

#### Revision 1

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## HYDROGEOLOGIC INVESTIGATION REPORT

FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Prepared For: Exelon Generation Company, LLC

DISCLAIMER:

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#### **EXECUTIVE SUMMARY**

This Hydrogeologic Investigation Report (HIR) documents the results of Conestoga-Rovers & Associates' (CRA's) May to July 2006 hydrogeologic investigation pertaining to the Quad Cities Generating Station in Cordova, Illinois (Station). CRA prepared this HIR for Exelon Generation Company, LLC (Exelon) as part of its Fleetwide Program to determine whether groundwater at and in the vicinity of its nuclear power generating facilities has been adversely impacted by any releases of radionuclides.

CRA collected and analyzed information on any historical releases, the structures, components, and areas of the Station that have the potential to release tritium or other radioactively contaminated liquids to the environment and past hydrogeologic investigations at the Station. CRA used this information, combined with its understanding of groundwater flow at the Station, to identify Areas for Further Evaluation (AFEs) and sample locations for the Station.

CRA installed 22 monitoring wells and collected 32 groundwater samples (22 from newly installed monitoring wells, two from existing monitoring wells near the AFEs, and eight from water supply wells) and two surface water samples at the Station. All groundwater and surface water samples were analyzed for tritium, strontium-89/90, and gamma-emitting radionuclides.

The results of the hydrogeologic investigation are:

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 picoCuries per liter (pCi/L) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Tritium was detected at concentrations greater than LLD of 200 pCi/L in groundwater samples from nine wells in the vicinity of and south/southwest of the Service and Reactor Buildings, from two wells north/northwest of the Turbine Building, and in surface water samples collected from the Spray Canal. The concentrations of tritium in groundwater greater than the LLD of 200 pCi/L ranged from  $250 \pm 126$  to  $9,640 \pm 660$  pCi/L with the exception of MW-QC-102I at  $32,600 \pm 977$ , which is greater than the United States Environmental Protection

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Agency (USEPA) drinking water standard of 20,000 pCi/L. These tritium detections are likely related to the historical releases;

- Tritium was detected in the Station's Spray Canal at  $497 \pm 140 \,\mathrm{pCi/L}$  and  $550 \pm 14 \,\mathrm{pCi/L}$ , which is well below USEPA's drinking water standard of 20,000 pCi/L. The tritium in the Spray Canal is likely associated with the canal's water supply, the Big Fish Well (740 pCi/L  $\pm$  152);
- Based on the results of this investigation, tritium has not migrated off site at detectable concentrations;
- Based on the results of this investigation, there is no current risk of exposure to radionuclides associated with licensed plant operations through any of the potential exposure pathways; and
- Based on the results of this investigation, there are no known active releases into the groundwater at the Station.

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

#### 1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) prepared this Hydrogeologic Investigation Report (HIR) for Exelon Generation Company, LLC (Exelon) as part of its Fleetwide Program to determine whether groundwater at and near its nuclear power generating facilities has been adversely impacted by any releases of radionuclides. This report documents the results of CRA's May 2006 Hydrogeologic Investigation Work Plan (Work Plan), as well as several other investigative tasks recommended by CRA during the course of the investigation. The investigations pertain to Exelon's Quad Cities Generating Station in Cordova, Illinois (Station) (see Figure 1.1) between May and July 2006. The Station is defined as all property, structures, systems, and components owned and operated by Exelon located at 22710 206th Avenue North, Cordova, Illinois. The approximate property boundaries are depicted on Figure 1.2.

Pursuant to the Work Plan, CRA assessed groundwater quality at the Station in locations designated as Areas for Further Evaluation (AFEs). The process by which CRA identified AFEs is discussed in Section 3.0 of this report.

The objectives of the Work Plan were to:

- characterize the geologic and hydrogeologic conditions at the Station, including subsurface soil types, the presence or absence of confining layers, and the direction and rate of groundwater flow;
- characterize the groundwater/surface water interaction at the Station, including a determination of the surface water flow regime;
- evaluate groundwater quality at the Station including the vertical and horizontal extent, quantity, concentrations and potential sources of tritium and other radionuclides in the groundwater, if any;
- define the probable sources of any radionuclides released at the Station;
- evaluate potential human, ecological, or environmental receptors of any radionuclides that might have been released to the groundwater; and
- evaluate whether interim response activities are warranted.

#### 2.0 STATION DESCRIPTION

This section presents a summary of the Station location and definition, an overview of Station operations, surrounding land use, and an overview of both regional and Station-specific topography, surface water features, geology, hydrogeology, and groundwater flow conditions. This section also presents an overview of groundwater use in the area.

#### 2.1 STATION LOCATION

The Station is located at 22710 206th Avenue North, Cordova, Illinois (see Figure 1.1). The Station property consists of approximately 784 acres. The Station is owned by Exelon Nuclear (75 percent) and MidAmerican Energy (25 percent). Figure 2.1 presents a Station base map with the Station infrastructure shown.

#### 2.2 OVERVIEW OF COOLING WATER OPERATIONS

The Station consists of two nuclear reactors, associated structures and ancillary buildings, a 310-foot main stack, intake and discharge canals, and a former Spray Canal. The Spray Canal is approximately 3 miles long and was used for condenser cooling water until 1983, at which time it was changed to a facility to raise game fish for release into the Mississippi River.

The Station's generating system consists of a two-unit nuclear-powered steam electric plant. Each unit is a boiling water reactor (BWR) that produces a net electrical power output of 930 megawatts. Unit 1 began commercial operation on February 18, 1973, and Unit 2 began commercial operation on March 10, 1973. The Station currently operates under the Nuclear Regulatory Commission (NRC) Operating Licenses DPR-29 and DPR-30 and is permitted to discharge liquid waste to the Mississippi River under its National Pollutant Discharge Elimination System (NPDES) permit IL0005037.

A BWR plant consists of two separate fluid loops. A separate loop design avoids mixing the fluids of one loop with the fluids of the other. The loops are called the primary loop and the cooling loop.

The main purpose of the primary loop is to transfer the energy generated from fission in the fuel to the turbine generator. It is a closed loop system. Nuclear fission creates heat in the fuel. This heat produces steam, which is passed through a steam dryer and

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moisture separator. The steam turns the turbine generator, which makes electricity. The unused steam is exhausted to the condenser where it is condensed into water. The resulting water is pumped out of the condenser with a series of pumps, reheated, and pumped back to the reactor vessel.

The main purpose of the cooling loop is to use cooler river water to condense the steam in the condenser and transfer the heat to the environment. This loop is a single pass process. The cooling water is pumped to the discharge bay and then discharged back to the Mississippi River.

The total flow of river water through Units 1 and 2 for condenser circulating water and service water is approximately 970,000 gallons per minute (gpm). Water is withdrawn from the river at the intake bay through a canal that is perpendicular to the river flow. The Station uses a two-pipe diffuser system to discharge cooling water to the Mississippi River from the discharge bay. The pipes are 16 feet in diameter and lie on the bottom of the river across the main river flow. Water is discharged into the deepest part of the river through regularly spaced jet nozzles in the pipes.

Radioactive liquid wastes (radwastes) are collected in sumps and drain tanks at various locations at the Station and then transferred to tanks in the Radwaste Building for processing, storage, and release. Liquid wastes that can be reused are returned to the Contaminated Condensate Storage Tanks (CCSTs). Liquid wastes that cannot be reused are returned to the Radwaste System for reprocessing or discharging to the river (NRC, 2004). Liquid wastes are discharged via the River Discharge Tank (RDT). Water from the RDT is pumped out to the diffuser house that empties into the south diffuser below the water surface. The liquid waste mixes with the effluent from the discharge bay prior to dispersion out the diffuser pipe.

#### 2.3 <u>SURROUNDING LAND USE</u>

The area surrounding the Station to the north, east, and south is rural farmland and woods. There is an industrial park 1 mile further to the north, and the Cordova Energy Center, a gas-fired power plant, is located 1 mile to the southeast.

The Station is located on the east bank of the Mississippi River opposite the mouth of the Wapsipinicon River. The Upper Mississippi River National Wildlife and Fish Refuge is across the river from the Station and also on islands in the river about 2 miles downstream from the Station.

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#### 2.4 STATION SETTING

The following section presents a general summary of the topography, surface water features, geology, hydrogeology, and groundwater flow conditions near the Station. The information was primarily gathered from Chapter 2.5 of the Quad Cities Station Updated Final Safety Analysis Report (UFSAR, Revision 8, October 2005). The main references the UFSAR relies upon are listed in Section 10.0. CRA checked and verified all UFSAR references that apply to this HIR.

#### 2.4.1 TOPOGRAPHY AND SURFACE WATER FEATURES

The Station is located in Rock Island County, which is within the Galesburg Plain physiographic subsection of the Till Plains Section of the Central Lowland Province. A flat to gently rolling topography in the Central Lowland Province characterizes almost all of Illinois. The Galesburg Plain is level to undulating and is largely an Illinoian stage glacial drift but only locally is there prominent glacial topography. Much of the surface topography mimics the underlying bedrock surface.

The Station's natural grade level is at an elevation of 594.5 feet above mean sea level (AMSL). The Station is on moderately high ground on the east bank of the Mississippi River. The ground surface rises from the river to form steep bluffs approximately 20 to 40 feet in height. The bluffs are breached in places by gullies extending short distances inland.

The Station is on the east side of the Mississippi River opposite the mouth of the Wapsipinicon River. The Upper Mississippi River near the Station is composed of a series of slack-water pools during low flow. The pools are formed by navigation dams located on the river both above and below the Station. The Station is located near Pool #14; the normal elevation of this pool is 572 feet AMSL (Blume, 1966).

Station surface water bodies include the former Spray Canal, discharge bay, intake bay, and dredge ponds. Silt pumped from the intake bay and from the Mississippi River in front of the intake bay is deposited in the dredge ponds. The dredge ponds contain river sediment so tritium impact from the Station is not anticipated.

#### 2.4.2 GEOLOGY

The region is on the extreme northwest flank of the Illinois Basin. The upper bedrock consists of Paleozoic sedimentary strata that dip gently, at approximately 15 to 20 feet per mile, to the southeast toward the center of the Illinois Basin. The region is on the south limb of the Savanna-Sabula Anticline (also known as the Plum River Fault Zone), which trends east-west through Carroll County, several miles north of the Station. The Paleozoic sedimentary rocks are of Silurian and older age and are on the order of 3,000 feet thick. They are underlain by Precambrian crystalline rocks (granite and granodiorite) (Blume, 1966).

Beneath the Station are unconsolidated sediments comprised of clay, silt, sand, and gravel deposited as glacial till, outwash, and river alluvium deposits. The unconsolidated sediments are underlain by bedrock of Silurian (Niagaran/Alexandrian Dolomite), Ordovician (Maquoketa Shale, Galena - Platteville Dolomite, and Glenwood - St. Peter Sandstone), and Cambrian age (dolomites, sandstones, and shales) (Blume, 1966).

The Niagaran Dolomite is fossiliferous and sandy. In an abandoned Niagaran Dolomite quarry, which is located approximately 1 mile south of Cordova, there is a high degree of fracturing in the dolomite, and the dolomite was weather-stained along fractures but was a hard competent crystalline rock. Exploration test borings indicate that the upper bedrock surface is weathered to varying depths. Deep borings indicate that the Silurian Dolomite (Niagaran and Alexandrian Formations) is approximately 250 to 300 feet thick (Blume, 1966).

Figure 2.2 presents the stratigraphic column for the Rock Island area and the area to the south and southeast. Although the stratigraphic column shows the Pennsylvanian, Mississippian, and Devonian systems, these systems are not present in northern Rock Island County, where the first bedrock encountered beneath the overburden is Silurian Dolomite. Figure 2.3 presents a bedrock geologic map with a cross-section location. The Station is adjacent to the northern portion of the cross-section and is underlain by Silurian Dolomite. The cross-section in Figure 2.4 shows the sequence and structure of the bedrock in the Station area (J.E. Bruckmann and R.E. Bergstrom, 1968).

The dolomite bedrock surface in northern Rock Island County has been eroded by the ancient Mississippi drainage system. The Meredosia Channel, the upper portion of the Princeton Bedrock Valley system, is drift-filled lowland connecting the present Mississippi River Valley and the Green River Lowland to the east. The mean elevation of the bedrock surface in the channel is approximately 450 feet AMSL. However, a

glacially scoured groove more than 100 feet deep, nearly 4 miles long, and 3,000 feet wide is present along a portion of the south wall of the channel. It is thought that the Meredosia Channel was entered at least once by glaciers during each of the four major glaciations, with the glaciers entering first from the west and later from the east (L.D. McGinnis and P.C. Heigold). The channel has been filled with unconsolidated sediments.

The Station is on a rock hill that was left as an erosional remnant between channels (Blume, 1966), as is shown on Figure 2.5. The depth to bedrock beneath the Station is approximately 50 feet. South of the Station, the thickness of the sand and gravel increases greatly, to as much as 300 feet, due to the presence of the buried Meredosia Channel that cuts into the dolomite bedrock (Blume, 1966). Figure 2.6 shows the approximate northern extent of the Meredosia Channel.

#### 2.4.3 <u>HYDROGEOLOGY</u>

Groundwater can be obtained from three aquifer systems:

- unconsolidated alluvial and outwash sand and gravel deposits, 40 to 60 feet thick in the vicinity of the Station;
- shallow Silurian dolomitic formations, approximately 200 to 250 feet thick; and
- artesian sandstone aquifers of Cambrian-Ordovician age.

The potential yield from the upper unconsolidated aquifer is unknown because of lack of local pumping data. But in other parts of the Mississippi Valley, this aquifer is generally capable of yielding large quantities of water on a long-term basis. The groundwater elevation in the unconsolidated aquifer ranged between 17 and 21 feet below ground surface (bgs) on the Station. The groundwater flow direction in this unit was anticipated in a westerly direction toward the Mississippi River. However, as noted in Section 2.4.2, the Station sits on bedrock high with buried bedrock valleys of the Meredosia Channel to the north and south (see Figure 2.5). These buried channels contain thick (greater than 200 feet) deposits of sand and gravel. The buried channels will likely affect the groundwater flow in the upper consolidated aquifer beneath the Station. It is also likely that the groundwater table will undergo seasonal fluctuations and that a temporary reversal of groundwater flow direction may occur from the Mississippi River (Blume, 1966). Based on published records, it is known that the Army Corps of Engineers maintains the water level in the Mississippi River adjacent to the Station at an elevation of 572 feet AMSL.

In addition to these natural effects, the groundwater flow direction may be affected locally by structure basements and foundations, and by sheet piles beneath the Station to a depth of 36 feet bgs at the river along the discharge bay and the inlet to the Spray Canal (sheet pile locations are illustrated on Figure 2.6)

The Silurian Dolomite formations yield moderate to high quantities of water, particularly in areas where unconsolidated sand and gravel sediments are present. Dolomite aquifers immediately below the alluvium and outwash deposits are slowly recharged from water in these deposits. Wells in the Cambrian-Ordovician sandstone artesian aquifers produce large quantities of water. Groundwater in the deep artesian aquifers is independent of the shallow near surface aquifers (Blume, 1966).

#### 2.5 AREA GROUNDWATER USE

CRA performed a comprehensive private well survey in the vicinity of the Station. CRA obtained water well information from the Illinois State Geological Survey and the Illinois State Water Survey. Eighty-seven private wells were identified as potentially within 1 mile of the Station. CRA notes that the Illinois State Geological Survey and the Illinois State Water Survey data sources are not updated with abandoned or closed well information and distances from a referenced point may not be accurately reported. The private wells range in depth between 20 and 250 feet bgs with the oldest private well dating back to 1909 and the most recent private well being installed on November 3, 2005. Fifteen public, industrial, and commercial wells were identified as potentially within 1 mile of the Station. The public, industrial, and commercial wells range in depth from 58 to 1,800 feet bgs with the oldest well dating back to 1966 and the most recent well being installed in 2004. Thirteen of the public, industrial, and commercial wells are listed as being located at the Station. The remaining two public, industrial, and commercial wells list the owner as "Saddle Club Farms", a horse farm/dinner club no longer in operation that was located over 1 mile from the Station. Copies of the well logs obtained are provided in Appendix A.

The Station receives potable water from three wells:

- Well #1 (drilled 1966, 242 feet deep, cased to 52 feet bgs);
- Well #5 (drilled 1969, 264 feet deep, cased to 59 feet bgs); and
- Fish House Well #10 (drilled 2004, 135 feet deep).

None of these wells are of a suitable depth or construction to use for determining groundwater contours. The well locations are shown on Figure 2.6 (see Appendix A for well information).

The following water supply wells are also located at the Station:

- Fire Training Well (drilled 1987, 225 feet deep);
- Big Fish Well (drilled 1984, 175 feet deep);
- Little Fish Well (drilled 1986, 60 feet deep);
- Dry Cask Storage Well (also know as East Well, drilled approximately 1960, 84 feet deep); and
- Sewage Treatment Plant (STP) Sand Point Well (drilled 1985, 30 feet deep).

#### 3.0 AREAS FOR FURTHER EVALUATION

CRA considered all Station operations in assessing groundwater quality at the Station. During this process, CRA identified areas at the Station that warranted further evaluation or "AFEs". This section discusses the process by which AFEs were selected at the Station.

CRA's identification of AFEs involved the following components:

- Station inspection on March 22, 2006 accompanied by Station personnel;
- interviews with Station personnel;
- evaluation of Station systems;
- investigation of confirmed and unconfirmed releases of radionuclides; and
- review of previous Station investigations.

CRA analyzed the information collected from these components combined with information obtained from CRA's study of hydrogeologic conditions at the Station to identify those areas where groundwater potentially could be impacted from operations at the Station.

CRA then designed an investigation to determine whether any confirmed or potential releases or any other release of radionuclides adversely affected groundwater. This entailed evaluating whether existing Station groundwater monitoring systems were sufficient to assess the groundwater quality at the AFEs. If the systems were not sufficient to adequately investigate groundwater quality associated with any AFE, CRA installed additional monitoring wells.

The following sections describe the above considerations and the identification of AFEs. The results of CRA's investigation are discussed in Section 5.0.

#### 3.1 <u>SYSTEMS EVALUATIONS</u>

Exelon launched an initiative to systematically assess the structures, systems, and components that store, use, or convey potentially radioactively contaminated liquid. Maps depicting each of these systems were developed and provided to CRA for review. The locations of some of these systems are presented on Figure 3.1. The Station identified a total of 16 systems that contain or could contain potentially radioactively contaminated liquid. The following presents a list of these systems.

System Identification	Description
1000	Residual Heat Removal (RHR)/RHR Service Water
1300	Reactor Core Isolation Cooling
1400	Core Spray
2000	Radwaste includes Reactor Building Equipment and Floor Drains
2300	High Pressure Coolant Injection
2600	Sewage Treatment Plant
2600	Wastewater Treatment Plant
3000	Main Steam
3300	Condensate Transfer
4400	Circulating Water System
4900	Turbine Building Floor Drains
5400/9300	Off Gas
5650	Electro Hydraulic Control (EHC)
5700	Heating System/Heating Ventilation and Air
	Conditioning
5773	Heating Boilers
8900	High Rad Sample System (HRSS)

After these systems were identified, Exelon developed a list of the various structures, components, and areas of the systems (e.g., piping, tanks, and process equipment) that handle or could potentially handle radioactively contaminated liquid. The structures, components, and areas may include:

- aboveground storage tanks;
- condensate vents;
- areas where confirmed or potential historical releases, spills, or accidental discharges may have occurred;
- pipes;
- pools;
- sumps;
- surface water bodies (i.e., basins, pits, ponds, or lagoons);
- trenches;
- underground storage tanks; and
- vaults.

The Station then individually evaluated the various system components to determine the potential for any release of radioactively contaminated liquid to enter the environment. Each structure or identified component was evaluated against the following seven primary criteria:

- location of the component (i.e., basement or second floor of building);
- component construction material (i.e., stainless steel or steel tanks);
- construction methodologies (i.e., welded or mechanical pipe joints);
- concentration of radiological contaminated liquid stored or conveyed;
- amount of radiological contaminated liquid stored or conveyed;
- existing controls (i.e., containment and detection); and
- maintenance history.

System components, which were located inside a building or otherwise had some form of secondary containment, such that a release of radioactively contaminated liquid would not be discharged directly to the environment, were eliminated from further evaluation. System components that are not located within buildings or did not have some other form of secondary containment were retained for further qualitative evaluation of the risk of a release of radioactively contaminated liquid to the environment and the potential magnitude of any release.

Exelon's risk evaluation took into consideration factors such as:

- the potential concentration of radionuclides;
- the volume of liquid stored or managed;
- the probabilities of the systems actually containing radioactive contaminated liquid;
   and
- the potential for a release of radioactively contaminated liquid from the system component.

These factors were then used to rank the systems and system components as to the risk for a potential release of a radioactively contaminated liquid to the environment. The evaluation process resulted in the identification of structures, components, and areas to be considered for further evaluation.

#### 3.2 HISTORICAL RELEASES

CRA reviewed information concerning confirmed or potential historical releases of radionuclides at the Station, including reports and documentation previously prepared by Exelon and compiled for CRA's review. CRA evaluated this information in identifying AFEs. Any historical releases identified during the course of this assessment that may have a current impact on Station conditions are further discussed in Section 3.4.

#### 3.3 <u>STATION INVESTIGATIONS</u>

CRA also considered previous Station investigations in the process of selecting the AFEs for the Station. This section presents a summary of the pre-operational Radiological Environmental Monitoring Program (pre-operational REMP), past Station investigations, and the Radiological Environmental Monitoring Program (REMP).

## 3.3.1 PRE-OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The pre-operational REMP report was conducted to establish background radioactivity levels prior to operation of the Station. The program was completed in December 1971 by Eberline Instrument Corporation for the Commonwealth Edison Company. The pre-operational REMP report included monitoring for atmospheric radiation, fall-out, domestic water, surface water, marine life, and foodstuffs.

Atmospheric radiation monitoring consisted of gas and air particulate radioactivity measurements; fall-out monitoring consisted of radioactivity measurements of soil, vegetation, and rain water; domestic water monitoring consisted of well water sample analysis; surface water samples were collected from the Mississippi River near the Station, the Davenport Water Works, and the East Moline Water Works; and foodstuffs monitoring included samples of milk.

The pre-operational REMP surface water tritium analytical results ranged from non detect at an unspecified Lower Limit of Detection (LLD) to  $1,590 \pm 850$  picoCuries/liter (pCi/L).

Gross alpha groundwater analytical results ranged from non detect at unspecified LLDs to a maximum detected activity of  $2.00 \pm 0.9$  pCi/L. Gross beta groundwater analytical

results (including tritium) ranged from non detect at unspecified LLDs to a maximum detected activity of  $34.2 \pm 2.3$  pCi/L.

#### 3.3.2 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The REMP was initiated at the Station in 1968. The REMP includes the collection of multi-media samples including air, surface water, groundwater, fish, clams, crabs, sediment, and vegetation. The samples are analyzed for beta and gamma-emitting radionuclides, tritium, iodine-131, and/or strontium as established in the procedures developed for the REMP. The samples are collected at established locations, identified as stations, so that trends in the data can be monitored. An annual report is prepared providing a description of the activities performed and the results of the analysis of the samples collected from the various media.

As part of REMP, surface water samples are collected at two locations and groundwater samples are collected at two locations. The Station collects quarterly groundwater samples from two off-site wells (sample locations Q-35 and Q-36) and analyzes the samples for tritium. Quarterly composites of weekly samples of Mississippi River water collected upstream (Q-34) and downstream (Q-33) from the Station are analyzed for tritium. The REMP reports for 2001 through 2004 state that tritium concentrations remained below the LLD of 200 pCi/L in all of the groundwater and river water samples. According to the Station, tritium concentrations in the well water and river water samples have remained less than the LLD of 200 pCi/L since this testing was first initiated.

The report reviewed by CRA was prepared by Station personnel and is entitled "Annual Radiological Environmental Operating Report for the Quad Cities Nuclear Power Station, dated May 2005". This report concluded that the operation of the Quad Cities Station had no adverse radiological impacts on the environment.

#### 3.3.3 <u>HISTORIC INVESTIGATIONS</u>

No historic investigations related to radionuclides impact to groundwater were completed at the Station.

#### 3.3.4 POWER PLANT DOCUMENTS - UFSAR REPORT

During the construction of the Station, a series of comprehensive investigations of regional and local geology, surface water, and groundwater conditions were conducted. These studies are documented in UFSAR Revision 8, October 2005.

#### 3.4 IDENTIFIED AREAS OF FURTHER EVALUATION

CRA used the information presented in the above sections along with its understanding of the hydrogeology at the Station to identify AFEs which were a primary consideration in the development of the scope of work in the Work Plan. The establishment of AFEs is a standard planning practice in hydrogeologic investigations to focus the investigation activities at areas where there is the greatest potential for impact to groundwater.

Specifically, AFEs were identified based on these six considerations:

- systems evaluations;
- risk evaluations;
- review of confirmed and/or potential releases;
- review of documents;
- review of the hydrogeologic conditions; and
- Station inspection completed on March 22, 2006.

Prior to CRA completing its analysis and determination of AFEs, Station personnel completed an exhaustive review of all historic and current management of systems that may contain potentially radioactively contaminated liquids.

CRA reviewed the systems identified by the Station that have the potential for the release of radioactively contaminated liquid to the environment and groundwater flow at the Station. This evaluation allowed CRA to become familiar with Station operations and potential systems that may impact groundwater. CRA then evaluated information concerning historic releases as provided by the Station. This information, along with a review of the results from historic Station investigations, was used to refine CRA's understanding of areas likely to have the highest possibility of impacting groundwater. Where at risk systems or identified historical releases were located in close proximity or were located in areas which could not be evaluated separately, the systems and historical releases were combined into a single AFE. At times, during the Station

investigation, separate AFEs were combined into one or were otherwise altered based on additional information and consideration. This HIR details the AFEs investigated.

Finally, CRA used its understanding of known hydrogeologic conditions (prior to this investigation) to identify AFEs. Groundwater flow was an important factor in deciding whether to combine systems or historical releases into a single AFE or create separate AFEs. For example, groundwater flow beneath several systems that contain radioactively contaminated liquid that flows toward a common discharge point were likely combined into a single AFE. The AFEs were created based on known groundwater flow conditions prior to the work completed during this investigation.

Based upon its review of information concerning confirmed or potential historical releases, historic investigations, and the systems at the Station that have the potential for release of radioactively contaminated liquids to the environment combined with its understanding of groundwater flow at the Station, CRA identified five AFEs (see Figure 3.1).

#### AFE-Quad Cities-1 - Piping West of Radwaste Building/Floor Drain Surge Tank

This area was identified as an AFE due to its proximity to buried piping west of the Radwaste Building where historic releases have occurred and due to its proximity to the Floor Drain Surge Tank, which conveys waste and liquids potentially containing tritium.

#### AFE-Quad Cities-2 - Historic Releases Area South of Station Blackout Building (SBO)

This area was identified as an AFE due to its proximity to three reports of historic releases in this area. Historic releases related to this AFE occurred on August 17, 1975, December 10, 1979, and March 21, 1986. The locations of the releases are shown on Figure 3.2.

• On August 17, 1975, a Unit 2 feedwater valve leaked, releasing radioactively contaminated water to the soil east of the Trackway 2 (TW-2) rollup door. The impacted soil was excavated and shipped off site. Approximately 12,500 gallons of water were released: 8,500 gallons of feedwater and 4,000 gallons of fire suppression system water. Approximately 2,570 gallons of water entered the Unit 2 Oil/Water Separator, which was recovered and released through a permitted discharge point. Approximately 100 gallons of the water was released to Station surface soils in the vicinity of the TW-2 rollup door. Tritium was detected in Unit 2 Oil/Water Separator output at a concentration 97,000 pCi/L.

- On December 10, 1979, approximately 4,200 gallons of radioactively contaminated Residual Heat Removal (RHR) water was spilled into a storm drain system and on the surrounding blacktop east of the Unit 1 Reactor Building. Water which entered the Unit 1 Oil/Water Separator was recovered and released through a permitted discharge point. Based on subsequent sampling of the Unit 1 Oil/Water Separator, an estimated 25 millicuries were released through the discharge bay, which is a permitted pathway, and the remaining 12.8 millicuries went into the ground.
- On March 21, 1986, approximately 10 to 25 gallons of reactor water that contained tritium and radionuclides leaked onto the asphalt east of the Unit 1 Reactor Building from the Integrated Leak Rate Compressor. A small area of contaminated asphalt was removed. None of the water entered the storm drain.

All three of these historic releases occurred east of the Reactor Building, with the 1975 release occurring near the northeast corner of the Reactor Building and the 1979 and 1986 releases occurring at the current location of the Station Blackout Building (SBO).

#### AFE-Quad Cities-3 - CCSTs and Ancillary Piping

This area was identified as an AFE due to its proximity to the CCSTs and associated piping, which are not provided with secondary containment. Any historic releases from this storage system could potentially impact groundwater downgradient of the CCSTs.

#### AFE-Quad Cities-4 - Unit 1 Oil/Water Separator

This area was identified as an AFE as potential releases from the CCSTs and the south side of the plant would discharge to the Unit 1 Oil/Water Separator.

#### AFE-Quad Cities-5 - Unit 2 Oil/Water Separator

This area was identified as an AFE as potential releases from the north side of the plant would discharge to the Unit 2 Oil/Water Separator.

#### 4.0 FIELD METHODS

The field investigations for this HIR were completed from May through July 2006. The initial field investigations completed for this HIR in May and June 2006 were focused near the five AFEs identified for the Station. Additional field investigations were completed in June and July 2006 to determine the vertical and lateral extent of tritium in groundwater. CRA supervised the installation of monitoring wells at the Station and collected samples from the newly installed monitoring wells, the existing monitoring wells, and the existing water supply wells, as well as from surface water locations. The field investigations were completed in accordance with the methodologies presented in the Work Plan (CRA 2006).

In 2002, CRA installed three monitoring wells (MW-1, MW-2, and MW-3), which were screened from 17 to 27 feet bgs and located in the northwest portion of the Protected Area (PA). CRA collected groundwater samples as part of a separate hydrogeologic assessment for non-radionuclide parameters. No impacts were detected.

# 4.1 SURFACE WATER GAUGING POINT INSTALLATION AND MONITORING

Figure 4.1 presents the location of the three new surface water gauging points installed as part of this investigation. SW-QC-1 and SW-QC-2 are located on bridges that cross the Station Spray Canal. A third surface water gauging point (SW-QC-3) was installed at the discharge bay near MW-QC-103I. These gauging points were used for surface water elevation monitoring.

#### 4.2 GROUNDWATER MONITORING WELL INSTALLATION

Twenty-two new monitoring wells were installed at the Station as part of the fleetwide hydrogeologic investigation. Eleven monitoring wells were installed during the initial field investigations conducted in May 2006. These locations were selected based on a review of all data provided, the hydrogeology at the Station, and the current understanding of identified AFEs. An additional 11 monitoring wells were installed during the additional field investigations conducted in June and July 2006. These locations were selected based on a review of the hydrogeology at the Station, the current understanding of identified AFEs, and the analytical results from groundwater sampling conducted at the initial 11 monitoring wells and the eight water supply wells.

Monitoring well construction logs are provided in Appendix B. Figure 4.1 presents the location of the 22 new monitoring wells. Table 4.1 summarizes the monitoring well completion details.

Prior to completing any ground penetration activities, CRA completed subsurface utility clearance procedures to minimize the potential of injury to workers and/or damage to subsurface utility structures. The subsurface clearance procedures consisted of completing an electronic survey within a minimum of 10-foot radius of the proposed location utilizing electromagnetic and ground penetrating radar technology. Additionally, an air knife was used to verify utilities were not present at the proposed location to a depth of 10 feet bgs.

Specific installation protocols for the monitoring wells are described below:

- the borehole was advanced to the target depth using 4.25-inch inside diameter hollow-stem augers (HSA);
- a nominal 2-inch diameter (No. 10 slot) PVC screen, 5 or 10 feet in length, attached to a sufficient length of 2-inch diameter schedule 40 PVC riser pipe to extend to the surface, was placed into the borehole through the augers;
- a filter sand pack consisting of silica sand was installed to a minimum height of 2 feet above the top of the screen as the augers were removed;
- a minimum 2-foot thick seal consisting of 3/8-inch diameter bentonite pellets or bentonite chips was placed on top of the sand pack and hydrated using potable water;
- the remaining borehole annulus was sealed to within 3 feet of the surface using bentonite grout;
- the remaining portion of the annulus was filled with concrete and a 6-inch diameter protective above-grade or flush mount casing. The well head was fitted with a water-tight, lockable cap; and
- cement-filled bollard posts were installed around selected monitoring well locations.

The shallow soil borings completed in unconsolidated materials that were to be used for monitoring well installation were installed using 4.25-inch inside diameter HSA drilling techniques. The borehole depths ranged from 29 to 70 feet bgs. During the subsurface utility clearance activities described above, the borehole was periodically examined and the soil types documented. A description was added to each monitoring well construction log. The overburden soils were classified using the Unified Soil Classification System (USCS).

#### 4.3 GROUNDWATER MONITORING WELL DEVELOPMENT

To establish good hydraulic communication with the aquifer and to reduce the volume of sediment in the monitoring well, monitoring well development was conducted in accordance with this procedure:

- Monitoring wells were surged using a pre-cleaned surge block for a period of at least 20 minutes.
- Water was purged from the monitoring well using an electronic submersible pump.
- Groundwater was collected at regular intervals with the pH, temperature, and conductivity measured using field instruments. These instruments were calibrated daily according to the manufacturer's specifications. Additional observations such as color, odor, and turbidity of the purged water were recorded.
- Development continued until the turbidity and silt content of the monitoring wells was significantly reduced and three consistent readings of pH, temperature, and conductivity were recorded, or a minimum of ten well volumes was purged.

A summary of the well development parameters is provided in Table 4.2.

#### 4.4 SURVEY

The new monitoring wells and surface water gauging points were surveyed to establish reference elevations relative to mean sea level. The top of each well casing was surveyed to the nearest 0.01 foot relative to the National Geodetic Vertical Datum (NGVD), and the survey point was marked on the well casing. The survey included the ground elevation at each well to the nearest 0.10 foot relative to the NGVD and the well location to the nearest 1.0 foot. A reference point was also marked at each gauging point.

# 4.5 GROUNDWATER AND SURFACE WATER ELEVATION MEASUREMENTS

On May 24, 2006 and July 26, 2006, CRA collected water level measurements from new monitoring wells and surface water gauging points installed in accordance with the Work Plan and from two existing monitoring wells. CRA collected additional water level measurements at the surface water gauging points on June 22, 2006. Based on the

measured depth to water from the reference point and the surveyed elevation of the reference point, the groundwater elevation was calculated. A summary of groundwater elevations is provided in Table 4.3. A summary of surface water elevations is provided in Table 4.4.

Prior to the water level measurements, the wells were identified and located. Once the wells were identified, CRA completed a thorough inspection of each well and noted any deficiencies. Water level measurements were collected using an electronic depth-to-water probe accurate to  $\pm\,0.01$  foot. The measurements were made from the designated location on the inner riser or protective casing of each monitoring well. Surface water measurements were made from the designated location at each surface water gauging point.

The water level measurements were obtained using the following procedures:

- the proper elevation of the meter was checked by inserting the tip into water and noting if the contact was registering correctly;
- the tip was dried, and then slowly lowered into the well until contact with the water was indicated;
- the tip was slowly raised until the light and/or buzzer just began to activate. This indicated the static water level;
- the reading at the reference point was noted to the nearest hundredth of a foot;
- the reading was then re-checked; and
- the water level was then recorded, and the water level meter decontaminated prior to use at the next well location.

# 4.6 GROUNDWATER AND SURFACE WATER SAMPLE COLLECTION

CRA conducted two rounds of groundwater and surface water sampling during the completion of the Work Plan for these hydrogeologic investigations. A total of 13 monitoring wells and eight water supply wells were sampled on May 31 and June 1, 2006. An additional 11 monitoring wells were sampled on July 27 and 28, 2006. Of the 24 monitoring wells sampled, 22 were newly installed. The sampling was scheduled to allow for 2 weeks to elapse between well development and groundwater sample collection. The two existing wells were selected for inclusion in this monitoring program based on their proximity to the AFEs. The new wells were installed to complete the monitoring network in the vicinity of the AFEs.

At the monitoring well locations, CRA conducted the sampling using dedicated tubing and a peristaltic pump or a submersible electronic pump, and employed low-flow purging techniques as described in Puls and Barcelona (1996).

The groundwater in the monitoring wells was sampled by the following low-flow procedures:

- the wells were located and identified;
- a water level measurement was taken;
- the well was sounded by carefully lowering the water level tape to the bottom of the
  well (so as to minimize penetration and disturbance of the well bottom sediment),
  and comparing the sounded depth to the installed depth to assess the presence of
  any excess sediment or drill cuttings;
- the pump or tubing was lowered slowly into the well and fixed into place such that the intake was located at the mid-point of the well screen, or a minimum of 2 feet above the well bottom / sediment level;
- the purging was conducted using a pumping rate between 100 to 500 milliliters per minute (mL/min). Initial purging began using the lower end of this range. The groundwater level was monitored to ensure that a drawdown of less than 0.3 foot occurred. If this criterion was met, the pumping rate was increased dependent on the behavior of the well. During purging, the pumping rate and groundwater level were measured and recorded every 5 minutes;
- the field parameters [pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity] were monitored during the purging to evaluate the stabilization of the purged groundwater. Stabilization was considered to be achieved when three consecutive readings for each parameter, taken at 5-minute intervals, were within the following limits:

pH ± 0.1 pH units of the average value of the three readings,

Temperature ± 3 percent of the average value of the three readings,

Conductivity ± 0.005 milliSiemen per centimeter (mS/cm) of the average value

of the three readings for conductivity <1 mS/cm and  $\pm 0.01 \text{ mS/cm}$  of the average value of the three readings for

conductivity >1 mS/cm,

ORP ± 10 millivolts (mV) of the average value of the three readings,

DO  $\pm 10$  percent of the average value of the three readings, and

Turbidity ± 10 percent of the average value of the three readings, or a final

value of less than 5 nephelometric turbidity units (NTU); and

• once purging was complete, the groundwater samples were collected directly from the pump/tubing directly into the sample containers.

All groundwater samples were labeled with a unique sample number, the date and time, the parameters to be analyzed, the project number, and the sampler's initials. The samples were screened by the Station for shipment to Teledyne Brown Engineering, Inc. (Teledyne Brown).

A groundwater sample key is presented in Table 4.5. Purging parameters for the monitoring wells are presented in Table 4.6.

Water samples collected on May 31 and June 1, 2006 from the existing water supply wells were collected from existing taps or spigots on the well pump header or distribution. Prior to collecting a water sample, the water was allowed to flow from the tap or spigot for several minutes. Water purging parameters for these supply wells are presented in Table 4.7.

CRA containerized the water purged from the Station monitoring wells during sampling as well as water purged from all of the wells during the hydrogeologic investigation. The water was placed into 55-gallon drums, which will be processed by the Station in accordance with its NPDES permit.

Surface water samples were collected on May 31, 2006 at the two gauging points along the Station Spray Canal. The surface water sampling locations (SW-QC-1 and SW-QC-2) are presented on Figure 4.1.

The surface water samples were collected by submerging a disposable bailer in the Spray Canal. The samples were poured directly from the disposable bailer into the sample containers. The samples were shipped to Teledyne Brown for analysis.

#### 4.7 DATA QUALITY OBJECTIVES

CRA has validated the analytical data to establish the accuracy and completeness of the data reported. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. Analytical data for groundwater and surface water samples collected in accordance with the Work Plan are presented in Appendix D. Data validation memoranda are presented in Appendix E. The data validation included the following information and evaluations:

- sample preservation;
- sample holding times;
- laboratory method blanks;
- laboratory control samples;
- laboratory duplicates;
- verification of laboratory qualifiers; and
- field quality control (field blanks and duplicates).

Following the completion of field activities, CRA compiled and reviewed the geologic, hydrogeologic, and analytical data.

The data were reviewed using the following techniques:

- data tables and databox figures;
- hydrogeologic cross-sections; and
- hydraulic analyses.

#### 4.8 <u>SAMPLE IDENTIFICATION</u>

Systematic sample identification codes were used to uniquely identify all samples. The identification code format used in the field was: WG-QC-SW-QC-001-053106-JH-002. A summary of sample identification numbers is presented in Table 4.5.

WG - Sample matrix - groundwater

WS - Sample matrix - surface water

RB - Sample matrix - rinse blank

QC - Station code

SW-QC-001 - Sample location

053106 - Date

JH - Sampler initial002 - Sample number

#### 4.9 CHAIN-OF-CUSTODY RECORD

The samples were delivered to Station personnel under chain-of-custody protocol. Subsequently, the Station shipped the samples under chain-of-custody protocol to Teledyne Brown for analyses.

#### 4.10 QUALITY CONTROL SAMPLES

Quality control samples were collected to evaluate the sampling and analysis process.

#### Field Duplicates

Field duplicates were collected to verify the accuracy of the analytical laboratory by providing two samples collected at the same location and then comparing the analytical results for consistency. Field duplicate samples were collected at a frequency of one duplicate for every ten samples collected. A total of five duplicate samples were collected. The locations of duplicate samples were selected in the field during the performance of sample collection activities. The duplicate samples were collected simultaneously with the actual sample and were analyzed for the same parameters as the actual samples.

#### Rinsate Blank Samples

Rinsate blanks were collected to verify that decontamination procedures conducted in the field were adequate. Rinsate blanks were collected by routing Station-supplied demineralized water through decontaminated sampling equipment. Rinsate blanks were collected at a frequency of one rinsate blank for every day samples were collected using non-disposable or non-dedicated equipment. Three rinsate blanks were collected.

#### Split Samples

Split samples were collected by CRA for the NRC for tritium simultaneously with the actual sample at each sample location. Split samples were delivered to the Station personnel and made available to the NRC. In addition, split samples were collected May 31, 2006 at monitoring wells MW-QC-106I and MW-QC-107I for the NRC and were given to the NRC representative.

#### 4.11 ANALYSES

Groundwater and surface water samples were analyzed for tritium and gamma-emitting radionuclides as listed in NUREG-1302 and strontium-89/90 as listed in 40 CFR 141.25.

#### 5.0 RESULTS SUMMARY

This section provides a summary of Station geology and hydrogeology, along with a discussion of hydraulic gradients, groundwater elevations, and flow directions in the vicinity of the Station. This section also presents and evaluates the analytical results obtained from activities performed in accordance with the Work Plan.

#### 5.1 STATION GEOLOGY

The geology encountered during monitoring well installation is consistent with the geology described in Section 2.4.2. The geology beneath the Station consists of unconsolidated sediments comprised of sand and gravel deposited as outwash and river alluvium deposits. The unconsolidated sediments are underlain by bedrock of Silurian (Niagaran/Alexandrian Dolomite), Ordovician (Maquoketa Shale, Galena - Platteville Dolomite, and Glenwood - St. Peter Sandstone), and Cambrian age (dolomites, sandstones, and shales).

Figure 5.1 displays the locations of the hydrogeologic cross-sections across the Station. These hydrogeologic cross-sections are presented on Figures 5.2 to 5.5. These cross-section locations were chosen because of their close proximity to the AFEs and structures potentially influencing groundwater flow patterns.

The new shallow, intermediate, and deep interval wells installed pursuant to the Work Plan were installed in the overburden. The Station is underlain by overburden deposits consisting primarily of unconsolidated sediments comprised of fine- to coarse-grained sands and trace gravel (see Section 2.4.2). The monitoring well logs are presented in Appendix B.

Figure 5.2 is a southwest-northeast cross-section (A-A') through the middle of the Station. It begins near monitoring well MW-QC-114I at the southwestern corner of the Station and terminates near the access road in the northeast portion of the Station. This cross-section also shows the relationship between the groundwater and geology, excavated areas, and Reactor/Turbine Building foundations that were set on the bedrock. The Service Building foundation in this area was constructed on concrete piers within the sand overburden fill to a depth of approximately 589.5 feet AMSL. The Service Building foundation is not seated in bedrock. Engineered compacted fill was placed around the foundation of the Service Building to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. The northern extent of the buried paleochannel or the Meredosia Channel is located to the

south of the Service Building. May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross-section drop slightly from north (573.85 feet AMSL at MW-QC-101S) to south (572.51 feet AMSL at MW-QC-108S) due to the presence of the Meredosia Channel.

Figure 5.3 is a southeast-northwest profile (B-B') that intersects AFE-Quad Cities-2. This cross-section shows the relationship between the groundwater and geology, sheet piles, utilities, and building foundations. Sheet piles installed as part of the Station construction are located to the west of the Service Building. The sheet piles were set into the top of the dolomite bedrock. The discharge bay was also excavated into the top of dolomite bedrock in this portion of the Station. The northern extent of the buried paleochannel or the Meredosia Channel is located to the south of the Service Building. The surface of the dolomite bedrock in this portion of the Station drops approximately 100 feet based on the bedrock topography map (Figure 2.5). May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross section drop slightly from northwest (573.09 feet AMSL at MW-QC-103I) to the southeast (572.77 feet AMSL at MW-QC-102I) due to the competing influence of the Meredosia Channel and the sheet piles.

