			
Conductivity (uS/cm)	216			
pH	8.25	1.77 NTU		
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J. Brown Date: 6-28-05

~~SW-JUN~~ GTSWJUN02 (9 oz) Blind Dup. (1340) Sample

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fert Site GT Canyon		Personnel: JB Brown / S. Sprague		
Instruments:	YSI 556 MPS	Standards	Lot No. ✓	Expiration
PH	"	pH ~~4.0~~ 10	4A16055	11-06
Conductivity	"	pH 7.0	9AB020	4-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	Hach Turbidity Meter 2100P			
GENERAL				
Date: 6-28-05		Location: GTSW-9		
Time:				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf.		
Water Appearance: Clear — water coming down off east side drainage ditch - flowing into site.				
Stream Flow: ~ 2-3 GPM				
FIELD MEASUREMENTS				
TIME:	1426			
Temperature (°C or °F)	11.27			
Conductivity (uS/cm)	237			
pH	8.16		0.46 NTU	
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: J. S. [illegible] Date: 6-28-05

1420

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: CF Fertilizer Site Georgetown Gin		Personnel: JB Brown / S Sprague		
Instruments:	YSI 556 MPS	Standards	Lot No:	Expiration
PH	"	pH 4.0/10	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	1413 uS/cm	5AB050	-2006
Other:	Hach 2100P Turbidity Meter			
GENERAL				
Date: 6-28-05		Location: GTSW-10		
Time: 14 40		between furnace and slurry pit		
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear				
Stream Flow: 2-3 GPM				
FIELD MEASUREMENTS				
TIME:	14 40			
Temperature (°C or °F)	18.14			
Conductivity (uS/cm)	220			
pH	8.62	1.53	NTU	
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J. Brown Date: 6-28-05

1440

Surface

FIGURE

FIELD ~~GROUND~~ WATER QUALITY SAMPLING FORM

Project: CF Fertilizer Plant GT Canyon		Personnel: JB Brown / S Sprague		
Instruments:	YSI 556 MPS	Standards	Lot No.	Expiration
PH	"	pH ~~4.0~~ 7.0	4AK055	11-06
Conductivity	"	pH 7.0	4AB020	4-06
Temperature	"	~~1413~~ uS/cm	5AB050	2-06
Other:	Turbidity meter	2100 P		

GENERAL	
Date: 6-28-05	Location: GTSW-11
Time: 15-35	
SAMPLING CONDITIONS	
Sampling Method: Grab	Depth Sample Taken: Surf
Water Level BTC (ft): —	Well Depth BTC (ft):
Water Appearance: Clear / odorless — taken w 5's of fence.	
Stream Flow:	

FIELD MEASUREMENTS

TIME: (h:m:s)	15-46						
Depth to Water (ft)							
Flow Rate (gpm)							
Temperature (°C or °F)	22.20						
Conductivity (uS/cm)	456						
pH	8.83						
Turbidity (ntu)	2.69						
Evacuation (gal)							
Cumulative Evac. (gal)							

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 6-28-05

1540

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gin			Personnel: JB Brown		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech		pH ~~4.0~~ 7.0	9AB020	4-06
Conductivity	"		pH 10.0	9AK055	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:					
GENERAL					
Date: 7-21-05			Location: GTSW-1		
Time: 8:50					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear / odorless					
Stream Flow: See measurements					
FIELD MEASUREMENTS					
TIME:	900				
Temperature (°C or °F)	8.7				
Conductivity (uS/cm)	388				
pH	7.12				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: [signature] Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers		Personnel:	JB Brown S Sprague	
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH 4.07	4AB020	4-06
Conductivity	"	pH 7.010	4AK055	11-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:				
GENERAL				
Date: 7-21-05		Location: GTSW-2		
Time: 945				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear / Odorless				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	945			
Temperature (°C or °F)	8.6			
Conductivity (uS/cm)	375			
pH	8.26			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			Raw / Filtered	
Organics – Sulfuric Acid Preserved:			Raw / Filtered	

Sampler's Signature: J.S. Brown Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Central Farmers Fert Site			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Cole Parmer		pH ~~4.0~~ ~~7.0~~ 7	4AB020	4-06
Conductivity	"		pH ~~7.0~~ 10	4AK015	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:					
GENERAL					
Date: 7-21-05			Location: GTSW-3		
Time: 1030					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear / odorless					
Stream Flow: See meas. sheet					
FIELD MEASUREMENTS					
TIME: 1030	1030				
Temperature (°C or °F)	13.1				
Conductivity (uS/cm)	376				
pH	8.23				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: J. J. [illegible] Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers		Personnel: JB Brown, S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH ~~4.0~~ 10.07	4AB020	4-06
Conductivity	"	pH ~~7.0~~ 10	4AK055	11-06
Temperature	"	1413 uS/cm	5AB050	2-06
Other:	None			
GENERAL				
Date: 7-21-05		Location: 67SW-4		
Time: 1130				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surf		
Water Appearance: Clear / odorless				
Stream Flow: ~ 0.1 → 0.3 cfs				
FIELD MEASUREMENTS				
TIME:	1130			
Temperature (°C or °F)	13.4			
Conductivity (uS/cm)	463			
pH	8.16			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:			Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:			Raw / Filtered	
Total Suspended Solids – Unpreserved:			Raw / Filtered	
Organics – Unpreserved:			~~Raw / Filtered~~	
Organics – Sulfuric Acid Preserved:			~~Raw / Filtered~~	