Figure 5.4 is an east-west cross-section (C-C') through the Station to the Mississippi River. This profile shows the relationship between the groundwater and geology, excavated areas, building foundations, and the Mississippi River. The Reactor Building, Turbine Building, and Crib House foundations in this area were constructed to approximate depths of 548, 542.5, and 545 feet AMSL, respectively. The Reactor Building, Turbine Building, and Crib House foundations are seated in bedrock. Engineered compacted fill was placed around these buildings to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. May 2006 groundwater elevations in the fill overburden sand along this cross-section are relatively flat from east (573.85 feet AMSL at MW-QC-101S) to the west (573.82 feet AMSL at MW-QC-106S). Groundwater in the overburden flows around the building foundations to the southwest.

Figure 5.5 is a north-south cross-section (D-D') through the Station. This cross-section shows the relationship between the groundwater and geology, excavated areas, and building foundations. Engineered compacted fill was placed around the foundation of the Service Building to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. The northern extent of the buried Meredosia Channel is located to the south of the Service Building. Dolomite bedrock in this portion of the Station drops approximately 100 feet. May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross-section drop from north

(574.30 feet AMSL at MW-1) to south (572.51 feet AMSL at MW-QC-108S) in response to the presence of the Meredosia Channel.

#### 5.2 STATION HYDROGEOLOGY

Figure 5.1 presents the monitoring well network in relationship to the hydrogeologic cross-section locations. Hydrogeologic cross-sections are presented on Figures 5.2 to 5.5. The cross-sections show the overburden that overlies the dolomite bedrock. In general, the overburden consists of naturally occurring unconsolidated sand or sand fill (fill is present where the Station was excavated prior to construction of the buildings).

#### 5.2.1 MAN-MADE INFLUENCES ON GROUNDWATER FLOW

The PA (Figure 1.2) is located at the west area of the Station and is surrounded by the lined Spray Canal. The Spray Canal was constructed with a polyvinyl chloride (PVC) liner underlain by 6 inches of sand covered by 1 foot of crushed rock. The polyethylene sheeting was placed on 1 foot of compacted sand and gravel.

The canal flows counter-clockwise around the Station during the time when the canal is being filled with water pumped from the Big Fish water supply well. The Station fills the canal in the spring for a 3-month period to a depth of approximately 3 feet. The depth of the water in the Spray Canal during the hydrogeologic investigation ranged from 4.21 feet at SW-QC-1 on May 31, 2006 to 1.61 feet at SW-QC-2 on July 26, 2006. The Spray Canal was initially operated as a component of the cooling water operations at the Station. Cooling water from the condenser was pumped to the Spray Canal to further reduce the water temperature prior to discharge from the discharge bay. The operation of the Spray Canal as part of cooling water operations was suspended in 1983. The Spray Canal was modified for use in fish hatchery operations. The Station fills the canal as part of a fish hatchery program for the Mississippi River.

When the canal is not being filled, there is no flow; however, there is a residual amount of water in some parts of the canal. Due to the higher head in the canal than the surrounding groundwater elevation (approximately 25 feet of head difference as of June 2006) there may be some groundwater recharge from the Spray Canal into the overburden. There is some evidence that seepage through the canal liner exists. Based on the HIR water level measurements and an understanding of the construction of the Spray Canal, the water leakage does not appear to have a significant effect on the groundwater flow direction within the PA.

During construction of the structures and buildings in the PA, a dam was constructed to minimize groundwater infiltration into the excavation and water was pumped from the excavation. This excavation was greater than 40 feet deep and on top of the underlying dolomite bedrock formations (UFSAR, 2005). The dam was constructed at the current location of the inlet bay and was subsequently removed after the completion of plant construction activities.

Sheet piles were installed around the discharge bay and the western portion of the Spray Canal as part of Station construction activities. The discharge bay sheet piles extend below the water table to an elevation of 535 feet AMSL, but not to the top of competent bedrock. They are set on crushed stone and rip rap. As such, groundwater flow is intercepted by the sheet pile walls, but will continue to flow beneath and through the sheet piles. The sheet piles are shown on Figures 5.3 and 2.6. The foundations or basements associated with the Reactor Building and the Turbine Building extend to depths below the water table and are set into the top of competent bedrock (see Figure 5.4). The total depth of the Reactor Building is 548 to 550 feet AMSL. The total depth of the majority of the Turbine Building is 542.5 feet AMSL. These basements are barriers to groundwater flow in the overburden.

The Station structures and utilities were reviewed to assess their impact on groundwater flow conditions. All non-process related utilities (e.g., storm drains) are above the groundwater table and do not appear to impact groundwater flow.

The Station and surrounding land is generally flat and is covered by paved areas, roadways, and parking lots. These areas are drained by a storm water system that drains to the north and south of the Station and passes by the location of MW-QC-102S (see Figure 3.1). The south storm water system drains to an Oil/Water Separator (Unit 1) at the south end of the PA whose outfall discharges to the discharge bay. The north storm water system drains to an Oil/Water Separator (Unit 2) at the north end of the PA whose outfall discharges to the intake bay.

The water level in the discharge bay fluctuates. The discharge bay water level was measured on May 31, 2006 at 576.91 feet AMSL, on June 22, 2006 at 576.53 feet AMSL, and on July 26, 2006 at 576.36 feet AMSL (see Table 4.4). The discharge bay water level was approximately 4 feet higher than the water level measured in nearby monitoring wells MS-QC-103I and MW-QC-105I (see Table 4.3) but does not appear to significantly affect groundwater flow direction in this area.

#### 5.2.2 GROUNDWATER FLOW DIRECTIONS

Groundwater level measurements were collected in May and July 2006. Groundwater contours for the upper unconsolidated aquifer for these dates are presented on Figures 5.6 and 5.7, respectively. The May 2006 groundwater contour maps are based on data obtained from 13 wells while the groundwater contour maps from July 2006 are based on data from 24 monitoring wells.

Examination of Figure 5.6 shows that groundwater flow in May 2006 is primarily to the southwest towards the Mississippi River and the southern buried valley of the Meredosia Channel. Groundwater levels on the north side of the Station are approximately 2 feet above the controlled river level elevation. As discussed in the previous section, the foundations of the Reactor and Turbine Buildings restrict the groundwater flow, which causes the groundwater to flow around the buildings. The groundwater flow in the upper unconsolidated aquifer may have been affected by the pumping of the Big Fish Well to supplement the water level in the Spray Canal.

The Big Fish Well was completed in the upper unconsolidated aquifer at a depth of approximately 175 feet bgs. This well is capable of pumping on the order of 1,800 gallons per minute (gpm). In a typical year, the Big Fish Well is operated for up to 2 weeks in April to fill the Spray Canal. The well is then operated twice a week, running between 5 to 8 hours during each event through to early August to maintain a minimum water level in the canal.

Groundwater flow directions for the July 2006 water level monitoring event are shown on Figure 5.7. This figure provides a more complete representation of groundwater flow in the upper unconsolidated aquifer at the Station, given the larger data set and broader distribution of monitoring wells. In general, groundwater levels are approximately 2 feet lower than those measured in May 2006 (see Table 4.3). This indicates that seasonal fluctuations in the water table occur. In general, groundwater flows from the east to the west towards the Mississippi River. However, the groundwater flow diverges to a southerly and northerly component and flows towards both the buried valleys of the Meredosia Channel (see Figure 2.5 for Meredosia Channel detail). In July 2006, the river elevation was higher than all groundwater levels near the river, indicating that flow from the river to the aquifer is occurring. This will result is localized reversal in the flow direction. The river recharge also resulted in a much flatter hydraulic gradient at the Station than that measured in May 2006, when groundwater discharge to the river occurred. The data also show that basement walls restrict the groundwater flow, which causes the groundwater to flow around the buildings.

The water level in the discharge bay will fluctuate. The discharge bay water level was measured on May 31, 2006 at 576.91 feet AMSL, on June 22, 2006 at 576.53 feet AMSL, and on July 26, 2006 at 576.36 feet AMSL (see Table 4.4). The discharge bay water level was approximately 4 feet higher than the water level measured in nearby monitoring wells MS-QC-103I and MW-QC-105I (see Table 4.3) but does not appear to significantly affect groundwater flow direction in this area.

A comparison of the water levels in monitoring wells located on the east side of the sheet piles with river levels indicates that the sheet piles are not acting as an effective hydraulic barrier. This is illustrated on the groundwater contour map (Figure 5.6) by the minimal changes in contour spacing when the river level is compared to groundwater elevations in adjacent wells. There are no sheet piles along the river bank. The river bank protection consists of rip-rap (rocks) present to prevent erosion.

#### 5.2.3 <u>VERTICAL HYDRAULIC GRADIENTS</u>

The HIR included the installation of monitoring well clusters in the upper unconsolidated aquifer to determine not only the vertical distribution of impacted groundwater (as necessary), but also the vertical hydraulic gradient within the aquifer. Vertical hydraulic gradients were calculated at the well pairs and are provided in Table 5.1. Downward vertical hydraulic gradients were calculated for four well pairs: MW-QC-101 and MW-QC-108, where the vertical hydraulic gradient was very slight, 0.001 feet/foot; MW-QC-106, where the vertical hydraulic gradient was 0.003 feet/foot; and MW-QC-109, where the vertical hydraulic gradient was 0.006 feet/foot. An upward vertical gradient was calculated for the remaining well pair, MW-QC-102, where the vertical hydraulic gradient was -0.003 feet/foot (May 30, 2006) and -0.0004 feet/foot (July 26, 2006).

The calculated vertical hydraulic gradients at the Station are slight and vary with proximity to the canal and Mississippi River. There were no significant vertical hydraulic gradients observed.

#### 5.2.4 <u>LATERAL GROUNDWATER FLOW AND VELOCITY</u>

The calculated horizontal hydraulic gradient in the upper unconsolidated aquifer along the east side of the PA based on the May 2006 data is 0.002 feet/foot and based on the June 2006 data, after the installation of additional monitoring wells, is 0.0004 feet/foot. The horizontal hydraulic gradient was calculated by dividing the change in

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groundwater elevation along the groundwater flow path by the corresponding distance along the flow path. The groundwater flow direction in this area is from the northeast to southwest during both monitoring events. Figure 5.6 displays the May 2006 groundwater elevation contours and Figure 5.7 displays the July 2006 groundwater elevation contours.

The calculated horizontal hydraulic gradient in the upper unconsolidated aquifer along the west side of the Turbine Building based on the May 2006 data is 0.004 feet/foot and based in the June 2006 data is 0.003 feet/ foot. The general groundwater flow direction in this area is from east-northeast to west-southwest (Figure 5.6).

The hydraulic conductivity of the surficial sands is expected to be approximately 12 feet per day based on the median measurement from a study conducted at the Illinois-Indiana border of the shallow aquifer along Lake Michigan (USGS, 1996). The aquifer media tested in this study was consistent with unconsolidated aquifer material at the Station. The velocity of the shallow groundwater may be roughly approximated using the Station-specific hydraulic gradient with the literature value for hydraulic conductivity and a typical value for porosity. The hydraulic gradient range of 0.0004 to 0.004, based on the collected May 2006 and July 2006 data, with a hydraulic conductivity of 12 feet per day and an assumed porosity of 0.32, yields a velocity of 6 to 54 feet per year (USEPA, 1996). The hydraulic gradient and the calculated groundwater velocity are subject to seasonal fluctuation.

#### 5.3 GROUNDWATER QUALITY

CRA personnel collected 32 groundwater samples from 22 newly installed monitoring wells, two previously installed groundwater monitoring wells, and eight existing water supply wells. The samples were analyzed for tritium and additional radionuclides. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical data reports are in Appendix D.

The analytical data have been subjected to CRA's data validation process. CRA has used the data with appropriate qualifiers where necessary.

The data reported in the figures and tables does not include the results of recounts that the laboratory completed, except if those results ultimately replaced an initial report. The tables and figures therefore include only the first analysis reported by the

laboratory. Where multiple samples were collected over time then the most recent result has been used in the discussion below.

## 5.3.1 SUMMARY OF BETA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

A summary of the tritium results for the groundwater samples collected during this investigation is provided in Table 5.2. and shown on Figure 5.8.

The tritium groundwater data have been divided into upper and intermediate intervals of the upper unconsolidated aquifer. CRA evaluated the groundwater data using upper and intermediate overburden data sets to better understand the potential vertical distribution of tritium in Station groundwater.

Concentrations of tritium in groundwater samples collected south of the Turbine and Reactor Buildings and in the SBO Area ranged from 262 ± 130 pCi/L to 32,600 ± 977 pCi/L. The groundwater sample collected from MW-QC-102I, screened in the intermediate interval of the upper unconsolidated aquifer, had a tritium concentration of 32,600 ± 977 pCi/L. The following wells in the upper unconsolidated aquifer also revealed tritium concentrations greater than the LLD of 200 pCi/L, but less than 20,000 pCi/L: shallow wells MW-QC-102S, MW-QC-104S, and MW-QC-108S; intermediate wells MW-QC-108I, MW-QC-109I, and MW-QC-111I; deep well MW-QC-102D; and the Big Fish Well.

In addition, the following two groundwater samples collected north and northwest of the Turbine and Reactor Buildings revealed tritium concentrations greater than the LLD that ranged from  $250 \pm 126$  pCi/L (shallow overburden monitoring well MW-2) to  $371 \pm 134$  pCi/L (water supply well Little Fish Well).

Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L. A summary of the strontium-89/90 results for the groundwater samples collected as part of this HIR is presented in Table 5.3 and shown on Figure 5.9.

## 5.3.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

Gamma-emitting target radionuclides were not detected at concentrations greater than their respective LLDs. A summary of the gamma-emitting radionuclide results for the groundwater samples collected as part of this investigation that is the subject of this HIR is provided in Table 5.3 and shown on Figure 5.9.

Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

#### 5.3.3 SUMMARY OF FIELD MEASUREMENTS

Table 4.6 presents monitoring well purging parameters collected during the well purging and sampling activities. These field measurements included pH, dissolved oxygen, ORP, conductivity, turbidity, and temperature. The field parameters were typical of a shallow sand aquifer with carbonate source rock (i.e., the underlying limestones and shales). As such, the pH values were found to be approximately 7.0 and the conductivity was indicative of a shallow water table system subject to surface water recharge. The conductivity of the water purged from MW-QC-104S was elevated when compared to the readings from other sampling locations.

#### 5.4 SURFACE WATER QUALITY

Two surface water samples were collected from the two gauging points located at the Spray Canal shown on Figure 4.1. The samples were analyzed for tritium, gamma-emitting radionuclides, and strontium-89/90. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical reports are presented in Appendix D.

## 5.4.1 SUMMARY OF BETA-EMITTING RADIONUCLIDE ANALYTICAL RESULTS

A summary of the tritium results for the surface water samples collected in this investigation is provided in Table 5.2 and shown on Figure 5.8. Surface water samples collected from locations SW-QC-1 and SW-QC-2 contained tritium at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively.

Strontium-89/90 was not detected at concentrations that were greater than the LLD of 2.0 pCi/L. A summary of the strontium-89/90 analytical results for surface water samples collected in this investigation is presented in Table 5.3 and shown on Figure 5.9.

## 5.4.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

Gamma-emitting target radionuclides were not detected at concentrations greater than their respective LLDs. A summary of the gamma-emitting radionuclides results for the surface water samples collected in this investigation is provided in Table 5.3 and shown on Figure 5.9.

Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

#### 6.0 RADIONUCLIDES OF CONCERN AND SOURCE AREAS

This section discusses radionuclides evaluated in this investigation, potential sources of the radionuclides detected, and their distribution.

#### 6.1 GAMMA-EMITTING RADIONUCLIDES

Gamma-emitting target radionuclides were not detected at concentrations greater than their respective LLDs. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

#### 6.2 <u>BETA-EMITTING RADIONUCLIDES</u>

Strontium-89/90 was not detected in any of the groundwater samples collected at concentrations greater than the LLD of 2.0 pCi/L. Tritium was detected in 13 of the 34 total sample locations. Concentrations of tritium ranged between  $250 \pm 126$  pCi/L to  $32,600 \pm 977$  pCi/L.

Since only tritium was detected at concentrations great than the LLD during the fleetwide investigation, the following sections focus on tritium, specifically, providing general characteristics of tritium, potential sources, distribution in groundwater, and a conceptual model for migration.

#### 6.3 TRITIUM

This section discusses the general characteristics of tritium, the distribution of tritium in groundwater and surface water, and the conceptual model of tritium release and migration.

#### 6.3.1 GENERAL CHARACTERISTICS

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common forms of tritium are tritium gas and tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen. Tritiated

water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted from the body primarily through urine within a month or so after ingestion. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are bombarded to produce tritium.

Although tritium can be a gas, its most common form is in water because, like non-radioactive hydrogen, radioactive tritium reacts with oxygen to form water. Tritium replaces one of the stable hydrogen atoms in the water molecule and is called tritiated water. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 (<sup>3</sup>He). This radioactive decay releases a beta particle (low-energy electron). The radioactivity of tritium is the source of the risk of exposure.

Tritium is one of the least dangerous radionuclides because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

#### 6.3.2 <u>DISTRIBUTION IN GROUNDWATER / SURFACE WATER</u>

This section provides an overview of the lateral and vertical distribution of tritium detected in groundwater and the distribution of tritium in surface water at the Station. Tritium has been the only parameter detected in the upper unconsolidated aquifer at a concentration greater than the LLD of 200 pCi/L. This observation is based upon the studies recently completed at the Station. Consequently, this section of the report will focus on the distribution of tritium in the upper and intermediate intervals of the upper unconsolidated aquifer.

Tritium concentrations that are greater than the LLD of 200 pCi/L are limited to three areas at the Station. The first area is located to the north and northwest of the Turbine Building. The second larger area is located to the south and southwest of the Reactor, Service, and SBO Buildings. Tritium was also detected in the Spray Canal, the third area. The tritium detections are summarized in Table 5.2 and shown on Figure 5.8.

#### North and Northwest of Turbine Building

Tritium was detected at concentrations slightly above the LLD of 200 pCi/L in MW-2, completed to 27 feet bgs in the upper zone of the upper unconsolidated aquifer, and the Little Fish Well, completed to 60 feet bgs. Both of these wells are located north and northwest of the Turbine Building. Groundwater in this area of the Station has been determined to flow from northeast to southwest towards the Mississippi River based on the May 2006 groundwater elevations, with a more westerly flow component present during July 2006.

Historical tritium analytical data for groundwater samples collected from the Little Fish Well are available back to 2003. These samples were analyzed in accordance with NUREG 1302 to an LLD of 3,000 pCi/L (LLD of 200 pCi/L for the five March 10, 2006 samples). Tritium was not detected in any of the samples collected at concentrations greater than the LLD.

As part of the May 31, 2006 sampling event, tritium was detected in the Little Fish Well at concentrations of 371 ± 134 pCi/L. Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in the sample from the Fish House Well. The Fish House Well is screened within the Niagaran Dolomite of the Hunton Megagroup. The driller's well log shows that competent dolomite begins at 69 feet bgs and that the well was cemented with bentonite grout to a depth of 71 feet bgs. Therefore, the Fish House Well draws water from the dolomite aquifer from 71 feet bgs and deeper. Based on the Fish House Well information, the adjacent 60 foot deep Little Fish Well, screened from 50 to 60 feet bgs, is screened within the upper unconsolidated aquifer (the sand aquifer above the dolomite). The Spray Canal is located north and hydraulically upgradient of well MW-2 and the Little Fish Well. Tritium was detected in surface water samples collected from the Spray Canal. The upper unconsolidated aquifer in this portion of the Station may be partially recharged from surface water in the Spray Canal at the dam/end of the canal when it is in use during the spring and summer, as discussed previously in Section 5.2.1.

#### South/Southwest of Reactor, Service, and SBO Buildings

Tritium has been detected at concentrations greater than the LLD of 200 pCi/L in the area south and southwest of the Reactor, Service, and SBO Buildings. Specifically, monitoring wells MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-104S, MW-QC-108S, MW-QC-108I, MW-QC-109I, and MW-QC-111I, and the Big Fish Well contained concentrations of tritium greater than the LLD. Groundwater flow direction in this area of the Station varies seasonally, and groundwater flows either from northeast to southwest towards the Mississippi River or from east to west towards the Mississippi River.

The concentration of tritium in the Big Fish Well, screened at three intervals from 77 feet to 175 feet in the unconsolidated deposits of the Meredosia Channel, has been reported as less than the Station LLD of 3,000 pCi/L (2003 through 2006 samples). The new monitoring wells in this area are screened from 18 to 70 feet bgs within the unconsolidated aquifer. The highest concentration of tritium, 32,600 ± 977 pCi/L, was detected in the groundwater sample collected at MW-QC-102I. Tritium was also detected in the groundwater sample collected from MW-QC-109I at 1,140 ± 182 pCi/L in the vicinity of historical release referenced in AFE-Quad Cities-2 in Section 3.4. Tritium was detected as far south as MW-QC-111I at a concentration of 420J ± 133 pCi/L, but was not detected in either MW-QC-114I or MW-QC-115S, which are located further south of MW-QC-111I. Tritium detections above the LLD are limited to a localized area between the Reactor and Service Buildings to the north and the Spray Canal to the south. Tritium has not been detected above the LLD of 200 pCi/L in wells adjacent to the Mississippi River (MW-QC-112I, MW-QC-113I, MW-QC-114I, and the STP Sand Point Well) or beyond the area delineated by the Spray Canal.

Wells with tritium detections greater than the LLD of 200 pCi/L, MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-104S, MW-QC-108S, MW-QC-108I, MW-QC-109I, MW-QC-111I, and the Big Fish Well, are downgradient of the AFE-Quad Cities-2 SBO Area, which is the likely source of tritium in these wells. Figure 6.1 presents a profile depicting detected tritium concentrations along cross-section A-A'. Figure 6.2 presents a plan view depicting detected tritium concentrations.

#### Surface Water

Tritium was detected in the surface water samples collected from the Spray Canal at sampling points SW-QC-1 and SW-QC-2 at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively. The Spray Canal is filled with water pumped from the Big Fish Well, which is impacted by tritium.

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## 6.3.3 CONCEPTUAL MODEL OF TRITIUM RELEASE AND MIGRATION

This section presents CRA's conceptual model of groundwater and tritium migration at the Station.

Tritium has not been detected at concentrations greater than the LLD of 200 pCi/L in samples collected from bedrock potable supply wells located at the Station (Well #1, Well #5, and Fish House Well #10). As such, CRA's conceptual hydrogeologic model focuses on the migration of groundwater and tritium in the upper unconsolidated aquifer.

Within the upper unconsolidated aquifer, tritium was not detected in monitoring wells installed adjacent to the Mississippi River (STP Sand Point Well, MW-QC-103I, MW-QC-105I, MW-QC-106S, MW-QC-106I, MW-QC-112I, MW-QC-113I, and MW-QC-114I). Tritium was also not detected in the monitoring wells installed adjacent to residential properties (MW-QC-115S and MW-QC-116S). Therefore, the vertical and horizontal extent of tritium impact to Station groundwater is limited to the Station property.

The groundwater flow in May within the upper unconsolidated aquifer beneath the Station is from northeast to southwest, toward the southern buried valley of the Meredosia Channel. As shown on Figure 5.6, groundwater flow appears to divide around the Reactor and Turbine Buildings, as a result of the foundations sitting on bedrock. Groundwater may also undergo seasonal fluctuations as a result of the filling of the Spray Canal and water level change within the Mississippi River. CRA observed seasonal changes in the two rounds of groundwater levels collected. The groundwater flow in July is, in general, from east to west, but the groundwater flow diverges to a southerly and northerly component toward the buried valleys of the Meredosia Channel (see Figure 5.7). There is no indication from this HIR investigation that tritium-impacted groundwater is migrating off Station.

#### Hydrogeologic Framework

Groundwater flow within the upper unconsolidated aquifer at the Station is to the southwest toward the Mississippi River in May 2006 and generally to the west toward the Mississippi River in July 2006, with southerly and northerly components present.

Groundwater moving within the overburden is separated from the deeper regional bedrock aquifer zones by the upper dolomite. In the vicinity of the Turbine and Reactor Buildings, groundwater flow in the upper unconsolidated aquifer is affected by the building foundations, as they extend to the bedrock. This results in a deviation of the flow around the buildings.

In May 2006, groundwater from the west side of the Turbine Building discharges into the intake bay and the Mississippi River to the southwest. The southern component of flow is also influenced, to some degree, by the pumping of the Big Fish Well and by the Meredosia Channel. The Big Fish Well was constructed in the Meredosia Channel, an ancient channel of the Mississippi River that eroded the bedrock. This channel has been filled over time with unconsolidated sediments ranging from approximately 50 to 300 feet deep (Blume, 1966). The well construction logs indicate that the Big Fish Well was screened over three intervals (77 to 97, 118 to 148, and 157 to 175 feet bgs) and has an overall depth of 175 feet. Pumping tests performed on this well indicate that it can pump at a sustained rate of 1,800 gpm.

In a typical year, the Big Fish Well is operated for up to 2 weeks in April to fill the Spray Canal. The Big Fish Well is then operated twice a week, running between 5 to 8 hours during each event through to early August to maintain a minimum water level in the canal. The canal is used for a fish hatchery. During the time of sustained pump operation, the water table should draw down around the well. Given the constraints imposed by the presence of the Turbine/Reactor Building foundation, groundwater will flow in a north to south direction towards the Big Fish Well, within the capture zone of the well when the pump is operated. However, given the high rate of hydraulic conductivity present in the shallow aquifer, the shallow unconsolidated aquifer will recharge quickly after the pumping has stopped. Pumping of the Big Fish Well draws water from the upper unconsolidated aquifer. Pumping at this location may draw surface water from the Mississippi River east towards the southern portion of the Station.

The northern edge of the Meredosia Channel runs along the southern portion of the Station as shown on Figure 2.6. This channel eroded the top of the dolomite bedrock in this portion of the Station and further influences overburden groundwater flow at the Station to a further southern flow. CRA believes that the location of the channel directs overburden groundwater flow in a southwest direction.

In July 2006, general groundwater flow in the upper unconsolidated aquifer is to the west toward the Mississippi River. However, the groundwater flow diverges to a southerly and northerly component and flows towards both buried valleys of the

Meredosia Channel. The southern component of flow is also influenced, to some degree, by the pumping of the Big Fish Well.

#### Sources and Migration of Tritium

Tritium was detected above the LLD of 200 pCi/L in three areas at the Station:

- north and northwest of the Turbine Building;
- south/southwest of the Reactor, Service, and SBO Buildings; and
- surface water.

This distribution of tritium (both within the shallow water table zone and within the deeper portions of the upper unconsolidated aquifer) is likely related to the following water release history:

- historical releases of tritium to the subsurface that have been documented by the Station that are associated with AFE-Quad Cities-2; and
- potential recharge of the upper unconsolidated aquifer from the Spray Canal.

All tritium detections appear to be related to historical releases at AFE-Quad Cities-2. The groundwater data suggest that a release of tritium has occurred in AFE-Quad Cities-2 to the north and upgradient of MW-QC-102S and MW-QC-102I, possibly in the vicinity of MW-QC-109S and MW-QC-109I. The effect of the periodic operation of the Big Fish Well pump is to pull the release in the direction of the Big Fish Well. This is explained by tritium detections in groundwater samples from MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-108S, MW-QC-108I, MW-QC-111I, and the Big Fish Well. CRA notes that the historical releases associated with AFE-Quad Cities-2 occurred as long ago as 21 years. The effects of groundwater flow (advection), diffusion, and dilution have resulted in the current distribution of tritium to the south and west of AFE-Quad Cities-2. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

In addition, the tritium detected in the Spray Canal is also likely attributable to historic releases in the AFE-Quad Cities-2. The Spray Canal is filled from water pumped from the Big Fish Well. Tritium was detected at a concentration of  $740 \pm 152$  pCi/L in the groundwater sample collected from the Big Fish Well. The source of tritium detected in the Spray Canal, therefore, is likely the same as the source of tritium in the Big Fish Well, which is historic releases from AFE-Quad Cities-2.

The Spray Canal potentially recharges overburden groundwater downgradient of the Spray Canal. Water from the Spray Canal enters the upper unconsolidated aquifer in the northern portion of the Site and water drawn from the Little Fish Well is partially recharged from the Spray Canal in this area of the Site. Therefore, the source of tritium detected in the Little Fish Well and MW-2 is also the historic releases associated with AFE-Quad Cities-2.

Based on the results of the hydrogeologic investigation that is the subject of this HIR, tritium-impacted groundwater is not migrating off the Station property.

Naturally occurring isotopes not produced by the Station were identified and excluded from this report.

#### 7.0 EXPOSURE PATHWAY ASSESSMENT

This section addresses the groundwater impacts from tritium and other radionuclides at the Station and potential risks to human health and the environment.

Based upon historical knowledge and data related to the Station operations, and based upon radionuclide analyses of groundwater samples, the primary constituent of concern (COC) is tritium. The discussions that follow are restricted to the exposure pathways related to tritium.

Teledyne Brown reports all samples to their statistically-derived minimum detectable concentration (MDC) of approximately 150 to 170 pCi/L, which is associated with 95 percent confidence interval on their hardcopy reports. However, the laboratory uses 99 percent confidence range (± 3 sigma) for determining whether to report the sample activity concentration as detected or not. This 3-sigma confidence interval typically equates to 150 (± 135.75) pCi/L.

Exelon has specified an LLD of 200 pCi/L for the Fleetwide Assessment. Exelon has also required the laboratory to report related peaks identified at the 95 percent confidence level (2-sigma).

This HIR, therefore, screens and assesses data using Exelon's LLD of 200 pCi/L. As is outlined below, this concentration is also a reasonable approximation of the background concentration of tritium in groundwater at the Station.

#### 7.1 <u>HEALTH EFFECTS OF TRITIUM</u>

Tritium is a radionuclide that decays by emitting a low-energy beta particle that cannot penetrate deeply into tissue or travel far in air. A person's exposure to tritium is primarily through the ingestion of water (drinking water) or through ingestion of water bearing food products. Inhalation of tritium requires the water to be in a vapor form (i.e., through evaporation or vaporization due to heating). Inhalation is a minor exposure route when compared to direct ingestion or drinking of tritiated water. Absorption of tritium through skin is possible, but tritium exposure is more limited here versus direct ingestion or drinking of tritiated water.

#### 7.2 BACKGROUND CONCENTRATIONS OF TRITIUM

The purpose of the following paragraphs is to establish a background concentration through review of various media.

#### 7.2.1 GROUNDWATER

Tritium is created in the environment from naturally occurring cosmic and subterranean as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium isotopes <sup>6</sup>Li (92.5 percent abundance) and <sup>7</sup>Li (7.5 percent abundance) present in crystalline rocks by neutrons produced by the radioactive decay of uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium comes from the former atmospheric testing of thermonuclear weapons. Concentrations of tritium in precipitation, increased during the 1950 and early 1960s, coinciding with the release of significant amounts of tritium to the atmosphere during nuclear weapons testing prior to the signing of the Limited Test Ban Treaty in 1963, which prohibited atmospheric nuclear tests.

#### 7.2.2 PRECIPITATION DATA

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclide analyses. Two publicly available databases that provided tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations through the U.S. from 1960 up to and including 2006.

Based on GNIP data for sample stations located in the U.S. Midwest including Chicago, St. Louis, and Madison, Wisconsin, as well as Ottawa, Ontario, and data from the University of Chicago, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of

thermonuclear weapons. Tritium concentrations showed a sharp decline until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been less than 100 pCi/L since around 1980.

The RadNet database for several stations in the U.S. Midwest (Chicago, Columbus, Indianapolis, Lansing, Madison, Minneapolis, Painesville, Toledo, and Welsch, MN) did not show the same trend, which can be attributed to pre-1995 data handling procedures. The pre-1995 data were rounded to the nearest 100 pCi/L, which damped out variances in the data. The post-1995 RadNet data, where rounding was not applied, exhibit much more scatter, and similar to the GNIP data, most of the data were less than 100 pCi/L.

CRA constructed a non-parametric upper tolerance limit with a confidence of 95 percent and coverage of 95 percent based on RadNet data for USEPA Region 5 from 2004 to 2005. The resulting upper tolerance limit is 133 pCi/L, which indicates that CRA is 95 percent confident that 95 percent of the ambient precipitation concentration results are less than 133 pCi/L. The statistical confidence, however, must be compared with the limitations of the underlying RadNet data, which does not include the minimum detectable concentration for a majority of the measurements. Some of the RadNet values less than 200 pCi/L may be approximated. Nevertheless, these results show a background contribution for precipitation of up to 133 pCi/L.

#### 7.2.3 SURFACE WATER DATA

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Surface water data from the RadNet database for Illinois sampling stations include East Moline (Mississippi River), Moline (Mississippi River), Marseilles (Illinois River), Morris (Illinois River), Oregon (Rock River), and Zion (Lake Michigan). As is the case for the RadNet precipitation data, the pre-September 1995 Illinois surface water data was rounded to the nearest 100 pCi/L, creating a dampening of variances in the data. The post-1995 Illinois surface water data, similar to the post-1995 Midwest precipitation data, were less than 100 pCi/L with the exception of the Moline (Mississippi River) station. Tritium surface water concentrations at this location varied between 100 and 800 pCi/L, which may reflect local natural or anthropogenic inputs.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ± 70 to 100 pCi/L 95 percent confidence bound on each given measurement. Therefore,

the typical background data provided may be subject to measurement uncertainty of approximately  $\pm 70$  to 100 pCi/L.

Routine surface water measurements for tritium sampling locations upstream of the Quad Cities Generating Station show that concentrations in the Mississippi River are consistently less than 200 pCi/L (Exelon, 2005).

Pre-operational REMP quarterly and semi-annual surface water composite samples collected from downstream and on-Station locations were analyzed for tritium. Tritium was not detected (LLD 1,000 pCi/L) in surface water samples collected from the Davenport Water Works, the Moline Water Works, and the Inlet Canal for 1969, 1970, and 1971 (1st quarter).

1971 2nd quarter tritium results were as follows:

- East Moline Water Treatment Plant 540 ± 370 pCi/L;
- Davenport Water Treatment Plant 540 ± 370 pCi/L; and
- Intake and Discharge Canal 180 ± 370 pCi/L.

1971 3rd quarter tritium results were as follows:

- East Moline Water Treatment Plant 700 ± 230 pCi/L;
- Davenport Water Treatment Plant 730 ± 230 pCi/L; and
- Intake and Discharge Canal 590 ± 210 pCi/L.

1971 4th quarter tritium results were as follows:

- East Moline Water Treatment Plant 770 ± 200 pCi/L;
- Davenport Water Treatment Plant 850 ± 200 pCi/L;
- Intake Canal  $610 \pm 200 \text{ pCi/L}$ ; and
- Discharge Canal 420 ± 200 pCi/L.

#### 7.2.4 DRINKING WATER DATA

Tritium concentrations in drinking water from the RadNet database for three Illinois sampling stations (Chicago, Morris, and East Chicago) exhibit similar trends as the precipitation and surface water data. As with the precipitation and surface water data,

the pre-1995 data has dampened out variances due to rounding the data to the nearest 100 pCi/L. The post-1995 results show tritium concentrations in samples of drinking water were less than 100 pCi/L and less than the tritium concentrations found in precipitation and surface water.

#### 7.2.5 EXPECTED TRITIUM BACKGROUND FOR THE STATION

As reported in the GNIP and RadNet databases, tritium concentrations in U.S. Midwest precipitation have typically been less than 100 pCi/L since 1980. Tritium concentrations reported in the RadNet database for Illinois surface water and groundwater, at least since 1995, have typically been less than 100 pCi/L. Based on the USEPA Region 5's 2004 to 2005 RadNet precipitation data, 95 percent of the ambient concentrations of tritiated water in Illinois are expected to be less than 133 pCi/L, based on a 95 percent confidence limit. Tritium concentrations in surface water and drinking water are expected to be comparable or less based on historical data and trends.

Concentrations in groundwater similar to surface water and drinking water are expected to be less than precipitation values. The lower groundwater concentrations are related to the age of the groundwater as compared to the half-life of tritium. Deep aquifers near crystalline basement rock, however, can potentially show elevated concentrations of tritium due to lithogenic sources.

Based on the evaluation presented above, the background concentration for tritium at the Station is reasonably represented by the LLD of 200 pCi/L.

## 7.3 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

Two potential exposure pathways were considered during the evaluation of tritium in groundwater:

- potential groundwater migration on and off the Station property to private and public groundwater users; and
- potential groundwater migration off the Station property to a surface water body.

The following section provides an overview of these two potential exposure pathways for tritium in groundwater.

## 7.3.1 POTENTIAL GROUNDWATER MIGRATION TO DRINKING WATER USERS ON AND OFF THE STATION PROPERTY

Tritiated groundwater would migrate to the south-southwest and the north-northwest with groundwater flow away from the Station towards the Mississippi River.

The Station receives its potable water from the three potable wells on the property (Well #1, Well #5, and Fish House Well #10). The three potable wells are cased off through the upper unconsolidated (sand) aquifer and are screened in the Dolomite bedrock aquifer beneath the upper unconsolidated aquifer. Well #1 and Well #5 are upgradient of the source area. Although tritium was detected in the Little Fish Well, which is near the Fish House Well but screened in the upper unconsolidated aquifer, tritium was not detected in the deeper Fish House Well; this proves that the Fish House Well is isolated from the upper unconsolidated aquifer. The potable wells were sampled as part of the investigation and did not contain tritium or other radionuclides above background levels.

Although there is a potentially complete exposure pathway to these supply wells, there is no current risk of exposure associated with groundwater ingestion at the Station.

Residences are present both north and south of the Station. Tritium was not detected in monitoring wells installed adjacent to residential properties (MW-QC-115S and MW-QC-116S).

Although there is a potentially complete exposure pathway to the residential wells, there is no current risk of exposure associated with groundwater ingestion off the Station property.

## 7.3.2 GROUNDWATER MIGRATION TO SURFACE WATER USERS OFF THE STATION PROPERTY

Under this potential exposure route groundwater would migrate from the Station property to the Mississippi River. Potential exposures could occur if the groundwater discharge to the surface water body was sufficient to increase tritium levels in the Mississippi River to detectable levels above background. Based on the results of the HIR, tritium has not migrated off the Station property at detectable concentrations. Tritium was not detected in the groundwater samples collected adjacent to the Mississippi River (STP Sand Point Well, MW-QC-112I, MW-QC-113I, and MW-QC-114I), which is somewhat indicative of river water quality.

This exposure pathway is incomplete as tritium was not detected above the LLD of 200 pCi/L in groundwater samples collected from monitoring wells installed adjacent to the Mississippi River. Therefore, there is no current risk of exposure to surface water users off the Station property.

#### 7.4 SUMMARY OF POTENTIAL TRITIUM EXPOSURE PATHWAYS

There are two potential exposure pathways for tritium originating in or adjacent to the Station:

- potential groundwater migration off the Station property to private and public groundwater users; and
- potential groundwater migration off the Station property to a surface water body.

In summary, based upon the groundwater and surface water data provided and referenced in this investigation, none of the potential receptors are at risk of exposure to concentrations of tritium in excess of USEPA drinking water standards (20,000 pCi/L).

#### 7.5 OTHER RADIONUCLIDES

Target radionuclides were not detected in the groundwater and surface water samples at concentrations greater than their respective LLDs. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

#### 8.0 CONCLUSIONS

Based on all of the studies completed to date at this Station, CRA concludes:

#### **Groundwater Flow**

- Groundwater flow beneath the Station fluctuates seasonally. Groundwater was observed to flow to the south-southwest in May 2006 and toward the west in July 2006. Station groundwater discharges to the Mississippi River. Groundwater flows beneath the Station at a rate of approximately 6 to 54 feet per year.
- Groundwater flow at the Station is affected by the presence of a natural paleochannel, the Meredosia Channel. The northern extent of this paleochannel runs along the southern portion of the Station. The bedrock surface in this portion of the Station drops more than 100 feet.
- Groundwater flow within the PA is affected by the construction (basements/foundations) of the Reactor/Turbine Building structure, which was constructed into the Niagaran Dolomite. This building is a barrier to local lateral flow in the upper unconsolidated aquifer.
- The deeper bedrock water supply aquifers are not separated from the upper unconsolidated aquifer.
- Water from the Spray Canal enters the upper unconsolidated aquifer in the northern portion of the Station, and water drawn from the Little Fish Well is partially recharged from the Spray Canal in this area of the Station.

#### **Groundwater Quality**

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the samples collected as part of this investigation.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any of the groundwater samples collected as part of this investigation.
- Tritium was detected at concentrations greater than the LLD of 200 pCi/L in 11 of the 32 groundwater samples collected as part of this investigation.
- Tritium concentrations were identified in groundwater in two areas at the Station: wells downgradient of AFE-Quad Cities-2 (including the Big Fish Well) and wells downgradient of the Spray Canal (MW-2 and Little Fish Well).

- All tritium concentrations appear to be related to historical releases at AFE-Quad Cities-2. Tritium is present in wells south and southwest of AFE-Quad Cities-2, including the Big Fish Well.
- Tritium was not detected in monitoring wells installed adjacent to the Mississippi River at concentrations greater than the LLD of 200 pCi/L (STP Sand Point Well, MW-QC-103I, MW-QC-105I, MW-QC-106S, MW-QC-106I, MW-QC-112I, MW-QC-113I, and MW-QC-114I).
- Tritium was not detected in the monitoring wells installed adjacent to residential properties at concentrations greater than the LLD of 200 pCi/L (MW-QC-115S and MW-QC-116S).

#### Surface Water Quality

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the two surface water samples collected as part of this investigation.
- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L in the two surface water samples collected as part of this investigation.
- Tritium was detected at concentrations greater than the LLD of 200 pCi/L in two surface water locations, SW-QC-1 and SW-QC-2, at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively.
- The likely source of tritium in the Spray Canal is historic releases associated with AFE-Quad Cities-2.

#### AFE-Quad Cities-1 - Piping West of Radwaste Building/Floor Drain Surge Tank

- Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-1.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-1.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from new monitoring well MW-QC-103I located to the southwest of this AFE area.
- There is no impact to groundwater from AFE-Quad Cities-1.

#### AFE-Quad Cities-2 - Historic Releases Area Near Station Blackout Building (SBO)

- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L in the groundwater monitoring wells in the vicinity of AFE-Quad Cities-2.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected in the groundwater monitoring wells at concentrations greater than their respective LLDs in the vicinity of AFE-Quad Cities-2.
- Tritium was detected in groundwater samples from monitoring wells MW-QC-102S (9,410 ± 655 pCi/L sample and 9,640 ± 660 pCi/L sample duplicate), MW-QC-102I (32,600 ± 977 pCi/L sample and 31,800 ± 972 pCi/L sample duplicate), MW-QC-102D (3,930J ±450 pCi/L), MW-QC-108S (1,460 ± 217 pCi/L), MW-QC-108I (1,890J ±252 pCi/L), MW-QC-109I (768J ±156 pCi/L), and MW-QC-111I (420J ±133 pCi/L); and from water supply well Big Fish Well (740 ± 152 pCi/L).
- Water from the Big Fish Well fills the Spray Canal. Tritium was detected in Spray Canal surface water samples from sampling points SW-QC-1 ( $550 \pm 143 \text{ pCi/L}$ ) and SW-QC-2 ( $497 \pm 140 \text{ pCi/L}$ ).
- The Spray Canal potentially recharges overburden groundwater downgradient of the Spray Canal. Tritium was detected in water supply well Little Fish Well (371 ± 134 pCi/L) and monitoring well MW-2 (250 ± 126 pCi/L).
- Additional delineation of tritium in groundwater is not necessary.
- There have been three historical releases that have influenced the AFE.

#### AFE-Quad Cities-3 - CCSTs and Ancillary Piping

- Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-3.
- Gamma-emitting radionuclides associated with licensed plant operation were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-3.
- Tritium was detected in the groundwater sample collected from new monitoring well MW-QC-104S ( $262\pm130~pCi/L$ ). This value is slightly greater than the LLD of 200~pCi/L.

#### AFE-Quad Cities-4 - No. 1 Oil/Water Separator

• Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-4.

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-4.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from new monitoring well MW-QC-105I located immediately to the northeast of this AFE area.
- There have been no impacts to groundwater from AFE-Quad Cities-4.

#### AFE-Quad Cities-5 - No. 2 Oil/Water Separator

- Strontium-89/90 was not detected in the groundwater monitoring wells at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-5.
- Gamma-emitting radionuclides associated with licensed plant operation were not detected in the groundwater monitoring wells at concentrations greater than their respective LLDs in the vicinity of AFE-Quad Cities-5.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from monitoring wells MW-QC-106S and MW-QC-106I located immediately southwest of this AFE area.
- There is no impact to groundwater from AFE-Quad Cities-5.

#### Potential Receptors

• Based on the results of this investigation, there is no current risk of exposure to radionuclides associated with licensed plant operations through any of the potential exposure pathways.

#### General Conclusions

- Based upon the results of this investigation, there are no known active releases into the groundwater at the Station.
- Based on the results of this investigation, tritium has not migrated off the Station property at detectable concentrations.

#### 9.0 <u>RECOMMENDATIONS</u>

The following presents CRA's recommendations for proposed activities to be completed at the Station.

#### 9.1 DATA GAPS

Based on the results of this hydrogeologic investigation, there are no data gaps remaining to support CRA's conclusions regarding the characterization of the groundwater regime and potential impacts from radionuclides at the Station.

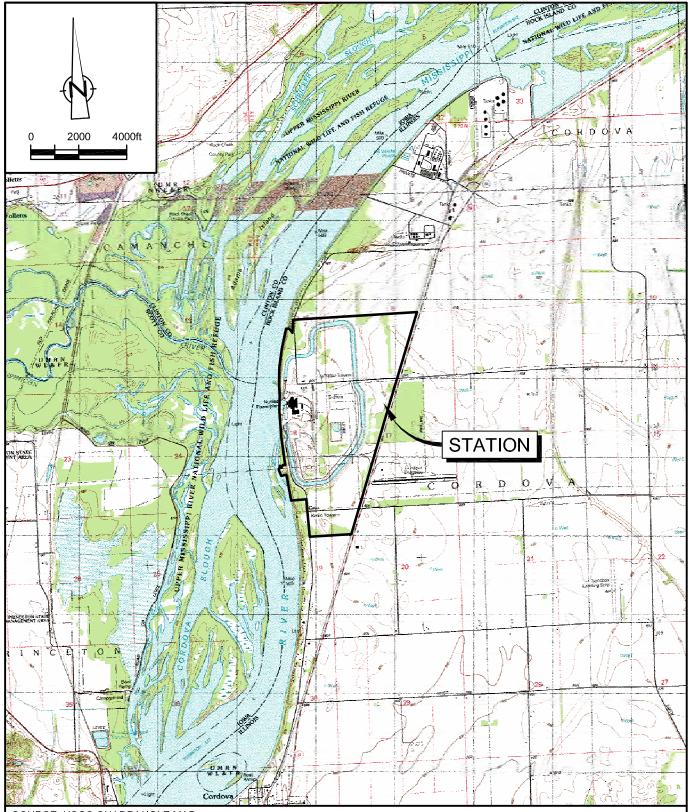
#### 9.2 GROUNDWATER MONITORING

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

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SOURCE: USGS QUADRANGLE MAP; QUAD CITIES MOSAIC, ILLINOIS 1986 (EDITED: 1991)

figure 1.1

Exelon.

STATION LOCATION MAP QUAD CITIES GENERATING STATION EXELON GENERATION COMPANY, LLC Cordova, Illinois

## FIGURE 1.2 STATION BOUNDARIES AND FEATURES

(Withheld)

# FIGURE 2.1 STATION BASE MAP (Withheld)

	· · · · · · · · · · · · · · · · · · ·	GR	100P	T 7	тн	ICK-		DRILLING	
		0	R	CRAPHIC	N.	ESS	DESCRIPTION	& CASING	WATER-YIELDING PROPERTIES
	SERIES PLEIS-	FORMATION		LOG		FT) :	Unconsolidated	CONDITIONS Wells usually need careful	Variable; large yields from thicker sand & gravel de-
SEA	PLEIS - TOCENE				0-230	posits, loess and alluvium	development and screens	posits in bedrock valleys	
PENNSYLVANIAN					0-	-400	stone, and coal	Casing usually required	thin limestone and sand- stone beds locally
	AN	Salem- Warsaw Fm Keokuk Ls Burlington Ls Chouteau New Albany Group			0-30		Sh, ss, and ls	Casing usually required	Not water yielding at most places
MISSISSIPPIAN	VALMEYERAN				0		Limestone		Generally creviced, water yielding; wells penetrate Is from 30 to more than 150 ft dependable aquifer for farm supplies in much of area
	KINDER- HOCKIAN				0-275		Shale	Casing re- quired	Not water yielding at most places; limestones within shale are source of small farm supplies locally
DEVONIAN	UPPER								
DEV	MIDDLE	Hunton Megagroup				20- 140	Limestone		Devonian limestone locally water yielding from crevices; Silurian dolomite more dependable aquifer for farm supplies in most areas; satisfactory wells may require penetration from 25-150 ft into Silurian; dolomite usually "tighter" in lower half
SILURIAN	NIAGARAN NIAGARAN				20-375	0- 375	Dolomite, cherty at base		
ORDOVICIAN	CINCIN- NATIAN	Maquoketa Group			200- 215		Green to blue and brown shale with limestone and dolomite	Shale requires casing	Generally not water yielding
	CHAMPLAINIAN	Ottawa Mg	Galena and Platteville Groups		300-320		Dolomite with shaly zone near middle; limestone in lower part	Crevicing not common	Not important as aquifer; crevices yield some water
		(Glen	ell Gr nwood- Peter Ss)			0 - 50	Sandstone; green shale; cherty shale at base	Shale may re- quire casing; sand may cave	Dependable source of ground water

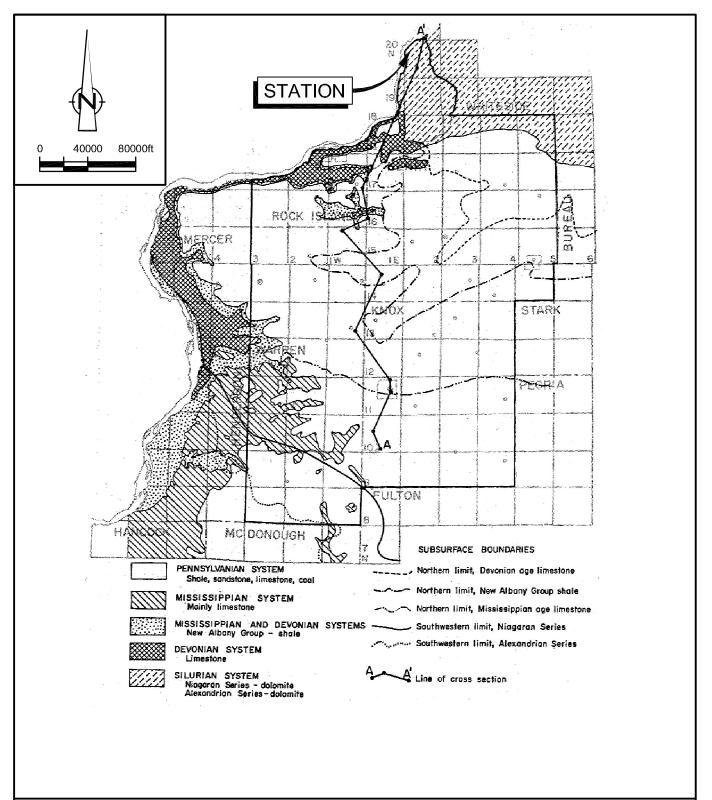
			GROUP		THICK-		DRILLING & CASING		
SYSTEM	SERIES	F	OR DRMATION	LOG	NESS (FT)	DESCRIPTION	CONDITIONS	WATER-YIELDING PROPERTIES	
ORDOVICIAN	CANADIAN	Shak- opee Uner New Rich- mond Ss Oneota		7		Dolomite with some shale and sand-stone Sandstone with some dolomite,			
		H Prairie	Dol minence		300 50- 120	cherty  Dolomitic sand- stone and	Casing not required; crevices encountered locally	Some water from sandstones and creviced dolomite; not developed for large supplies	
CAMBRIAN		f m		77		sandy dolo- mite			
			Potosi Dol		150- 200	Dolomite with drusy quartz			
	CROIXAN	F	ranconia Fm		120- 200	Green sand- stone, shale, and dolomite			
		Ironton- Galesville Ss		士: 二	100- 200	Sandstone, partly dolomitic	May cave	Widespread and important aquifer for large supplies	
		Eau Claire Fm			2 <b>2</b> 5~ 300	Sandstone and shale with some dolo- mite	Weak shales may require casing	Some water from sandstone	
		M-	t. Simon Ss		800~ 1300	Sandstone, beds of shale and siltstone	Casing not required	Water yielding	
The state of the s	n 2								
	PRECAMBRIAN					Igneous rock		Not water yielding	
L	(2)								

(1)

SOURCE: J.E. BRUECKMANN AND R.E. BERGSTROM, GROUND-WATER GEOLOGY OF THE ROCK ISLAND, MONMOUTH, GALESBURG, AND KEWANEE AREA, ILLINOIS, 1968 figure 2.2

REGIONAL STRATIGRAPHIC COLUMN QUAD CITIES GENERATING STATION EXELON GENERATION COMPANY, LLC Cordova, Illinois





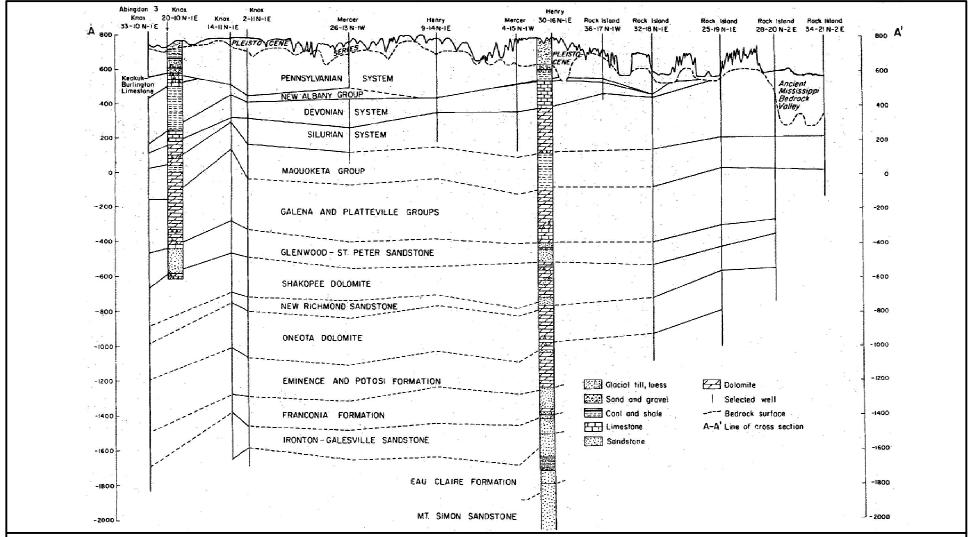
SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488; FIG. 4 - BEDROCK GEOLOGIC MAP WITH SELECTED SUBSURFACE GEOLOGIC BOUNDARIES.

figure 2.3

BEDROCK GEOLOGIC MAP WITH **CROSS-SECTION LOCATION** QUAD CITIES GENERATING STATION EXELON GENERATION COMPANY, LLC

Cordova, Illinois





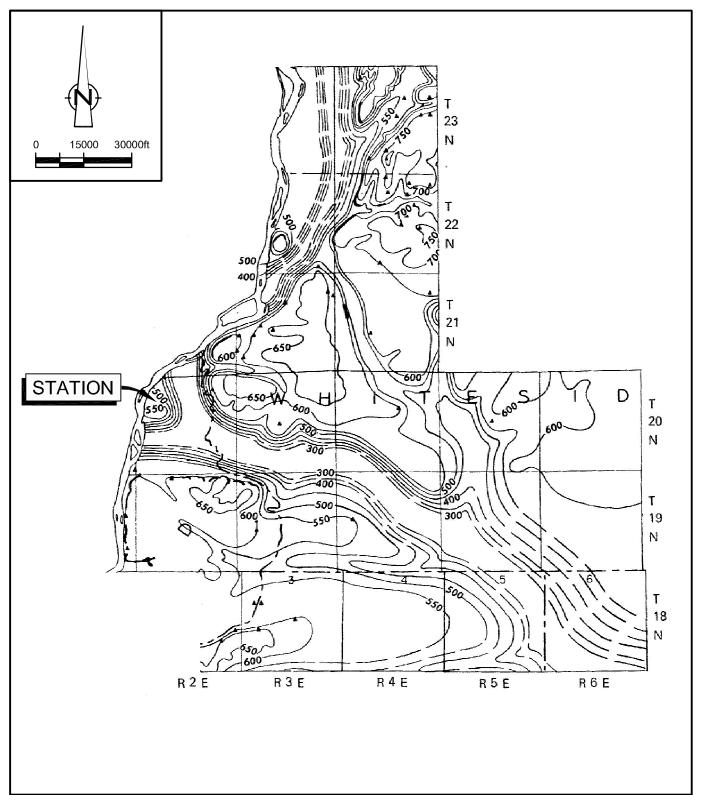
SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488; FIG. 5 - CROSS SECTION OF FORMATIONS, BEDROCK SURFACE, AND LAND SURFACE FROM ABINGDON, KNOX COUNTY, TO NORTHERN ROCK ISLAND COUNTY.

figure 2.4

CROSS-SECTION OF FORMATIONS, BEDROCK SURFACE, AND LAND SURFACES FROM ABINGDON, KNOX COUNTY, TO NORTHERN ROCK ISLAND COUNTY QUAD CITIES GENERATING STATION EXELON GENERATION COMPANY, LLC Cordova, Illinois



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SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488; FIG. 7 - BEDROCK TOPOGRAPHY OF THE MEREDOSIA CHANNEL AREA, FROM HORBERG (1950 [1957]).

figure 2.5

Exelon.



BEDROCK TOPOGRAPHY OF THE MEREDOSIA CHANNEL AREA QUAD CITIES GENERATING STATION EXELON GENERATION COMPANY, LLC Cordova, Illinois

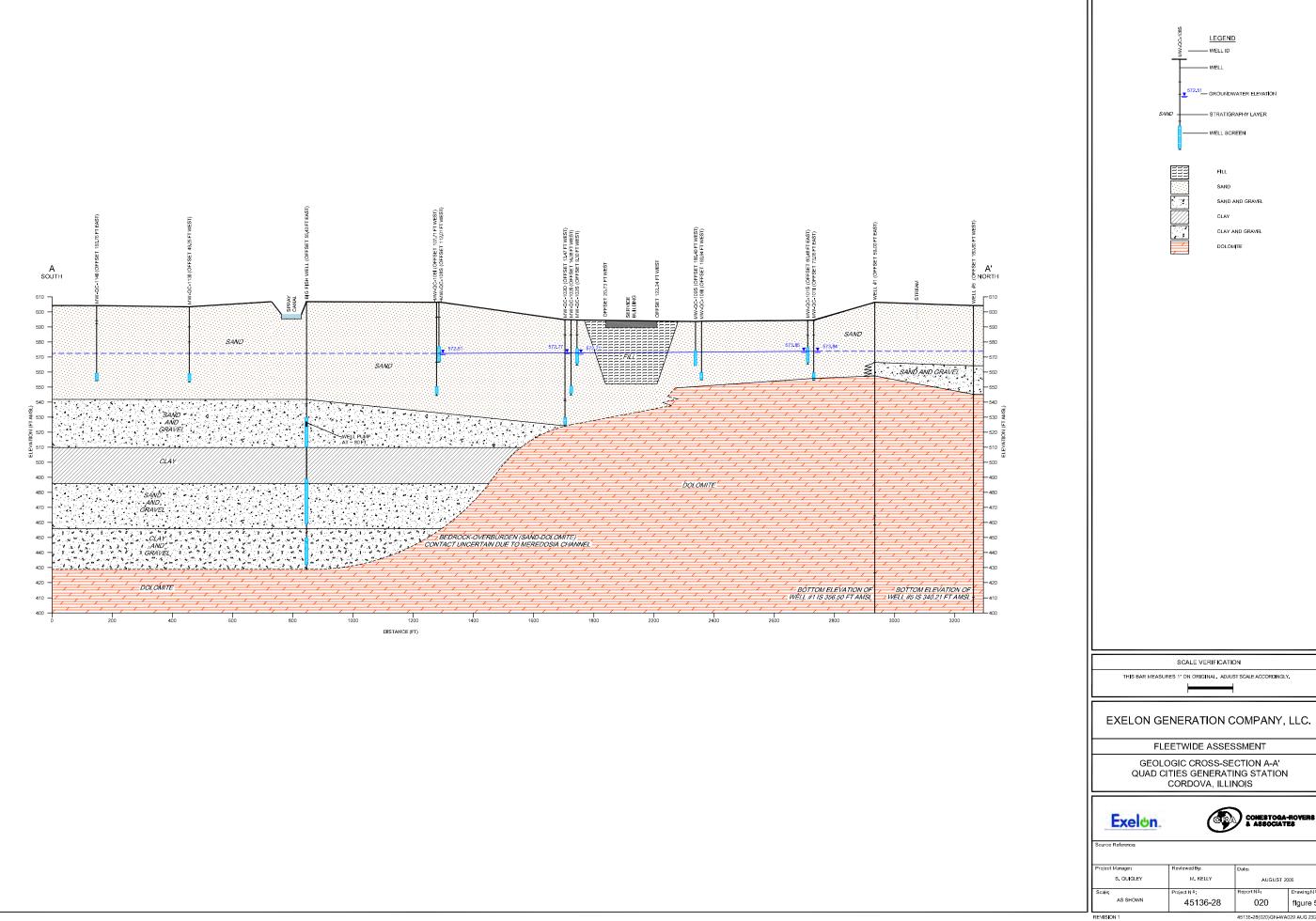
### FIGURE 2.6 WATER WELL LOCATIONS

### FIGURE 3.1 AREAS FOR FURTHER EVALUATION

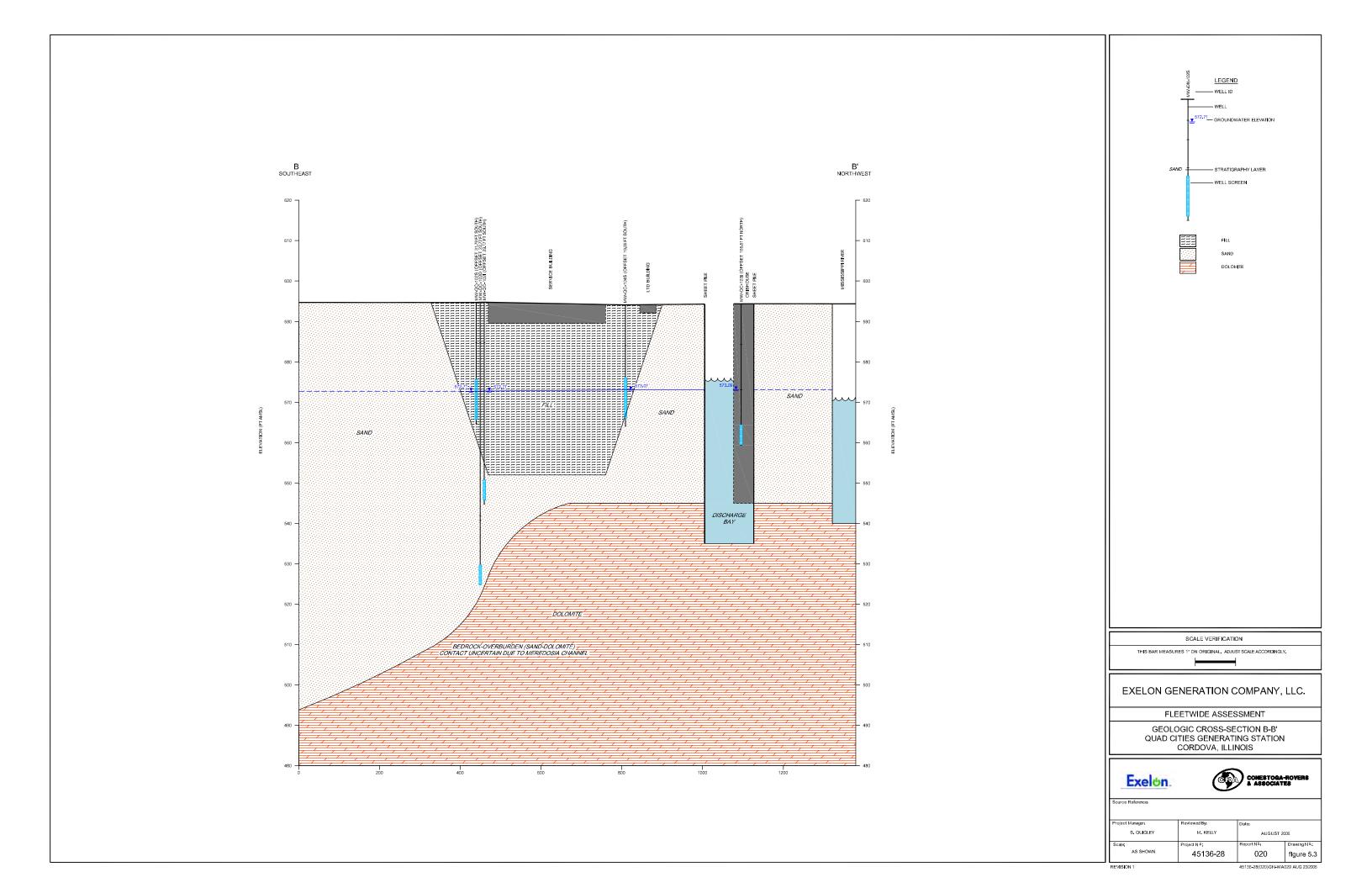
### FIGURE 3.2 HISTORICAL RELEASE LOCATIONS FOR AFE QUAD CITIES 2

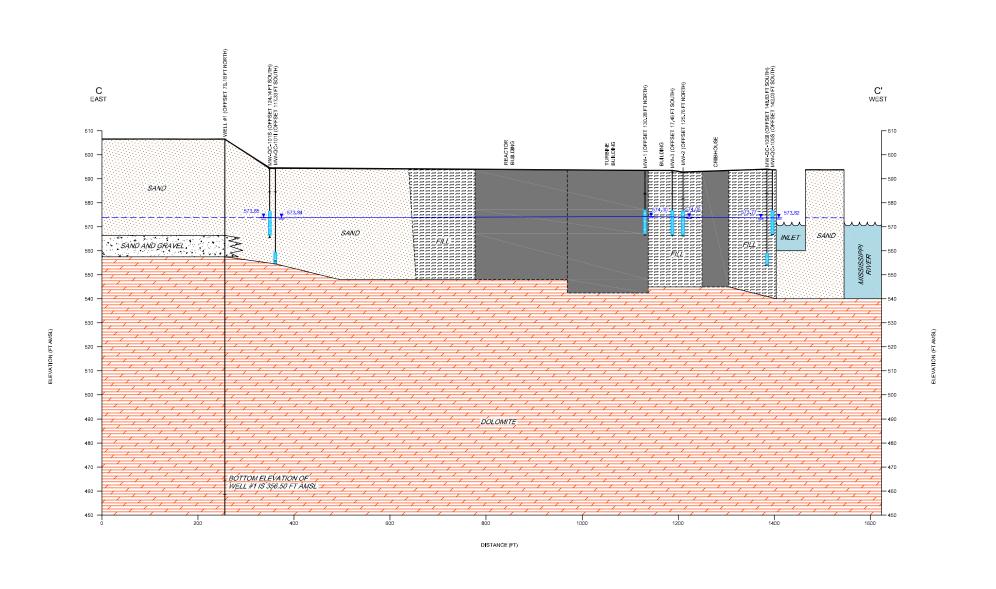
# FIGURE 4.1 GROUNDWATER AND SURFACE WATER MONITORING LOCATIONS

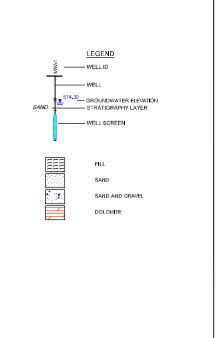
### FIGURE 5.1 GEOLOGIC CROSS-SECTION LOCATIONS



flgure 5.2







SCALE VERIFICATION

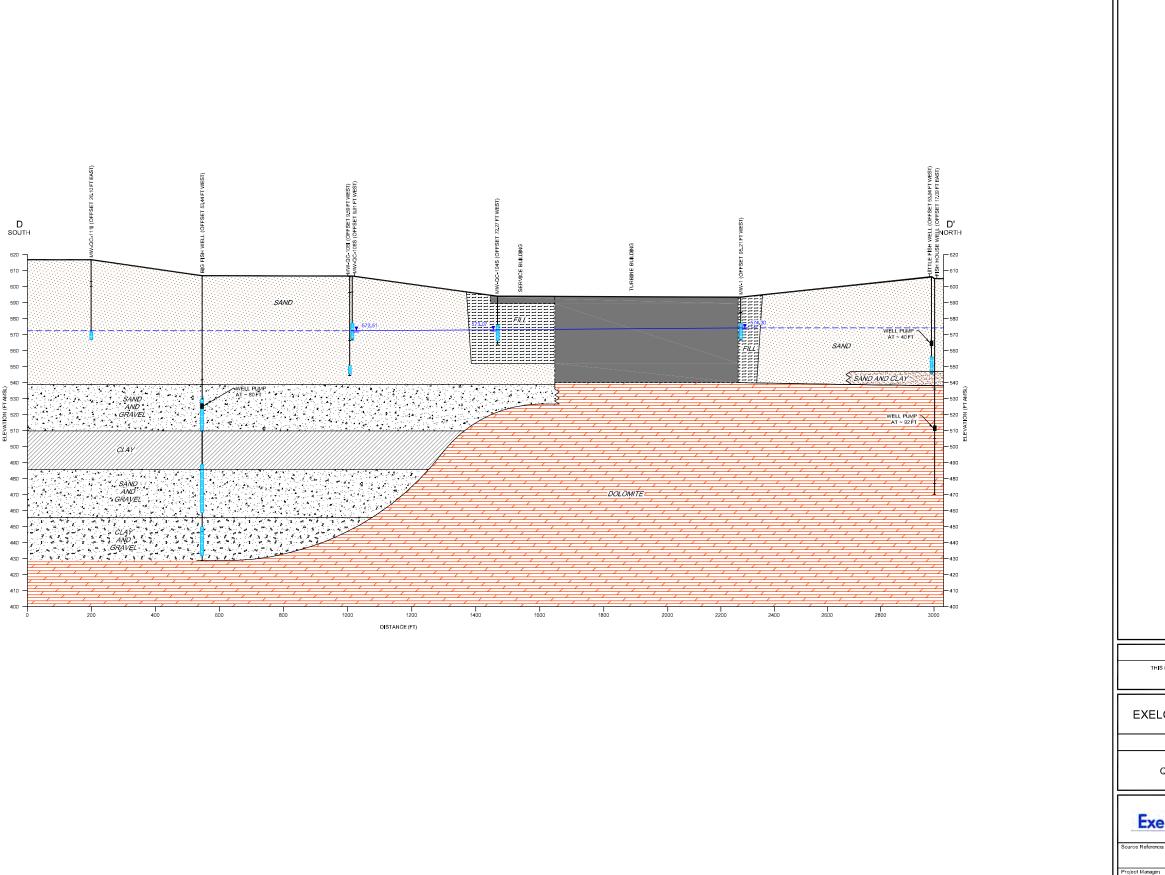
THIS BAR MEASURES 1\* ON ORIGINAL, ADJUST SCALE ACCORDINGLY.

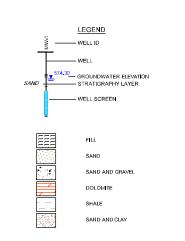
EXELON GENERATION COMPANY, LLC.

FLEETWIDE ASSESSMENT

GEOLOGIC CROSS-SECTION C-C' QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS







SCALE VERIFICATION THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC.

FLEETWIDE ASSESSMENT

GEOLOGIC CROSS-SECTION D-D' QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS





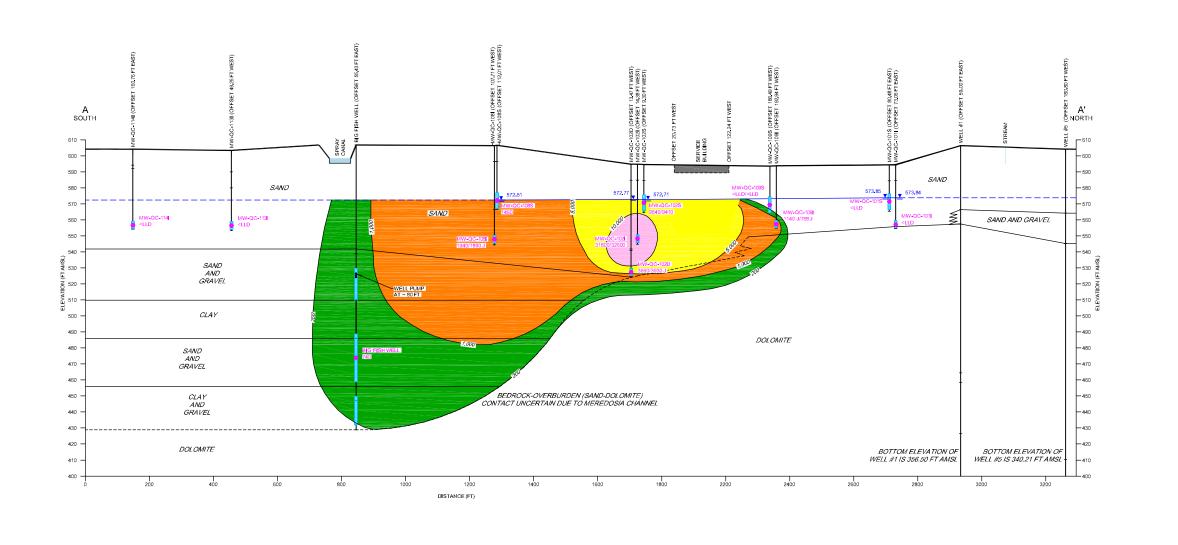
Project Manager:	Reviewed By:	Date:	
S. QUIGLEY	M. KELLY	AUGUST 20	006
Scale: AS SHOWN	Project Nº: 45136-28	Report Nº: 020	Drawing Nº: flgure 5.5

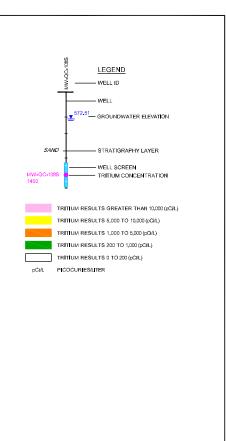
### FIGURE 5.6 POTENTIOMETRIC SURFACE CONTOURS – MAY 2006

### FIGURE 5.7 POTENTIOMETRIC SURFACE CONTOURS – JULY 2006

# FIGURE 5.8 TRITIUM CONCENTRATIONS GROUNDWATER AND SURFACE WATER

### FIGURE 5.9 RADIONUCLIDE CONCENTRATIONS -GROUNDWATER AND SURFACE WATER





SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC.

EXCECTA GENERATION COMPANY, EE

FLEETWIDE ASSESSMENT

TRITIUM PLUME CROSS-SECTION QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS





Source Reference

Project Manager:	Reviewed By:	Date:	
S. QUIGLEY	M. KELLY	AUGUST 20	006
Scale: AS SHOWN	Project Nº: 45136-28	Report Nº: 020	Drawing Nº: flgure 6.1

### FIGURE 6.2 TRITIUM PLUME MAP PLAN VIEW

TABLE 4.1 Page 1 of 1

### SUMMARY OF MONITORING WELL INSTALLATION DETAILS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample			Surface	Reference	Installation	Boring		Screene	ed Interval		Well	Hydrogeologic Unit
Location	X-coord.	Y-coord.	Elevation	Elevation	Date	Total Depth	Top	Bottom	Top	Bottom	Construction (4)	Screened
	(UTM Coo		(ft AMSL) (2)	(ft AMSL)		(ft bgs) (3)		bgs)		MSL)		
MW-1	2374174.31	15167246.22	594.10	593.44	1/8/2002	27.5	17	27	577.10	567.10	2-inch PVC Screen	Sand
MW-2	2374095.24	15167236.04	593.70	592.90	1/8/2002	27.5	17	27	576.70	566.70	2-inch PVC Screen	Sand
MW-3	2374127.66	15167094.77	593.80	593.44	1/8/2002	27.5	17	27	576.80	566.80	2-inch PVC Screen	Sand
MW-QC-101S	2374971.49	15167048.04	594.52	597.03	5/3/2006	29	18	28	576.52	566.52	2-inch PVC Screen	Sand
MW-QC-101I	2374966.40	15167054.51	594.58	597.10	5/3/2006	40	35	40	559.58	554.58	2-inch PVC Screen	Sand
MW-QC-102S	2374545.85	15166383.76	594.69	596.83	5/8/2006	30	19	29	575.69	565.69	2-inch PVC Screen	Sand
MW-QC-102I	2374540.07	15166383.51	594.76	597.14	5/5/2006	50	44	49	550.76	545.76	2-inch PVC Screen	Sand
MW-QC-102D	2374538.06	15166377.34	594.80	597.27	6/20/2006	70	65	70	529.80	524.80	2-inch PVC Screen	Sand
MW-QC-103I	2374012.83	15166772.84	594.39	596.44	5/10/2006	35	30	35	564.39	559.39	2-inch PVC Screen	Sand
MW-QC-104S	2374197.08	15166486.39	594.07	596.08	5/11/2006	28	18	28	576.07	566.07	2-inch PVC Screen	Sand
MW-QC-105I	2374091.76	15166468.31	593.11	595.36	5/9/2006	50	45	50	548.11	543.11	2-inch PVC Screen	Sand
MW-QC-106S	2373919.55	15167239.81	593.79	596.24	5/10/2006	27	17	27	576.79	566.79	2-inch PVC Screen	Sand
MW-QC-106I	2373919.31	15167246.61	594.00	596.19	5/10/2006	40	35	40	559.00	554.00	2-inch PVC Screen	Sand
MW-QC-107I	2375644.68	15167623.47	606.62	609.05	5/2/2006	39	29	39	577.62	567.62	2-inch PVC Screen	Sand
MW-QC-108S	2374259.34	15166032.65	606.64	608.64	5/15/2006	40	29.5	39.5	577.14	567.14	2-inch PVC Screen	Sand
MW-QC-108I	2374259.66	15166023.53	606.41	608.54	6/13/2006	62	56.0	61.0	550.41	545.41	2-inch PVC Screen	Sand
MW-QC-109S	2374559.94	15166815.03	593.93	593.72	7/12/2006	29	19.5	29.5	574.43	564.43	2-inch PVC Screen	Sand
MW-QC-109I	2374554.96	15166819.53	593.93	593.82	7/13/2006	39	34.0	39.0	559.93	554.93	2-inch PVC Screen	Sand
MW-QC-110I	2374719.18	15165737.66	605.20	604.85	7/11/2006	50	45.0	50.0	560.20	555.20	2-inch PVC Screen	Sand
MW-QC-111I	2374295.16	15165216.74	616.74	618.97	7/12/2006	50	45.0	50.0	571.74	566.74	2-inch PVC Screen	Sand
MW-QC-112I	2373920.24	15165723.47	601.99	604.90	7/10/2006	50	44.0	49.0	557.99	552.99	2-inch PVC Screen	Sand
MW-QC-113I	2373950.50	15165260.09	603.49	605.23	7/11/2006	50	44.5	49.5	558.99	553.99	2-inch PVC Screen	Sand
MW-QC-114I	2374003.52	15164891.14	604.22	607.30	7/10/2006	50	45.0	50.0	559.22	554.22	2-inch PVC Screen	Sand
MW-QC-115S	2374898.80	15163051.45	607.23	609.89	7/13/2006	40	30.0	40.0	577.23	567.23	2-inch PVC Screen	Sand
MW-QC-116S	2374329.41	15169726.03	609.58	612.33	7/13/2006	44	34.0	44.0	575.58	565.58	2-inch PVC Screen	Sand

### Notes:

- (1) Universal Transverse Mercator (UTM), Zone 15, NAD 83, in feet
- (2) ft AMSL feet above mean sea level
- (3) ft bgs feet below ground surface
- (4) PVC polyvinyl chloride

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Turbidity (NTU) <sup>(4)</sup>	Observations
MW-QC-101S	5/12/2006	1.2	1.2	6.13	680	23.4	560	Cloudy, brown
~			2.4	6.90	690	23.4	110	Cloudy, brown
			3.6	6.91	723	23.6	57	Slightly cloudy
			4.8	6.91	730	23.6	23	Clear
			6.0	6.92	734	23.6	9.3	Clear
MW-QC-101I	5/12/2006	3.0	3	6.87	590	23.2	210	Cloudy
			6	6.89	610	22.7	97	Slightly cloudy
			9	6.94	620	22.7	66	Slightly cloudy
			12	6.90	628	22.7	27	Clear
			15	6.90	630	22.7	10	Clear
MW-QC-102S	5/11/2006	1.31	1.3	6.87	720	25.3	293	Cloudy
			2.6	6.89	730	25.1	56.2	Slightly cloudy
			3.9	6.86	740	25.1	20.1	Clear
			5.2	6.86	<b>74</b> 0	25.1	8.2	Clear
			6.5	6.87	730	25.1	5.1	Clear
MW-QC-102I	5/11/2006	4.45	4.5	7.23	690	24.2	29.3	Clear
			9.0	7.04	698	24.2	10.1	Clear
			13.5	7.00	720	24.2	4.3	Clear
			18.0	6.97	720	24.2	2.7	Clear
MW-QC-102D	6/21/2006	7.5	2	7.55	540	22.7	>1,000	Cloudy, brown
			55	8.19	388	21.3	160	Cloudy, brown
			110	8.13	1 <b>7</b> 8.9	22.9	57.7	Cloudy, brown
			165	8.18	186.6	21.9	103	Cloudy, brown
			220	8.26	176.7	20.8	17.7	Clear
			275	7.74	168.3	19.1	8.67	Clear
			330	7.82	167.2	19.4	14.0	Clear

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Turbidity (NTU) <sup>(4)</sup>	Observations
			340	7.88	167.6	19.8	19.8	Clear
			350	7.89	168.3	19.7	22.0	Clear
MW-QC-103I	5/11/2006	2.3	22.5	6.75	602	22.3	157.5	Turbid, brown
			25.0	6.76	602	22.3	141.8	Cloudy, brown
			27.5	6.78	602	22.3	102.8	Cloudy, brown
MW-QC-104S	5/11/2006	1.24	1.25	6.73	730	25.7	30	Slightly cloudy
			2.50	6.82	780	25.6	19.9	Clear
			3.75	6.80	820	25.5	5.2	Clear
			5.00	6.86	810	25.4	5.0	Clear
			6.25	6.86	815	25.4	5.0	Clear
MW-QC-105I	5/11/2006	5.0	30	6.72	524	25 <i>.</i> 7	36.8	Sl. cloudy, light orange
			36	6.75	525	25.7	29.2	Clear
			42	6.78	525	25.7	25.6	Clear
			48	6.72	524	25.8	21.3	Clear
MW-QC-106S	5/11/2006	1.25	6.0	6.77	900	14.0	22.1	Clear
			7.5	6.64	900	14.0	18.4	Clear
			9.0	6.63	900	14.1	11.5	Clear
			10.5	6.62	900	14.1	6.28	Clear
			12.0	6.61	900	14.1	4.81	Clear
MW-QC-106I	5/11/2006	3.35	24	6.71	834	14.6	51.5	Slightly cloudy, brown
			28	6.68	833	14.6	31.5	Slightly cloudy, brown
			32	6.79	830	14.6	21.3	Clear
			36	6.75	830	14.7	7.7	Clear
			40	6.73	829	14.6	4.4	Clear

TABLE 4.2 Page 3 of 6

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature	Turbidity (NTU) <sup>(4)</sup>	Observations
MW-QC-107I	5/12/2006	1.04	1	6.72	680	22.1	590	Turbid
11211 20000	•, ==, ====		2	6.80	720	22.3	210	Cloudy
			3	6.95	760	21.4	57	Slightly cloudy
			4	6.90	<i>77</i> 0	22.3	15	Clear
			5	6.95	780	22.1	7.2	Clear
MW-QC-108S	5/16/2006	1.19	16.5	6.87	794	13.7	8.41	Clear
~			18.0	6.87	801	13.9	6.54	Clear
			19.5	6.84	793	13.8	3.14	Clear
MW-QC-108I	6/15/2006	4.5	55	7.57	452	23.8	13.7	Clear
~			110	7.61	436	24.3	7.90	Clear
			165	7.61	427	24.6	3.23	Clear
			220	7.61	428	24.5	1.60	Clear
			275	7.66	429	24.0	4.25	Clear
			285	7.65	427	23.4	2.83	Clear
			295	7.63	428	23.4	1.40	Clear
			305	7.62	427	23.3	1.54	Clear
MW-QC-109S	7/14/2006	0.5	5	6.68	2,380	19.1	502	Cloudy, brown
			10	7.20	946	18.6	320	Cloudy, brown
			15	7.18	950	18.5	300	Cloudy, brown
			20	7.04	947	18.2	195	Cloudy, brown
			25	7.02	951	18.4	87	Slightly cloudy, brown
			30	7.01	960	18.4	62	Slightly cloudy, brown
			35	7.00	970	18.6	55	Slightly cloudy, brown
			40	6.98	965	18.8	50	Clear
			<b>4</b> 5	6.99	967	18.6	40	Clear
			50	7.00	968	18.6	15	Clear

TABLE 4.2 Page 4 of 6

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Turbidity (NTU) <sup>(4)</sup>	Observations
MW-QC-109I	7/14/2006	2.7	15	6.86	2,380	19.1	>1,000	Cloudy
~	, ,		30	7.14	1,270	18.6	595	Cloudy
			45	7.16	1,280	18.4	320	Cloudy
			60	7.12	1,270	18.2	105	Slightly cloudy
			<i>7</i> 5	7.14	1,300	18.2	20	Clear
			90	7.04	1,190	18.6	18	Clear
			105	7.00	1,200	18.6	10	Clear
			120	6.98	1,200	18.6	5	Clear
			135	6.98	1,200	18.6	4	Clear
			150	7.00	1,210	18.6	4	Clear
MW-QC-110I	7/12/2006	2.5	75	7.80	341	16.7	1	Clear
			100	7.77	342	15.9	1	Clear
			125	7.46	342	15.2	1	Clear
			150	7.45	344	14.9	0	Clear
			175	7.61	345	15.0	0	Clear
			200	7.72	345	15.2	0	Clear
MW-QC-111I	7/13/2006	0.8	25	6.67	450	16.8	321	Cloudy
MIV QC IIII	7, 10, 2000	0.0	50	6.57	465	16.0	12	Clear
			<b>7</b> 5	6.52	457	16.0	3	Clear
			100	6.41	451	16.6	1	Clear
			125	6.44	453	15.9	1	Clear
			150	6.47	<b>4</b> 51	16.0	4	Clear
			175	6.28	455	15.7	1	Clear
			200	6.47	453	15.7	1	Clear
MW-QC-112I	7/12/2006	2.7	25	7.23	516	15.6	4	Clear
-			50	7.14	501	15.2	1	Clear

TABLE 4.2 Page 5 of 6

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Turbidity (NTU) <sup>(4)</sup>	Observations
			<i>7</i> 5	7.09	499	14.9	1	Clear
			100	7.11	498	15.2	1	Clear
			125	7.06	499	15.8	1	Clear
			150	7.15	497	15.1	1	Clear
			1 <b>7</b> 5	7.12	497	15.1	1	Clear
			200	7.09	496	15.1	0	Clear
MW-QC-113I	7/12/2006	2.9	25	7.47	501	15.8	12	Clear
~			50	7.55	488	15.3	11	Clear
			<i>7</i> 5	7.50	494	15.4	9	Clear
			100	7.38	503	15.4	2	Clear
			125	<b>7.</b> 55	503	15.3	2	Clear
			150	7.49	495	15.2	2	Clear
			1 <b>7</b> 5	7.51	496	15.2	1	Clear
			200	7.50	495	15.2	1	Clear
MW-QC-114I	7/12/2006	2.8	25	7.38	519	15.9	4	Clear
			50	6.39	486	15.2	1	Clear
			<b>7</b> 5	7.26	504	15.7	1	Clear
			90	7.23	496	15.3	1	Clear
			100	7.28	483	15.1	1	Clear
MW-QC-115I	7/14/2006	0.8	0.8	6.33	442	15.2	229	Cloudy, light brown
			1.6	8.87	453	14.3	45	Clear
			2.4	8.40	439	14.0	12	Clear
			3.2	8.13	437	13.8	8	Clear
			4.0	7.45	436	15.1	46	Clear
			4.8	6.60	436	13.8	41	Clear
			5.6	6.00	436	13.7	12	Clear