Sampler's Signature: J.A. Brown Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Central Farmers Plant Facility			Personnel:		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech		pH ~~4.0~~ 7	4AB020	4-06
Conductivity	"		pH ~~7.0~~ 10	4AK055	11-05
Temperature	"		1413 uS/cm	5AB050	2-06
Other:					
GENERAL					
Date: 7-21-05			Location: GTSW-5		
Time: 11 50					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: surf.		
Water Appearance: clear - odorless					
Stream Flow: ~ 0.1 cfs					
FIELD MEASUREMENTS					
TIME:	11 50				
Temperature (°C or °F)	17.2				
Conductivity (uS/cm)	452				
pH	8.37				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: J. S. Zier Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers Fert.		Personnel: B Brown S Sprague		
Instruments:		Standards	Lot No.	Expiration
PH	Geotech	pH ~~4.0~~ 7	4AB020	4-06
Conductivity	"	pH ~~7.0~~ 10	4AK055	11-06
Temperature	"	~~1413~~ uS/cm	5AB050	2-06
Other:				

GENERAL

Date: 7-21-05	Location: GTSW-6
Time: 11 10	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: Surf
Water Appearance: slightly cloudy	
Stream Flow: NA - seep pond	

FIELD MEASUREMENTS

TIME:	11 10				
Temperature (°C or °F)	20.4				
Conductivity (uS/cm)	448				
pH	8.10				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Central Farmers			Personnel: JB Brown S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech		pH 4.0 7	4AB070	4-06
Conductivity	"		pH 7.0 10	4AK055	11-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:					
GENERAL					
Date: 7-21-05			Location: GTSW-7		
Time: 1055					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surf.		
Water Appearance: slightly cloudy - slight odor					
Stream Flow: NA					
FIELD MEASUREMENTS					
TIME:	1055				
Temperature (°C or °F)	21.7				
Conductivity (uS/cm)	252				
pH	7.58				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

Sampler's Signature: [signature] Date: 7-21-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sponsler / JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL060	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:				
GENERAL				
Date: Aug 25, 05		Location: GTSW-1		
Time: 1075				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken:		
Water Appearance: clear				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1015			
Temperature (°C or °F)	7.7			
Conductivity (uS/cm)	370			
pH	7.94			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
$NO_2 + NO_3$		Y	Raw	

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: Georgetown Gen			Personnel: JB Brown, S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	Geotech		pH 4.0	5AA002	1-07
Conductivity	"		pH 7.0	4AL060	12-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	Hach Turbidity meter				
GENERAL					
Date: 8-26-05			Location: GTSW-2		
Time: 12 35					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear - odorless					
Stream Flow: See meas. sheet					
FIELD MEASUREMENTS					
TIME:	12 35				
Temperature (°C or °F)	14.5				
Conductivity (uS/cm)	374				
pH	8.35				
SAMPLES COLLECTED					
General Indicators & Anions – Unpreserved:				Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:				Raw / Filtered	
Total Suspended Solids – Unpreserved:				Raw / Filtered	
Organics – Unpreserved:				Raw / Filtered	
Organics – Sulfuric Acid Preserved:				Raw / Filtered	

12 35

Sampler's Signature: [signature] Date: 8-26-05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant			Personnel: JB Brown, S Sprague		
Instruments:			Standards	Lot No.	Expiration
PH	~~Hach~~ Geotech		pH 4.0	5AA002	1-07
Conductivity	"		pH 7.0	4AL060	12-06
Temperature	"		1413 uS/cm	5AB050	2-06
Other:	Hach 2100P turbidity				
GENERAL					
Date: 8-26-05			Location:		
Time: 1205					
SAMPLING CONDITIONS					
Sampling Method: Grab			Depth Sample Taken: Surface		
Water Appearance: Clear - odorless					
Stream Flow: See meas sheet					
FIELD MEASUREMENTS					
TIME:					
Temperature (°C or °F)	9.0°C				
Conductivity (uS/cm)	367				
pH	8.01				

SAMPLES COLLECTED	
General Indicators & Anions – Unpreserved:	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Raw / Filtered
Total Suspended Solids – Unpreserved:	Raw / Filtered
Organics – Unpreserved:	Raw / Filtered
Organics – Sulfuric Acid Preserved:	Raw / Filtered