TABLE 4.2 Page 6 of 6

### SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Date	Well Volume (gallons)	Volume Purged (gallons)	pH (Std. Units) <sup>(1)</sup>	Conductivity (µS/cm) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Turbidity (NTU) <sup>(4)</sup>	Observations
			6.4	6.12	431	14.0	7	Clear
			7.2	5.81	433	13.7	5	Clear
			8.0	5.84	431	13.8	3	Clear
MW-QC-116S	7/14/2006	1.0	1.0	NM <sup>(5)</sup>	412	13.3	622	Cloudy, brown
			2.0	NM	412	15.9	29	Clear
			3.0	NM	376	14.5	8	Clear
			4.0	NM	370	14.2	5	Clear
			5.0	NM	370	14.0	3	Clear
			6.0	NM	369	14.0	3	Clear
			7.0	NM	371	13.9	2	Clear
*			8	NM	371	13.9	2	Clear
			9	NM	371	13.7	2	Clear
			10	NM	371	13.8	2	Clear

### Notes:

- (1) Std. Units standard units
- (2)  $\mu$ S/cm microSiemens per centimeter
- $^{\circ}$  C degrees Celsius
- (4) NTU nephelometric turbidity units
- (5) NM not measured; meter malfunction

TABLE 4.3 Page 1 of 1

### SUMMARY OF GROUNDWATER ELEVATIONS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

			May 30,	2006	July 26,	2006
Sample Location	Reference Elevation	Total Depth	Depth to Water	Groundwater Elevation	Depth to Water	Groundwater Elevation
	(ft AMSL) (1)	=	(ft below Reference)	(ft AMSL)	(ft below Reference)	(ft AMSL)
Shallow Wells						
MW-QC-101S	597.03	30.65	23.18	573.85	24.93	572.10
MW-QC-102S	596.83	30.92	24.12	572.71	25.04	571.79
MW-QC-104S	596.08	30.15	23.01	573.07	24.07	572.01
MW-QC-106S	596.24	29.87	22.42	573.82	24.50	571.74
MW-QC-108S	608.64	42.31	36.13	572.51	36.90	571.74
MW-QC-109S	593.72	29.45	NI <sup>(2)</sup>		21.99	571.73
MW-QC-115S	609.89	42.72	NI		38.29	571.60
MW-QC-116S	612.33	46.35	NI		40.61	571.72
MW-1	593.44	26.61	19.14	574.30	21.29	572.15
MW-2	592.90	26.65	18.84	574.06	20.82	572.08
Intermediate Wells						
MW-QC-101I	597.10	42.19	23.26	573.84	25.02	572.08
MW-QC-102I	597.14	51.60	24.37	572.77	25.27	571.87
MW-QC-103I	596.44	37.36	23.35	573.09	24.82	571.62
MW-QC-105I	595.36	52.53	22.43	572.93	23.55	571.81
MW-QC-106I	596.19	41.98	22.42	573.77	24.49	571.70
MW-QC-107I	609.05	41.53	34.94	574.11	36.51	572.54
MW-QC-108I	608.54	64.20	NI		36.82	571.72
MW-QC-109I	593.82	39.04	NI		22.16	571.66
MW-QC-110I	604.85	49.44	NI		33.12	571.73
MW-QC-111I	618.97	52.57	NI		47.31	571.66
MW-QC-112I	604.90	50.00	NI		32.98	571.92
MW-QC-113I	605.23	52.37	NI		34.62	570.61
MW-QC-114I	607.30	52.85	NI		35.60	571.70
Deep Wells						
MW-QC-102D	597.27	71.81	NI		25.48	571.79

Notes:

<sup>(1)</sup> ft AMSL - feet above mean sea level

<sup>(2)</sup> NI - not installed

### **TABLE 4.4**

### SUMMARY OF SURFACE WATER ELEVATIONS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

				May 31	May 31, 2006		, 2006	July 26, 2006		
Sample	Reference	Total Depth	Total Depth	Depth to Water	Surface Water	Depth to Water	Surface Water	Depth to Water	Surface Water	
Location	Elevation	(ft Below	Elevation	(ft Below	Elevation	(ft Below	Elevation	(ft Below	Elevation	
	(ft AMSL) (1)	Reference)	(ft AMSL)	Reference)	(ft AMSL)	Reference)	(ft AMSL)	Reference)	(ft AMSL)	
SW-QC-1	611.14	16.92	594.22	12.71	598.43	14.00	597.14	14.27	596.87	
SW-QC-2	611.12	15.86	595.26	12.72	598.40	14.01	597.11	14.25	596.87	
Discharge Bay	594.25	(2)		17.34	576.91	17.72	576.53	17.89	576.36	
Mississippi River					572.09 <sup>(3)</sup>		572.23 <sup>(3)</sup>		572.03 <sup>(3)</sup>	

### Note:

- (1) ft AMSL feet above mean sea level
- (2) Total depth of the discharge bay was not measured due to the turbulence of the water
- (3) www.rivergages.com; Mississippi River at Lock and Dam 14 (Pool); river elevation on the date specified at 12 PM

TABLE 4.5 Page 1 of 2

### SAMPLE KEY FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Sample Identifiation	QC Sample	Sample Date	Matrix	Analysis
Fire Training Well	WG-QC-MW-QC-FTW-053106-JH-001		5/31/2006	Groundwater	Tritium / Target Radionuclides
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	Surface Water	Tritium / Target Radionuclides
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	Surface Water	Tritium / Target Radionuclides
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	Groundwater	Tritium / Target Radionuclides
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	Groundwater	Tritium / Target Radionuclides
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	Groundwater	Tritium / Target Radionuclides
Big Fish Well	WG-QC-MW-QC-BFW-060106-JH-007		6/1/2006	Groundwater	Tritium / Target Radionuclides
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	Groundwater	Tritium / Target Radionuclides
WELL #1	WG-QC-MW-QC-WELL#1-060106-JH-009		6/1/2006	Groundwater	Tritium / Target Radionuclides
WELL #5	WG-QC-MW-QC-WELL#5-060106-JH-010		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	Groundwater	Tritium / Target Radionuclides
Rinsate	RB-QC-MW-QC-108S-053106-JH-013	Rinsate	5/31/2006	Water	Tritium / Target Radionuclides
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-018		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	Groundwater	Tritium / Target Radionuclides

TABLE 4.5 Page 2 of 2

### SAMPLE KEY FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Sample Identifiation	QC Sample	Sample Date	Matrix	Analysis
MW-QC-115S	RB-QC-MW-QC-115S-072706-NZ-007	Rinsate	7/27/2006	Water	Tritium / Target Radionuclides
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012	-	7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102D	RB-QC-MW-QC-102D-072806-NZ-014	Rinsate	7/28/2006	Water	Tritium / Target Radionuclides
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		7/28/2006	Groundwater	Tritium / Target Radionuclides

### Notes:

QC - Quality Control

Target Radionuclides: Sr-89/90, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140, and La-140 Duplicate (020) - Duplicate of sample number in parenthesis

TABLE 4.6 Page 1 of 4

Sample Location	Date	Time	Pumping Rate (mL/min) <sup>(1)</sup>	pH (Std. Units) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Conductivity (µS/cm) <sup>(4)</sup>	ORP (5) (mV) (6)	DO <sup>(7)</sup> (mg/L) <sup>(8)</sup>	Turbidity (NTU) <sup>(9)</sup>	Volume Purged (gallons)
MW-QC-101S	6/1/2006	14:00	420	7.40	15.0	0.873	95.8	8.56	4.28	
		14:05	420	7.39	15.0	0.870	94.8	8.46	3.26	
		14:10	420	7.39	15.0	0.869	94.7	8.48	2.21	2.2
MW-QC-101I	6/1/2006	13:55	460	7.69	16.5	1.681	129.6	7.12	16.0	
		14:00	460	7.66	16.4	1.680	123.2	6.96	13.0	
		14:05	460	7.66	16.5	1.678	116.6	7.04	10.87	3.0
MW-QC-102S	5/31/2006	15:50	420	6.90	17.6	0.963	152.6	1.71	38.2	
		15:55	420	6.90	17.6	0.961	151.2	1.65	40.8	
		16:00	420	6.91	17.6	0.960	149.7	1.52	38.2	2.2
MW-QC-102I	5/31/2006	15:45	460	7.43	17.6	1.079	86.1	1.00	12.0	
		15:50	460	7.41	1 <b>7</b> .5	1.082	84.2	0.98	9.6	
		15:55	460	7.40	17.6	1.082	83.2	0.98	4.7	3.0
MW-QC-102D	7/28/2006	12:10	400	8.27	18.0	0.476	<b>7</b> 1	4.91	14.9	
		12:15	400	8.26	18.0	0.478	71	4.87	7.1	
		12:20	400	8.27	18.0	0.480	71	4.89	4.7	4.2
MW-QC-103I	6/1/2006	7:35	420	7.45	24.2	0.589	49.9	0.29	36.5	
		7:40	420	7.45	24.2	0.590	46.1	0.28	32.8	
		7:45	420	7.45	24.2	0.591	42.8	0.27	27.4	3.3
MW-QC-104S	6/1/2006	12:45	480	6.77	20.3	2.695	87.7	0.31	31.0	
		12:50	480	6.76	20.3	2.617	78.6	0.34	26.0	
		12:55	480	6.75	20.3	2.614	70.7	0.25	23.0	2.5

TABLE 4.6 Page 2 of 4

Sample Location	Date	Time	Pumping Rate (mL/min) <sup>(1)</sup>	pH (Std. Units) <sup>(2)</sup>	Temperature (°C) (3)	Conductivity (µS/cm) (4)	ORP (5) (mV) (6)	DO <sup>(7)</sup> (mg/L) <sup>(8)</sup>	Turbidity (NTU) <sup>(9)</sup>	Volume Purged (gallons)
MW-QC-105I	6/1/2006	11:05	450	7.74	24.4	0.469	-3.5	0.61	10.0	
		11:10	450	7.72	24.4	0.463	-2.9	0.32	9.2	
		11:15	450	7.71	24.4	0.463	-3.8	0.33	8.0	2.5
MW-QC-106S	5/31/2006	14:25	360	7.24	14.5	0.414	162.9	9.31	10.77	
		14:30	360	7.24	14.5	0.413	159.2	9.24	9.42	
		14:35	360	7.24	14.5	0.413	157	9.25	8.07	1.5
MW-QC-106I	5/31/2006	14:30	300	6.95	16.0	0.669	37.6	0.48	3.47	
		14:35	300	6.94	16.0	0.670	39.2	0.46	3.40	
		14:40	300	6.93	16.0	0.672	38.7	0.45	3.40	2.7
MW-QC-107I	5/31/2006	8:55	360	6.86	16.2	0.537	137.3	7.91	13.0	
		9:00	360	6.83	16.2	0.540	131.3	7.87	37.47	
		9:05	360	6.79	16.1	0.540	124.7	7.63	13.3	3.8
MW-QC-108S	5/31/2006	10:20	400	6.79	20.6	0.636	61.7	0.39	17.7	
		10:25	400	6.79	20.6	0.633	59.4	0.46	11.8	
		10:30	400	6.79	20.6	0.628	56.3	0.62	7.92	1.6
MW-QC-108I	7/27/2006	8:20	400	7.39	20.9	0.491	71	0.67	5.12	
		8:25	400	7.39	20.9	0.491	<b>7</b> 0	0.66	4.33	
		8:30	400	7.39	20.9	0.491	71	0.67	4.12	3.2
MW-QC-109S	7/28/2006	9:45	400	6.84	17.7	3.320	77	1.06	6.3	
		9:50	400	6.84	17.7	3.340	<i>7</i> 6	1.04	5.60	
		9:55	400	6.83	17.7	3.350	76	1.03	4.96	3.2

TABLE 4.6 Page 3 of 4

Sample Location	Date	Time	Pumping Rate (mL/min) <sup>(1)</sup>	pH (Std. Units) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Conductivity (µS/cm) (4)	ORP (5) (mV) (6)	DO <sup>(7)</sup> (mg/L) <sup>(8)</sup>	Turbidity (NTU) <sup>(9)</sup>	Volume Purged (gallons)
MW-QC-109I	7/28/2006	10:55	400	7.14	18.4	1.477	75	0.36	17.8	
		11:00	400	7.14	18.4	1.470	<i>7</i> 5	0.35	9.5	
		11:05	400	7.14	18.4	1.471	75	0.34	4.5	5.3
MW-QC-110I	7/27/2006	9:05	400	7.62	14.8	0.286	72	8.90	4.75	
		9:10	400	7.64	14.8	0.287	<b>7</b> 1	8.88	3.12	
		9:15	400	7.63	14.8	0.286	72	8.87	2.98	2.6
MW-QC-111I	7/27/2006	13:45	400	6.49	15.6	0.402	<i>7</i> 5	3.43	2.14	
		13:50	400	6.48	15.5	0.403	76	3.45	1.95	
		13:55	400	6.47	15.5	0.405	77	3.44	1.78	2.6
MW-QC-112I	7/27/2006	13:00	400	7.21	14.5	0.440	76	0.49	7.21	
		13:05	400	7.20	14.5	0.442	77	0.47	5.14	
		13:10	400	7.19	14.5	0.441	77	0.46	4.95	2.6
MW-QC-113I	7/27/2006	10:40	400	7.38	16.4	0.446	<i>7</i> 5	0.41	20	
		10:45	400	7.37	16.4	0.446	<i>7</i> 5	0.40	15.10	
		10:50	400	7.37	16.4	0.447	75	0.40	8.58	2.6
MW-QC-114I	7/27/2006	9:55	400	7.34	14.9	0.428	72	0.49	10.8	
		10:00	400	7.31	15.0	0.428	72	0.48	7.65	
		10:05	400	7.31	15.0	0.428	73	0.47	4.95	2.6
MW-QC-115S	7/28/2006	7:35	400	7.30	13.7	0.388	88	8.00	10.40	
		7:40	400	7.28	13.7	0.386	87	8.00	7.26	
		7:45	400	7.30	13.7	0.387	88	8.01	4.97	3.2

TABLE 4.6 Page 4 of 4

### SUMMARY OF MONITORING WELL PURGING PARAMETERS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample			Pumping				(-)	-		Volume
Location	Date	Time	Rate (mL/min) <sup>(1)</sup>	pH (Std. Units) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Conductivity (µS/cm) <sup>(4)</sup>	$ORP^{(5)}$ $(mV)^{(6)}$	DO <sup>(7)</sup> (mg/L) <sup>(8)</sup>	Turbidity (NTU) <sup>(9)</sup>	Purged (gallons)
MW-QC-116S	7/28/2006	6:35	400	6.91	13.3	0.309	90	7.98	22.8	
		6:40	400	6.90	13.3	0.310	90	7.97	6.97	
		6:45	400	6.89	13.4	0.310	90	7.98	3.95	3.2
MW-1	6/1/2006	9:05	460	6.15	15.6	13.66	112.8	6.07	7.45	
		9:10	460	6.15	15.5	13.87	115.9	6.18	7.69	
		9:15	460	6.16	15.5	13.91	118.6	6.11	6.17	3.0
MW-2	6/1/2006	10:05	440	6.51	17.1	8.598	112.5	1.76	12.7	
		10:10	440	6.50	17.1	8.623	110.6	1.62	11.2	
		10:15	440	6.51	17.1	8.655	108.5	1.51	9.28	3.0

### Notes:

- (1) mL/min milliliters per minute
- (2) Std. Units standard units
- (3) °C degrees Celsius
- (4)  $\mu$ S/cm microSiemens per centimeter
- (5) ORP oxidation-reduction potential
- (6) mV millivolts
- (7) DO dissolved oxygen
- (8) mg/L milligrams per Liter
- (9) NTU nephelometric turbidity units

The last three readings are provided in the table

TABLE 4.7 Page 1 of 1

### SUMMARY OF EXISTING SUPPLY WELL PURGING PARAMETERS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Date	Time	pH (Std. Units) <sup>(2)</sup>	Temperature (°C) <sup>(3)</sup>	Conductivity (µS/cm) <sup>(4)</sup>	ORP (5) (mV) (6)	DO (7) (mg/L) (8)	Turbidity (NTU) <sup>(9)</sup>
Fire Training Well	5/31/06	8:00	7.54	17.2	353	223.7	8.63	2.85
Fish House Well	5/31/06	9:10	7.87	22.0	402	266.8	5.10	2.67
Little Fish House	5/31/06	9:40	7.57	17.2	377	54.1	7.27	3.26
Dry Cask Storage Well	6/1/06	8:20	8.14	16.7	232	124	5.71	2.7
Big Fish Well	6/1/06	8:50	8.08	14.1	357	188.2	5.21	2.94
STP Sand Point Well	6/1/06	9:05	7.31	14.2	439	-26.2	5.70	2.23
Well #1	6/1/06	9:15	7.48	13.6	587	7.6	8.0	3.72
Well #5	6/1/06	9:30	7.26	14.3	1,131	82.5	8.12	3.00

### Notes:

- (1) mL/min milliLiters per minute
- (2) Std. Units standard units
- (3) °C degrees Celsius
- (4)  $\mu$ S/cm microSiemens per centimeter
- (5) ORP oxidation-reduction potential
- (6) mV millivolts
- (7) DO dissolved oxygen
- (8) mg/L milligrams per Liter
- (9) NTU nephelometric turbidity units

TABLE 5.1 Page 1 of 1

### SUMMARY OF CALCULATED VERTICAL GRADIENTS FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

	Top of	Bottom of	Mid-Point	May	30, 2006	July 26, 2006		
Sample Location	Screen Elevation (ft AMSL) <sup>(1)</sup>	Screen Elevation (ft AMSL)	of Screen Elevation (ft AMSL)	Water Level (ft AMSL)	Vertical Gradient (ft/ft) <sup>(2)</sup>	Water Level (ft AMSL)	Vertical Gradient (ft/ft) <sup>(2)</sup>	
MW-QC-101S MW-QC-101I	576.52 559.58	566.52 554.58	571.52 557.08	573.85 573.84	0.001	572.10 572.08	0.001	
MW-QC-102S MW-QC-102I	575.69 550.76	565.69 545.76	570.69 548.26	572.71 572.77	-0.003	571.79 571.87	-0.004	
MW-QC-106S MW-QC-106I	576.79 559.00	566.79 554.00	571.79 556.50	573.82 573.77	0.003	571.74 571.70	0.003	
MW-QC-108S MW-QC-108I	577.14 550.41	567.14 545.41	572.14 547.91	NI <sup>(3)</sup> NI		571.74 571.72	0.001	
MW-QC-109S MW-QC-109I	574.43 559.93	564.43 554.93	569.43 557.43	NI NI		571.73 571.66	0.006	

### Notes:

- (1) ft AMSL feet above mean sea level
- (2) Positive value denotes downward vertical gradient; negative value denotes upward vertical gradient
- (3) NI paired wells not installed

TABLE 5.2 Page 1 of 1

### ANALYTICAL RESULTS SUMMARY - TRITIUM IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Sample Identification	QC Sample	Sample Date	Tritium (pCi/L)	Result Error
Big Fish Well	WG-OC-MW-OC-BFW-060106-JH-007		6/1/2006	740	+/-152
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	ND (200)	-
Fire Training Well	WG-OC-MW-OC-FTW-053106-JH-001		5/31/2006	ND (200)	-
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	ND (200)	-
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	371	+/-134
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	ND (200)	-
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	250	+/-126
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	ND (200)	-
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	ND (200)	-
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		7/28/2006	3930 J	+/-450
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	32600	+/-977
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	31800	+/-972
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-018	-	5/31/2006	9410	+/-655
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	9640	+/-660
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020	_	6/1/2006	ND (200)	-
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	ND (200)	-
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025	_	6/1/2006	262	+/-130
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	ND (200)	-
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	ND (200)	-
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	ND (200)	-
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	ND (200)	-
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	1890 J	+/-252
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	1460	+/-217
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012		7/28/2006	768 J	+/-156
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	1140 J	+/-182
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010	_	7/28/2006	ND (200)	-
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	ND (200)	-
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	ND (200)	-
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	420 J	+/-133
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	ND (200)	-
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	ND (200)	-
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	ND (200)	-
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	ND (200)	-
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	ND (200)	-
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	ND (200)	-
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	550	+/-143
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	497	+/-140
Well #1	WG-MW-QC-WELL#1-060106-JH-009		6/1/2006	ND (200)	-
Well #5	WG-MW-QC-WELL#5-060106-JH-010		6/1/2006	ND (200)	-

### Notes:

Samples analyzed by: Teledyne Brown Engineering, Inc.

QC - Quality Control

I - Estimated.

ND ( ) - Non-detect; value in parentheses is the LLD.

LLD - Lower limit of detection.

- - Non-detect value, +/- value not reported.

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### ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		Big Fish Well WG-QC-MW-QC-BFW-060106-JH-007 6/1/2006	Big Fish Well Result Error	Dry Cask Storage Well WG-QC-MW-QC-DCS-060106-JH-006 6/1/2006	Dry Cask Storage Well Result Error	Fire Training Well WG-QC-MW-QC-FTW-053106-JH-001 5/31/2006	Fire Training Well Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	•	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	•	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI		RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	106.3	+/-33.68	RNI	-

### Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected. Peak not identified, but forced activity

Detectable Concentration and 3 sigma. - - Non-detect value, +/- value not reported.

concentration exceeds Minimum

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### ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		Fish House Well WG-QC-MW-QC-FHW-053106-JH-004 5/31/2006	Fish House Well Result Error	Little Fish Well WG-QC-MW-QC-LFW-053106-JH-005 5/31/2006	Little Fish Well Result Error	MW-1 WG-QC-MW-1-060106-JH-022 6/1/2006	MW-1 Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	ū.	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10) U*	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	•	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

### Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Non-detect; value in parentheses is the LLD.

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity

concentration exceeds Minimum

Detectable Concentration and 3 sigma.

- - Non-detect value, +/- value not reported.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:	MW-2 WG-QC-MW-2-060106-JH-023 6/1/2006	MW-2 Result Error	MW-QC-1011 WG-QC-MW-QC-1011-060106-JH-027 6/1/2006	MW-QC-101I Result Error	MW-QC-101S WG-QC-MW-QC-101S-060106-JH-026 6/1/2006	MW-QC-101S Result Error
Units Target Radionuclides						
Barium-140 pCi/L		-	ND (60)	-	ND (60)	-
Cesium-134 pCi/L		-	ND (10)	-	ND (10)	-
Cesium-137 pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58 pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60 pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59 pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140 pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54 pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95 pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total) pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65 pCi/L		-	ND (30)	-	ND (30)	-
Zirconium-95 pCi/L		-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)						
Actinium-228 pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40 pCi/L	144.8	+/-50.51	RNI	-	RNI	-

# Notes:

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds Minimum Detectable Concentration and 3 sigma.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:	Units	MW-QC-102D WG-QC-MW-QC-102D-072806-NZ-015 7/28/2006	MW-QC-102D Result Error	MW-QC-1021 WG-QC-MW-QC-102I-053106-JH-016 5/31/2006	MW-QC-1021 Result Error	MW-QC-1021 WG-QC-MW-QC-1021-053106-JH-017 5/31/2006 Duplicate	MW-QC-102I Result Error
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10) U*	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30) U*	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	•	RNI	-	21.46	+/-7.75
Potassium-40	pCi/L	RNI	-	RNI	-	84.48	+/-37.32

# Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND () - Non-detect; value in parentheses is the LLD.

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT **OUAD CITIES GENERATING STATION** CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		MW-QC-102S WG-QC-MW-QC-102S-053106-JH-018 5/31/2006	MW-QC-102S Result Error	MW-QC-102S WG-QC-MW-QC-102S-053106-JH-019 5/31/2006 Duplicate	MW-QC-102S Result Error	MW-QC-1031 WG-QC-MW-QC-1031-060106-JH-020 6/1/2006	MW-QC-103I Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30) U*	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

### Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:	Units	MW-QC-103I WG-QC-MW-QC-103I-060106-JH-021 6/1/2006 Duplicate	MW-QC-103I Result Error	MW-QC-104S WG-QC-MW-QC-104S-060106-JH-025 6/1/2006	MW-QC-104S Result Error	MW-QC-105I WG-QC-MW-QC-105I-060106-JH-024 6/1/2006	MW-QC-1051 Result Error
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

# Notes:

concentration exceeds Minimum Detectable Concentration and 3 sigma. - - Non-detect value, +/- value not reported.

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND () - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected. Peak not identified, but forced activity

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT **QUAD CITIES GENERATING STATION** CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		MW-QC-106I WG-QC-MW-QC-106I-053106-JH-014 5/31/2006	MW-QC-1061 Result Error	MW-QC-106S WG-QC-MW-QC-106S-053106-JH-015 5/31/2006	MW-QC-106S Result Error	MW-QC-107I WG-QC-MW-QC-107I-053106-JH-011 5/31/2006	MW-QC-107I Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	•	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	•
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	=	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

### Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		MW-QC-108I WG-QC-MW-QC-108I-072706-NZ-001 7/27/2006	MW-QC-108I Result Error	MW-QC-108S WG-QC-MW-QC-108S-053106-JH-012 5/31/2006	MW-QC-108S Result Error	MW-QC-109I WG-QC-MW-QC-109I-072806-NZ-012 7/28/2006	MW-QC-109I Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	=	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10) U*	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	•	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI		RNI	-
Potassium-40	pCi/L	RNI	-	162.9	+/-55.66	RNI	-

# Notes:

Samples analyzed by: Teledyne Brown
(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.
RNI- Radionuclide Not Identified during analysis.
RNI- Radionuclide Not Identified during analysis.
ND () - Non-detect; value in parentheses is the LLD.
LLD - Lower limit of detection.
U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:	Units	MW-QC-109I WG-QC-MW-QC-1091-072806-NZ-013 7/28/2006 Duplicate	MW-QC-109I Result Error	MW-QC-109S WG-QC-MW-QC-109S-072806-NZ-010 7/28/2006	MW-QC-109S Result Error	MW-QC-109S WG-QC-MW-QC-109S-072806-NZ-011 7/28/2006 Duplicate	MW-QC-109S Result Error
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	•	ND (10) U*	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	=	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	=	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10) U*	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30) U*	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	=	RNI	-	RNI	-

# Notes:

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.
-- Non-detect value, +/- value not reported.

TABLE 5.3 Page 10 of 13

# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		MW-QC-110I WG-QC-MW-QC-110I-072706-NZ-002 7/27/2006	MW-QC-110I Result Error	MW-QC-111I WG-QC-MW-QC-111I-072706-NZ-006 7/27/2006	MW-QC-111I Result Error	MW-QC-1121 WG-QC-MW-QC-1121-072706-NZ-005 7/27/2006	MW-QC-112I Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10) U*	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	=	ND (2)	=	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30) U*	-	ND (30) U*	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

### Notes:

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND () - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

TABLE 5.3 Page 11 of 13

# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:	MW-Qi WG-QC-MW-QC-1 7/27/;	13I-072706-NZ-004 Result	MW-QC-114I WG-QC-MW-QC-114I-072706-NZ-00 7/27/2006	MW-QC-114I Result Error	MW-QC-115S WG-QC-MW-QC-115S-072806-NZ-009 7/28/2006	MW-QC-115S Result Error
Target Radionuclides	Inits					
Barium-140	Ci/L ND (	(60)	ND (60)	-	ND (60)	-
Cesium-134	Ci/L ND (1	(0) U*	ND (10)	-	ND (10)	-
Cesium-137	Ci/L ND	(18)	ND (18)	•	ND (18)	-
Cobalt-58	Ci/L ND	(15)	ND (15)	-	ND (15)	-
Cobalt-60	Ci/L ND	(15)	ND (15)	<del>-</del>	ND (15)	-
Iron-59	Ci/L ND	(30)	ND (30)	-	ND (30)	-
Lanthanum-140	Ci/L ND	(15)	ND (15)	-	ND (15)	-
Manganese-54	Ci/L ND	(15)	ND (15)	-	ND (15)	-
Niobium-95	Ci/L ND	(10)	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	Ci/L ND	(2)	ND (2)	=	ND (2)	-
Zinc-65	Ci/L ND (3	30) U* -	ND (30)	-	ND (30)	-
Zirconium-95	Ci/L ND	(10)	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)						
Actinium-228	Ci/L R	NI -	RNI	-	RNI	-
Potassium-40	Ci/L R	NI -	RNI	-	RNI	-

# Notes:

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected. Peak not identified, but forced activity

Detectable Concentration and 3 sigma. - - Non-detect value, +/- value not reported.

concentration exceeds Minimum

**TABLE 5.3** Page 12 of 13

# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		MW-QC-116S WG-QC-MW-QC-116S-072806-NZ-008 7/28/2006	MW-QC-116S Result Error	STP Sand Point Well WG-QC-MW-QC-STP-060106-JH-008 6/1/2006	STP Sand Point Well Result Error	SW-QC-1 WS-QC-5W-QC-001-053106-JH-002 5/31/2006	SW-QC-1 Result Error
	Units						
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10)	•	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	~	ND (30)	•	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	•	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	•	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30)	•	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	

### Notes:

Samples analyzed by: Teledyne Brown

concentration exceeds Minimum
Detectable Concentration and 3 sigma.
- - Non-detect value, +/- value not reported.

Samples analyzed by: Telegyne brown

(1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND() - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity

TABLE 5.3 Page 13 of 13

# ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location: Sample Identification: Sample Date:		SW-QC-2 WS-QC-SW-QC-002-053106-JH-003 5/31/2006	SW-QC-2 Result Error	Well #1 WG-MW-QC-WELL#1-060106-JH-009 6/1/2006	Well #1 Result Error	Well #5 WG-MW-QC-WELL#5-060106-JH-010 6/1/2006	Well #5 Result Error
Target Radionuclides	Units						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10) U*	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)		ND (10)	-	ND (10)	-
Non-Target Radionuclides (1)							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	97.31	+/-44.6	RNI	-	RNI	-

# Notes:

Samples analyzed by: Teledyne Brown (1) - These non-targeted radionuclides are included in this table but excluded from the discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station. RNI- Radionuclide Not Identified during analysis. RNI- Radionuclide Not Identified during analysis. ND ( ) - Non-detect; value in parentheses is the LLD. LLD - Lower limit of detection. U\* - Compound/Analyte not detected.

Peak not identified, but forced activity

concentration exceeds Minimum

Detectable Concentration and 3 sigma.

# Revision 0

# APPENDIX A

WATER SUPPLY WELL INFORMATION



# Illinois State Water Survey

Main Office • 2204 Griffith Drive • Champaign, IL 61820-7495 • Tel (217) 333-2210 • Fax (217) 333-6540

Peoria Office • P.O. Box 697 • Peoria, IL 61652-0697 • Tel (309) 671-3196 • Fax (309) 671-3106



6/1/2006

Ms. Patrica Klick CRA 8615 W. Bryn Mawr Chicago, IL 60631



Dear Ms. Klick:

As you requested during our telephone conversation on June 01, 2006, we are enclosing printouts from our Private Well Database and Public, Industrial, Commercial Survey (PICS) Database for the following locations:

<b>COUNTY</b>	<b>TOWNSHIP</b>	<u>RANGE</u>	<b>SECTIONS</b>
ROCK ISLAND	20 NORTH	2 EAST	7, 8, 17-20

No available information is indicated on the printout by the statement "0 records were found for the specified locations." Also enclosed are explanations of the Illinois State Water Survey Private Well and PICS Databases.

The data included in the Private Well Database are those non-municipal wells which are known to the Illinois State Water Survey, and the PICS Database is an inventory of municipal well information and large industrial groundwater users. We may not have a copy of well records for these groundwater users.

The enclosed statement reflects the charges for this request which includes a \$35.00 query fee for PICS information, a \$35.00 query fee for Private well information, and a \$0.10 per page charge for 10 pages, plus a \$5.00 shipping and handling fee, totaling \$76.00.

If you have any questions or if I can be of further assistance, please call.

Sincerely,

Susce Casly &

Associate Supportive Scientist Center for Groundwater Science

Phone: (217) 333-9043

Enclosures as stated

# ISWS 10-ACRE PLOT LOCATION SYSTEM

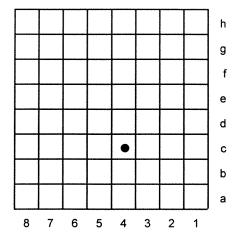
The following is an explanation of the ISWS Private Well Database location system.

The location system uses Township, Range, and Section. The location consists of five parts: County abbreviation, Township, Range, Section, and coordinate within the section (subsection or 10-acre plot). Sections are divided into rows of 1/8-mile squares. Each 1/8-mile square contains 10 acres and corresponds to a quarter of a quarter of a quarter section. A normal section of 1 square mile contains 8 rows of 1/8-mile squares; an odd-sized section contains more or fewer rows. Rows are numbered from east to west and lettered from south to north as shown in the diagram.

Example:

St. Clair County, FIP No. 163

T2N, R10W Section 23



The location of the well shown above is 163 2N10W-23.4c. The well point is located at the center of this 10-acre plot.

# ILLINOIS STATE WATER SURVEY PRIVATE WELL DATABASE EXPLANATION

WID Illinois State Water Survey Identification Number

FIPS County Code Number

TWN Civil Township

RNG Range SEC Section

**PLOT** 10-acre Plot Location within the Section

**OWNER** Well Owner

**DRILLER** Well Drilling Contractor of Well

**DATE DRILLED**Depth (well to nearest ft)

**RECORD TYPE** Record Type (types of information on file)

R - Construction Report

G - GeologyS - SealedA - Affidavit

C - Chemical Analysis

I - Inventory

X - Indicates Comment in Owners Field Something Unusual

O - Any Other Type of Record

P - Pump Installation

**USE** Well Use (two-letter code indicating the usage of the well)

CO - Conservation

CS - Community Supply

DO - Domestic DW - De-Watering

IC - Industrial/Commercial

IN - Injection Well IR - Irrigation

MO - Monitoring

NC - Non-Community

NW - Non-Well Source

OB - Observation

PK - Park

RC - Recovery Well RW - Relief Well

SC - School

ST - State

**USE** 

(Continued)

TB - Test Boring
TH - Test Hole
TW - Test Well
~ - Unknown

WELL TYPE

Well Type (two-letter code indicating the type of well)

BLANK - Assumed Drilled

BD - Bored DL - Drilled

DU - Dug (Being Phased Out)

DR - Driven
NW - Non-Well
SP - Sand Point
SG - Spring

~ - Assumed Drilled or Possibly Unknown

**AQUIFER TYPE** 

Aquifer Type (two-letter code indicating aquifer type)

BR - Bedrock
DH - Dry Hole
SW - Surface Water
UN - Unconsolidated
~ - Unknown

STAT LVL PUMP LVL Static Level - Reported non-pumping water level

Pumping Level - Reported water level during initial pumping of

the well

**PUMP GPM** 

Pumping GPM - Gallons per minute at time of well construction

THE DATA IN THE PRIVATE WELL DATABASE IS A LISTING OF THE NON-COMMUNITY WELLS WHICH ARE KNOWN TO THE ILLINOIS STATE WATER SURVEY (ISWS). THIS INFORMATION HAS BEEN ENTERED VERBATIM FROM WELL LOGS SUBMITTED BY THE DRILLER, FROM CHEMICAL ANALYSIS REPORTS, FROM WELL SEALING FORMS, OR WELL INVENTORY FORMS FROM THE 1930-34 WELL SURVEY AND OTHER SPECIAL PROJECTS. THE ACCURACY OF THIS DATA IS CONTROLLED BY THOSE WHO SUBMITTED THE FORM. INFORMATION IN THE PRIVATE WELL DATABASE HAS NOT BEEN VERIFIED.

# ILLINOIS STATE WATER SURVEY PICS DATABASE EXPLANATION

SWS ID ISWS Facility ID Number

NAME Facility Name

WELL # ISWS Point Source Well/Intake Number

STATUS Point Source Status of Well/Intake

A = Abandoned - no longer in existence, no affidavit on file, or

do not know if it has been filled in

C = Capped - cap attached to top

D = Disconnected - disconnected from system
 E = Emergency - available for standby use
 I = In Use - produces major portion of water

O = Observation - used for water level measurements

S = Sealed - filled in

U = Unused - exists but not used

FIPS County Code Number

TWN Civil Township

RNG Range SEC Section

**PLOT** 10-acre Plot Location within the Section

**DEPTH** Depth (well to nearest ft)

**TYPE LOG** D = Driller's log

O = Other
X = Chemical
C = Correlated log
S = Sample study log
- Log not available

YEAR Year Point Source Initially Constructed

**DRILLER** Well Drilling Contractor of Well

# Illinois State Water Survey Private Well Database

# Thursday, June 1, 2006

County:

**ROCK ISLAND** 

Township: 20N

Range:

Sections: 07,08,17,18,19,20

Records Found: 87

02E

Questions:

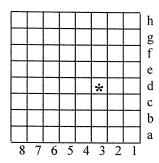
Contact the Illinois State Water Survey's Ground Water Division @ (217)-333-9043

**Publication:** 

Please cite the Illinois State Water Survey's Private Well Database in all publications based wholly or partially on this information.

Note: The data in the Private Well Database is a listing of non-municipal wells which are known to the Illinois State Water Survey (ISWS). This information has been entered verbatim from well logs submitted by the driller, chemical analysis reports, well sealing forms, well inventory forms from the 1930-1934 well survey, and other special projects. The accuracy of this data is controlled by those submitting the forms. Information in the Private Well Database has not been verified.

This data cannot be resold or redistributed. The Illinois State Water Survey must be acknowledged in any use of this material.



Location of a 10-acre-plot within a section:

The origin can be found at the lower right-hand-corner of an 8 x 8 grid. In this example, the well is in the 10-acre plot '3d'.

PUMP GPM					ļ							40	30		}
σUMP VI.										40	39	39	25 ·	44	46
STAT										- 61	<u>8</u>	61	17	29	29
AQ LYPE		1	}	}	} {	}	1		}	3	5	3	5	5	5
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RD E USE		.		1				-	8	8	8	8	8	8	8
RECORD TYPE	U	RG	RG	RG	RG	RG	RG	RG	RG	RG	RG	RG	RG	RG	RG
DEPTH	3 42	0 36	9 41	4 24	4 34	4 48	9 20	8 28	44	9 48	5 76	2 50	8 106	5 63	6 51
DRILL DATE.	00/00/1913	00/00/1910	00/00/1929	00/00/1934	00/00/1914	00/00/1934	6061/00/00	00/00/1918	03/06/1968	11/27/1989	09/21/1995	08/28/2002	07/31/1968	08/09/1995	10/11/1996
ΩΩ.	8	ŏ		ŏ	ŏ	0	.   8	8	0	= .	80	õ	0	80	
		7	B BAUMGARTNER	N.	S	9	<b>&gt;</b>				SNO	ill &			ONS
	ı I	UNKNOWN	AUMG,	B JACOBSEN	J SALLOWS	A ROWLAND	F M BAILEY	MLAMB	M J FENNO	LYONS	GLENN LYONS	LATTA WELL & PUMP/KIRK	WINSLOW	LYONS	GLENN LYONS
DRII		5	B B	T AB	J S.	AR	F.	M	Σ	LY	G	LA	M	Γλ	GF
												·			
OWNER															
	,									10	E .	IF UBD.	91	2E	2E
SEC PLOT	07	07	0.7	0.0	07	07	0.7	07	07	07 1	07	100 SU	07	07 2	07 2
	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E 3CLUS	02E	02E	02E
'N RNG	N02	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N R'S SUE	20N	20N	20N
FIPS	161	161	161	191	161	191	161	191	161	191	191	161 KIPPEJ	161	161	191
WID	127628	127629	127630	127631	127632	127633	127634	127635	127637	249299	330143	358883 161 20N 02E 07 1F LOT 10 SKIPPER'S SUBCLUSION SUBD	249300	275580	297449

WID	FIPS	TWN RNG	RNG	SEC	PLOT	SEC PLOT OWNER	DRILLER	DATE DEPTH	RECORI TYPE	USE	WELL AQ STAT	AQ S YPE L	<u>.</u>	PUMP I	PUMP GPM
375638	161	20N	02E	07	2E		LATTA WELL & PUMP/KIRK	11/03/2005 50	RG	20	]년	3	<u>8</u>	39	20
127640	161	20N	02E	07	2F		M J FENNO	09 8/61/10/90	RG	8	DF	<u>z</u>	20	21	15
240684	161	20N	02E	07	38		LYONS	09/18/1992 45	RG	8		25	81	30	
311201	161	20N	02E	07	38		LYONS DRILLING/HUBB	06/27/1997 50	RG	8	DI	5	29	. 34	<u>8</u>
244019	161	20N	02E	07	30		HOYLE WELL & PUMP 05/28/1993	P 05/28/1993 12	RG	8	DL	25	91	23	20
297451	191	20N	02E	07	3D		GLENN LYONS	09/26/1995 67	RG	8	DI	5	36	49	
318841	161	20N	02E	07	3D		LYONS DRILLING	06/25/1997 46	RG	8	DI	<u>\$</u>	14	34	40
355182	191	20N	02E	0.1	σ£		LYONS WELL DRILLING/DALE HUBB	07/31/2003 53 B	RG	8	JG	3	81	34	25
127636	161	20N	02E	07	30		UNKNOWN	00/00/1934 60	RGC		DR	1			
127641	191	20N	02E	80			NEIDIG BROS	00/00/1941 73	RG	8	}	1			
127642	191	20N	02E	80			E WILLIAMS	00/00/1918 54	RG		DR	}			
127643	191	20N	02E	80			C SALLOWS	00/00/1904 65	RG		DO	}			
127644	191	20N	02E	90			FLAGEL WELL DRLG	10/00/1958 45	RG	DO	}	}	:		
127645	191	20N	02E	80			FLAGEL WELL DRLG	10/00/1958 100	RGX	00	}	}			
127646	191	20N	02E	08			FLAGEL WELL DRLG	10/00/1958 71	RGX	00	<b>}</b>	}			

**∮** \\$50 •

WID	FIPS	Ž	'N RNG	SEC	PLOT	SEC PLOT OWNER	DRII	DRILL DEPTH	RECORI TYPE	USE	AQ YPE	E.	<u>بم</u>	PUMP
127671	191	N07	02E	80	Ξ	MILWAUKEE R R	M J FENNA	09/16/1969 47	RG		<b>}</b>	1		: ]
340486 SKIPPEI	340486 161 2 SKIPPERS SUBD.	20N BD.	02E	80	25		GINGERICH WELL DRILLING	04/19/2001 205	RG	TO OO	BR			İ
127649	191 6	20N	02E	80	98		G LYONS	10/23/1985 47	RG	→ 00	}			1
249301	191	20N	02E	80	H8		LYONS	11/30/1989 47	RG	DG DF	<u>-</u> - <u>5</u>	16 3	30	1
263201	191 1	20N	02E	80	H8		LYONS	11/24/1993 70	RG	DO DE	<u>N</u>	33 5	50	
358776	9 161	20N	02E	80	8H		LATTA WELL & PUMP 04/10/2002	04/10/2002 72	RG	DO DE	5	14 3	39 \$	80
366145	191 \$	20N	02E	80	8H		LYONS WELL DRILLING/DALE HUBB	09/23/2003 70 B	RG	70 OG	<u>z</u>	15 3	39 4	40
127648	8 161	20N	02E	80	8Н		G LYONS	05/24/1984 45	RG	→ 20	}			
127666 161	191 - 5	20N	02E	7			HELLINGSHEAD	00/00/1873 62	RG	00	1			,
127667	191 /	20N	02E	17			UNKNOWN	00/00/1934 47	RG	DR _	}			
355215	191 2	20N	02E	17	99	EXELON GENERATION CO.LLC	JOHN KOPP	/ / 167 Sealed: 6/23/03	∢	IC DF				
127674	4 161	20N	02E	<u>8</u>	2A		E WILLIAMS	00/00/1920 60	RG	DR	}			
127675	191 2	20N	02E	<u>∞</u>	2B		E WILLIAMS	00/00/1915 60	RG	DR _	}			
127676	2 161	20N	02E	- R	3C	. tu	OWNER	09 6061/00/00	RG .	na –	<b>*</b>			,
340848	191 8	20N	02E	∞_	2E 1		HOYLE WELL & PUMP/TIMMERMAN	01/12/2001 80	RG	7d Od	ON 5	23 3:	38. 2	. 20

PUMP GPM		1									1	15	!		20
PUMP												31			39
_											-	29			24
( <del>-</del> )	}	}	}	1	}	1	1	}	}	1	}	<u>3</u> .	}	1	S
WELL AQ	eg Oğ	DO	R.	8	ద్ద	ğ	1	1	dS	1	1	70	1	}	DI
RD .			.			1	8	8	1	00 00	8	8	8	OQ	8
RECORD TYPE	RG	RG	RG	RG	RG	RG	RG								
DRILL DATE DEPTH	00/00/1927 54	00/00/1910 52	00/00/1933 60	00/00/1928 60	00/00/1929 60	00/00/1934 60	10/30/1972 68	08/24/1974 90	08/07/1974 59	07/14/1972 75	06/24/1977 62	07 7761/60/90	10/24/1980 67	09/01/1973 71	09/22/2003 70
DRILLER	M WILLIAMS	BENSTER	F L WILLIAMS	) SALLOWS	J JOHNSON	UNKNOWN	M J FENNO	M J FENNO	M J FENNO	M J FENNO	M J FENNOP	FENNO	M J FENNO	M J FENNO	LATTA WELL & PUMP/KIRK
TWN RNG SEC PLOT OWNER	3G -							IA	q <sub>I</sub>	1G (	DI DI	H	2D	2E :	2Н
SEC I	18	16	61	16	61	61	61	61	6	6	61	61	61	19	19
RNG	02E	02E	02E	02E	02E	02E	02E								
TWN	20N	20N	70N	20N	20N	20N	20N								
FIPS	191	161	161	161	191	191	191	191	191	191	191	191	191	191	161
WID	127678	127680	127681	127682	127683	127684	127685	127686	127687	127688	127689	249302	127690	127691	362267

PUMP	70		09	1	}		15		20	13	09				
PUMP			43	į			58	49	84	49	49				
STAT			28				. 25	39	33	39	36				
(-)	BR		3				BR.	25	5	5	3	}	}	}	j   .
WELL AQ	ם	SP	DT D	Sp	8	DR	DL	<u></u>	DE	DF	DI.	DO	DR	}	DR DR
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RECORD TYPE	RG	<	RG	<b>4</b>	₹	<b>*</b>	RG	RG .	RG	RG	RG	RG	RG	RG	RG
DEPTH	96	70	86	44/23/04	20/1/04	42	235	65	80	08	70	45	38	35	37
DRILL DATE 1	03/08/2004	00/00/0000 70 Sealed: 3/29/04	10/21/2004 98	00/00/0000 44 Sealed: 10/23/04	00/00/0000 20 Sealed: 12/1/04	00/00/0000 42 Sealed: 8/20/04	24/2004	06/20/1995	3/2000	0/2000	08/31/2000	00/00/1924	00/00/1926	00/00/1884	00/00/1921
DR DA	03//	00/ Sea	10/	00/ Sea	%ea Sea	00/l	JOE06/7	7/90	Æ 10/2	AP 05/2	08/3	0/00	0/00	0/00	0/00
DRJ: t	HOYLE WELL & PUMP/CORWIN	SELF	GINGERICH WELL/CORWIN	HOYLE WELL & PUMP/TOM	HOYLE WELL & PUMP/TOM	JOEL JOHNSON	GINGERICH WELL /JOE06/24/2004 235 ALLEN	LYONS	HOYLE WELL & PUMP 10/23/2000	HOYLE WELL & PUMP 05/20/2000	LYONS DRILLING	1 SALLOWS	J SALLOWS	UNKNOEN	PREVIOUS OWNER
r owner							*						ţāi.i		
SEC PLOT	3C	3C	4C	4C	4C	4E	· 4E	4E	<b>6</b> A	DZ	<b>8</b>				
	19	61	10	19	10	61	61	61	61	61	19	20	50	20	20
RNG	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E	02E
, X	N07	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N	20N
FIPS	161	191	191	191	191	[6]	161	191	191	191	161.	191	191	191	191
WID	361991	371586	371677	369108	369109	363143	368552	272141	328274	324661	325280	127692	127693	127694	127695

WID FIPS	TWN	RNG	SEC	PLOT	FIPS TWN RNG SEC PLOT OWNER	DRILLER	DRILL DATE DEPTH	RECORD TYPE	USE	WELL AQ STAT TYPE TYPE LVL	PUMP LVL	PUMP GPM
127696 161	20N	02E	. 20	•		M J FENNO	.09 1961/51/90	, RG	₹ . 20	. } .		
127697 161	20N	02E	20			M J FENNO	06/06/1968 49	RG	~ 00			
232166 161	20N	02E	20	2A		HOYLE WELL & PUMP 04/16/1991 80 CO	04/16/1991 80	RG	- 00	UN 30	99	
127698 161	20N	02E	70	3E		S D ALBRECHT	00/00/1977 104	RG.	R	}		
263202 161	20N	. 02E	20	4B		GROSCH IRRIGTION	03/17/1993 102	RG	. DIL	5		Ì
325276 161	20N	02E	20	<b>4</b> D		LYONS DRILLING		RG	~ DL	NO.		
127699 161	20N	02E	20	6E		HOYLE WELL DRLG	08/02/1978 140	RG	8	.		
127700 161	20N	02E	20	7.B		GROSCH IRRIG	03/13/1984 115	RG	<b>X</b>	}		
267574 161	20N	02E	50	70		HOYLE WELL & PUMP 10/21/1993	10/21/1993 61	RG	DO DE	UN .29	44	12
227309 161	20N	02E	20	8A		HOYLE WELL & PUMP 08/24/1990	08/24/1990 59	RG	OQ	SE 33	45	02
249303 161	20N	02E	20	8B		HOYLE WELL & PUMP 07/24/1989	07/24/1989 60	RG	DO DL	BR 35	37	
127701 161	20N	02E	20	8H		WINSLOW WELL DRLG04/29/1968 250	304/29/1968 250	RG	na –	}		

# Illinois State Water Survey "ICS Database

# Thursday, June 1, 2006

ROCK ISLAND County:

Township: 20N

02E Range: 07,08,17,18,19,20 Sections:

Records Found: 15

Contact the Illinois State Water Survey's Ground Water Division @ (217)-333-9043 Questions:

Please cite the Illinois State Water Survey's PICS (Public-industrial-Commercial) Database in all publications based wholly or partially Publication:

on this information.

information was initially entered from public water supply data and supplemented with the Illinois State Water Inventory Project data. This database is Note: The data in the PICS Database is a listing of municipal and commercial wells which are known to the Illinois State Water Survey (ISWS). This updated as additional information is received and verified.

This data cannot be resold or redistributed. The Illinois State Water Survey must be acknowledged in any use of this material.

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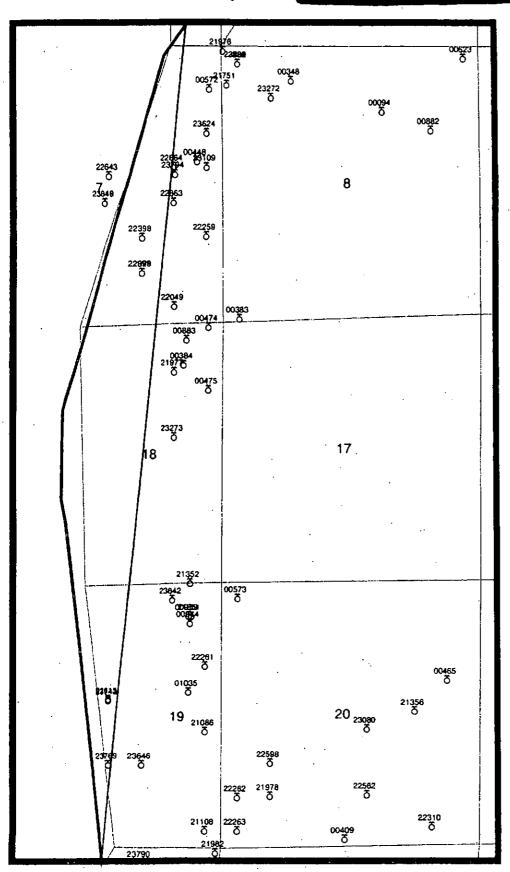
Location of a 10-acre-plot within a section:

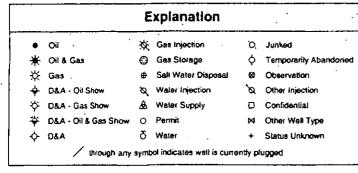
example, the well is in the 10-acre plot '3d'. right-hand-corner of an 8 x 8 grid. In this The origin can be found at the lower

SWSID	FIPS	TWN RNG	RNG		SEC PLOT	NAME	DB ID	WELL #	DEPTH	STATUS	YEAR SEALED TYPE		YEAR	DRILLER
16130340	161	20N	02E	0.2	2A	EXELON - QUAD CITIES STATION	12950	∞	225	ъ	1	Ω	1987	ALBRECHT WELL DRLG
16130340	191	Z0N	02E	07	3A	EXELON - QUAD CITIES STATION	12948	9	588	-	1	0	1984	WINSLOW DRILLING COMPANY
16130340	161	20N	02E	.08	6A	EXELON - QUAD CITIES STATION	12944	7	250	<	1	S	1966	WEHLING WELL WORKS
16130340	191	20N	02E	80	<b>4</b> 9	EXELON - QUAD CITIES STATION	12952	2		n			•	
16130340	161	20N	02E	8		EXELON - QUAD CITIES STATION		6	84	_		Q	1966	WEHLING WELL DRILLING
16130340 161	l i	20N	02E	8-	10	EXELON - QUAD CITIES STATION	12946	4	1798	×	1	٥	8961	WEHLING WELL WORKS
16130340_161	191	20N	02E	81	Н	EXELON - QUAD CITIES STATION	12945	3	1800	4		D	1968	WEHLING WELL WORKS
16130340	191	20N	02E	8.	2G	EXELON - QUAD CITIES STATION		=	250	,		Q	9961	E.C. WEHLING
16130340	191	20N	02E	<u>~</u>	2G	EXELON - QUAD CITIES STATION		10	250	-		۵	1966	E C WEHLING
16130340	191	20N	02E	<u>∞</u>	26	EXELON - QUAD CITIES STATION	12949	7	178			Ω .	1984	GROSCH IRRIGATION CO
16130340 161	1	20N	02E	8-	2H	EXELON - QUAD CITIES STATION	12947	8	264	<b>-</b>		۵	6961	WEHLING WELL WORKS
16130340	191	70Z	02E	8-	2H	EXELON - QUAD CITIES STATION	12943	_	242	-	}	۵	9961	WEHLING WELL WORKS
16130340	191	20N	02E	81	3G	EXELON - QUAD CITIES STATION	12951	_		_				

	3 ID # DEPTH STATUS SEALED TYPE YEAR DRI R	D 1990 GROSCH IRRIGATION CO	1984 GROSCH IRRIGATION CO
AR	ALED TYPE	Q	Q
YEAR	SEA	1	;
	STATUS	_	<b>—</b> ·
	DEPTH	100	115
WELL	#	œ	-
>	310	14211	14187
	SWSID FIRS ON RING SEC PLOT NAME	16133578 161 20N 02E 19 IF	16133578 161 20N 02E 20 7B

map Area:







0 2000 4000 ft

Illinois State Geological Survey

**QuEStoR: Custom Map** 

Date: 09-JUN-06 Scale: 1:24000

Displayed data is based upon information supplied to the Illinois State Geological Survey (ISGS) and are not field verified. The ISGS does not guarantee the validity, accuracy or completeness of these data. Map Area:

009**5**85

00914

0103

22613 2374

		E	xplanation			Enlargement Consisted are
•	Oil	*	Gas Injection	ď	Junki	Congested are
*	Oil & Gas	0	Gas Storage	¢	Tem	
Ċ.	Gas	⊕	Salt Water Disposal	8	Obse	Sec. 19
<b>\rightarrow</b>	D&A - Oil Show	Ø	Water Injection	Ø	Othe	
∜	D&A - Gas Show	A	Water Supply	0	Confl	
¢	D&A - Oil & Gas Show	0	Permit .	×	Othe	
ò	D&A	ð	Water	+	Statu	***************************************

0 296 592 f

Illinois State Geological Survey

**QuEStoR: Custom Map** 

Date: 09-JUN-06 Scale: 1:3552

Displayed data is based upon information supplied to the Illinois
State Geological Survey (ISGS) and are not field verified. The ISGS
does not guarantee the validity, accuracy or completeness of these data.

# QuEStoR Data Extraction

DB: oradb

Non Oil and Gas - Wells 121612286300 7-20N- 2E 2 RockIsland Status: WATER NW NE SE Elev: 0 permit date: 09/21/95 comp. date: 09/26/95 permit: 161WW76 Lambert X: 2780131 Lambert Y: 31.68546 td: 67 producing formation: td formation: longitude: latitude: 7-20N- 2E. 121612225900 RockIsland SE NE SE -0 Status: WATER Elev: permit date: 11/16/89 comp. date: 11/27/89 permit: 015939 Lambert X: 2780795 Lambert Y: 3167872 td: 48 producing formation: td formation: latitude: longitude: 7-20N- 2E 121612301900 1 RockIsland Status: WATER NW NW SE Elev: 0 permit date: 06/20/97 comp. date: 06/25/97 permit: Lambert X: 2778742 Lambert Y: 3168530 46 td: producing formation: td formation: longitude: latitude: 7-20N- 2E 121612204900 Albrecht, Dean S. Commonwealth Edison RockIsland Status: WATER SW SE SE Elev: comp. date: 11/17/87 permit date: 11/03/87 permit: 136904 td: 225 Lambert Y: 3166493 Lambert X: 2780143 td formation: producing formation: longitude:1 latitude: 1 7-20N- 2E 121612379400 RockIsland SW SE NE Elev: Λ Status: WATER permit date: 10/25/05 comp. date: 11/03/05 permit: Lambert X: 2780133 Lambert Y: 3169108 td: 50 td formation: producing formation: longitude: 1 latitude:1 121610057200 7-20N- 2E 0001 RockIsland n Status: WATER SE NE NE Elev: comp. date: 07/01/68 permit: 0 permit date:

Lambert X: 2780844 Lambert Y: 3170753 td: 106

producing formation: td formation:

latitude: longitude:

7-20N- 2E 121610044800 0001 RockIsland

Elev: 0. Status: WATER NE comp. date: 03/01/68 permit: 0 permit date:

Lambert X: 2780596 Lambert Y: 3169352 td: 44

producing formation: td formation: longitude:

latitude: '

7-20N- 2E 121612334800 1 RockIsland

Status: WATER NW NW SE Elev: n permit: permit date: 07/30/03 comp. date: 07/31/03 Lambert X: 2778742 Lambert Y: 3168530 td: 53 producing formation: td formation: latitude: longitude: 121612362400 7-20N- 2E RockIsland Status: WATER NE SE NE Elev: n permit: permit date: 07/26/02 comp. date: 08/28/02 Lambert X: 2780783 Lambert Y: 3169916 td: 50 producing formation: td formation: latitude: longitude: 121612310900 7-20N- 2E RockIsland Status: WATER SE SE NE Elev: permit: permit date: 09/18/95 comp. date: 09/21/95 Lambert X: 2780787 Lambert Y: 3169235. 76 td: producing formation: td formation: longitude: latitude: ] 121612286400 7-20N- 2E RockIsland 1 Elev: Status: WATER SW SE NE n permit: 161WW61 permit date: 10/09/96 comp. date: 10/11/96 Lambert X: 2780127 51 Lambert Y: 3169230 td: producing formation: td formation: latitude: longitude: 121612239800 7-20N- 2E RockIsland Status: WATER SE NW SE Elev: 0 permit date: 05/24/93 permit: comp. date: 05/28/93 Lambert X: 2779475 Lambert Y: 3167851 td: 50 producing formation: td formation: latitude: longitude: 121612239900 7-20N- 2E RockIsland Status: WATER NE SW SE Elev: permit: permit date: 09/08/92 comp. date: 09/18/92 Lambert X: 2779479 Lambert Y: 3167163 td: 45 producing formation: td formation: latitude: longitude: 121612297500 7-20N- 2E RockIsland 1 Status: WATER NE SW SE Elev: permit: 161 WW4 permit date: 06/16/97 comp. date: 06/27/97 Lambert X: 2779479 Lambert Y: 3167163 td: 50 producing formation: td formation: latitude: longitude: 121612264300 7-20N- 2E RockIsland

121612264300 7-20N- 2E
RockIsland Verification: 7-20N- 2E
Status: WATER SW SW NE Elev: 0
permit: permit date: 08/07/95 comp. date: 08/09/95
Lambert X: 2778809 Lambert Y: 3169084 td: 63
producing formation: td formation: latitude: longitude: longitude:

121612197600 8-20N- 2E RockIsland 0 Status: WATER NL 20 Elev: permit: 112072 permit date: 04/27/84 comp. date: 05/21/84 Lambert X: 2781123 Lambert Y: 3171516 td: 45 producing formation: td formation: latitude: longitude: 121610088200 8-20N- 2E RockIsland Status: WATER NW SE NE Elev: permit: 0 permit date: comp. date: 01/01/41 Lambert X: 2785435 Lambert Y: 3169970 td: 73 producing formation: td formation: latitude: longitude: 121612256000 8-20N- 2E RockIsland Status: WATER NW NW NW Elev: ۵ permit: WW61'93 permit date: 11/18/93 comp. date: 11/24/93 Lambert X: 2781437 Lambert Y: 3171277 70 td: producing formation: td formation: latitude: longitude: 121610038300 Wehling Well Works Inc. 8-20N- 2E RockIsland Comm Edison 2 Status: WATER 50 SL 350 WL Elev: 0 permit: 0 permit date: comp. date: 09/01/66 Lambert X: 2781484 Lambert Y: 3166240 255 td: producing formation: td formation: latitude: 41.728662 longitude: 90.304030 121612226000 8-20N- 2E RockIsland Status: WATER NW NW NW Elev: 0 permit: 016023 permit date: 11/21/89 comp. date: 11/30/89 Lambert X: 2781437 Lambert Y: 3171277 td: 47 producing formation: td formation: latitude: longitude:1 121612370100 8-20N- 2E RockIsland Status: WATER WN WN WN Elev: permit: permit date: 09/12/03 comp. date: 09/23/03 Lambert X: 2781437 Lambert Y: 3171277 td: 70 producing formation: td formation: latitude: longitude: 1 121612175100 8-20N- 2E RockIsland Status: WATER 100 NL 100 WL SW NW NW Elev: permit: 120728 permit date: 10/03/85 comp. date: 10/23/85 Lambert X: 2781207 Lambert Y: 3170837 47 td: producing formation: td formation: latitude: longitude: 121610009400 Flagel Drlg Co 8-20N- 2E Mallory Lyle. RockIsland 0001 Status: WATER 1300 NL 2000 EL Elev: Û permit: 0 permit date: comp. date: 10/01/58 Lambert X: 2784430 Lambert Y: 3170327 td: 100 producing formation: td formation:

latitude: 41.739998

121610034800 Flagel Drlg Co 8-20N- 2E RockIsland Status: WATER Elev: Lambert X: 2782526 producing formation: td formation: latitude: comp. date: 10/01/58 td: 71 td formation: 121610062300 8-20N- 2E RockIsland Milwaukee Rl Rd 0001 250 NL 300 EL. Status: WATER Elev: 0 permit: 0 permit date: producing formation: Lambert Y: 3171382 latitude: 41 740017 comp. date: 09/01/69 td: 57 td formation: latitude: 41.742947 longitude: 90.287129 121612362200 8-20N- 2E RockIsland Status: WATER Dermit date: 04/05/02

Lambert X: 2781437

Droducing 5 NW NW NW Elev: comp. date: 04/10/02 td: 72 producing formation: td formation: latitude: longitude: 121612327200 8-20N- 2E RockIsland Status: WATER Elev: 0 permit: permit date: 04/17/01
Lambert X: 2782106
Lambert V: 2170000 SE NW NW comp. date: 04/19/01 td: 205 producing formation. td formation: latitude: longitude: Wehling Well Works Inc. Common W Edison 121610088300 18-20N- 2E RockIsland 0001 Elev: 606GL Status: WATER 350 NL 750 EL permit: 0 producing formation:
latitude: 41 70714 permit date: comp. date: 09/01/66 td: 255 td formation: latitude: 41.727441 longitude: 9Q.308067 121612197700 McKinney, Ted RockIsland Commonwealth Status: WATER permit: 115930
Lambert Water Status: WATER permit: 115930 18-20N- 2E SW NE NE Dermit: 115930 permit date: 11/21/84 Lambert X: 2780142 Lambert Y: 3165177 producing formation: 1atitude: 41 725742 SW NE NE Elev: 0 comp. date: 11/28/84 td: 178 producing formation: td formation: latitude: 41.725743 longitude: 90.307303 121610038400 18-20N- 2E RockIsland Commonwealth Edison 0 . 840 NL 780 EL Lambert X: 2780352 producing formation: latitude: 41 726000 Status: WATER Elev: comp. date: 09/01/66 td: 250 td formation: longitude: 90.308165 latitude: 41.726087 Wehling Well Works Inc. Commonwealth Edison 121610047400 18-20N- 2E RockIsland 100 NL 300 EL Status: WATER Elev: 610GL permit: 0 permit date: comp. date: 08/01/68

td: 1800

Lambert Y: 3166070

Lambert X: 2780834

producing formation: td formation: latitude: 41.728177 longitude: 90.306416

121610047500 Wehling Well Works Inc. 18-20N- 2E

RockIsland Commonwealth Edison

Status: WATER 1360 NL 300 EL Elev: 610GL permit: 0 permit date: comp. date: 07/01/68

Lambert X: 2780831 Lambert Y: 3164810 td: 1798

producing formation: td formation: latitude: 41.724704 longitude: 90.306386

121612327300 18-20N- 2E

RockIsland . Status: WATER ` 0 SW SE NE Elev:

permit: permit date: 01/02/01 · comp. date: 01/12/01

Lambert X: 2780138 Lambert Y: 3163879 td: 80

producing formation: td formation

latitude: longitude:

121612110800 19-20N- 2E

RockIsland Status: WATER SE SE SE Elev:

permit: 0 permit date: comp. date: 08/01/74

Lambert X: 2780791 Lambert Y: 3155967 90

td: producing formation: td formation:

latitude: longitude:

121610095300 19-20N- 2E RockIsland 0001

Status: WATER Elev: NE NE n

permit: 0 permit date: comp. date: 10/01/72

Lambert X: 2780460 Lambert Y: 3160298 td: 68 producing formation:

td formation: latitude: longitude:

121610103500 19-20N- 2E

RockIsland 1

Status: WATER SL 675 EL NE Elev: 0 permit: 0 permit date: comp. date: 09/01/73

Lambert X: 2780445 Lambert Y: 3158762 td: 71

producing formation: td formation: latitude: 1 longitude:

121612135100 19-20N- 2E RockIsland 1 Status: WATER MP 650 EL 0

Elev: permit: 0 permit date: comp. date: 06/01/77

Lambert X: 2780500 Lambert Y: 3160294 td: 62

producing formation: td formation:

latitude: 1 longitude:

latitude:

121612364200 19-20N- 2E RockIsland

Status: WATER 'NW NE NE Elev: 0 permit: permit date: 09/18/03

comp. date: 09/22/03 Lambert X: 2780130 Lambert Y: 3160626

td: 70 producing formation; td formation:

121612374300 19-20N- 2E RockIsland Status: MATER SW SW NE Elev: 0

longitude:

-5-

permit: permit date: 06/23/04 comp. date: 06/24/05 Lambert X: 2778821 Lambert Y: 3158611 td: 235 producing formation: td formation: latitude: longitude: 121610091400 19-20N- 2E RockIsland 0001 800 NL 650 EL Status: WATER Elev: 0 permit: 0 permit date: comp. date: 07/01/72 Lambert X: 2780470 Lambert Y: 3160164 td: 75 producing formation td formation: latitude: longitude: 121612135200 19-20N- 2E RockIsland 1 Status: WATER NL 640 EL Elev: 0 permit: 0 permit date: comp. date: 07/01/77 Lambert X: 2780480 Lambert Y: 3160954 td: 70 producing formation: td formation: latitude: longitude: 121612261300 19-20N- 2E RockIsland Status: WATER SW SW NE Elev: n permit: permit date: 06/09/95 comp. date: 06/20/95 Lambert X: 2778811 Lambert Y: 3158624 td: 65 producing formation: td formation: latitude: longitude: 121612108600 19-20N- 2E RockIsland -1 Status: WATER NE NE SE Elev: 0 permit: 0 Lambert X: 2780791 permit date: comp. date: 07/01/74 Lambert Y: 3157970 59 td: producing formation: td formation: latitude: longitude: 121612226100 19-20N- 2E RockIsland Status: WATER Elev: permit: 017598 permit date: 04/19/90 comp. date: 04/25/90 -Lambert X: 2780790 Lambert Y: 3159303 td: 100 producing formation: td formation: latitude: longitude: 121612376900 19-20N- 2E RockIsland Status: WATER SW NW SE Elev: n permit date: 10/19/04 permit: comp. date: 10/21/04 Lambert X: 2778822 Lambert Y: 3157297 cd: 98 producing formation: td formation: latitude: longitude: 121612364600 19-20N- 2E RockIsland Status: WATER SE NW SE Elev: permit: permit date: 03/03/04 comp. date: 03/08/04 Lambert X: 2779471 Lambert Y: 3157304 td: 96 producing formation: td formation: latitude: longitude:

121610040900

RockIsland 0001 Status: WATER 120 SL 100 EL Elev: 0 permit: 0 permit date: comp. date: 06/01/67 Lambert X: 2783647 Lambert Y: 3155792 td: 60 producing formation: td formation: latitude: 1 longitude: 121612226200 20-20N- 2E RockIsland Status: WATER NW SW SW Elev: 0 permit: 013116 permit date: 07/19/89 comp. date: 07/24/89 Lambert X: 2781450 Lambert Y: 3156641 td: 60 producing formation: td formation: latitude: longitude: 121610057300 20-20N- 2E RockIsland Status: WATER NW NW NW Elev: n permit: 0 comp. date: 04/01/68 permit date: Lambert X: 2781450 Lambert Y: 3160646 td: 250 producing formation: td formation: latitude: longitude:1 121612256200 20-20N- 2E RockIsland Status: WATER NW SW SE Elev: permit date: 01/05/93 permit: WW05'93 comp. date: 03/17/93 Lambert X: 2784079 Lambert Y: 3156679 td: 102 producing formation: td formation: latitude: longitude: 1 121612231000 20-20N- 2E RockIsland Status: WATER SW SE SE Elev: 0 permit: WW10'91 permit date: 04/04/91 comp. date: 04/16/91 Lambert X: 2785390 Lambert Y: 3156031 td: 80 producing formation: td formation: latitude: longitude: 121612259800 20-20N- 2E RockIsland Status: WATER SE NW SW Elev: permit: permit date: 10/20/93 comp. date: 10/21/93 Lambert X: 2782108 Lambert Y: 3157318 td: 61 producing formation: td formation: latitude: longitude: 121612135600 20-20N- 2E RockIsland 1823 Status: WATER SL 10 ELSW NE Elev: 0 permit: 0. permit date: comp. date: 06/01/77 Lambert X: 2785064 Lambert Y: 3158370 td: 130 producing formation: td formation: latitude: longitude: 121610046500 20-20N- 2E RockIsland 0001 Status: WATER 660 SL 660 EL Elev: 0 permit: 0 permit date: comp. date: 06/01/68 Lambert X: 2785736 Lambert Y: 3159030 • td: 49 producing formation: td formation: latitude:

longitude: 1

121612308000 RockIsland Status: WATER permit: Lambert X: 2784084 producing formation: latitude: 121612197800 RockIsland Status: WATER permit: 111479 Lambert X: 2782107 producing formation:

NW NW SE

permit\_date: 08/22/00

Lambert Y: 3158013

20-20N- 2E 1

. 0 Elev:

comp. date: 08/25/00

td: 70

td formation: longitude: 1

20-20N- 2E

0

NE SW SW Elev: permit date: 03/08/84 comp. date: 03/13/84 Lambert Y: 3156650

td: 45 td formation:

longitude: 1

121612226300

latitude: 9

RockIsland Status: WATER permit: 018841 Lambert X: 2781450

producing formation: latitude:

20-20N- 2E

SW SW SW Elev: 0

permit date: 08/14/90 comp. date: 08/24/90 Lambert Y: 3155973 td: 59

> td formation: longitude: 1

121612198200

RockIsland Status: WATER

permit: 113659 Lambert X: 2781018

producing formation: latitude:

125 NL 100 EL

permit date: 07/27/84 Lambert Y: 3155510

td formation: longitude:

30-20N- 2E

Elev: 0 comp. date: 08/24/84

td: 52

ddress Mell address			<del></del>	
ot	Subo	<b></b> ,		
riller Lyons		linere W	4-2	L
	161-W44-97		o. <u>102-2771</u>	<del></del>
ater from	ravel			<del></del>
t depth <u>23</u>	to 46 ft.		Rock Island	
creen: Diam	6 in.		20 N	
ength: 5 f	t. Slot <u>40</u>	Rge.	2 E	
		Elev	· 📙	
sing and Lin		NW N	V SE	
iam. (in.)	Kind and Weight	From (ft)	To (ft)	
6	A53B	0	42	
	<u> </u>			
atic level ove ground le m for 4		top which is	numping at	40
atic level ove ground le m for 4	<u>15</u> ft, below casing evel. Pumping level	top which is	1 Aumping at	ft. _40
atic level ove ground le m for 4	15 ft. below casing evel. Pumping levelhours.	top which is	numping at	40
atic level ove ground le n for4 Formations	15 ft. below casing evel. Pumping levelhours. passed through	top which is	Thickness	40 Bottom
atic level ove ground le m for4  Formations  topso red c	15 ft. below casing evel. Pumping levelhours. passed through	top which is	Thickness	Bottom
atic level ove ground le m for4  Formations  topso red c		top which is	Thickness  1 2 20	80ttom 1 3 23
atic level ove ground le m for4  Formations  topso  red c		top which is	Thickness  1 2	Bottom
atic level ove ground le m for4  Formations  topso  red c		top which is	Thickness  1 2 20	80ttom 1 3 23
atic level ove ground le m for4  Formations  topso  red c		top which is	Thickness  1 2 20	80ttom 1 3 23
etic level  ove ground lem for4  Formations  topso  red c		top which is	Thickness  1 2 20	80ttom 1 3 23
atic level ove ground le m for4  Formations  topso  red c		top which is	Thickness  1 2 20	80ttom 1 3 23
atic level ove ground le m for4  Formations  topso  red c		top which is	Thickness  1 2 20	80ttom 1 3 23

Address 22710-206 Ave. North Cordova IL  Driller Albrecht, Dean S. License No. 102-1203  11. Permit No. 136904 Date 11/03/87  12. Water from rock 13. County Rock Island at depth 200 to 225 ft. Sec. 7  14. Screen: Diam. in. Twp. 20 N Rge. 2 E Elev. 10 N Rge. 2 E Elev	iu. Property o	wner <u>Commonwealth Edis</u>	on	Well No.	
11. Permit No. 136904 Date 11/03/87  12. Water from rock 13. County Rock Island at depth 200 to 225 ft. Sec. 7  14. Screen: Diam. in. Iwp. 20 N Rge. 2 E Elev. 2 Elev.	Address <u>22</u>	710-206 Ave. North Cor	dova IL		
11. Permit No. 136904 Date 11/03/87  12. Water from rock 13. County Rock Island at depth 200 to 225 ft. Sec. 7  14. Screen: Diam. in. Iwp. 20 N Rge. 2 E Elev. 2 Elev.	Driller <u>Al</u>	brecht, Dean S.	Licens	e No. 102-	1203
12. Water from rock  at depth 200 to 225 ft.  14. Screen: Diam. in. Length: ft. Slot  Sec. 7  14. Screen: Diam. in. Length: ft. Slot  Sec. 7  15. Casing and Liner Pipe  SW SE SE  Diam. (in.) Kind and Weight From (ft) To (ft)  8 SIEEL  0 44  16. Size hole below casing: 8 in. 17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through  dirty sand  dirty sand  3 3  muscatine 60 slot 39 42  yellow timestone 92 134  badly fractured 3 137  yellow timestone 16 153  badly fractured 2 155  yellow timestone 8 163  hrd yt is more witr 22 185	11. Permit No.	136904	Date	11/03/87	
at depth 200 to 225 ft. Sec. 7  14. Screen: Diam	12. Water from	<u>rock</u>	_ 13. County	Rock Isla	and
15. Casing and Liner Pipe    SW SE SE   Diam. (in.)   Kind and Weight   From (ft)   To (ft)     8	at depth _ 14. Screen: Di	<u>200</u> to <u>225</u> ft. am, in.	Sec. Twp. Rge.	7 20 N 2 E	
Diam. (in.) Kind and Weight From (ft) To (ft)  8 STEEL 0 44  16. Size hole below casing: 8 in.  17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through Thickness Bottom dirty sand 3 3  muscatine 60 slot 39 42  yellow limestone 92 134  badly fractured 3 137  yellow limestone 16 153  badly fractured 2 155  yellow limestone 8 163  hrd yl ls more wtr 22 185	15. Casing and	Liner Pipe	•	٠ ـــ	<u> </u>
8 STEEL 0 44  16. Size hole below casing: 8 in.  17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through Thickness Bottom dirty sand 3 3  muscatine 60 slot 39 42  yellow limestone 92 134  badly fractured 3 137  yellow limestone 16 153  badly fractured 2 155  yellow limestone 8 163  hrd yl ls more wtr 22 185			<del></del>		
17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through Thickness Bottom dirty sand 3 3 muscatine 60 stot 39 42 yellow limestone 92 134 badly fractured 3 137 yellow limestone 16 153 badly fractured 2 155 yellow limestone 8 163 hrd ylls more wtr 22 185	8	STEEL	+		
17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through Thickness Bottom dirty sand 3 3 muscatine 60 stot 39 42 yellow limestone 92 134 badly fractured 3 137 yellow limestone 16 153 badly fractured 2 155 yellow limestone 8 163 hrd ylls more wtr 22 185		· · · · · · · · · · · · · · · · · · ·	<del> </del>		
17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level ft. when pumping at 250 gpm for 4 hours.  18. Formations passed through Thickness Bottom dirty sand 3 3 muscatine 60 stot 39 42 yellow limestone 92 134 badly fractured 3 137 yellow limestone 16 153 badly fractured 2 155 yellow limestone 8 163 hrd ylls more wtr 22 185					
muscatine 60 stot         39         42           yellow limestone         92         134           badly fractured         3         137           yellow limestone         16         153           badly fractured         2         155           yellow limestone         8         163           hrd yl ls more wtr         22         185	18. Formati	ons passed through		Thickness	Bottom
muscatine 60 stot         39         42           yellow limestone         92         134           badly fractured         3         137           yellow limestone         16         153           badly fractured         2         155           yellow limestone         8         163           hrd yl ls more wtr         22         185		dirty s	and .	3	3
badly fractured   3   137     yellow limestone   16   153     badly fractured   2   155     yellow limestone   8   163     hrd yl ls more wtr   22   185				39	42
yellow limestone         16         153           badly fractured         2         155           yellow limestone         8         163           hrd yl ls more wtr         22         185		yellow	limestone	92	134
badly fractured 2 155 yellow limestone 8 163 hrd yl ls more wtr 22 185		badly f	ractured	3	137
yellow limestone         8         163           hrd yl ls more wtr         22         185	<u>-</u>	yellow	limestone	16	153
hrd yl ls more wtr 22 185		badly fi	ractured	2	155
		yellow	imestone	8	163
yellow limestone 15 200		hrd yt (	s more wtr	22	. 185
		yellow I	imestone	15	200

Rock Island

07-20N-02E

18. Formations passed through (continued)	Thickness	Bottom
white limestone	25	225

(49.)T

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Property owne		CL.	al to su	
Address		we	ell No	
Well address		<del></del>	<del></del>	
Lot	Subd		<u> </u>	<del></del>
Driller <u>Latta</u>	Kirk Stephen	License		
		nete	102-275 10/25/2005	5
Water from	sand	County	Rock Island	<del></del> ·
at depth 2	0 to 50 ft		7	<del></del>
creen: Diam.	5 in.		20 N	III
10	ft. Slot .014	_ Rge.	_2 E	1-1-1
		Elev	• —	+++
asing and Lir		SM 'SI	E NE	<del></del>
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
5	PVC	-1	40	
<del></del>	PVC SCREEN	40	50	
atic level	# casing:in. 19_ft. below casing t	_		
ove allocated (	ever. Pumping level	40 ft.when p	umping at	rt. 50
m for 1	ever. Pumping level	40 ft.when p	Umping at	<u>50</u>
m for 1	hours.	40 ft.when p	Thickness	50 Bottom
m for 1	hours.	40 ft.when p	Thickness	50
m for 1	passed through	40 ft.when p	Thickness	50 Bottom
m for 1	hours.	40 ft.when p	Thickness	50 Bottom
m for 1	hours.  passed through  medium and	40 ft.when p	Thickness	50 Bottom
m for 1	hours.  passed through  medium and	40 ft.when p	Thickness	50 Bottom
m for 1	hours.  passed through  medium and	40 ft.when p	Thickness	50 Bottom
m for 1	passed through	40 ft.when p	Thickness	50 Bottom
formations gray	passed through	40 ft.when p	Thickness	50 Bottom
formations gray	passed through	40 ft.when p	Thickness	50 Bottom
formations gray	passed through	40 ft.when p	Thickness	50 Bottom
formations gray	passed through	40 ft.when p	Thickness	50 Bottom
for 1  Formations  gray	passed through medium and	40 ft.when p	Thickness	50 Bottom
for 1  Formations  gray	passed through medium and	40 ft.when p	Thickness	50 Bottom
for 1  Formations  gray  wate Water We	passed through medium and	40 ft.when p	Thickness 50	Bottom 50
for 1  Formations  gray  wate Water We	passed through medium and	40 ft. when p	Thickness 50 7-20N	50 Bottom 50
formations gray	passed through medium and	40 ft. when p	Thickness 50	50 Bottom 50

Property of Address					ll No.			· ·
	any Wing	Cur	Lice: 13. Co					
Water from	Formation			. •	K tiet fi			
at depth⊿ Screen: D	<u>03</u> to 106 f iam4ir	l. 1.		c. <u></u>	EN'	-	╁	•
Length: 4	ft. Slot	36	<u>o</u> Rn	ıg. 🞝		-	1	
	d I iwan Dina		El	lev. 🖺	<u>4700.</u> Sa		† †	_
em. (in.)	d Liner Pipe Kind and Wel	leht	From (Ft.	) To	(Ft.)	' <b></b>	8HO	
- H:	6614	1801	10	1/2	23			N IN PLAT
	- 14-7 10	77	<u> </u>	1				
£".								
Static leve above grou gpm for	below casing:  of the bear of	low casi oping lev	ing top wheel	hich ft. w	is	mping	g ata	(per
Static leve above grou gpm for	ft. be and level. Pun	low casi oping lev	ing top wheel	hich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi oping lev	ing top wheel	nich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for	ft. be and level. Pun hours.	low casi oping lev	ing top wheel	nich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi oping lev	ing top wheel	hich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi oping lev	ing top wheel	nich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi oping lev	ing top wheel	nich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi oping lev	ing top where I	hich ft. w	is	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi	ing top where I	ft. w	THICK	3 mpin	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi	ing top where I	ft. w	THICK	mpine NESS	g ata	(per
Static leve above grou gpm for FORM	ft. be and level. Pun hours.	low casi	ing top where I	ft. w	THICK	mpine NESS	g ata	(per

roperty owner			l No#1	-
ell address				
	Subd		· · · · · · · · · · · · · · · · · · ·	
riller typns		Licence No	. 102-2771	
ermit No.	161-W46-03	t.rcerise no Date (		
	sand & gravel mixed			<del></del>
	<u>0 to 53 ft.</u>	Sec.		
creen: Diam.	<u>6</u> in.	Тwp.	20 N	<del></del>
ength: 5	ft. Slot 40	Rge.	2 E	<del>-  -  -  -  -  -  -  -  -  -  -  -  -  -</del>
•		Elev.	· —— . 🛨	
esing and Li		NW NN	) SE	
iam. (in.)	Kind and Weight	From (ft)	To (ft)	•
6	STEEL	0	49	•
6	STAINLESS STL SCREEN	48	53	
tatic level	ow casing:ininining tevelhours.			
tatic level pove ground on for 3	19 ft. below casing t level. Pumping level			25
tatic level pove ground on for 3	19 ft. below casing t level. Pumping levelhours. s passed through		oumping at	25
atic level pove ground on for 3  Formation san	19 ft. below casing t level. Pumping levelhours. s passed through		Thickness	Bottom 10
atic level pove ground on for 3  Formation sand	19_ft. below casing t level. Pumping level _hours s passed through		Thickness	Bottom 10
atic level pove ground on for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through		Thickness 10	25 Bottom 10 30
eatic level pove ground om for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through		Thickness 10 20	25 Bottom 10 30
eatic level pove ground om for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through		Thickness 10 20	Bottom 10 30 53
eatic level pove ground om for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through	35_ft.when p	Thickness 10 20 23	Bottom 10 30 53
tatic level pove ground om for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through	35_ft.when p	Thickness 10 20 23	25  Bottom 10 30 53
tatic level pove ground om for 3  Formation sand	19_ft. below casing tevel. Pumping levelhours. s passed through	35_ft.when p	Thickness 10 20 23	25  Bottom 10 30 53

roperty owne address			No	<del></del>
iell address	7.			<del></del>
ot <u>10</u>				
	, Kirk Stephen		102-2755	
	161-W37-02			•
	sand	County Ro		
	<u>6 to 50 ft.</u>	Sec.		
creen: Diam.	<u>, 5</u> in.	Тир. <u>2</u>		++-
ength: <u>     10   </u>	ft. Slot <u>.014</u>	Rge		++1
	•	Elev.	— <u> </u>	
asing and Li	ner Pipe	NE SE	NE	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
5	PVC	-1	40	
5	PVC SCREEN	40	50	
		]		
tatic level bove ground pm for 1		top which is _	mping at	40
tatic level bove ground pm for1	20 ft. below casing level. Pumping level.	top which is _		40
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping level	top which is _	mping at	40
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.	top which is _	Thickness	8ottom
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness	Bottom 6
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	Bottom 6
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	Bottom 6
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	80ttom 6 50
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	8ottom 6 50
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	8ottom 6 50
tatic level bove ground pm for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is _	Thickness 6	80ttom 6 50
tatic level bove ground pm for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is	Thickness 6 44	80ttom 6 50
tatic level bove ground om for 1 Formation	20 ft. below casing level. Pumping levelhours.  us passed through leck topsail	top which is	Thickness 6 44	80ttom 6 50
tatic level bove ground om for 1  Formation bla		top which is	Thickness 6	80ttom 6 50
tatic level bove ground pm for 1 Formation		top which is	Thickness 6	80ttom 6 50

Property owne	r <u> </u>	We	ll No#2	
Address T				<del></del>
Well address				
Lot	<del></del>	•		
Driller <u>Lyons</u>		License N	o. <u>092-0017</u>	
	161 WV74195	Date	09/18/1995	
Water from		County	Rock Island	
Screen: Diam. .ength:5_1	ft. Slot <u>40</u>	Twp.	7 20 N 2 E	
asing and Lir	<del></del>	SE SI		
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
6	SCH 40 T&C 19.45#	0	71	•
	<u> </u>			
tatic level _ pove ground l	u casing: <u>6</u> in.  19 ft. below casing evel. Pumping level hours.	top which is 40 ft.when p	1 oumping at	ft.
tatic level	19 ft. below casing evel. Pumping level	top which is 40 ft.when p	1 cumping at	ft
tatic level pove ground lom for 2	19 ft. below casing evel. Pumping levelhours.	top which is 40 ft.when p	oumping at	······································
tatic level pove ground l om for 2 Formations	19 ft. below casing evel. Pumping levelhours.  passed through	top which is 40 ft.when p	Thickness	Bottom
tatic level pove ground l om for 2 Formations tops	19 ft. below casing evel. Pumping levelhours.  passed through	top which is 40 ft.when p	Thickness	Bottom 1
satic level	19 ft. below casing evel. Pumping levelhours.  passed through	top which is 40 ft.when p	Thickness  1 .9	Bottom 1
satic level	19_ft. below casing evel. Pumping levelhours.  passed through oil	top which is	Thickness  1  9  33	Bottom 1 10 43
pove ground to more formations tops:  sand grave	19_ft. below casing evel. Pumping levelhours.  passed through oil	top which is	Thickness  1  9  33	Bottom 1 10 43 68
tatic level pove ground l pove	19_ft. below casing evel. Pumping levelhours.  passed through oil	top which is	Thickness  1  9  33	Bottom 1 10 43 68
tatic level pove ground l pm for 2 Formations tops: sand grave	19_ft. below casing evel. Pumping levelhours.  passed through oil	top which is	Thickness  1  9  33	Bottom 1 10 43 68
tatic level pove ground l pm for 2 Formations tops: sand grave	19_ft. below casing evel. Pumping levelhours.  passed through oil	top which is	Thickness  1  9  33  25  8	Bottom 1 10 43 68
tatic level pove ground l pm for 2 Formations tops: sand grave	19 ft. below casing evel. Pumping levelhours.  passed through oil  el yellow clay	top which is 40_ft.when p	Thickness  1 9 33 25 8	Bottom 1 10 43 68