Sampler's Signature: [signature] Date: 8-26-05 1205

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SS Sprague / JS Brown		
Instruments:		Standards	Lot No.	Expiration
PH	GroTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL069	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:				

GENERAL

Date: Aug 25, 2005	Location: GTSW-4
Time: 930	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: Surface

Water Appearance: clear

Stream Flow: not determined

FIELD MEASUREMENTS

TIME:	930				
Temperature (°C or °F)	9.0				
Conductivity (uS/cm)	476				
pH	7.58				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SB Sprague / JSBrow		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL009	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:				

GENERAL

Date: Aug 25, 2005	Location: SW GT-7
Time: 830	

SAMPLING CONDITIONS

Sampling Method: Grab	Depth Sample Taken: surface

Water Appearance: slightly turbid with moss

Stream Flow: — level - 1.5 inches

FIELD MEASUREMENTS

TIME:	930				
Temperature (°C or °F)	13.9				
Conductivity (uS/cm)	251				
pH	6.73				

SAMPLES COLLECTED

General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	~~N~~ Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2 + NO_3	Y	Raw

Sampler's Signature: [signature] Date: Aug 25, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidimeter			
GENERAL				
Date: ~~1242~~ Oct 11, 05		Location: GT4SW-1		
Time: 1245		OCT05 taken here		
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear LOB				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1245			
Temperature (°C or °F)	5.9			
Conductivity (uS/cm)	398			
pH	7.77			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
NO_2+NO_3		Y	Raw	

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS/JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL069	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other: Hach 2100 Turbidimeter				
GENERAL				
Date: Oct 11, 05		Location: GTSW-2		
Time: 1350				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear Turb 1.09 NTU				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1350			
Temperature (°C or °F)	8.0			
Conductivity (uS/cm)	401			
pH	8.27			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	(Raw) (Filtered)
Metals & Cations – Nitric Acid Preserved:	Y	(Raw) / (Filtered)
Total Suspended Solids – Unpreserved:	Y	(Raw) / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2+	Y	(Raw)

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL065	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidimeter			
GENERAL				
Date: Oct 11, 05		Location: GTSW-3		
Time: 1430				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: Clear — Turb = 0.51				
Stream Flow:				
FIELD MEASUREMENTS				
TIME:	1430			
Temperature (°C or °F)	6.6			
Conductivity (uS/cm)	397			
pH	8.42			
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
$NO_2 + NO_3$		Y	Raw	

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	5AL068	Dec 06
Temperature	"	1413 uS/cm	5AB070	Feb 06
Other:	Hach 2100 Turbidimeter			
GENERAL				
Date: Oct 11, 05		Location: GTSW-4		
Time: 1110				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface		
Water Appearance: clear				
Stream Flow: not measured				
FIELD MEASUREMENTS				
TIME:	1110			
Temperature (°C or °F)				
Conductivity (uS/cm)				
pH				
SAMPLES COLLECTED				
General Indicators & Anions – Unpreserved:		Y	Raw / Filtered	
Metals & Cations – Nitric Acid Preserved:		Y	Raw / Filtered	
Total Suspended Solids – Unpreserved:		Y	Raw / Filtered	
Organics – Unpreserved:		N	Raw / Filtered	
Organics – Sulfuric Acid Preserved:		N	Raw / Filtered	
$NO_2 + NO_3$		Y	Raw	

Sampler's Signature: [signature] Date: Oct 11, 05

FIGURE 4
FIELD SURFACE WATER QUALITY SAMPLING FORM

Project: GTC Plant		Personnel: SBS / JSB		
Instruments:		Standards	Lot No.	Expiration
PH	GeoTech	pH 4.0	5AA002	Jan 07
Conductivity	"	pH 7.0	4AL068	Dec 06
Temperature	"	1413 uS/cm	5AB050	Feb 06
Other:	Hach 2100 Turbidimeter			
GENERAL				
Date: Oct 11, 05		Location: GTSW-07		
Time: 1045				
SAMPLING CONDITIONS				
Sampling Method: Grab		Depth Sample Taken: Surface - 1.5 ft		
Water Appearance: Turbid 14.9 NTU				
Stream Flow: —				
FIELD MEASUREMENTS				
TIME:	1045			
Temperature (°C or °F)	5.6			
Conductivity (uS/cm)	263			
pH	6.95			

SAMPLES COLLECTED		
General Indicators & Anions – Unpreserved:	Y	Raw / Filtered
Metals & Cations – Nitric Acid Preserved:	Y	Raw / Filtered
Total Suspended Solids – Unpreserved:	Y	Raw / Filtered
Organics – Unpreserved:	N	Raw / Filtered
Organics – Sulfuric Acid Preserved:	N	Raw / Filtered
NO_2+NO_3	Y	Raw

Sampler's Signature: [signature] Date: Oct 11, 05