Property owner	a	W	ell No. <u>#1</u>	
Address	<u>}L</u>			<del></del>
Well address				<del></del> .
Lot	Subdi		ISUS P#	
Driller <u>Lyons,</u>	Glenn L	License I	lo. 092-0017	_
Permit No	161WH61 196	Date	10/09/1996	
Water from <u>gi</u>	avel		Rock Island	
et depth <u>16</u>	to <u>51</u> ft.	Sec.	7 1rr	<del></del>
Screen: Diam.	in. Slót	Тыр.	20 N	╼╅╍╂╼┥
		Kge. Elev	<u>2 E</u>	
المناه المنتاء				
Casing and Line		<del></del>	E NE	
6 (in.)	Kind and Weight	From (ft)		
-·- <del></del>	SCH 40 T&C 19.45#	<b>*</b> 0	47	
<del></del>		<del></del>	<del> </del>	
	·			
tatic level	30 ft. below casing vel. Pumping levelhours.	top which is 47 ft.when	pumping at	ft.
bove ground le	vel. Pumping level	top which is 47 ft.when	pumping at Thickness	ft.
bove ground le	vel. Pumping level hours. passed through	top which is 47_ft.when	pumping at	<del></del>
bove ground le pm for 2 Formations   topso sand	vel. Pumping level hours. passed through	top which is 47 ft.when	Thickness	Bottom
pm for 2 Formations topso	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness	Botton 1
pm for 2  Formations topso	vel. Pumping levelhours.  passed through	top which is 47_ft.when	Thickness  1 15	Bottom 1 16
pm for 2  Formations topso	vel. Pumping levelhours.  passed through	top which is	Thickness  1 15	Bottom 1 16
formations topso sand	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
pm for 2  Formations    topso  sand	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
formations topso sand	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
bove ground le pm for 2  Formations  topso  sand  grave	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
bove ground le pm for 2  Formations  topso sand gravel	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
bove ground le pm for 2  Formations  topso  sand  grave	vel. Pumping levelhours.  passed through	top which is 47 ft.when	Thickness  1 15	Bottom 1 16
bove ground le pm for 2  Formations  topso sand gravel	vel. Pumping levelhours.  passed through  il	top which is 47 ft.when	Thickness 1 15	Bottom 1 16 51

). Property o			_ Well No	
Address			<del></del>	
Driller		Licens	ве No. <u>102-1</u>	781
	W/20 '93	Date	05/24/93	
. Water from	sand & gravel		Rock Islan	
at depth _	46 to 50 ft.	Sec.	7	777
. Screen: Dia	m. in.		<u>20 H</u>	++
Length:	ft. Slot	Rge. Elev.	<u> </u>	
		•	— Ц	
. Casing and			SE NV SE	
	Kind and Weight	<del></del>		•
5	PLASTIC	0	46	
gon for	4 hours.	el <u>' 25'</u> ft.w		
·····	4 hours.		Thickness	Bottom
. Formeti			Thickness	<del>                                     </del>
. Formeti	_4_hours.		<del>                                      </del>	Bottom 12 50
. Formeti	ons passed through & clay		12	12
. Formeti	4 hours.  ons passed through & clay		12	12
. Formeti	4 hours.  ons pessed through & clay & gravel		12	12
. Formeti	4 hours.  ons passed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons pessed through & clay & gravel		12	12
. Formeti sand sand	4 hours.  ons passed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons passed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons passed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons passed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons passed through & clay & gravel		12	12
Formati sand sand	4 hours.  ons passed through & clay & gravel		38	12
. Formeti sand sand	4 hours.  ons pessed through & clay & gravel		12	12
Formeti sand sand	4 hours.  ons pessed through & clay & gravel		38	12
. Formeti sand sand	4 hours.  ons passed through & clay & gravel		38	50

O. Property o	mer		Well No	
Address				
Driller		License	e No. <u>092-00</u>	017
1. Permit No.	VM57 192		09/08/92	<u> </u>
2. Water from	gravel	_ 13. County _		1
at depth _	<u>9</u> to <u>45</u> ft.	Sec.	7	TTT
. Screen: Di	am. 6 in.	Тыр. }		++-
Length:	5 ft. Slot 40	Rge. Elev.	<u> </u>	
	•		<u> </u>	
. Casing and			E SW SE	
iam. (in.)		From (ft)		
6	STEEL TAC 19.45	0	40	
	, , , , , , , , , , , , , , , , , , ,			
	,	<u> </u>		
	nd level. Pumping level 	1T C. MI		
gona for	2 hours.	1T C. MI	) <del></del>	·. 1
gpm for	2 hours.	1T C. MIII	Thickness 9	Bottom
gom for Formet	2 hours.  ions pessed through y clay		Thickness 9	Bottom 9
gpm for	2 hours.  ions pessed through y clay	30_TE.MI	Thickness	Bottom 9
gpm for	2 hours.  ions pessed through y clay	1	Thickness 9	Bottom 9
gpm for Formet	2 hours.  ions pessed through y clay	30_TE.MI	Thickness 9	Bottom 9
gpm for	2 hours. ions passed through y clay		Thickness 9 36	Bottom 9
gpm for	2 hours.  ions pessed through y clay		Thickness 9	8ottom 9
gpm for	2 hours. ions passed through y clay		Thickness 9 36	8ottom 9
gom for Formet	2 hours.  ions pessed through y clay		Thickness 9 36 7 7 1001170000	8ottom 9
gom for	2 hours.  ions pessed through y clay el		Thickness 9 36	8ottom 9
gpm for	2 hours.  ions pessed through y clay el		Thickness 9 36	8ottom 9 45
gpm for	2 hours.  ions pessed through y clay el		Thickness 9 36	8ottom 9 45
gom for	2 hours.  ions pessed through y clay el		Thickness 9 36	8ottom 9 45
gom for Formet sand	2 hours.  ions pessed through y clay el		Thickness 9 36	8ottom 9 45
gom for Formet sand	2 hours.  ions pessed through y clay el		Thickness 9 36	Bottom 9
gom for	2 hours.  ions pessed through y clay el		Thickness 9 36	Bottom 9

roperty owner			No. <u>#1</u>	<del></del>
tell address				<del></del>
ot	Subd			
	Larry	License No.	102-2771	•
	161 W41'97			
ater from <u>g</u>		County Ro		
	to <u>50</u> ft.	Sec.		<del></del>
creen: Diam	<u>6</u> in.	†wp. <u>2</u>	O N	++-
ength: 5 f	t. Slot <u>40</u>	_ Rge Elev.		
		2.000	<u> —</u> Ц	
asing and Line	<del></del>	NE SW		
Diam. (in.)	Kind and Weight	From (ft)		
6	A538	0	45	
		<del>                                     </del>		-
		. I <u> </u>	<u>.                                    </u>	•
tatic level _	w casing:in.  30 ft. below casing evel. Pumping level hours.	top which is _	· · · · · · · · · · · · · · · · · · ·	
tatic level _ bove ground le pm for4	30 ft. below casing evel. Pumping level	top which is _	· · · · · · · · · · · · · · · · · · ·	
tatic level _ bove ground le pm for4	30 ft. below casing evel. Pumping levelhours.	top which is _	mping at	<u>18</u>
tatic levelbove ground to	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness	18 Bottom
tatic level	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness	Bottom 1
tatic level	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	18
tatic level _ bove ground to pm for4 formations topso	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	Bottom 1 8
tatic level _ bove ground to pm for4 formations topso	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	18
tatic level _ bove ground to pm for4 formations topso	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	18
tatic level _ bove ground to pm for4 formations topso	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	Bottom 1
tatic level _ bove ground to pm for4 formations topso	30 ft. below casing evel. Pumping levelhours.  passed through	top which is _	Thickness  1  7	18 Bottom 1 8 50

STATE OFFICE BUILDING, SPRINGFIELD,
/WATER SURVEYS SECTION. BE SURE TO

Mell No.  Address  Driller The Family License No. 122-134/  11. Permit No. 74198 Date May. 11-78  12. Water from Sand 13. County Read Island  at depth 15 to 570 ft.  14. Screen: Diam. Sin. Twp. 201/ Length: 5 ft. Slot 20 Rge. 2 Elev. 3 11/ Elev. 3 17/  15. Casing and Liner Pipe  Diam. (in.) Kind and Weight Prom (Ft.) To (Ft.) Location in Section in S				COmbre	eted 6-	1-/0	•
Address Driller 770 FORM License No. 192-134/ 11. Permit No. 74198 Date May. 11-78 12. Water from Sand 13. County Row T. Sand at depth 15 to 50 ft. 14. Screen: Diam. 5 in. Twp. 201 100 Length: 5 ft. Slot 20 Rge. 2 Elev. 59071  15. Casing and Liner Pipe  Dism. (in.) Klod and Weight Prom (Pt.) To (Pt.) Location in Section 15.  16. Size Hole below casing: 5 in. 17. Static level 21 ft. below casing top which is 6. (permit) 16. Size Hole below casing: 1 in. 17. Static level 21 ft. below casing top which is 6. (permit) 18. FORMATIONS PASSED THROUGH THICKNESS DEPTHOF BOTTOM.  TO Sail Plan Hand Dan 5 G. Clan Hand Dan 6 G. Continue on Separate Sheet is necessary  SIGNED Maxima Plant Date 178  COUNTY No. 21/29	<ol><li>Propert</li></ol>	y owner.			Well No.		<del></del>
Driller THE LICENSE No. 191-1327  11. Permit No. 74198 Date May, 11-78  12. Water from Sand 13. County Poux Island  of depth 4/5 to 50 ft. Sec. 7  14. Screen: Diam. 5 in. Twp. 2004  Length: 5 ft. Slot 20 Rge. 2E  15. Casing and Liner Pipe  Diam. (in.) Elied and Weight From (Ft.) To (Ft.) Location in Section 15.  5" #53 TVC +1 IS  NE (permit)  16. Size Hole below casing: 5 in.  17. Static level 21 ft. below casing top which is 18. Above ground level. Pumping level 21 ft. when pumping at 15 gpm for 6 hours.  18. FORMATIONS PASSED THROUGH THICKNESS DEPTHOF BOTTOM  Clay + Sand 14 20  Sand + Grand 14 20  COUNTINUE ON SEPARATE SHEET 15 NECESSARY)  SIGNED Marrier DATE June - 7-78							<del></del>
11. Permit No. 74/19 Date 14/24, 17/24  12. Water from Sand 13. County Recht Island  at depth 45 to 50 ft. Sec. 7  Length: 5 ft. Slot 20 Rge. 2E  Length: 5 ft. Slot 20 Rge. 3E  Show Elev. 5907/1  15. Casing and Liner Pipe  Diem. (in.) Kind and Weight From (Ft.) To (Ft.) Location in Section 15.  The Size Hole below casing: 15 in.  16. Size Hole below casing: 15 in.  17. Static level 2/ ft. below casing top which is 18.  above ground level. Pumping level 2 ft. when pumping at 15.  gpm for 6 hours.  18. FORMATIONS PASSED THROUGH THICKNESS DEPTHOF BOTTOM.  TO Soll Hard Dan 5 6 6 7 7 8 60 14 20 14 20 14 20 14 20 15 16 16 16 16 16 16 16 16 16 16 16 16 16	Driller	TYNN F CISH	0	Licens	e No. <i>18</i>	1 - /	34/
12. Water from SAMD  Permatter  at depth 45 to 50 ft.  14. Screen: Diam. 5 in. Twp. 20M  Length: 5 ft. Slot 20 Rge. 2E  Elev. 7  Elev. 7  It. Screen: Diam. 5 in. Twp. 20M  Elev. 7  It. Show Rge. 2E  Show Rge. 3E  Elev. 7  It. Show Rge. 3E  Elev. 7  It. Show Rge. 3E  Elev. 7  It. Show Rge. 3E  Elev. 7  It. Show Rge. 3E  It. Show Rge. 3E  Elev. 7  It. Show Rge. 3E  Elev. 7  It. Show Rge. 3E  It. Show Rge. 3	11 Permit	No. 74198		Date	Мау.	// /	<u> </u>
at depth 1/5 to 50 ft.  14. Screen: Diam	12. Water f	from Sand	1	3. Çouz	ity Rec	<u> </u>	5/3/10_
14. Screen: Diam		•		Sec.	フ	П	
Length: 5 ft. Slot 20 Rge. 2E  Elev. 3  Show  Dism. (in.) Rind and Weight From (FL) To (FL)  5" #53 TVC +/ LOCATION IN  SECTION IN  NE  (permit)  16. Size Hole below casing: 5 in.  17. Static level 2/ ft. below casing top which is / ft. above ground level. Pumping level 2 ft. when pumping at 1.5  gpm for 6 hours.  18. FORMATIONS PASSED THROUGH THICKNESS DEPTH OF BOTTOM.  TOP CSa:  Play Hayd Dan  Clay + Sand  1-1 20  Sand + Gravei  Yellow Play  Signed Marrie Sheet is Necessary  SIGNED Marrie Date Date Thing - 7-78  COUNTY No. 24, 79	at dept	19 <u>- 1/2 (0</u> - 277 )			· · · · · · · · · · · · · · · · · · ·	<b> </b>	1
Elev. 5907/1    Show and Liner Pipe   Show	14. Screen	: Diam				-	
15. Casing and Liner Pipe  Dism. (in.)	Length	i:_ <u></u>					
Dism. (in.) Rind and Weight From (Ft.) 10 (Ft.)    15     15	15. Casing	and Liner Pipe			31977	4 <b>—</b>	
NE (permit)  16. Size Hole below casing:	Diam. (in.)	Kind and We	eight P	rom (Ft.)	To (Pt.)	LOC	ATION IN
NE (permit)  16. Size Hole below casing:	۱۱ سی	#:53 TX	ر+ ا		سحان	SECT	ION
(continue on separate sheet is necessary)  (permit)  (permit)  (permit)  (permit)  in.  in.  in.  in.  in.  in.  in.  in		7,00 7.					NE
16. Size Hole below casing:	<b></b>					(1	_
17. Static level 2/ ft. below casing top which is	L	<u> </u>				•	,
above ground level. Pumping level 3 th. when pumping at 15  gpm for 6 hours.  18. FORMATIONS PASSED THROUGH  THICKNESS DEPTH OF BOTTOM.  TO D CSO.    C   AN HAND DAN  C   AN HAND DAN  C   AN HAND DAN  SAND + CNAVE    Yellow C   AN  (CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Howeld A THE THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE OF THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THE THREE TYPE OF THREE TYPE	16. Size H	lole pelow coama	·	whi	ch ie	,	· ft.
gpm for 6 hours.  18. FORMATIONS PASSED THROUGH  TOP CSO!  Play Hard Dan  Clay + Sand  14 20  Sand + Grave!  72 52  Yellow Play  (CONTINUE ON SEPARATE SHEET 15 NECESSARY)  SIGNED Manney Play  COUNTY No. 24, 79	17. Static	level <u>=2/_II. D</u>	eton casind	A T 4	when n	mnina	ا کر ہم
18. FORMATIONS PASSED THROUGH  TOP CSO!  Play Hard Dan  Clay + Sand  14 20  Sand + Grave!  Yellow Play  (CONTINUE ON SEPARATE SHEET 15 NECESSARY)  SIGNED Married DATE TUNE - 7-78	above	ground level. Pu	mbrud ie∧er⊐	<u> </u>	. миси р	amp amy	··
TOP CSOIL  P./AN HAND PAM  C./AN + GAND  SAND + GAND  SAND + GAND  TOP CSOIL  P./AN HAND PAM  THE 20  SAND HAND  CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Married Pame DATE June - 7-78  COUNTY No. 21, 29	gpm fo	or <u>(e</u> hours.			<u> </u>		
Clay Hard Dan  Clay + Gand  Sand + Grave  32 52  Yellow Clay  (CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Harris Plant DATE June - 7-78  COUNTY No. 21/29	18.	FORMATIONS PASSI	D THROUGH		THIC	iness	BOTTOM.
Clay Hard Dan  Clay + Gand  Sand + Grave  32 52  Yellow Clay  (CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Harris Plant DATE June - 7-78  COUNTY No. 21/29	TOP	osail				1	
Clay + Gand  Sand + Grave  32 52  Yellow Play  (CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Harris Plant DATE June - 7-78  COUNTY No. 21/29			n			<u>ت</u>	6
SAND + GNAVE   32 52  Yellow Play  (CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Harris Plant DATE June - 7-78					1	111	ا م م
CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Harris Plant DATE June - 7-78  COUNTY No. 21/29	1/4//	P (3 ) (1 ) (1 )				/ /	1 2 <u>0</u>
(CONTINUE ON SEPARATE SHEET IF NECESSARY)  SIGNED Marris Plant DATE June - 7-78			1			/_/_ 31_	52
(CONTINUE ON SEPARATE SHEET IS NECESSARY)  SIGNED Harris Plane DATE June - 7-78			1				52
(CONTINUE ON SEPARATE SHEET IS NECESSARY)  SIGNED Harris Plane DATE June - 7-78							52
(CONTINUE ON SEPARATE SHEET IS NECESSARY)  SIGNED Harris Plane DATE June - 7-78			<u> </u>				52
SIGNED Harris Plant DATE JUNE - 7-78							52
SIGNED Marin Plane DATE THE - 7-78							
SIGNED Marin Plane DATE THE - 7-78							
COUNTY No. 21/279	70/10	w Play		CESSAS			
COUNTY No. 21/27	70/10	w Play	SHEET IS NE		ar)	8	40
COUNTY NO 21/6 79 7-20N-2E	(CONTINU	UE ON SEPARATE	SHEET IS NE		ar)	8	40
ROCK ISLAND COUNTY NOS! 7-20N-21	(CONTINU	UE ON SEPARATE	SHEET IS NE		ar)	8	40

10. Property	owner		Well No. #1	
Address				17
Driller	Lyons, Glenn L	Licens	e No. <u>092-00</u>	· · · · · · · · · · · · · · · · · · ·
11. Permit N	o. 161 W60 195	Date	08/07/99	
12. Weter fr	om <u>gravel</u>	_ 13. County	KOCK 1919IM	
at depth		Sec.	7 20 N	
14. Screen:	Diam. 6 in. 5 ft. Slot 40	Rge.	2 E +-	<del>[                                    </del>
គេស្វេក:-		Elev.		<del>                                     </del>
AS Cacion I	and Liner Pipe	S	N SW NE	
Diam. (in.)		From (ft)	To (ft)	
6	SCH 40 T&C 19.45#	0	59	
		-		•
	<del></del>	1		•
L	_1			4
	3_hours.		Thickness	Bottom
	mations passed through	<u></u>	1	1
· t	op soil			ļ
8	and .		16	. 17
ÿ., 9	revel		. 46	63
		,		
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<u>.</u>		<del>.,</del>		<del>                                     </del>
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<u> </u>	·		<u>_1</u>	<u></u>
	•		ı	
Nousehold -	Private	•		
in the				
······································			07-20	M-02F
KOCK TE	sland		07-20	N-02E

Diam. (in.) Kind and Weight From (ft) To  6 STEEL T&C 19.45 0  16. Size hole below casing:6_ in.  17. Static level12 ft. below casing top which is above ground level. Pumping level30 ft.when pumping for2_hours.	27/84 ock Island  20' E NWC  (ft)  42	
1. Permit No. 112072 Date 0 2. Water from gravel 13. County R at depth to ft. Sec. 8 4. Screen: Diam. 6 in. Twp. 20 M Length: 3 ft. Slot 100 Rge. 2 E Elev. 5 5. Casing and Liner Pipe 100° S Diam. (in.) Kind and Weight From (ft) To 6 STEEL T&C 19.45 0 6. Size hole below casing: 6 in. 7. Static level 12 ft. below casing top which is above ground level. Pumping level 30 ft. when g gpm for 2 hours.  8. Formations passed through top soil red clay sandy & gravel	27/84 ock Island  20' E NWC  (ft)  42	
2. Water from gravel 13. County R at depth to ft. Sec. 8. Screen: Diam. 6 in. Twp. 20 M Rge. 2 E Elev. 5 Elev.	201 E NWC	
at depth to ft. Sec. 8 Screen: Diam. 6 in. Twp. 20 M Length: 3 ft. Slot 100 Rge. 2 E Elev. 5  Casing and Liner Pipe 100's  iam. (in.) Kind and Weight From (ft) To 6 STEEL T&C 19.45 0  Static level 12 ft. below casing top which is above ground level. Pumping level 30 ft. when p gpm for 2 hours.  Formations passed through top soil red clay sandy & gravel	201 E NWG	
Screen: Diam. 6 in. Twp. 20 M Length: 3 ft. Slot 100 Rge. 2 E Elev. 5  G. Casing and Liner Pipe 100' S  Diam. (in.) Kind and Weight From (ft) To 6 STEEL T&C 19.45 0  G. Size hole below casing: 6 in. 7. Static level 12 ft. below casing top which is above ground level. Pumping level 30 ft. when p gpm for 2 hours.  G. Formations passed through top soil red clay sandy & gravel	20' E NWG	
Length: 3 ft. Slot 100 Rge. 2 E Elev. 5:  i. Casing and Liner Pipe 100's  ii. Casing and Liner Pipe 100's  iii. Casing and Liner Pipe 100's  i	20' E NWG	
Elev 50. Casing and Liner Pipe 100° S  Diam. (in.) Kind and Weight From (ft) To  6 STEEL T&C 19.45 0  S. Size hole below casing:6_in.  7. Static level12_ft. below casing top which is above ground level. Pumping level30_ft.when gapm for2_hours.  8. Formations passed through  top soil  red clay  sandy & gravel	201 E NWG	
Casing and Liner Pipe  iam. (in.) Kind and Weight From (ft) To 6 STEEL T&C 19.45 0  Size hole below casing:6_ in. Static level12 ft. below casing top which is above ground level. Pumping level30 ft.when pumping for2 hours.  Formations passed through  top soil  red clay sandy & gravel	20° E NWC (ft) 42	
iam. (in.) Kind and Weight From (ft) To 6 STEEL T&C 19.45 0  5. Size hole below casing:6_ in. 7. Static level12_ft. below casing top which is above ground level. Pumping level30_ft.when g gpm for2_hours.  6. Formations passed through  top soil  red clay  sandy & gravel	(ft) 42	
6 STEEL T&C 19.45 0  6. Size hole below casing:6_ in. 7. Static level12 ft. below casing top which is above ground level. Pumping level30 ft.when pumping for2 hours. 7. Formations passed through top soil red clay sandy & gravel	42	ft.
size hole below casing:6in.  Static level12_ft. below casing top which is above ground level. Pumping level30_ft.when pages for2_hours.  Formations passed through top soil red clay sandy & gravel		ft.
Static Level 12 ft. below casing top which is above ground Level. Pumping Level 30 ft.when g gpm for 2 hours.  Formations passed through top soil red clay sandy & gravel	, .	ft.
7. Static level 12 ft. below casing top which is above ground level. Pumping level 30 ft.when g gpm for 2 hours.  3. Formations passed through top soil red clay sandy & gravel	<b>,</b> .	ft.
Static Level 12 ft. below casing top which is above ground Level. Pumping Level 30 ft.when g gpm for 2 hours.  Formations passed through top soil red clay sandy & gravel	<b>,</b> .	ft.
top soil  red clay  sandy & gravel	h i ckness	Bottom
red clay sandy & gravel	1	1
sandy & gravel	10-	11
	34	45
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Rock Island

08-20N+02E

ss	ell No. <u>#2</u>	_
	<del></del>	<del></del>
address		
Subd	ISWS P#	<del></del> -
er <u>Lyons, Glenn L</u> License I	No. <u>092-0017</u>	
T No Date		
from <u>gravel</u> County	Rock Istand	
oth <u>8 to 67 ft</u> . Sec. n: Diam. <u>6</u> in. Two	. 7 irr	
	20 N	
Elev	,. <del>-<u>^-</u>-</del> □	
and Liner Pipe NW h		
(in.) Kind and Weight From (ft)	IE SE	
SCH 40 T&C 19.45# 0	To (ft) .	
		•
	+	
	<del></del>	
mations passed through	Thickness	Bottom
topsoil	Thickness 1	Bottom
	<del></del>	1
topsoil	1 . 7 .	1 8
topsoil sand	1	Bottom 1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand gravel	1 . 7 .	1 8
topsoil sand	1 . 7 .	1 8
topsoil sand gravel		1 7

Driller  Permit No. WM61'93 Date	Rock Island  N E  N To (ft) 65	ft.
Permit No. WM61'93 Date	Rock Island  N E  N To (ft) 65	ft.
Permit No. WM6193 Date  Water from gravel 13. County at depth 65 to 70 ft. Sec. 8 Screen: Dism. 6 in. Twp. 20 Length: 5 ft. Slot 40 Rge. 2 Elev.  Casing and Liner Pipe NW am. (in.) Kind and Weight From (ft) 6 SCH 40 T&C 19.45# 0  Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	Rock Island  N E  NHW NW To (ft) 65	ft.
Water from gravel 13. County at depth 65 to 70 ft. Sec. 8 Screen: Diam. 6 in. Twp. 20 Length: 5 ft. Slot 40 Rge. 2 Elev.  Casing and Liner Pipe NW  am. (in.) Kind and Weight From (ft) 6 SCH 40 T&C 19.45# 0  Size hole below casing:in. Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	N E E HW NW To (ft) 65	ft.
at depth 65 to 70 ft. Sec. 8 Screen: Diam. 6 in. Twp. 20 Length: 5 ft. Slot 40 Rge. 2 Elev.  Casing and Liner Pipe NW  am. (in.) Kind and Weight From (ft) 6 SCH 40 T&C 19.45# 0  Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	N E E HW NW To (ft) 65	ft.
Screen: Dism. 6 in. Rep. 20 Length: 5 ft. Slot 40 Rge. 2 Elev.  Casing and Liner Pipe NW  mm. (in.) Kind and Weight From (ft) 6 SCH 40 T&C 19.45# 0  Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	NW NW To (ft) 65	ft.
Length: 5 ft. Slot 40 Rge. 2 Elev.  Casing and Liner Pipe NW  Mm. (in.) Kind and Weight From (ft)  6 SCH 40 T&C 19.45# 0  Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	MW NW To (ft) 65	ft.
Casing and Liner Pipe NW  am. (in.) Kind and Weight From (ft)  6 SCH 40 T&C 19.45# 0  Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through  sand  coarse sand  small gravel	NW NW To (ft) 65	ft.
Size hole below casing:in.  Static level35 ft. below casing top which above ground level. Pumping level50 ft. whe gpm for4 hours.  Formations passed through sand coarse sand small gravel	10 (ft) 65	ft.
Size hole below casing:in.  Static level35_ft. below casing top which above ground level. Pumping level50_ft.whe gpm for4_hours.  Formations passed throughsandcoarse sandsandsandsandsandsandsandsand	65 is2	ft.
Size hole below casing:in.  Static level35_ft. below casing top which above ground level. Pumping level50_ft.whe gpm for4_hours.  Formations passed throughsandcoarse sandsandsandsandsandsandsand	is2	ft.
Size hole below casing:in.  Static level35_ft. below casing top which above ground level. Pumping level50_ft.whe gpm for4_hours.  Formations passed throughsand	is 2 n pumping at	ft.
Static level35 ft. below casing top which above ground level. Pumping level50 ft.whe gpm for4 hours.  Formations passed through sand coarse sand small gravel	is <u>2</u> n pumping at	ft.
Static level35 ft. below casing top which above ground level. Pumping level50 ft.whe gpm for4 hours.  Formations passed through sand coarse sand small gravel	is <u>2</u> n pumping at	ft.
Static level35 ft. below casing top which above ground level. Pumping level50 ft.whe gpm for4 hours.  Formations passed through sand coarse sand small gravel	is <u>2</u> n pumping at	ft.
sand coarse sand small gravel	Thickness	Bottom
coarse sand	. 8	8
small gravel	27	35
	35	70
		<del>                                     </del>
		<u> </u>
	<u> </u>	·
	Legition Light	
		<del> </del>
	valence 2.	<u> </u>
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the same stages of		\$ <u>:</u> -
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usehold - Private		
ock Island		With the

#### ILLINOIS GEOLOGICAL SURVEY, URBANA

Permit #1597	Thickness	Top	Bottom
Summary Sample Study by J. R. McLean	3/28/6	7	
No samples		0	49
Dolomite, yellowish brown, fine grained; some medium sized, rounded quartz grains Dolomite, pale yellow brown, very		60	120
finely grained giving samples a chalky appearance		120	140
Dolomite; yellowish brown, fine grained; cherty in places Dolomite, yellow brown to buff and		140	230
light brownish gray; fine-medium crystalline		230	250
Sand Gravel Lime	35 23 197	·	35 58 255
inished in rock at 58' to 255'.			TD
asing: 10", seamless, 0-61' 8", seamless, 0-125', cemented	1		
lize of hole below casing: 8"	:		
itatic level from surface: 35'			
ested capacity: 35 gallons per minute	4	-	
later lowered to 250'.			
ength of test: 6 hours and 20 minutes	4		49. 3 49. 40.0 49. 100. 1
			A Company of the Comp

Wehling Well Works, Inc.

Wehling Well Works, Inc.

Wehling Well Works, Inc.

EDRILED September 1966

EDRILED September 1966

FOR MCLEAN

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LID T

ROCK ISLAND

5.5. #53796

8-20N-2E

		1	Well No	
O. Property ow	ner			
Address		License	No. 092-001	7
	ns, Glenn L		11/21/89	
	016023	Date _	Rock Island	
	gravel	•		<del></del>
at depth	14 to <u>47</u> ft.	Sec Twp. <u>k</u>	<del>,,                                   </del>	$\Box$
14. Screen: Dia	m. 6 in.	Rge.	2 E	
Length:	5 ft. Slot <u>40</u>	Elev.		<del>     </del>
	•		نسب نسب	
15. Casing and	Liner Pipe		און און או	
Diam. (in.)	. Kind and Weight	From (ft)		
6	STEEL T&C 19.45	0	42	•
<b></b>				
	below casing: el18 ft. below cas nd level. Pumping leve	ing top which	is <u>2</u> sen pumping at	ft.
above grou	2 hours	,		
gpm for	2 hours.			
18. Format	ions passed through	•	Thickness	Bottom
	<del></del>		14	14
sand				ļ
grav	et		33	47
				1
è				<del> </del>
		•		
			<del></del>	<del> </del>
	<del></del>			
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Household - P	Lingte			
			- 00-20	いれーロンド

Rock Island

08-20N-02E

Property owner		Wel	l No#1	
Address		F		
Well address				·
Lot	Subd	15	WS P# 366145	
Driller Lyons,		License No	. 102-2771	·
Permit No.		Date <u>0</u>		<del></del>
Water from g		County R	ock Island	
at depth7	70 ft	Sec.		
Screen: Diam.	6 in.	Twp.	20 N	4-4-1
Length: 4 f		_ Rge.	2 E	╬┼
• •		Elev.	· —	++1
Casing and Lin	er Pipe	אי אין	INU	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
. 6	STEEL	0	66	
6	SS SCREEN	66	70	
L	<del></del>		<del></del>	
Formations	passed through		Thickness	Bottom
tops	oíl	.` .	1	1
sand	y clay		6	7
grav	el .		63	70
	<u> </u>			
			· ·	
				<u> </u>
	<u>·                                      </u>			
Private Water	Well			
			, 🦠	آرائی گذاشتر برچی ج
Rock Isla	and		8-20N	<b>- Z E</b>   * ********************************

-			Well No	
Address				<del></del>
Driller <u>Lyons, Gl</u>				017
11. Permit No. <u>120</u>				<del></del>
12. Water from <u>gray</u>	el	13. County	Rock Islan	<u>d</u> _
at depth38_to	<u>47</u> ft.	Sec.		<del></del>
14. Screen: Diam.	<u>6</u> in.	Twp. Rge.	20 N	1.1
Length: 5 ft.	Stot	kge. Elev.	5977M	
				<u></u>
15. Casing and Liner	Pipe			
Diam. (in.) Kin	d and Weight	From (ft)	To (ft)	• ,
6 STEEL	T&C 19.45	. 0	42	
·				
ló. Size hole below c	asing: 6	in.	•	
17. Static level			ıis 2	ft.
above ground leve	l Pumping l'evel	25 ft.ul	en cumpine at	20
gpm for 2 ho				<del></del>
gpm for <u>z</u> no	MI B.			
			•	
18. Formations pa	ssed through		Thickness	Bottom
8. Formations pa	ssed through top soi	t .	Thickness 1	Bottom 1
8. Formations pa	top soi	l dy clay	<del></del>	<del> </del>
8. Formations pa	top soi red sañ	<del></del>	1 8	9
18. Formations pa	top soi	<del></del>	1	1
18. Formations pa	top soi red sañ	<del></del>	1 8	9
18. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
	top soi red sañ	<del></del>	1 8	9
8. Formations pa	top soi red sañ	<del></del>	1 8	9
	top soi red sañ	<del></del>	1 8	1 9
No.	top soi red sañ	<del></del>	1 8 38	47
	top soi red sañ	<del></del>	1 8 38	1 9

# ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thiotness	Top	Battom
ST WELL			
p soil and fine sand ck and gravel iform small gravel (under 2") ck with a little gravel me rock		0 55 65 67 78	55 65 67 78 100
timated 150-300 gallons per minute. t enough for irrigation.			1
te: It was difficult to catch a presentative sample when the larger is coming out. A lot of the smaller iterial got away.	stone		
AND THE STATE OF T			

PARY # Flagel Drilling Co.  H DEFLIED UC CODEL 29, 1958 HORRY Company YATTON G. J.	NO. COUNTY NO.	1 94 ·	
ATON SERVICE SEAND	The second secon		8-20

### ILLINOIS GEOLOGICAL SURVEY, URBANA

9 (9 1 TET T		Thickness	Tep	Bottom
ST WELL				<del></del>
	•		1	
•			1	
p soil			0	2
ne sand .		].	2	18
ig sand an	d large gravel		18	32
dimter hea	ring sand and gravel	1	32	71
d Agres ner	Ting bases			
onles from P	ermanent Well		,	ļ
_		,	. 0	34
Burbles		İ	ľ	36
d gravel sm	mall stone			45
nd and grave	91			1
0 13 -	101 - 721 deen.			Ì
88 OI Mell:	18" x 72' deep.	·	1	
		<b>I</b>		li e
presentative one was comi	iifficult to catch a sample when the larging out. A lot of the l got away.	er	·	
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larg ing out. A lot of the	ger		
presentative one was comi all material	e sample when the larging out. A lot of the	ger		
presentative one was comi all material	e sample when the larging out. A lot of the	ger		
presentative one was comi all material	e sample when the larging out. A lot of the	ger		
nvocents ti Ve	e sample when the larging out. A lot of the	er		

TABLE Drilling Co. 3. No. 2
TO BILLED OCTOBER 2936 202 COUNTY NO. 348
HORITY Company
VATION 600 TABLE
ATTORNAL ROCK ISLAND

8-20N-2E

dress		<del></del>			
ll address					
ot	Subd	<b>T</b>			
riller <u>Latta</u>	, Kirk Stephen	License No	102-	2755	<del></del>
ermit No.	161-W14-02	Date <u>0</u>	<u>4/05/200</u>	2	
eter from	sand	· CountyR	ock isla	nd	
t depth5	<u>8 to 72 ft.</u>	Sec.	8	FT-	П ·
creen: Diam.	5 in.	Twp.	20 N		
ength: <u>10</u>	ft. Slot014			-	
	· <del>-</del> .			لللا	
asing and Li		NW NV		$\overline{}$	•
Diam. (in.)	Kind and Weight	From (ft)			
5	PVC	-1	62	_	•
5	PVC SCREEN	62	- 16		
			<u>                                     </u>		
tatic level bove ground pm for	ow casing:ini5 ft. below casing level. Pumping level ihours.	top which is	pumping (	et	
tatic level bove ground pm for	15 ft. below casing level. Pumping level.	top which is	pumping (	nt	_ft. _50 Bottom
tatic level bove ground pm for Formation	15 ft. below casing level. Pumping level.	top which is	pumping (	et	
tatic level bove ground pm for Formation	15 ft. below casing level. Pumping level.  L hours.  ns passed through	top which is	pumping (	kness	Bottom
tatic level bove ground pm for Formation sai	15 ft. below casing level. Pumping level.  hours.  ns passed through hod/yellow clay	top which is	Thic	kness	Bottom 15
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level.  L hours.  Ins passed through hod/yellow clay  dium gray sand	top which is 40 ft.when	Thic	kness 15	Bottom 15 50
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level. L hours.  Ins passed through hod/yellow clay dium gray sand ay clay	top which is 40 ft.when	Thic	kness 15 35 8	Bottom 15 50
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level.  hours.  ns passed through   nd/yellow clay   dium gray sand   ay clay   dium to coarse gray san	top which is 40_ft.when	Thic	kness 15 35 8	Bottom 15 50 58 72
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level. L hours.  Ins passed through md/yellow clay dium gray sand ay clay dium to coarse gray san	top which is 40_ft.when	Thic	kness 15 35 8	Bottom 15 50 58 72
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level. L hours.  Ins passed through md/yellow clay dium gray sand ay clay dium to coarse gray san	top which is 40 ft.when	Thic	kness 15 35 8	Bottom 15 50
tatic level bove ground pm for  Formation sal	15 ft. below casing level. Pumping level. L hours.  Ins passed through md/yellow clay dium gray sand ay clay dium to coarse gray san	top which is 40_ft.when	Thic	kness 15 35 8	Bottom 15 50 58 72

_			No	
roperty owner		ŽĄ.		
ddress		I.A.		<del></del>
tell address				
.ot	Subd Skippers	Liegrae No.	002-8051	•
riller <u>Klint Gi</u>	ngerich	Date04/	17/2001	<del></del>
		County Roc		<del></del>
later from		Sec. 8		_
at deptht Screen: Diamt	in.	Twp. 20	N I	H
ength:ft.	Slot	Rge. <u>2</u>	<u> </u>	<del>                                     </del>
		Elev	<del></del> L	
Casing and Liner	Pipe	SE NW N	IV .	
	Kind and Weight	From (ft)	To (ft)	
	SDR 21 PVC	0	140	
tatic level	casing:in.	top which is	moine at	_ft.
above ground lev	ft. below casing vel. Pumping level	top which is	mping at	_ft. <del></del>
above ground leager for	ft. below casing vel. Pumping level	top which is	mping at	Bottom
above ground le	ft. below casing vel. Pumping level hours.	top which is	mping at	<del></del>
above ground leg	ft. below casing vel. Pumping level hours.	top which is	Thickness	Bottom
spove ground legan for  Formations	ft. below casing vel. Pumping level hours.	top which is	Thickness	Bottom 60
Formations sand	ft. below casing vel. Pumping level hours.	top which is	Thickness 60 10 36	Bottom 60 70 106 205
Formations   sand clay sand	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106
spove ground length for spin for sand clay	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106 205
above ground lenger for	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106 205
above ground length for	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106 205
sand	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106 205
above ground length for	ft. below casing vel. Pumping level hours.  passed through	top which is	Thickness 60 10 36	Bottom 60 70 106 205
Formations    Formations    sand  clay  sand  clay	ft. below casing vel. Pumping level hours.  passed through  limestone	top which is	Thickness 60 10 36 99	Bottom 60 70 106 205
above ground length for	ft. below casing vel. Pumping level hours.  passed through  limestone	top which is	Thickness 60 10 36	Bottom 60 70 106 205

Driller:Mc	Kinney, Ted R.	Licens	se No. 10	2-2540
	115930			
		13. County		
	toft.	Sec:		
4. Screen: Di	am. 18 in.	Twp.		
	<u>68</u> ft. Slot	Rge.	2 E	┡╌╁╌╂╼┨
		Elev.	G10TM B1	<del>┣┋</del>
5. Casing and	Liner Pipe	\$	W NE NE	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
18	JOHNSON STEEL SCREEN	0	. 18	
18	PLAIN STEEL	18	27	
18	STEEL SCREEN	27	57	Į
above groun		ng top which	en pumping	at3000
above groun	el <u>40</u> ft. below casir nd level. Pumping level	ng top which		at3000
above groun	el 40 ft. below casir and level. Pumping level 24 hours.	ng top which	Thicknes	at 3000
above groun	el 40 ft. below casir and level. Pumping level 24 hours.	ng top which	Thicknes	at <u>3000</u>
above groun	el 40 ft. below casir nd level. Pumping level 24 hours.  ons passed through SS #6524	ng top which	Thickness 2	at
above groun	el 40 ft. below casir and level. Pumping level 24 hours.  ons passed through SS #6524	71_ft.wh 6 (0'-175')	Thickness 2	ss Bottom  2 65
above groun	el 40 ft. below casir nd level. Pumping level_ 24 hours.  ons passed through  SS #6524  top soil  med sand	71_ft.wh 6 (0'-175')	Thickness 0 2 63	at 3000  ss Bottom  2  65  68
above groun	el 40 ft. below casir nd level. Pumping level_ 24 hours.  ons passed through  SS #6524  top soil  med sand	ng top which 71 ft.wh 6 (0'-175') to med gvl ay to med gvl	Thickness 0 2 63	at 3000 ss Bottom 2 65 68
above groun	et 40 ft. below casind level. Pumping level_24 hours.  one passed through SS #6524 top soil med sand brown cl med sand gray cla	ng top which 71 ft.wh 6 (0'-175') to med gvl ay to med gvl	Thickness 0 2 63 3 29	at 3000  ss Bottom  2  65  68
above groun	et 40 ft. below casind level. Pumping level_24 hours.  one passed through SS #6524 top soil med sand brown cl med sand gray cla	to med gvl to med gvl to med gvl	Thickness 0 2 63 3 29	at 3000  SS Bottom  2  65  68  97

Rock Island 12-161-21977-00

18-20N-02E

Umanup verture 3 17 16 A 3 L. O. 12 30 16

824

18.	formations passed	through (continued)	Thickness	Bottom
	. ,	limestone:	0	178

- To straight and the s

50

10

35

vugular and intercrystalline porosity, iron stained, some

Dolomite, light gray, dense, coarsely crystalline with abundant dolomite enhedra

clay filling in vugs

Dolomite, yellow, dense

	Thickness	Top	Potion
Summary Sample Study by M. R. McC	ORAS	11/66	
Pleistocene		-	
Sand, reddish, medium to coarse grained, mostly sub-angular to			
sub-round quarts	35		35
SILURIAN SISTEM Niagaran Series			
			l·
Dolomite, yellow, fine crystallin	- 1		
	120		155
Dolomite, yellow, fine crystalling	ا م		1

PANY E. C. Wehling Well Works, Inc.
Commonwealth Edison NO. 1
DRILLED September 28, 1966 COUNTY NO. 384
HORITY M. R. McComas
ATION

ROCK ISLAND



205

215

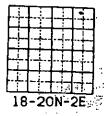
250



### ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Sand		0 -	26
Gravel		35	35 58
imestone	-	58 58	255
			TD
inle record - 100 in 1051			1 .
lole record - 10" 0-125"	]	•	
8" 125-255' (cemented)			
asing record - 10" 0-61'			
8" 0-125'			
hief aquifer - dolomite from 58 to 255'			
	}		
onpumping level 35			
			}
umping level 250° after pumping at			
35 gallons per minute for 6 hours	-		
on September 22, 1966.	1		
easuring point for above measurements	l		
top of casing, at land surface datum.	İ		
William			ļ
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Commonwealth Edison Co. No. 1
Commonwealth Edison Co. No. 1
Commonwealth Edison Co. No. 1
Commonwealth Edison Co. No. 1
Common September 1966 county No. 883
NO. State Water Survey
About 606' Mean: Sea Level
Thou 350'N line, 750'E line of NE
TO ROCK ISLAND



	Thickness	Tong	Bettora
• •			
hale		1589	1593
1me		1593	1599
hale		1599	1604
and .	16	1608*	1740
hale & Sand	,-	1740	1800
			120
asing: 30" 01 = 371			
26" 01 - 195' cemented in	n place		
16" 1474' - 1612'			
ole Size: 30" 0' - 37'			
29" 37! - 495!	-		
25" 495' - 930'			ļ
19" 930' - 1612' 16" 1612' - 1800'			<b> </b>
16" 1612" - 1800"	ļ		]
"- "			
ells #3 and #4 completed in Eau C			
iifference in yields probably due of dolomite cementation in Ironton			
rille. T.C. Buschbach August, 190	1 1		
ville. 1:0: beenbach kagast, 13	<sup>50</sup> •   .		
clear Log filed.		•	
mperature Log filed.			
diper Log filed.	i i		
oduction Test filed.	.	•	
Shown on Drillers Log			1
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The second secon	<u> </u>		!
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	227		

Wehling Well Works, Inc. Commonwealth Edison Co.
mr. ROCK ISLAND 18-20N-2E

# ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thinkness	Top	Bottom
Soil and sand	20	0	20
Sand	17	20	37
Sand and gravel	27	37	60
Gravel	7	60	67
Lime	208	67	275
Shale	70	275	345
Shale and lime	21	345	366
Shale	24	366	390
Shale and limee	19	390	409
Line	48	409	457
Lime and shale	33	457	490
ine	337	490	827
Shale with sand	28	827	855
Sand	45	855	890
and, lime with shale	32	890	922
ine	94	922	1016
ime and sand	9	1016	1025
and	57	1025	1082
and and lime	20	1082	1102
ime	13	1102	1115
and and lime	32	1115	1147
ime	146	1147	1293
and	52	1293	1345
ime	170	1345	1515
hale and lime	95	1515	1610
and	10	1610	1620
ime, shale, and sand	10	1620	1630
and	145	1630	1775
nale		1775	1790
and	8	1790	
		1, 20	1798
	- 57E	. 1	TD
using: 30" black pipe from 0' to 69'3	VII CHESTA		
ANY Wehling Well Works, Inc.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	<u> </u>	,
Commonwealth Edison Co. NO.	1000	[	
DRILLED July 24, 1968 GE COUNTY NO	47R	<del></del>	++++
THE COUNTY NOW	→/ フ原絵()	T	7-4-7-1

ARY	Wehling Well Works, Inc.	ù.
- 1	Commonwealth Edison Co. 10 4	<u> </u>
DAILCED	July 24, 1968 GELCOUNTY NO. 475	
ODITY	Company	
MOELL	610' G.L Nuclear log supus	
TOR	1360'N line. 300'E line of NE	
NY.	ROCK ISLAND	18-20N-2F

	•	
м	- 6	

	Thiokness	Tep	Bottom	
rtial Sample Study by Anne M. Graese	<del>                                     </del>	<del></del>	<del> </del>	
May 12, 1981	Ì	·		•
<b>,</b> ,	ļ	•		
LURIAN SYSTEM			ļ	
Dolomite, yellowish gray (5Y 8/1) t	o lia	ht	1	•
olive gray (5Y 6/1), trace very p	ale	'`	i	
orange (10 YR 8/2), slightly mott	led	'		
medium gray (N5), very fine to fi	ne			::1
grained, slightly argillaceous, t	Lace			***
glauconite, trace pyrite, slightl	v			
vesicular, slightly fossiliferous	ľi	,		
slightly cherty (white), slightly	'			
silty	.	265	275	
DOVICIAN SYSTEM	[	200	2/3	
Maquoketa Group		•		•
Siltstone to fine grained sandstone			}	
greenish gray (5 GY 4/1), argilla	ceous	-	}	
dolomitic, slightly dark gray (N3	1.	,		j
speckled, pyritic; trace shale,	/ <b>'</b> '			[2]
greenish gray (5 GY 6/1), weak, s	iltv.		,	
dolomitic	,	275	280	i L
Shale, greenish gray (5 GY 6/1), we	ak.			-  -
dolomitic, slightly pyritic.	· 1			,
very silty; trace siltstone, as a	bove	280	295	ĵ)
Shale, as above; trace dolomite,				
yellowish gray (5Y 8/1) to greenig	sh		•	<u>}</u> .;:
gray (5 GY 6/1), very fine to find	e			-
grained, argillaceous, fossilifend	ous		•	1
(brachiopod), slightly mottled with	th I		i	
dark gray (N3), pyritic, trace wh	ite			
chert, trace dark , rounded.	· ·	•		
phosphatic grains	i	295	315	
			010	
y Wehling Well Works	•	·		
Commonwealth Edison Co. No. 2	<b></b>	<del>▐</del> ▃ <del>┋</del>	<del>┊</del> ┋┋	#
RILLED July 24, 1968 COUNTY NO. 4	175			.
ny Anne M. Graese			<del>       </del>	1,0
on 610'GL-Nuclear Log	:			
N 1360' N line, 300' E line of NE ROCK ISLAND SS# 55607				
ROCK ISLAND SS# 55607 ···				

	Thickness	Top	Bettoe
Shale, as above; some dolomite, ligh	t .		
olive gray (5Y 6/1) to greenish or	ay		
(5 GY 6/1), mottled and speckled	_	ļ	•
dark gray (N3), fine grained, pyri	tic,	}	ŧ
fossiliferous (bryozoans, brachion	ods)	315	330
Shale, as above; trace dolomite, as	į į		
above, some very pyritic		330	350
Dolomite, as above, fossiliferous			
(bryozoans, crinoids), argillaceou	s;		1
some shale, as above		350	365
Shale, as above, some dolomite, as			
above	•	365	380
Shale, as above; trace dolomite, light	ht		
olive gray (5Y 6/1) to greenish gr	ay		
(5 GY 6/1), very fine grained,			
slightly mottled dark gray (N3), s	ılty,		
slightly fossiliferous (crinoids, bryozoans, gastropods)			<b>.</b>
As above fossilifenous (anathrough)		380	390
As above, fossiliferous (gastropods), trace dark, rounded, phosphatic gra		200	
Shale, light olive gray (5Y 6/1) to	1175	390	395
greenish gray (5 GY 6/1), weak,			
dolomitic; some dolomite, light oli			
gray (5Y 6/1) to olive gray (5Y 4/1	1		1
mottled and speckled dark gray (N3)	''		
very fine to fine grained, slightly	,	•	
fossiliferous (gastropods, bryozoan	15).		]
Silty, argillaceous	, -	395	400
Dolomite, as above; some shale, as ab	ove	400	420
Dolomite, as above, grades to a	İ		. ,_0
dolomitic siltstone, argillaceous	same		
color; trace olive gray (59 4/1) gh	ia le l		
. weak to moderately hard, dolomitid:	-		
Singhtly silty	-	420	450
Shale, as above; some dolomite, as ab	ove	450	455.
potomite, office gray (54 4/1), very of	ine		2
grained, argillaceous, slightly	.		_ [
speckled with dark gray (N3)	.	455	465
Wehling Well Works Commonwealt			1.44 \$ 3.2.35 \$

Wehling Well Works Commonwealth Edison to. #4 ROCK ISLAND SS# 55607 18-20N-2E

	Thickness	Тер	Bettom
Dolomite, as above; trace shale, oli (5Y 4/1), weak, trace hard, doloming Shale, olive gray (5Y 4/1), weak to	tic	465	470
dolomitic, slightly silty Shale, olive gray (5Y 4/1) to olive	nara,	470	475
black (5Y 2/1), dolomitic, hard, pyritic; grades slightly to a dolo same color, very argillaceous, pyritic, trace phosphatic grains, trace depauperate fauna (crinoid,			
gastopod); shale is slightly light colored at the base (5Y 4/1) Galena Group	er	475	483
Dolomite, pale yellowish brown (10 YR 6/2), fine to medium graine slightly mottled medium gray (N5),	d,		
relatively pure, slightly pyritic		483	495
	•	, •	i.
Charles of the control of the contro		· •	
Editable			-
	. i		! !
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Wehling Well Works ROCK ISLAND

Commonwealth Edison Co. #2 SS# 55607 18-20N-2E

ddress (		<del></del>	· <u> </u>	<del></del>
ell address				
ot				
	rman, Tom	License No.	102-1781	
ermit No	161HW01+01	Date <u>D</u>		<del></del>
ater from	sand & gravel	County Ro	ock Island	•
	<u>6 to 80 ft.</u>	Sec.		
reen: Diam.	<u>5</u> in.	Тир,	20 N	
mgth:4_	ft. Slot 20	_ Rge.	2 E	╅╃┪
		Elev.	— h	<del>'        </del>
sing and Li	ner Pi <b>pe</b>	SW SE	NE	<del></del>
iam. (in.).	Kind and Weight	From (ft)		
5	PVC SDR 21	0	76	•
		1	<del></del>	
	·		_	
atic level _	DW casing: in. 25 ft. below casing level. Pumping level hours.	top which is _	2 mping at	ft. 20
atic level ove ground I m for 4	25 ft. below casing level. Pumping level.	top which is _	mping at	20
atic level pove ground In for 4	25_ft. below casing level. Pumping level _hours.	top which is _	Thickness	20 Bottom
atic level pove ground In for 4	25_ft. below casing level. Pumping level _hours. passed through	top which is _	Thickness	20
atic level pove ground In for 4	25_ft. below casing level. Pumping level _hours. passed through	top which is _	Thickness	20 Bottom
stic level pove ground land for 4 Formations	25_ft. below casing level. Pumping level _hours. passed through	top which is _	Thickness	20 Bottom
atic level pove ground In for 4	25_ft. below casing level. Pumping level _hours. passed through	top which is _	Thickness	20 Bottom
atic level pove ground In for 4	25_ft. below casing level. Pumping level _hours. passed through	top which is _	Thickness	20 Bottom
atic level pove ground In for 4	25_ft. below casing level. Pumping level hours. passed through	top which is _	Thickness	20 Bottom
atic level _ pve ground   n for	25_ft. below casing level. Pumping levelhours.  passed through  & gravel	top which is _	Thickness	20 Bottom
atic level pove ground In for 4  Formations sand	25_ft. below casing level. Pumping level hours. is passed through	top which is _	Thickness	20 Bottom
atic level pove ground In for 4 Formations		top which is _	Thickness	20 Bottom
atic level pove ground In for 4 Formations		top which is _	Thickness	20 Bottom
atic level pove ground In for 4  Formations sand	25_ft. below casing level. Pumping levelhours.  s passed through  1 & gravel	top which is _	Thickness	20 Bottom
atic level pove ground In for 4  Formations sand	25_ft. below casing level. Pumping levelhours.  passed through  i & gravel	top which is	Thickness	20 Bottom

16. STATE OFFICE BUILDING, SPRINGFIELD, ICAL / WATER SURVEYS SECTION. BE SURE TO

## GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 8-24-74

		Com	Pleted	8-24	-74 ·
10. Prope	rty owner				
Addre		L	:Well No	). <u> </u>	
	1 200 200 200 1000				
		Licen	se No. 🚣	<u>ے بدرت</u>	1741
ii. reimi	t No. <u>でマノルウカ</u>	Date 🔾	Y	21 1 7	
12. Mater	t No. 7/200 from Sometion	13. Cou	inty P	S = 160	- 1/27 h
ort den	th to fit.				
Id Smaar	W 10 1t.	Sec	. رئ ن	. 1	
14 Screen	i: Diamin.	Tw	p. <u>ڪ جا ۸</u> /		<del>┞╌┞╌╒</del>
rengii	h:ft. Slot	Rae	. 7 =	·	<del>├─</del> <del></del> ┼─┼
			v. <u> </u>		
15. Casing	and Liner Pipe	r.ie	GOOTH		
Diam. (in.)		<del></del>		لساري	الكاسلون
	Kind and Weight	From (Ft.)	To (Pt.)		SHOW
-5	15 T T W 19	47	Q a	BECT	ATION IN
		<del> </del>	<u> </u>	_	- FAI
				3	İ,
<u> </u>					
16. Size Ho	ole below casing:	in			
17. Static I	evel 4 a ft. below casis	411.	•	. (1	ermit)
above o	mund level Description	nd tob MITC	h is	<u>'</u>	ft.
		=1_ <u>4/_3</u> _ft.	when pur	pping	ot <u>3 / )</u>
3bm 101	hours.			_	
18. PC	RMATIONS PASSED THROUG	ly .			
		n 	THICK	IESS I	BOTTOM.
<b>⊘</b> 2a/√	e Play				
		<del></del>	1.4	ra	
779 W	<i>;</i>		] ,	_ T	
				<del>-</del>	40
1000	( ) U <sub>1</sub> ( ( ) ( )			<u>a l</u>	80
Comme	Second + Fr	- 1- /	————	~	21:21
	SENDED FOR	370 1	1	2	<u> </u>
	<u> </u>		-	1	
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			<b>—</b> —		
		<del></del>			•
<b></b>					
			<del> </del>		
		•	1 .	i	
(CONTINUE C	N SEPARATE SHEET IF N		<u> </u>		
0,	11	CESSARY			
GNED 1	assess 180	7.7		,	
710	The state of the s	DAT	<u> 205 کا 8</u>	01.	2 74
•	(/ = - 222				
	COUNTY	No. 2//9	8		
K ISLAND		Al-Pitani,			. <del></del>
# TOTAMI)		The same of the sa		19_	20N-2E
<b>建设的基础</b>		a indi. Nama	सम्बद्धाः स्टब्स् सम्बद्धाः स्टब्स्		بنے۔ ،،۔۔۔

ATE OFFICE BUILDING, SPRINGFIELD, NATER SURVEYS SECTION. BE SURE TO

		Comp:	Leted 1	٠٠رز –ر	12
Property	OWBEL		Well No.	. /	
R 1.1					
Address	Marity Sept 3	License	No. 🍮	· 2/ 3-	
Driller -	87 12 72 2-	Date 05	10 m 7 2 2	೨	
Permit N	m_ <u>NS320</u>	13. Сош	ity <u> </u>	<u> </u>	ج عردم نت
	L OLDER CTOR				
at depth	58 to 68 ft.		10	-	<del>-  -  -  -  </del> -
Screen:	Diam, $\frac{2}{2}$ in.	_	. <u>201</u> /		_}_
Length:	15 ft. Slot 20		2		
		Elev	r. <del>Ci</del> Ago 71	$\Box$	1 1
Casing	md Liner Pipe		3,000	. }	
em. (ln.)	Kind and Weight	From (Ft.)	To (Pt.)		SHOW ATION IN
	,	· ,	مو <sub>ح</sub> ي	SECT	ION PLAT
⊏′′—	A53 TXP				
1			<u> </u>	(Per	mit)
- · ·	hours.	ROUGH .	тнісі	CNESS	DEPTH OF BOTTOM.
	- C5 M			10	
1 - A - 2 - 1					
	- \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			1/5-	48
ر مرد ک	L brazel			18	68
5220	~ bravel			V8-	68
5225	< brazel			V8-	68
کو مرھ کے	c bravel			V8_	68
S = /- 5/	~ 6-12x0/			V8	68
S = /- 5/	< 6-12x0/			V8-	68
S 2 1 2/	< brazel			<u> </u>	68
S = 2-5/	< brazel			¥8-	68
S = /- >/	~ b-rare/				68
S = /- >/	< braze/				68
S = / /	< brazel			Y8-	68
S = 1 = 5 /	x 6-1270/	ET IF NECESSA	RY	V8-	68
\$ \$ \$ # \$ /	E ON SEPARATE SHEE		•	78	68
(CONTINU	x 6-1270/		RY) DATE Q	78 	68
\$ \$ \$ # \$ /	E ON SEPARATE SHEE	A mar	•	×8-	68
(CONTINU	E ON SEPARATE SHEE		•	78 	68
(CONTINU	E ON SEPARATE SHEE	A mar	•		
(CONTINU	E ON SEPARATE SHEE	A mar	•		-20N-2E

TED AND MAIL ORIGINAL 10 5 1A 1E 1 HEALTH PROTECTION, 535 WEST 1 NOT DETACH GEOLOGICAL/WATER 1 ER 2000 OCCATIO

GEOL	OGICAL AN	24-80				·	
				Well	No	<u>.                                    </u>	
	owner						
Address	, <del></del>		License Date	No.		<u> </u>	
Desmit   Officer	No. 923	5-3	Date 🏯	· • • • • • • • • • • • • • • • • • • •			
Weter fr	om 53'7'	/	Date 13. Coun	ty 🗀			<del></del>
	701		. Sec.	2.5	L		
at depti	کے to کے ا کد Digm	in.	Twp		<u> —</u> Г		
Screen:	ft. S	lot 1.5		-		$\top$	77
rend(n)			Elev		, 不想。, [	11	17
Casing	and Liner P	ipe				SHO!	
. (ln.)		nd Weight	From (FL)	To (		OCATION_	NI N
5"	d = 3	740	+/	4	₃ <b>/ "</b>		
<del>∠</del>				<u> </u>			
		<u> </u>				(per	rmit)
			in	]	Hansen	's 21	bbA ba
Size H	oje petom co	sing:ft. below cas	whi	ch is	. / _		ft.
	hou		IGN .	T	THICKNE	as DE	PTH OF
	PORMATIONS	PASSED THROU		-			<u> </u>
_ 58.17	X + 1/100	137/1		}	<u> 6. </u>	7-1-4	<u> </u>
				i			
CONTIN	UE ON SEPA	RATE SHEET.	IF NECESSA	RY)			
CONTIN	UE ON SEPA	RATE SHEET	/ <u></u>			<i>+</i> =	- 7
CONTIN	ue on sepa	RATE SHEET	IF NECESSA		EDV	#: =	- 2
	UE ON SEPA	in A	/ <u></u>	DAT		<i>t</i> . =	-7

Address		We t	l No#1	
rell address		<u> </u>	<del></del>	
Lot	Subd		<u> </u>	
Oriller <u>Lyons</u>			. 102-2771	
Permit No. 161 W57 00		Date0		<del></del>
Water from gravel		County R		<del></del>
	5_to <u>70_</u> ft.		19	
Screen: Diam.	<u>6</u> in.	Тир.	20 N	
Length:	ft. Slot 40	Rge. Elev.		
	•	Elea.	<u> </u>	
Casing and Lin		אא אא	SV	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
6	STEEL STAIN ESS ST. SSRESH	0	65	
	STAINLESS STL SCREEN	65	70	
		•		
	evel. Pumping level <u>.</u> _hours.	50_ft.when p	umping at	ft. 60
pm for 3	_hours.	50_ft.when p	<del></del>	60
pm for 3	_hours. passed through	ft.when p	Thickness	60 Bottom
Formations	_hours.  passed through	50_ft.when p	<del></del>	60
Formations	_hours.  passed through	50_ft.when p	Thickness	60 Bottom
formations	_hours.  passed through	50_ft.when p	Thickness	60 Bottom
formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops:	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops sand	_hours.  passed through	50_ft.when p	Thickness	Bottom 1 25
Formations tops sand	_hours.  passed through  oil  et	50_ft.when p	Thickness	Bottom 1 25
Formations  topse sand grave	_hours.  passed through  oil  ei	50_ft.when p	Thickness	Bottom 1 25
Formations topse sand grave	_hours.  passed through  oil  ei	50_ft.when p	Thickness	60 Bottom 1 25 70

EU AND MAIL UNIGINAL 10 STATE DE-FATE OFFICE BUILDING, SPRINGFIELD, WATER SURVEYS SECTION. BE SURE TO

## GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 9-1-73

Propert	y owner		Well No.		
Addres	s The second second				
Driller	A Company of the Comp	License	. No. ڪ	7	<del></del>
Permit	NoVF	Date 🚟			***
Water f	Novice Formation	13. Coun	ty	<u> </u>	
-4 4-51	h to 75 ft.	Sec.	12	1 1	
Screen:	: Diamin.	Twp.	5 1 5.		ெ
Length	:ft. Slot	Rge.	<u> 5 7 </u>	$\Box$	
202910	···	Elev	. ===	┠╌┨	
Casina	and Liner Pipe		610 77	لبابر	
lam. (in.)		·From (Ft.)			SHOW ATION IN
18 ST (1871)			70	SECT	
5	1 -3 -08	<del>  = /  </del>	7 7		
				(Per	mit)
Size H	ole below casing:	<u> </u>			
Static	level 1/3 ft. below ca	sing top whic	h is	<u>)                                     </u>	ft.
. olunc	ground level. Pumping le	evel 114 ft.	when pu	mping	ot 22
above	ground level. Pumping it				
gpm to	r hours.				
, ,	FORMATIONS PASSED THRO	UGH ·	THICE	NESS	DEPTH OF BOTTOM.
					3.5
<u> </u>	<u> </u>				<u> </u>
C ( )				<del>?</del> %	7/
			į		
<del></del>			_		<del>                                     </del>
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· · · · · · · · · · · · · · · · · · ·	m ov proving the furth	IE-NECESSAD	<u>ν</u>		•
(CONTINU	JE ON SEPARATE SHEET				, .
	M. mar L. M.	no series	ATE <sup>©</sup>	1015	£4-73
IGNED	1 / / Julius				,
	The state of the s	14 11 No. 7	235		•
ROCK IS	LAND (50)	2111 No. 11	0.35	. 1	19-20N-2E

ATE OFFICE BUILDING, SPRINGFIELD, TATER SURVEYS SECTION. BE SURE TO

GEOL			pleted		
Propert	y owner		Well No.	/_	
Addres					N 1 2
D-iller	IVIOT, FRIGO	License	• No. –∠⊆ • No. –∠⊆	<u> </u>	<del></del>
Permit	No. 40203	Date	(4) 3 /2 -	<u> </u>	Jaca
Water f	rom Sa Mo	13. Сошт	ity <u>1523</u>	<del></del>	
	• = "	Sec.	10		ت ت
at dept	h <u>57</u> to <u>62</u> ft.	Twp	. <u>2011</u>		
Screen	Diamin.	Rge .	2. F	.	
Length	: <u>ح_</u> ft. Slot <u> عــ</u>		1. <u>1.</u> 600711		-+-+-1
C:	and Liner Pipe		60000	لمان	
	Kind and Weight	From (Pt.)	To (Ft.)	L.OC	SHOW ATION IN
o. (is.)				SECT	ION PLAT
<u>ٿ</u>	A53-TYC.				
			<del> </del>	1	ermit) o
			<u> </u>	J 50	ection
Static above gpm fo	lole below casing:	level <u>30.6</u> ft pump set a	50'.	umping	,
Static above gpm fo	level 30 ft. below C	level <u>30.6</u> ft pump set a	50'.		
Static above gpm fo	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		,
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		,
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	ground level. Pumping or 4 hours. Sub. 1	level <u>30.6</u> ft pump set a	50'.		DEPTH OF BOTTOM.
Static above gpm for	level 30_ft. below conground level. Pumping or 4 hours. Sub. 1 FORMATIONS PASSED THE	level 30-6 ft	THIS		DEPTH OF BOTTOM.
Static above gpm for	level 30_ft. below conground level. Pumping or 4 hours. Sub. 1 FORMATIONS PASSED THE	level 30-6 ft	THIS		DEPTH OF BOTTOM.
Static above gpm for	rue on separate shee	level 30-6 ft pump set a	THIC	KNESS	DEPTH OF BOTTOM.
Static above gpm for	rue on separate shee	level 30-6 ft pump set a	THIS	KNESS	DEPTH OF BOTTOM.

Note	roperty owner		.Well	l No	, .
Subd	\ddress				
Subd	Jell address				
Permit No.					
Permit No.	oriller Latta,	Kirk Stephen	License No	102-2755	
Rater from sand County Rock Island  It depth 22 to 70 ft. Sec. 19 Identification 6 in. Twp. 20 N Rege. 2 E Elev.  Lasing and Liner Pipe NW NE NE  Diam. (in.) Kind and Weight From (ft) To (ft) 6 PVC -1 65 6 PVC SCREEN 65 70  Size hole below casing:in.  Static level 25 ft. below casing top which is ft. above ground level. Pumping level 40 ft. when pumping at 50  gpm for 1 hours.  Formations passed through Thickness Bottom  fine sand 18 18  clay 4 22  medium to coarse red sand 48 70  Private Water Well	Permit No	161-WW065-03	Date0	9/18/2003	<del></del>
it depth 22 to 70 ft. Sec. 19 icreen: Diam. 6 in. Twp. 20 N			County R	ock Island	<del></del>
Screen: Diam. 6 in. ength: 5 ft. Slot 014   Rge. 2 E   Elev.	it depth 22	to <u>70</u> ft.	Sec.	19	Tie
Elev	Goreen: Diam.	<u>6</u> in.	D		
lasing and Liner Pipe  Diam. (in.) Kind and Weight From (ft) To (ft) 6 PVC -1 65 6 PVC SCREEN 65 70  Size hole below casing:in. Static level25 ft. below casing top which is1ft. above ground level. Pumping level40 ft.when pumping at50 gpm for1 hours.  Formations passed through Thickness Bottom fine sand 18 18  clay 4 22  medium to coarse red sand 48 70  Private Water Well	.ength: 5 f1	t. \$10t <u>.014</u>			
Diam. (in.) Kind and Weight From (ft) To (ft) 6 PVC -1 65 6 PVC SCREEN 65 70  Size hole below casing:in.  Static level 25 ft. below casing top which is 1 ft. above ground level. Pumping level 40 ft. when pumping at 50 gpm for 1 hours.  Formations passed through Thickness Bottom fine sand 18 18 clay 4 22 medium to coarse red sand 48 70  Private Water Well				L	
6 PVC -1 65 6 PVC SCREEN 65 70  Size hole below casing:in. Static level _25 ft. below casing top which is _1ft. above ground level. Pumping level _40 ft.when pumping at _50  gpm for _1 hours.  Formations passed through Thickness Bottom  fine sand 18 18  clay 4 22  medium to coarse red sand 48 70  Private Water Well	Casing and Line			<del> </del>	*
6 PVC SCREEN 65 70  Size hole below casing:in. Static level25 ft. below casing top which is1ft. above ground level. Pumping level40 ft.when pumping at50  gpm for1 hours.  Formations passed through Thickness Bottom  fine sand 18 18  clay 4 22  medium to coarse red sand 48 70  Private Water Well	Diam. (in.)	Kind and Weight			
Size hole below casing:in. Static level25 ft. below casing top which is1ft. above ground level. Pumping level40 ft.when pumping at50 gpm for1 hours.  Formations passed through	6	PVC			
Static level	6	PVC SCREEN	65	70	
Static level					•
fine sand 18 18  clay 4 22  medium to coarse red sand 48 70  Private Water Well				Thickness	Bottom
clay  medium to coarse red sand  48  70  Private Water Well			· · · · · · · · · · · · · · · · · · ·	18	18
medium to coarse red sand 48 70		- 30IN		<del></del>	12
Private Water Well	clay	· · · · · · · · · · · · · · · · · · ·			
Private Water Well	medi	um to coarse redisand		48	70
Private Water Well	· · · · ·			•	<u> </u>
Private Water Well			·		
Private Water Well					
Private Water Well					
Private Water Well					
Private Water Well					

			l No	
doress		<u>[L</u>	<del></del>	
ell address		<del></del>		
	Subd			
riller <u>Joseph</u>	_		. 092-8408	<del>_</del>
Permit No. 161-W035-04 Date 06/			<del></del>	
	imestone		ock Island	
creen: Diam.	to 235 ft. in. t. Slot		20 N 2 E	
asing and Lin	er Pipe	SM SM	/ NE	
Diam. (in.)	Kind and Weight	From (ft)		
6	PVC SDR 21	-1	175	
			L	
tatic level <u></u> bove ground l	w casing:in.  27 ft. below casing evel. Pumping level hours.	top which is		
tatic level _ bove ground t pm for2_	<u>27</u> ft. below casing evel. Pumping level_	top which is		<u>15</u>
tatic level _ bove ground t pm for2_	27_ft. below casing evel. Pumping level _hours. passed through	top which is	oumping at	<u>15</u>
tatic level _ bove ground t pm for2 Formations	27_ft. below casing evel. Pumping level _hours. passed through	top which is	Thickness	15 Bottom
tatic level _ bove ground l pm for2  Formations	27_ft. below casing evel. Pumping level _hours. passed through	top which is	Thickness	15 Bottom 138
tatic level _ bove ground t pm for2  Formations sand	27_ft. below casing evel. Pumping level _hours. passed through	top which is	Thickness 138	15 Botton 138 151
tatic level _ bove ground t pm for2  Formations  sand  clay	27_ft. below casing evel. Pumping level _hours. passed through	top which is	Thickness 138 13	15 Botton 138 151 162
tatic level _ bove ground t pm for2  Formations  sand  clay  clay	27_ft. below casing evel. Pumping level _hours. passed through	top which is	Thickness 138 13 11 10	15 Bottom 138 151 162 172 180 235
tatic level _ bove ground t pm for2  Formations  sand  clay  clay	27_ft. below casing evel. Pumping levelhours.  passed through  ow limestone	top which is	Thickness 138 13 11 10 8	15 Bottom 138 151 162 172 , 180
tatic level _ bove ground t pm for2  Formations  sand  clay  clay	27_ft. below casing evel. Pumping levelhours.  passed through  ow limestone	top which is	Thickness 138 13 11 10 8	15 Bottom 138 151 162 172 180 235
tatic level _ bove ground t pm for2  Formations  sand  clay  clay	27_ft. below casing evel. Pumping levelhours.  passed through  ow limestone	top which is	Thickness 138 13 11 10 8	15 Bottom 138 151 162 172 180 235

Rock Island

19-20N-2E

ddress		•	l No	
ell address				
ot	Subd			
riller <u>Timmer</u>	•	License No	. 102-1781	-
ermit No	161 WW79'00	Date1		
later from <u>s</u>	sand & gravel	County R		
t depth <u>75</u> creen: Diam. ength: <u>5</u> f			19 20 H 2 E	
				++-
asing and Lin	ner Pipe	SW SE	S <b>V</b> :	
Diam. (in.)	Kind and Weight	From (ft)		
5	PLASTIC	0	80	
		<u> </u>		
· · · · · · · · · · · · · · · · · · ·	1	<del></del>	<del></del>	
pove ground to om for 4	<del></del>			ft. 
bove ground to pm for 4	evel. Pumping level	top which is		
bove ground tom for 4 Formations	evet. Pumping level _hours.	top which is	sumping at	20
pove ground tom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
bove ground topm for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground tom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground loom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground tom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground tom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
bove ground tom for 4 Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground tom for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
bove ground topm for 4  Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
bove ground tom for 4 Formations	evel. Pumping level hours. passed through	top which is	Thickness	20 Bottom
pove ground tom for 4  Formations sand	evel. Pumping levelhours.  passed through & gravel	top which is 50 ft.when p	Thickness	20 Bottom
bove ground topm for 4  Formations sand	evel. Pumping levelhours.  passed through & gravel	top which is	Thickness 80	Bottom 80
pm for 4  Formations	evel. Pumping levelhours.  passed through & gravel	top which is 50 ft.when p	Thickness	Bottom 80

TATE OFFICE BUILDING, SPRINGFIELD, WATER SURVEYS SECTION. BE SURE TO

# GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 7-14-72

, Proper	ty owner		Well No.		· ·	
Addre:	ss 3			<u> </u>		
Drille	Mr Finns	Licens	e No. <u>-7</u>	- j.,		
	No					
. Water:	from Sand	13. Cou	nty <u> </u>	<u>- 41</u>	<u> </u>	•
	tb <u> </u>	Sec.	<u>, 5</u>		19	
	: Diamin.		<u> کی دی در .</u>			
	: <u>ノっ</u> ft. Slot <u>る</u> ク	-	2 -	1	╼┾╼┼╾┤	::
Leagu	1. 7.7 It: 510t <u>— 4.0.</u>		·			:
. Casing	and Liner Pipe	Liey	/, <del></del>			•
iem (in.)	Kind and Weight	From (Ft.)	To (Ft.)	1.00	SHOW CATION IN	-
- S	# 55 TY 0		650		ION PLAT	
<u>r. J</u>			76. L.			
<del></del>						
		L		Pe	ermit)	
	ole below casing: <i>&amp;!</i>					
Static	level <u>###</u> ft. below casi	ng top whic	ch is	1	ft.	
above	ground level. Pumping lev	el <u>4/ /</u> ft.	when pu	unping	at 44	
	r <u>- ?/</u> hours.	• .				:
	•				OFFITH OF	:
. 1	ORMATIONS PASSED THROUG	3H 	THUCK	NESS	DEPTH OF BOTTOM.	. :
2/22/	KARAND		۾	9	20	•
	1 Dime		4	_ى	6.5-	
	Jan Brown 1		1	O	75	
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CONTINU	E ON SEPARATE SHEET IF	NECESSARY	n		•	
(	W 1.12		سيب	, ,	4.4.4	
GNED 🚄	Manual 17	127 D	ATE VA	1/2	<u>, –/4                                    </u>	72
•	COUNTY No. 5	14	٠	. •		
ROCK I	SI AND		r.	40	001.05	. 17 <del>1</del>
TOON T	OLIMID		· ·	19	-20N-2E	

ATE OFFICE BUILDING, SPRINGFIELD, VATER SURVEYS SECTION. BE SURE TO

## GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 7-3-77

Property owner			
	`	Well No.	<del></del>
			<del></del>
	License	No. <u>*****</u>	<u> </u>
D. No.	Date	ر در از این از این از این از از از از از از از از از از از از از	
Water from Formation	13. Coun	ty Table 1	
Formation	Sec.	<u> </u>	
at depth toft. Screen: Diam <in.< td=""><td>Twp</td><td><u> </u></td><td></td></in.<>	Twp	<u> </u>	
Length:ft. Slot	Rge.		
Length.	Elev	635 779	
Casing and Liner Pipe		635 1 5 1	
m. (in.) Kind and Weight	From (Ft.)	To (Pt.) LO	SHOW CATION IN
	٠ بند	SRC.	
<u>5   200 250                             </u>			permit) NE
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Size Hole below casing:Static levelft. below		ahie /	ft.
FORMATIONS PASSED TH	IROUGH	THICKNESS	DEPTH OF BOTTOM
		1	
de ex		.5"	ت
in the second		5" 115	5
Carrier de l'action		15	<del></del>
Say - Waller	Santa Contract	<u>। ५५</u>	50
San San San	Colonie	10	35
Say - Williams	(alsole)	10	35
Say - Williams	Salanie !	10	35
Say - Williams	( -/s··	10	35
Say - Williams	Same.	10	35
Say - Williams		10	35
Say - Williams		10	35
CONTINUE ON SEPARATE SHE	ET IF NECESSA	115 111 6	30 31 70
CONTINUE ON SEPARATE SHE	ET IF NECESSA	115 111 6	30 31 70
CONTINUE ON SEPARATE SHE  GNED COUN  ROCK ISLAND COUN	ET IF NECESSA	THE DATE OF	30 31 70

License		
1		·
License	No. <u>092-0</u>	017
Date _	06/09/95	
13. County _	Rock Islan	<u>d</u>
		111
		<del> </del>
	— . Ц	
<del>,</del>		
<del> </del>		
	60	
ļ ·		
<b></b>		
	•	
	Thickness	Bottom
	<u> </u>	
	9	9
	21	30
	35	65
<del></del>		
	·	<u> </u>
		ľ
. '		
	Sec. 1 Twp. 2 Rge. Elev.  SW From (ft)  0	Sec. 19

TATE OFFICE BUILDING, SPRINGFIELD, /WATER SURVEYS SECTION. BE SURE TO

## GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 7-8-74

). Property owner		/ <b>_</b> '	Well No.		_
a diamen					<b>→</b>
Deiller M/A	7 Frenc	License	No. La	3-634-	_
」 Donnie No ハ	/= <u> </u>	Date	<u> </u>	<del></del>	-,
. Water from	Sand	_ 13. Count	ty / 401	JY ISAY	4
	Formation	Sec.	19_		
at depth 5.5	. to <u></u>		20 N		
1. Screen: Diam	4 Clot //)		3.E	<del>├─<del>╽</del>┈┋╾</del> ╅	<b>a</b>
Length:	ft. Slot	Elev.		<b>I</b>	9
	iner Dine	2.01			;
i. Casing and Li		From (Ft.)	To (Pt )	SHOW	•
22000	Cind and Weight		10 (1 (.)	LOCATION SECTION PI	IN Jat .
2 3"1	RUD TOCKED	+/	<u> </u>		
				(Permit)	
above amund	ft. below casi level. Pumping lev hours. Submers	ا <u>ا کے ک</u> ال	wnen pu	t 40'	
	TUDON		THICE	NESS DEPTH	OF
A. FORMATI	IONS PASSED THROUG	3н	, He	BOTTO	<u>, wc</u>
0.			THE.	59	<u> </u>
0.			THE.	5 9	<u> </u>
0.	Paint Draw well			5 9	<u> </u>
0.				5 9	<u> </u>
0.				5 9	<u> </u>
0.				5 9	<u> </u>
0.				5 9	) / 
0.				5 9	<u></u>
0.				5 9	<u> </u>
0.				5 9	OM. / 
0.				5 9	) / 
0.				5 9	OM. / 
Sand		NECESSAR		59	- <i>7</i>

			Well No	
) Property of				
Address	osch, Wayne A.	License	No. 102-255	57
		Date	04/19/90	
1. Permit No.	017598	13 County	Rock Island	
2. Water from		Sec.	19	<del></del>
at depth	toft. im. 16in.	Тир.	20 N	<del>├</del> ├-┪
· Length:	0 ft. Slot _5	Rge.	2 E	<del>     </del>
	•	Elev.	<u> </u>	
6. Cesing and	Liner Pipe	. N	E SE NE	
)iam. (in.)	Kind and Weight	From (ft)	To (ft)	
16	PLAIN STEEL	Ö	80	
16	STEEL SCREEN	80	100	
	hours.		Thickness	Bottom
3. Format	ions passed through		<del></del> -	2
top	soil		2	
sand	,		33	35
medi	um sand		20.	55
medi	um gravel		45	100
fine	send at		0	100
•				
<del></del>	· <u></u>			
<del></del>				
			<u> </u>	<del></del>
rrigation			٠	
			10-10	N-02E
lock Isla	and leading		TA-50	W-02E

operty owner dress				
l address				<del></del>
	SUE			
	Gingerich	License No.	092-8374	
	161-W61-04	Date <u>10</u>		·
ater from <u>s</u>	and	County Ro	ck Island	
t depth 93	to <u>98</u> ft.	Sec. 1		T-1
creen: Diam	<u>4.5</u> in.	Тмр. 2	<u> </u>	<del>     </del>
ength: <u>5</u> f	t. Slot <u>.02</u>	_ Rge Elev.		
		2.0	<u> </u>	
asing and Lin	ner Pipe	. SA NA		
Diam. (in.)	Kind and Weight	From (ft)		
6	PVC	-1	90	
4.50	PVC	88	93	
4.50	PVC SCREEN	93	98	
tatic level _ bove ground l	ow casing:in.  30 ft. below casing level. Pumping level hours.	top which is	2 umping at	ft. 60
tatic level _ bove ground l pm for1	30 ft. below casing level. Pumping level.	top which is	2 umping at	
tatic level _ bove ground l om for1	30 ft, below casing level. Pumping levelhours.	top which is	umping at	
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level_bove ground loss for1	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level_bove ground lom for1_	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level_bove ground loss for1	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level_bove ground loss for1	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft, below casing level. Pumping levelhours.	top which is 45 ft.when p	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft. below casing level. Pumping level. hours. s passed through	top which is 45 ft.when p	Thickness	60 Bottom
tatic level _ bove ground l pm for1  Formations	30 ft. below casing level. Pumping level. Pumping level. hours. s passed through	top which is 45 ft.when p	Thickness	60 Bottom
tatic level _ bove ground l pm for1 Formations	30 ft. below casing level. Pumping level. Pumping level_hours. s passed through	top which is 45 ft.when p	Thickness	60 8ottom 98

iddress	-	<u> </u>		
lell address		<u> </u>		
ot				5
	n Gingerich 161-WW005-2004	License No.		
				<del></del>
	sand 1 to 96 ft.	County Ro		
creen: Diam.	1 to <u>96</u> tt. 4.5 in.	Sec. <u>1</u> Тыр. <u>2</u>		
	t. Slot <u>.02</u>	Rge	2 E	$\Box$
		Elev.	H	++-
asing and Lir	ner Pipe	SE NW	SE L	<del></del>
iam. (in.)		From (ft)		
6	PVC	-1	80	
4.5	PVC	71	91	
4.5	PVC SCREEN	91	96	
pove ground l			unoping at	20
pove ground l	evel. Pumping level			20
pove ground l	evel. Pumping levelhours.  passed through		unoping at	20
pove ground l om for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
pove ground l om for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
pove ground l om for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
pove ground l om for 1 Formations	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
n for 1 Formations	evel. Pumping levelhours.  passed through	60 ft.when pu	Thickness	20 Bottom
pove ground to the formations sand	evel. Pumping levelhours.  passed through		Thickness	20 Bottom
pove ground lown for 1 Formations	evel. Pumping levelhours.  passed through	60 ft.when pu	Thickness 96	20 Bottom
rove ground to the formations sand	evel. Pumping levelhours.  passed through	60 ft.when pu	Thickness 96	Bottom 96
pove ground to the formations sand	evel. Pumping levelhours.  passed through	60 ft.when pu	Thickness 96	Bottom 96

dala an a E		Well		
ddress	4	a IL		
ell address				
ot				
riller <u>Timme</u>		License No.		
	161-WW25-00			
	sand & gravet	County <u>Ro</u>		<del></del>
creen: Diam.	5 to <u>80</u> ft. 5 in. ft. Slot <u>20</u>	Sec. 1 TMP. 2 Rge Elev.	20 N	
asing and Lin	ner Pipe	HE NW	SW	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
5	PVC SDR 21	0	75	
	1	1		
tatic level _ cove ground l	ow casing:in.  40 ft. below casing evel. Pumping level hours.	top which is _		ft. 15
tatic level _ pove ground l pm for4	40 ft. below casing evel. Pumping level_	top which is _	1 mping at	15
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	amping at	15
atic level poove ground lom for 4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
atic level poove ground lom for 4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
atic level poove ground lom for 4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
atic level poove ground lom for 4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
atic level poove ground lom for 4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom
tatic level_ pove ground l pm for4	40 ft. below casing evel. Pumping levelhours.	top which is _	Thickness	15 Bottom

Rock Island:

19-20N-2E

ICE BUILDING, SPRINGFIELD, RVEYS SECTION. BE SURE TO

GEOLO!	GICAL	WATER	SURVE"	YS WATE	R WELL	RE	CORD	
	•			C	omplete	ed 6	15-67	
), Dept. N	Aines co	id Minerals	permit N	o	יל <u>נגע</u>	ect_	67	-
!. Propert	y owne				ell No.	/_		-
Addres	s <sup>*</sup>		,		7 - K		1111	7
Driller		NT J	HAMO	Licens 13. Cou	ie No. フ	الموارد م	T \ /2	- 
?. Water f		Loumatron	1				1	ጂ <i>'</i> ገ
at dept	ь <u>-3</u> Д	to 60 f	t.		30	,		-
4. Screen	: Diam	i	n. 12)		. <u>aca</u> . <u>ae</u>		$\rightarrow$	-
Length	:- <del>7</del> -	ft. Slot_	10		, 3	. Ц		_
5. Casing	omd Li	ner Pine		·			•	ا
		ind and We	labe	From (Ft.)	To (Pt.)	l	SHOW	
Diam. (in.)				5	OK.		ATION IN TON PLA	
2"	158	DG	12		U.A.			
			_ <del></del>	·	<del> </del>			
		ow casing:	<u> </u>		L	J SW	(Permi	. <b>t</b> )
gpm fo	τ	hours.		el ft		KNESS	,	· :
	San	d				60	61	
								<u>.                                    </u>
				,				
								·
<del></del>				- :-			<u> </u>	;
			· · · · ·					
							· · ·	
	-		<del></del>					
(CONTINU	B ON BE	PARATE S	HERT IF	NECESSARY	,			_
	00	110	2	<del></del>	<u> </u>			
IGNED	1//	1//	usse	DA DA	TE O	uns	2-24	67
,		Cowod	o, RU.	1				
DOCK IC	LAND					 ::::::::::::::::::::::::::::::::::	 20-20N <del>-</del>	2E

O. Property of	iner		Well No	<del>_</del>
Address (				
Driller Tir	mmerman, Tom	<del></del> _	ie No. <u>102-17</u>	
1. Permit No.	013116		. 07/19/89	
	broken limestone			<del></del>
at depth _	55 to 59 ft.	Sec.	20 N	
4. Screen: Di	em. 5 in. 5 ft. Slot <u>20</u>		2 E	44 :
tengen	<u> </u>		· — +	1-1-1
			AN SH SH .	
5. Casing and		From (ft)		
Diam. (in.)	Kind and Weight	0	50	
5	PLASTIC			
	· · · · · · · · · · · · · · · · · · ·			
	<u> </u>		<u> </u>	
<ol> <li>Static levents</li> <li>above ground</li> </ol>	el <u>37</u> ft, below cas nd level. Pumping leve	in. ing top whic 1 <u>37</u> ft.w	h is <u>2</u> hen pumping at	ft.
above group	et <u>37</u> ft. below cas nd level. Pumping leve 10 hours.	ing top whic	hen pumping at	
above ground gpm for	nd level. Pumping leve	ing top whic	h is 2 hen pumping at Thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours.	ing top whic	hen pumping at	
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom
above groungpm for	nd level. Pumping leve 10 hours. ions passed through	ing top whic	thickness	Bottom

GEOLO(	SICAL WA	TER SURVEY	YS WATER	R WEL	יר עבו	עחטג
Complet Dept. N	ed 4-29- lines and M	68 inerals_permit N	o. <u>48/</u>	2	Year	1968_
Propert	y owner			Well N	۰	<del></del>
Addres						
	L. F. Wi	slow	License	e No	<u>92-5</u>	8
Waterf	rom L.m	estone	13. Coun	ty Ros	<u>t Jsl</u>	m4
		OLDERTON		20	•	
at dept	h <u>80</u> to 2	2 <u>80</u> ft.				<del>-      </del>
. Screen:	: Diam	in	ı wp.	<u> 20</u>		
Length	:ft:	Slot	nng.	_ <u>2_E</u>	7.2	
•			Elev	. <u>1605</u>		
. Casing	and Liner			- (D)		±——і——і эно₩
iem. (in.)	Kind	and Weight	From (Pt.)	To (Ft.	LOC	ATION IN_
4 5 1	2 5 #	scamless	0	187	SEC	TON PEAT
1 o.d.						
<u> </u>					│ (p	ermit)
	<u></u>		L			
. Size H . Static above	lole below ( level <u>35</u> ground leve	casing: 674 ft. below casi el. Pumping lev	in. ing top whicel <u>24</u> _ft	ch is_ . when	pumpin	ft.
gpm fo	or 4 ho	urs.				
).	FORMATIONS	PASSED THROU	GН	TH	CKNESS	DEPTH OF BOTTOM
Sand					0	175
	Rock				175	187
<del>7111101</del>					127	250
ines	lone.				-	
	·	<u> </u>				<del> </del>
			·			
				- 1		
& Due	lestre	el roell				
CONTINU		L WELL.	NECESSARY	,		
CONTIN	JE ON SEPA	RATE SHEET IF				-/0
(CONTENT	JE ON SEPA				5-1	-68
(CONTINU	JE ON SEPA	RATE SHEET IF			5-1	-68

0. Property o			_ Well No	
Address				
Driller Di	rks, Michael J.	Licens	e No. <u>092-7</u>	327
11. Permit No.	VAV05 193	Date	01/05/93	
	,			
at depth_	toft.	Sec.	20	
14. Scr <del>ee</del> n: Di	<b>a</b> m. 12 10.		20 N	
Length:	<u>20</u> ft. Slot <u>.05</u>	Rge. Elev.	2 E	
•		2107.	· — 🛚	
15. Casing and	Liner Pipe	N	IN SH SE	
Diam. (in.)	Kind and Weight	From (ft)	To (ft)	
14	PLAIN STEEL	0 .	82	
12	SS SCREEN	82	102	-
- above grou	etft.below cas nd level.Pumping leve hours.			
above grou	nd level. Pumping leve			
above groungpm for	nd level. Pumping leve hours.		then pumping a	nt
above groung gpm for	nd level. Pumping levehours. ions passed through		Thickness	Bottom 2
above groung gpm for	nd level. Pumping levehours. ions passed through		Thickness	Bottom 2
above groung gpm for	nd level. Pumping levehours.  ions passed through soil send	lft. •	Thickness 2 35	Bottom 2 37
above groungpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand	lft. •	Thickness 2 35 27	Bottom 2
above groungpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand to medium gravel & ro	lft. •	Thickness 2 35 27 38	Bottom 2 37 64 102
above groungpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand to medium gravel & ro	lft. •	Thickness 2 35 27 38	Bottom 2 37 64 102
above groungpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand to medium gravel & ro	lft. •	Thickness 2 35 27 38	Bottom 2 37 64 102
above groung gpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand to medium gravel & ro	lft. •	Thickness 2 35 27 38	Bottom 2 37 64 102
above groung gpm for	nd level. Pumping levehours.  ions passed through soil send um to coarse sand to medium gravel & ro	lft. •	Thickness 2 35 27 38	Bottom 2 37 64 102

Address				<del></del>
	immerman, Tom			781
	<u>w10191</u>		04/04/91	
<ol><li>Water from</li></ol>	sand & gravel	13. County	Rock Islan	<u>d</u>
at depth	toft,		20	<del></del>
4. Screen: Di	amin. ft. Slot		20 N	++-
renyth:				
		-;	. — Ц	
5. Casing and			SW SE SE	
	Kind and Weight	From (ft)	To (ft)	
5	PLASTIC	0	75	
		<u> </u>		,
		<u> </u>	<u> </u>	
above grou	nd level. Pumping leve 20_hours.	ing top which L <u>60</u> ft.வ	nen pumping st	
above grou	nd level. Pumping leve 20 hours. ions passed through			
above grou	nd level. Pumping leve 20 hours. ions passed through		nen pumping st	
above grougpm for	nd level. Pumping leve 20 hours. ions passed through		Thickness	Bottom
above grougpm for	nd level. Pumping leve 20 hours.  Tons passed through		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  Tons passed through		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  Tons passed through		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through  & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through  & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through  & gravel		Thickness	Bottom 10
above grougpm for	nd level. Pumping leve 20 hours.  ions passed through  & gravel		Thickness	Bottom 10

Rock Island

20-20N-02E

Address		a L		
Driller <u>Tim</u>	merman, Tom	Licens	e No. <u>102</u> -	1781
. Permît No.	W172 93		10/20/93	
. Water from	sand & gravel	_ 13. County .	Rock Isla	and
at depth	<u>55</u> to <u>60</u> ft.	Sec.	<u>20</u> -	<del> </del>
. Screen: Dia	m. <u>5</u> in.	Twp. '		╅┼┼┼
Length:	5 ft. \$lot <u>20</u>	Rge.		1 1 1
	•	Elev.	<del></del> [	
. Casing and	Liner Pipe	SI	E NV SV	
	Kind and Weight	From (ft)	To (ft)	•
5	PVC SDR 21	0	55	
<del></del>	SCREEN	55	61	•
<del> i</del>		· · · · · · · · · · · · · · · · · · ·	<del></del>	
above groun		t <u>45</u> ft.wh	en pumping	at <u>†2</u>
above groun	d level. Pumping leve	t <u>45</u> ft.wh		at <u>12</u>
above groungpm for	d level. Pumping leve	t <u>45</u> ft.wh	en pumping	at <u>†2</u>
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for  Formati	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom
above groungpm for  Formati	d level. Pumping leve  4 hours.  ons pessed through  4 gravel	t <u>45</u> ft.wh	Thicknes	s Bottom

Rock Island

20-20N-02E

		Well	No. <u>#1</u>	
ddress				
iell address				
ot	Subd		_	
		_	102-2771	_
ermit No	161 WW55100	Date <u>08</u>		·
ater from <u>g</u>	ravel	CountyRo	ock Island	
creen: Diam. 6 ength: 5 fi	t. Slot 40	Sec. 2 Twp. 2 Rge Elev.	2 E	
asing and Line		עא אוא	<del></del>	
Diem. (in.)	Kind and Weight	From (ft)	To (ft)	•
6	STEEL	0	65	
6	STAINLESS STL SCREEN	65	- 70	
	<u> </u>	<del>}</del>		
	evel. Pumping level _hours.	<u>40</u> ft.when pu	amping at	<u>60</u>
pm for 2		40 ft.when pu	Thickness	60 Bottom
pm for 2 Formations	hours.	40 ft.when pa	· · · · · · · · · · · · · · · · · · ·	Bottom
pm for 2 Formations	passed through	40 ft.when pu	Thickness	
pm for 2 Formations topse	_hours.  passed through  pil	40 ft.when pa	Thickness	Bottom 1
pm for 2 Formations topso sand	passed through	40 ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	4U ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	40 ft.when pa	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	40 ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	40 ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	40 ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	_hours.  passed through  pil	40 ft.when pu	Thickness 1	Bottom . 1
pm for 2 Formations topso sand	passed through	40 ft.when pa	Thickness 1	Bottom . 1
pm for 2 Formations tops: sand grave	passed through	40 ft.when pa	Thickness 1	Bottom . 1
pm for 2 Formations tops: sand grave	passed through  pil  el	40 ft.when pu	Thickness 1	Bottom 1 15 70

ER HEALTH PROTECTION, 535 WEST DO NOT DETACH GEOLOGICAL/WATER OPER TILL LOCATION

y owner						
5						
5.U. A.			ē No∵ <u>⊼</u> म	<u> </u>		
No58711	bass 2	Date	tv Ro	ck I	sland	
rom <u>eravel</u>	etion					
<u> </u>	<u>ን</u> ተ			-	╼╂╼╂╼┫╶	
: Dicm12_	in.	-		-	x	
: <u>32</u> ft. Slo	ot <u></u>			$\overline{\mu}$		
and Liner Pi	pe			[  <b></b> _		
		From (Pt.)	To (Pt.)		ATION IN	
				BRCT	ION PLAT	_
-lesti	<u> </u>	. 0	79		(nerm	
hiasen					(perm	_ ,
ole below cos	ing: 15	in.		_		
11 10 #	HAINW COST	ng top which	ch is_		ft.	
ground level.	Pumping lev	elft	. when I	oump inc	at 1000	
r 12 hours	•		-			
ORMATIONS PA	ASSED THROUG	SH.	тніс	KNESS	DEPTH OF BOTTOM	
			10		10	
			35		45	•
	/8" grav	el		5	50	
• •	<u> </u>		2		52	
	<del>. * </del>		4		56	
	<del></del>		8	,	64	_
	<del></del>		10		74	_
					76	•
						•
				.0		•
						-
S-Deau	allers	clis I	ATE	int!	1,197	/ -
	a	pe	. /			
	No. 5871 romgravel romgravel h 76 to 10 Diam. 12 32 ft. Sla and Liner Pi  grad Liner Pi  ground level r 12 hours rormations pr  gravel ot 20% 1 gravel ot sand gravel lot sand ravel lot sand ravel lot sand	No. 58711 romgravel & sand Formation h 76 to 104t. Dicm. 12 in. 32 ft. Slot 60  and Liner Pipe  Kind and Weight  plastic  ole below cosing: 15 level 36 ft. below cosing ground level. Pumping lever 12 hours. FORMATIONS PASSED THROUGH gravel  ot 20% 1/8" gravel  ot sand gravel lot sand cavel lot sand cavel lot sand cavel	No. 58711 Date	S.D. AIDrecht License No. A  No. 58711 Date romgravel & sand 13. County Ro  126 to 104 ft. Sec. 20  132 ft. Slot 60 Rge. 25  Elev. 577  and Liner Pipe  Elnd and Feight From (FL) To (FL)  plastic 0 79  ole below casing: 15 in. level 36 ft. below casing top which is ground level. Pumping level ft. when profit 12 hours.  FORMATIONS PASSED THROUGH THE  gravel 25  gravel 25  gravel 25  gravel 26  gravel 27  48  gravel 27  10  gravel 28  ot sand 49  gravel 29  ot sand 10  gravel 29  ot sand 20  gravel 20  ot sand 20  gravel 35  lot sand 35  lot sand 36  gravel 36  gravel 37  lot sand 37  lot sand 38  lot sand 39  lot sand 30  l	S.D. Alorecht License No. 102-12  No. 58711 Date romgravel & sand 13. County Rock Is romgravel & sand 13. County Rock Is Pormstion 12 in. Twp. 20N Rock Is Diam. 12 in. Twp. 20N Elev. 57714 Rock Is and Liner Pipe    Kind and Weight   From (Ft.) To (Ft.)   Loc sect	No. 5871 Date romgrayel & sand 13. County Rock Island romgrayel & sand 13. County Rock Island romgrayel & sand 13. County Rock Island romgrayel & sand 13. County Rock Island romgrayel & sand 13. County Rock Island romgrayel & sand 13. County Rock Island romgrayel & sand Rock 15. Island romgrayel & sand Rock 15. Island romgrayel & sand Rock 15. Island romgrayel & sand Rock 15. Island romgrayel & sand Rock 15. Island romgrayel & sand Rock 15. Island romgrayel & sand Island romgrayel & sand Island romgrayel & sand

ROCK ISLAND

#### GEOLOGICAL WATER SURVEYS WATER WELL RECORD Completed 6-6-68 0. Dept. Mines and Minerals permit No. NF4/04 1. Property owner Address License No. Driller . 13. County Pola Taken 2. Water from SSand Sec. <u>20</u> at depth 45 to 49 ft. Twp. 20% 4. Screen: Diam. Length: 4 ft. Slot\_ Rng. 2 E Elev. \_\_≥ 5. Casing and Liner Pipe SHOW LOCATION IN SECTION PLAT From (Ft.) To (Ft.) Kind and Weight Diem. (in.) <u>ي</u> (Permit) NE Size Hole below casing: in. 7. Static level 35 ft. below casing top which is 2 above ground level. Pumping level \_\_\_\_\_ft. when pumping at\_ No pump Test \_ hours. FORMATIONS PASSED THROUGH THICKNESS Tracing done by Dept. of Pub. Health (CONTINUE ON SEPARATE SHEET IF NECESSARY)

0, Property o	owner 5	B	. Well No	
Address 🕽				
Driller Mc	Kinney, Ted R.	Licens	e No. <u>102-2</u>	540
1. Permit No.	111479			
2. Water from	·	13. County	Rock Islan	rd
at depth _	toft.	Sec.		<del></del>
	am. 16 in.	Тыр.		++1
Length:	<u>20 ft. Slot</u>	Rge. Elev.	100 m	
5. Casing and	Lines Dine		79.1 L	
	Kind and Weight.	From (ft)	E SW SW	
16	STEEL PLAIN	0	95	•
16	STEEL SCREEN	95	115	
		<del>                                     </del>		
	below casing: el32_ft. below casi		is <u>      0                              </u>	<u>.                                    </u>
'. Static leve above groun		ng top which		
7. Static leve above groun gpm for	el <u>32</u> ft. below casi nd level. Pumping level	ng top which		
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours. ions passed through	ng top which	en pumping at	1250
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours. ions passed through	ng top which 72 ft.wh	en pumping at	Bottom 0
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  SS #644  top soi	ng top which 72 ft.wh	Thickness	1250  Bottom 0
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  SS #644  top soi	ng top which 72 ft.wh 08 (0'-115')	Thickness  0 2 32	1250 Bottom
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  \$\$ #644  top soi  med same	ng top which 72 ft.wh 08 (0'-115') l d to f gyl	Thickness  0 2 32 72	1250  Bottom  0 2
. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  \$\$ #644  top soi  med same	ng top which 72 ft.wh  08 (0'-115')  l d to f gyl d to med gyl	Thickness  0 2 32 72	1250  Bottom  0 2 34
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  \$\$ #644  top soi  med same	ng top which 72 ft.wh  08 (0'-115')  l d to f gyl d to med gyl	Thickness  0 2 32 72	1250  Bottom  0 2 34
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  \$\$ #644  top soi  med same	ng top which 72 ft.wh  08 (0'-115')  l d to f gyl d to med gyl	Thickness  0 2 32 72	1250  Bottom  0 2 34
'. Static leve above groun gpm for	el 32 ft. below casi nd level. Pumping level hours.  ions passed through  \$\$ #644  top soi  med same	ng top which 72 ft.wh  08 (0'-115')  l d to f gyl d to med gyl	Thickness  0 2 32 72	1250  Bottom  0 2 34

Rock Island

20-20N-02E

	License Date		
1. Permit No. <u>018841</u> 2. Water from <u>sand &amp; gravel</u>	Date _		
2. Water from <u>sand &amp; gravel</u>		08/14/90	
2. Water from <u>sand &amp; gravel</u>			<del></del>
	_ 13. County _		
4. Screen: Diam. 5 in. Length: 5 ft. Slot 10	Sec. 2 Twp. 2 Rge. Elev.	20 N 2 E	
5. Casing and Liner Pipe	Sk	I SW SW	
Diam. (in.) Kind and Weight	From (ft)	To (ft)	•
5 PLASTIC	0	54	
			•
8. Formations passed through		Thickness	Bottom
dirt.		4	4
sand & gravel		55	59
·····			ļ .
		· 1 ·	j
•			

IMER HEALTH PROTECTION, 535 WEST DO NOT DETACH GEOLOGICAL/WATER ROPERTYLL LOCATION.

## GEOLOGICAL AND WATER SURVEYS WELL RECORD Completed 8-2-78

_			Well No.	783	7
	y owner		Well No.		<del></del>
Addres	House well & Pump	1:	- No. 17	7-17	Ŷ.
Driller	TOULE WELL & TUMP	Licens	e 140. <u>1 2</u> 1 11/2/11	2978	K
11. Permit	No. 77605	Date 21	vy Roc	b TA	land
2. Water i	from Broken Limestone	13. COM	117 <u>- 1885</u>		
at dept	th <u>63</u> to <u>140</u> ft.	Sec.	20		
4. Screen	: Diconin.		. <u>20N</u>		
Length	n:ft. Slot	Rge	. <u>2F</u>		
IS Casino	a cond Liner Pipe	Elev	, <u>6057</u>		
Dista. (in.)	Kind and Weight	From (Pt.)	To (Ft.)	LOC	SHOW EXTION IN
6		0	63	BECT	
		<del></del>	<del></del>	(p	ermit)
• above	level <u>70</u> ft. below casi ground level. Pumping lever <u>3k</u> hours.	ng top which al <u>80</u> ft.	ch is . when p	mping	ot 30
	FORMATIONS PASSED THROUGH	GH	THIC	CHESS	DEPTH OF BOTTOM
18.			<del></del>		
Brown	Dirt & Sand			39	39
Light	Shale & Sand			8	47
Red Cl	'ay	·		6	53
Limesa	tone	·		87	140
	<u> </u>			<u> </u>	<u> </u>
_		•			l
127.			,		
one (					
(CONTINU	JE ON SEPARATE SHEET IF	NECESSAR	Y)		
	Tom timmerman		•	Auai	ust 1978
Signed		D	AIE		
ROCK	ISLAND COUNTY NO	21612		20-	20N-2E



## Downhole Video Survey

	·					'. I	Date:	10-10-03
Customer:	Exelon - Qua	d Cities S	tation	· <u>/ ~ _</u>				
Job Number:	169156N	·	Well No	1	· ·	s.w.l.	36'	
Location:	3 Miles north o	[Cordova	on west s	ide of	Route 84			·
County:	Rock Island		City:	Cordo	/a	State:	٠	IL
Sec:	18		Twp:		<u>2N</u>	Rge:		2E
Tape Made:	Yes X	_ No -	Taq	pe File	No:		<del></del>	····
Was Well Back	kflushed? Yes	<u> </u>	No _	·	·			
How Long Bac	kflushed?	Overnight	, <u>, , , , , , , , , , , , , , , , , , </u>	·		- <del></del>		
Tape Length in	Minutes						•	
Brief Well Des								installed from the
								r to this video survey
		232' and t	hen the w	ell wa	bailed to it	s current total de	pth of	242'. Brown sand with
shale was baile	d from the well.	<u></u> .	<del> </del>		· <u>-</u>	·		
<u> </u>		<del></del>	<del></del>		·	·- <del></del>		
			<del> </del>		<u>.</u>	·		
					<del>,</del>	· · · · · · · · · · · · · · · · · · ·	-	
7-4	<del></del>	<del></del>		1	<u> </u>	Descri	intion	
Depth +1'	52'			105	casing	Dusa	puou	
52'	242		· .		8" drill hole			<u> </u>
36'	+				ic water lev			<del></del>
40'							sing – r	othing substantial
59*	<u> </u>				rged hole a			
71'				Enle	rged hole a	nd fracture		· · · · · · · · · · · · · · · · · · ·
76'				Enl	rged hole a	nd fracture		
80'						nd fracture		
89°						nd fracture		
98'						nd fracture		
119'						nd fracture		
129'			- <u> </u>			nd fracture		
144'						nd substantial fra		
153'				Enl	arged hole a	nd substantial fra	cture	
206'				Pict	ure goes co	mpletely dark.		

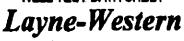
Total depth

Original total depth

Technician: L. Malaker

242'





8 division of Layres Christenson Company

	•	
PROFESSIONAL	SERVICES FOR WATER SYSTEMS	

721 West Illinois Avenue, Aurora, Illinois 60506-2892 Telephone 630/897-6941 229 West Indiana Avenue, Beecher, Illinois 60401 Telephone 708/946-2244

Þ	Exelon - Quad Cities Station		Well No		Date Tested 10-10-03				
cation	Cordova, iL					Tested B	y .	Senne/Klefer	
a. of We	<b>D</b>	10".				Driver	25HP Fr	enklin 460V 3	500 rpm
epth of W			Feet (orig. 250	) .		Column	and Shad	t .	3" T&C
auth of /	Alrline	149	Feat			Bowla	8 CHC -	4 stage	
•		37				Manufac	turer	Goulds/Christ	Brisen
rifice Siza		4 x 3		Page 1 of	1	Serial No	<b>).</b> ,	474465-Pum	9
Tene	Plezometer	G.P.M.	Air Geuge	Pumping	Drawdown	Olech. Pr			Remerks
( <b>6</b> 11 <b>m</b>	Reading (in.)		Roading (bet)	Level		Lba	Pt.	Апря	
			112	37				33:5 FLA	
:15	56	296	88	81	44	50	115.5	33.5-32	Clear
:20	50	280	67	82	45	50	115.5	32	Clear
:25	50	280	61	88	51	50	115.5	32	Trace of sand
:30	50	280	61	88	51	50	· 115.5	32	Clear
1-2	49	277	61	88	51	50	115.5	32	Clear
			Open to 40	psi					
1:50	54	291	56	93	56	40	92.4	32	Clear, trace of sand
1:65	54	291	54	95	58	40	92.4	32	Clear, trace of sand
2:05	54	291	54	95	58	40	92.4	32	Clear, trace of sand
2:15	54	291	- 54	95	58	40	92.4	32	Clear, trace of sand
			Open to 30	psi		<u> </u>			
2:20	61.5	310	50	99	62	30	69.3	·	Sp.Q = 5
2:30	61	309	40	100	63	30	69.3	32	
2:40	61	309	48	101	64	30	69.3		
2:50	61	309	48	101	84	30	69.3	32	Clear
				<u> </u>			<u> </u>		
	Notes			ļ	ļ		<b>_</b>		
	1) Pumpir	assembly ren	oved due to a k	w megohin	reading		<u> </u>	<u> </u>	1
	2) Pump (	nd motor were	eplaced		ļ				
	3) Motor S	N 03J19-25-01	57 Model No. 2	366159020	)		<u> </u>	ļ <u>.</u>	
	4) Pump	N 474465				<u> </u>	<b></b>		
	5) Downh	ole video sulve	conducted	<u> </u>			<u> </u>	<u> </u>	
		project engin <del>es</del> i		ann					
<b>T</b>						1	1		



<b>,</b>	Owner's No. 2
Location Condora County Local Sweet from Sec. Cor. 8 to 5 780 W - 1 WE CO)	a the manifestor
Feet from Sec. Cor.	g g
Owner Commonwealth Edison C Address	e
Driller Welling Well Works Address	
Date Drilled Od 1966 Method	
Depth 250 Hole record 10" 0-250	8 / 0 5 4 3 2 1
Casing record 10" 0-51'9"	•
Screen record Nme	
Log see back of steet Drill cuttings SES-V	Sample set no.
Chief aguifer limetone from 148 to 250	
Land surface elev. MSL Topography	<del></del>
onpumping level 38 below measuring point on 10-20-	
Pumping level 103 below measuring point after pump	4 -
265 gpm for 8 hours on 10-20-66 at (date)	AM _PM
Measuring point (MP) for above measurements	<u> </u>
Airline and measuring equipment	·
Pump and power	
Use of water	
Water quality	
Analysis No. and date	Cemp.
Data collected by driller I	)ate 10-20-66
Source of information	·
n well be used in pumping test?	Are nearby observa-
tion wells available?Are pumping records a	vailable?
Are water level records available?	

Remarks:

Depth(fr) Formation

0-40 Sand

40-49 Sand a gravel

49-142 Simestone

142-148 Sime a shale

148-250 Simestone



## Downhole Video Survey

		•				Date:	October 20, 2004
Customer:	Exelon – (	Quad Cities	Generating St	ation	,-,-		
Job Number:	169336N		Well No:	5	S.W.L.	35'	
Location:	Cordova	<del></del>					·
County:	Rock Islan	ıd	City: _Co	ordova	State:		Illinois
Sec:	18		Twp:	17N	Rge:		1W
Tape Made:	Yes _	X No	Таре	File No:			
Was Well Back	cflushed?	Yes X	No				
How Long Bac	kflushed?	Overnigh	nt	·			·
Tape Length in	Minutes					-	•
targets the Silu	Tan miesone	Tomaton.			·		
<u> </u>		-					
Depth				Des	scription		
+3'	54'	20" well					
54'	263'	Nominal	19" drill hole	·····			·
35'	54'	Heavy er	ncrustation on	well casing with	tubereles at v	arious lo	cations
54'	107'	Porous li	mestone form	ation			
107'	115'	Large vo	.d	<u> </u>			
119'	123'	Cave are					
130'		Fracture	-				
						<del></del>	· · · · · · · · · · · · · · · · · · ·
						<del>.</del>	
<u> </u>		-					
		-		<del></del>			
	<del>                                     </del>	+					
<u> </u>				<u> </u>			

Technician: Larry Malaker
Project Engineer: Nicholas Winkelmann

C:nick/misc/102104-TV



## WELL TEST DATA SHEET Layne-Western

a division of Layne Christensen Company

	,
DDACCCCIANAL	CERNICER FOR MAYOR AVAYENA
<b>PROFESSIONAL</b>	SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue, Aurora, Illinois 60506-2892 Telephone 630/897-6941 229 West Indiana Avenue, Beecher, Illinois 60401 Telephone 708/946-2244

doi	Exelon		<del></del>	Well No.	<u>5</u>	_Date Te	sted	10/22/2004	<u>-</u>
Location	Cordova		···	_		Tested i	Ву	R. Machak	
Dia. of We	ell	20"		•		Driver	50HP P	leuger 460V 1	10" Submersible
Depth of V	Vell	264	Feet	Pump Us	ed:	Column	and Sha	aft	5" Galvanized
Length of	Airline	211	Feet			Bowls	Layne 1	OWAHC - 6 S	Stage
Non-Pumi	oing Level	33	Feet			Manufac	cturer	Layne Christ	ensen
Orifice Siz	e	6 x 4		Page 1 of	1	Serial N	Q.	488896	·
Time	Piezometer Reading (in.)	G.P.M.	Air Gauge Reading (feet)	Pumping Level	Drawdown	Disch, P Lbs.	ressure Ft.	AMPS	Remarks
8:40	60	505	176	35	2	60	138.6	64.7	Cloudy
8:45	60	505	176	35	2	60	138.6	64.7	Rusty
8:50	60	505	176	35	2	60	138.6	64.7	Clear
9:00	60	505	176	35	2	60	138.6	64.0	Clear
9:15	60	505	176	35	2	60	138.6	64.0	Clear
	70	545	176	35	2	40	92.4	63.0	Clear
	71	548	175	36	3	40	92.4	63.0	Clear
9:50	71	548	175	36	3	40	92.4	63.0	Clear
10:00	81	592	174	37	4	20	46.2	64.0	Clear
10:15	81	592	174	37	4	20	46.2	64.0	Clear
10:30	81	592	174	37	4	20	46.2	64.0	Clear
10:40	81	592	174	37	4	20	46.2		
			RE	COVERY					
10:41		·	178	33	<u> </u>	ļ 			
10:42			178	33	<del></del>				
10:43	ļ		178	33					
10:45			178	33					
<u></u>	Motor Mode	l No. MI10-420	L4 1765 RPM						
	· · · · · · · · · · · · · · · · · · ·	nbly is rated for	· · · · · · · · · · · · · · · · · · ·				<del></del>		
							· · · · · · · · · · · · · · · · · · ·		
									·
	1	• 1	i				Ì	1	

1. Type of Well

d. Grout:

2. Distance to Nearest:

Cess Pool \_\_\_\_\_

Yes \_\_\_\_ No\_\_\_

Privy \_\_\_\_

Septic Tank \_\_\_\_\_

Leaching Pit \_\_\_\_\_

Manufacturer \_\_\_\_\_

ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

Tubular \_\_\_\_\_. Gravel Packed \_\_\_\_\_.

(KIND)

 a. Dug\_\_\_\_\_. Bored\_\_\_\_\_. Hole Diam. 20" in. Depth 61 ft.

 Curb material\_\_\_\_\_. Buried Slab: Yes\_\_\_\_\_No\_\_\_\_\_

 b. Driven\_\_\_\_\_. Drive Pipe Diam. \_\_\_\_in. Depth \_\_\_\_\_ft.

 c. Drilled \_\_\_\_\_. Finished in Drift \_\_\_\_\_. In Rock\_\_\_\_\_.

Building \_\_\_\_\_ Ft. Seepage Tile Field \_\_\_\_\_

3. Is water from this well to be used for human consumption?

6. Well Top Sealed? Yes \_\_\_\_\_No\_\_\_\_

4. Date well completed \_\_\_\_\_April 1, 1969

5. Permanent Pump Installed? Yes\_\_\_\_\_No\_\_\_x

Capacity \_\_\_\_\_gpm. Depth of setting \_\_\_\_\_ft.

FROM (Ft.)

TO (Ft.)

Sewer (non Cast iron)

Sewer (Cast iron) \_\_\_\_\_\_ Barnyard \_\_\_\_\_

Type\_\_\_\_\_

Manure Pile \_\_\_\_\_

FILL IN ALL PERTINENT INFORMATION RELEASE DEPARTMENT OF PUBLIC HEALTH, ROOM 61. THE OFFICE BUILDING, SPRINGFIELD, ILLINOIS, 62706. DO NOT DETACH GEOLOGICAL / WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

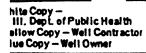
### GEOLOGICAL WATER SURVEYS WATER WELL RECORD

10. Dept. M	Mines and Minerals permit N	10. <u>701:8</u>	Y	/ear <u>l</u>	969
11. Propert	y owner <u>Commonwealth</u>	<u>Edison Ce</u>	Mell No.		<del></del>
Addres	s72 W. Adams St., Ch Wehling Well Works,	Inclicers	e No. S	2-56	
12 Water f	romFormation	13. Cour	ity Rock	Isl	and
			18 . 2	2	
at dept	h toft.	Sec.	171:20	7	
14. Screen	: Diamin. ::ft. Slot		1:02	£	
110'5 780	W NEC		604.2		
	g and Liner Pipe			<u> </u>	
Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)		SHOW ATION IN
20		0	59		rion plat S, 780'C
	,				NEC
					1440
above	levelft. below casi ground level. Pumping lev orhours. As per	el ft.	. when pu	ımping	tt. g at
18.	FORMATIONS PASSED THROUG	ЭН	THICE	NESS	DEPTH OF BOTTOM
Sand			1.0	)	1,0
Sand &	: Gravel			9	59
Lime			20	5	261:
	·				
-					
(CONTINU	E ON SEPARATE SHEET IF	NECESSARY)			
		•			

SIGNED Wehling Well Works. Inc. DATE April 19, 195

P12767	412	7	6	7		
--------	-----	---	---	---	--	--

REMARKS:



1. Type of Well

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

Fire Training.

## ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

. Hole Diam.\_

	Curb materia	1 Bu	ried Slab: Yes_	No
	b. Driven	Drive Pipe	Diamin.	Depthft.
	C. Utilled	rinished i	n Dritt	In nock
	Tubular X	Gravel Page	cked	
	d. Grout:			
		(KIND)	FROM (Ft.)	TO (Ft.)
		Puddled		
		Clay	0	44
_				
2.	Distance to Nec			
	Building		• •	eld
	Cess Pool		•	iron)
	Privy		Sewer (Cast iron	.)
	Septic Tank			•
	Leaching Pit _			
3.	Well furnishes	water for human	consumption? Y	es_X_No
4.	Date well comp	leted <u>Novemb</u>	E 1/9. 190/	
5.	Permanent Pum	p installed? Ye	s	No
	Manufacturer	Ty	pe Suba Loca	ition in well 26 Ft.
	Capacity	gpm. Depth of	Setting	<u>26 Ft.</u>
6.	Well Top Seale	d? YesNo		
7.	Pitless Adapte	r Installed? Yo	esX_No_	, .
	Manufacturer	Baker	Model Num	ber
	How attached t	o casing?	threaded	
8.	Well Disinfecte	d? Yes X	No	
. <b>9.</b>	Pump and Equi	pment Disinfecte	ed? Yes X	_No
10.	Pressure Tank	Size 100 gal.	Type hor1	zontal
	Location			
11.	Water Sample S	submitted? Yes	No	يام
RE	MARKS:			, , 07
				Co#22049
				Ü.

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

	0 1.1				<u>.</u>	
0. Propert	y owner Commonwealth	Edison	Well No.	302	3	
Addres	22710-206 Ave	e. N. Co	rdova,I	L		
Driller	S. Dean Albrecht No. 136904	Licens	e No 1	02-1	.20	
1. Permit	No. <u>136904</u>	Date _	<u>11/3/87</u>			
2. Water f	rom rock	13. Com	ty Roc	k Is	land	
at dent	h 200 to 225 ft.	Sec.	7.20			1
4. Screen	: Diamin.	Twp	20N	H		
	:ft. Slot	Rge	2E	H		
		Elev	60.5	$\mathbf{H}$		l
15. Casing	and Liner Pipe				L X	
Diem. (in.)	Kind and Weight	From (Ft.)	To (Ft.)		SHOW	
8	steel	0	44		ATION IN	r
				SW	SE SE	
				- 1960 (1871) - 1960 (1871)		
	L 8	<u>.</u>	L	Zrai	ning Bro Well <u>E</u> 10	rcc
16. Size H	ole below casing: 8 level 35 ft. below casi	in.		13	, we	
17. Static	levelit. below cast	ng top which	ch is		250 R	•
above	ground level. Pumping lever 4 hours.	.eı	. wnen pui	nbind	at <u>230</u>	-
dbiii io	nours.					
18. ¹	FORMATIONS PASSED THROUGH	3H	THICK	NE 85	DEPTH OF BOTTOM	
dirty:	sand		3	}	3	_
muscat	ine 25+5% 60 slot		39		42	-
	limestone - no wate	r to 601	92	)	134	-
yellow 60-7	0 75 gpm; 70-90 +75-	150 opm	1 34	-	104	-
	0 75 gpm, 70 50 175	720 Phil				-
badly	fractured		3	3	137	-
vellow	limestone		16	5	153	
	fractured		2	2	155	_
	limestone				163	-
		e water	22	2	185	-
yellow	yellowlimestone mor limestone	- 11444		)	200	-
	JE ON SEPARATE SHEET IF	NECESSAR	אר	-	005	
white	limestone		2.		225	
SIGNED _	XIIYA Kuck	D.	ATE	1/2:	1/88	-
						()

Well No.	3023	

Owner's Name:	COMMONWEALTH EDISC	ON	
Address:	22710-206 Ave. No	rth Cordova, IL	
Location:	The SW Quarter of the	SE Quarter of the SE Quarter of Section	on
	7 of Cordova[20N 2E]T	wp. in Rock Island County.	
Date: Nove	ember 13-17, 1987	WellLog: Rough Ref.# 1762	
Well		dirty sand	0-3
Diameter:	8" <sup>1</sup>	Muskatine 25+5% 60 slot	3-42
Depth:	225'	Yellow limestone	42-134
Cased to:	/ / 1	no water to 60° 60-70 75 gpm	
Water levels		70-90 +75-150 gpm badly fractured	134-137
Static:	35' est.	yellow limestone	137-153
		badly fractured	153 <b>-</b> 155
	250 est. w/air	yellow limestone	155-163
Time:		harder yellow limestone more H <sub>2</sub> O	163-185
Screen		yellow limestone	185-200
Type of: _	ROCK WELL	white limestone	200-225
Length: _			
Diameter:			
Şlot:			
Seal:			
Pump			
Size:	20 HP	Additional Comments	
Зу Туре:	%,230vFranklin Moto Submersible Model# 2366046010	Furnas Starter & Mercoid Switch	
Make:	Goulds 225-H20-6	135' Airline	*
Setting: _	126'x4" Steel	2/3 Subm. Cable- 200'	<del></del>
Pitless Unit:	8" Baker Threaded	1000 gal. horizontal pressure tank	
Who did work:	Jet,Bill,Tom Dennis,Harold, and Bryan		
Permit No.:	136904	·	



### WELL INFORMATION - ROCK WELLS

## Layne®-Western

a division of Layne Christensen Company

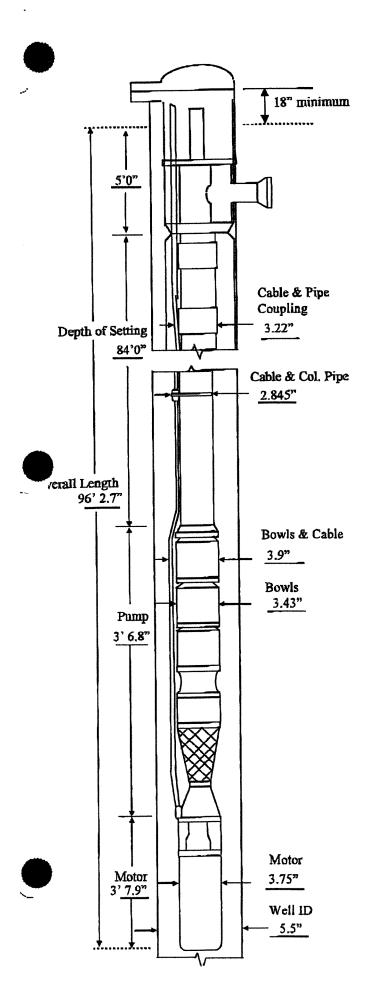
## PROFESSIONAL SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue • Aurora, Illinois 60506-2892 • Phone 630/897-6941 229 West Indiana Avenue • Beecher, Illinois 60401 • Phone 708/946-2244

Name Of Job	Exelon – Qua	d Cities				Date .	ote <u>09/09/2004</u>		/2004	
•						Stal	·e	ILLIN	ois	
City Cordov	/8									
Well Hatch No.	hery House #2	Drillers	Swanbe	erg and Lanan		•				
Well Location	1320	ft. (	N	_ ) and330	ft. (	_E)	of the	sw		corner of
the SW	1/4 of Section	7 ,	rwp. 17	( <u>N</u>	), Range	1	( <u>w</u>	)	Rock Island	County
Otherwise locate	ed as Hatche	ry House Wo	ell #2							
				``\						
Work Began:	9/9/2004				Work Complete	ed: <u>9/15/2</u>	2004			
Casing Record:		Wt. or T	hickness	Material						
	Dla.			Steel	with	T&C	joints fro	om	71_ to	+2
73	6"		0.280*	31001	with		joints fro		to	
									to	
					with		joints fro			
			-		with		joints fro	om	to	
Hole Record:										
	13	inch from			0 to	71'				
	5-1/2	inch from	_		71' to	135'				
		inch from			to					
		- ¨ •			to					
		inch from						·		oottom of hole
		inch from			to			www.		
Cementing Rec	cord: Benton	ite grout fror	n 71' to 10	)'						
				ping level	after		hours p	umping	at	g.p.m.
Well Test Data	: Static Level	32'	; puin	hind ieser						
Length of test		hrs. See	Nell Test Da	ita Sheet Dated					of from the C	Pock Jeland
'e:	Performance	test to be co	nducted w	hen the permar	ent power is	s installed.	Permit	obtair	led flour me i	COCK ISIBILIC
Cy Hea	Ith Department									
Layne Job No.	169326N				No.:					)90904NW-lb
I W•96				SEE OTHER	SIDE				,	<b>13030411410</b>

### **WELL LOG**

Feet	ì	Feet	Description
	to	58	Sand
0	to	67	Sandy clay
58		69	Broken limestone
67	10	100	Limestone
69	to		Soft and hard shale
100	to	128	Limestone
128		135	Limestone
	to —		
	. to		
	to		
	to		
	to		
	to		
	lo		
	to		
	10		
	to		
	to		
	 to		
	 to		
	 to		
	- " - 6		
	to		
	to -		





## SUBMERSIBLE OUTLINE

## PITLESS ADAPTER CONSTRUCTION

SEPTEMBER 9, 2004						
CUSTOMER Exclon-Quad Cities Station Cordova, IL						
WELL NO. Fish Hatchery Well #2						
SERIAL NO.						
LAYNE JOB NO. 16-9326N						
PURCHASE ORDER NO. 16-8032-9326N						
ADAPTER MANUFACTURER BAKER-MONITOR						
MODEL NUMBER 6X5 Kwikconnect w/ Monitor 7WPSM Cap						
2 " T&C GALVINIZED COLUMN PIPE						
2 " THREADED DISCHARGE						
BOWL ASSEMBLY GOULDS 80GS 75 / 14 STAGE						
10 HP 3450 RPM FRANKILN ELECTRIC SUBMERSIBLE MOTOR						
4" SIZE 3 PH. 60 CYCLE 460 VOLT						
100 GPM 185' TDH						
CABLE SIZE #10 3c w/g VOLTAGE 600 LENGTH 100'						
REMARKS 1. One (1) 2" bronze check valve located at the						
first joint above the bowl (21' above the bowl).						
2. One (1) - 1/2" Toro plastic airline & gauge installed						
3. Length of airline = 100'						
4. Pump startup was on 12/3/04						

### LAYNE-WESTERN

721 W. ILLINOIS AVENUE, AURORA ILLINOIS 60506 TEL: 630/897-6941



## WELL TEST DATA SHEET

## Layne-Western

a division of Layne Christensen Company

PROFESSIONAL SERVICES	FOR WATER	SYSTEMS	
-----------------------	-----------	---------	--

721 West Illinois Avenue, Aurora, Illinois 60506-2892 Telephone 630/897-6941 229 West Indiana Avenue, Beecher, Illinois 60401 Telephone 708/946-2244

	Cular Fish	Untohen/		Well No.	2	Date Tes	ted	12/3/2004	
lob	Exelon Fish	Halchery		-				Bob Machak	
_ocation		CII				Driver	-		
Dia. of We		135	Feet	Pump Use		Column :			2" galvanized
Depth of \			Feet	. ump oo				806S75	
_ength of						Manufac	turer	Goulds	
	ping Level	46	rect	Page 1 of	4	Serial No			
Orifice Siz	ze							Total	Remarks
Time	Piezometer	G.P.M.	Air Gauge	Pumping Level	Drawdown	Disch. P Lbs.	Ft	Pumping Head	1.0,1,0,1
	Reading (in.)		Reading (feet) 54	46					
			52	48	2	15	34.7	17	Disty
9:20				48	2		34.7	17	Little scale
9:25			52		2		34.7		Dusty
9:30			52	48		13	U-1.7		
9:35		Tripped Overl	oad					17	Rusty
		Restart							
y:45			52	48					Clearing
9:50			52	48	2	15	34.7	17	Oleaning
						<u> </u>		-	
			<del>                                     </del>						
							<del> </del>		
				+			+		
						_	+		
						_	+		

ILLINOIS DEPARTMENT OF PUBLIC FIELD

ILLINOIS DEPARTMENT	OF PUBLIC HELD
JO HAMANO TO CONS	
APPLICATION FOR PERMIT TO SELECT	INSTRUCTIONS ON REVERSE SIDE
APPLICATIONS WILL BE RETURNED	W. 11 Contractor License # 102
Current Mailing Addition	Name Layne-Western
Evelon Nuclear	
206th Avenue North	WENTER AUTOLOGIA
Condova, Il 01230	City/State/ZipAHARDA Telephone Number_630.897.6941
Pock Tsland	Lot #
ress 22710 206th Avenue North Subs	livision1/4 of the1/4
300	(F)(W) 1/4 of the1/4 of the1
tion 17 Township 20 (N)(S) Range 2	(E)(W)1/4 of the1/4
ections to Site	
BUILDING	ect.)
more space is needed see reverse side or place on additional sh	red [] Driven [] Drilled
more space is needed see reverse side or place on additional shapese to [X] Construct or [] Deepen a [] Boronse to [X] Construct or [] Semi-Private Well C.	[] Non-Community Public West
- Wall B. I Some	- 3 Timentack   Ollion
roposed Use: [] Imganon [1]	ft. Estimated Depth to Rosa
Vell Diameter 6 in. Estimated Deput 155  pated Aquifer: [] Sand & Gravel [X] Limeston	one [] Sandstone [] Other
pated Aquifer: [ ] Sand & State	Size 6 in. Estimated
roposed Casing: Type Steel  [] Check if anticipated yield is greater than 100,000 greater tha	allons per day.
1 Check if anticipated yield	and Type of Tablic Water Supply must be compared
Complete if B or C checked: Number of E. an Application For Permit to Construct, Alter or E.	Type of Pacility  Type of Pacility  Extend a Non-Community Public Water Supply must be completed)  Type of Pacility  Extend a Non-Community Public Water Supply must be completed)  Correct and that the work will conform to the current Illinois Water Well  September 2, 2004
(in C., Carry is complete and	correct and the
I certify that the attached information Construction Code.	September 2, 2004
Od A Koto	Date
	897/6941
Pump Type Submersible	License # 1021 @0353 Phone 630 / 897/ 6941
Contractor Laying	City/State/Zip Aurora, IL 60506
Address 721 W. Illinois Avenue	City/State Exp
Address 721 W. Illinois Avenue  I certify that the work will conform to the current I	September 2, 2004
Jan agkapp	Date
Signature of Pump Installation Contractor	
	SHOWING DIMENSIONS
ATTACH A SHEET WITH DIAGRAM (	OF WELL SITE SHOWING DIMENSIONS ruction site with dimensions showing the water well, distances to building and ruction site with dimensions showing the water well, distances to building and ruction site with dimensions above.  The contamination is a supply of the content of t
ATTACH A plot or draw the proposed constr	nuction site with dimensions distance to community wasterness of contamination. Indicate distance to community wasterness of contamination.
y lines, sewer lines, septic tanks and other source, y lines, sewer lines, septic tanks and other source, y lines, sewer lines, septic tanks and other source.	OF WELL SITE SHOW has been given by the water well, distances to building and cuction site with dimensions showing the water well, distances to building and cuction site with dimensions showing the water well, distances to community water supply, if available es of contamination. Indicate distance to community water supply, if available established.

	CRAM OF WELL SITE SHOWING DE	n die	crances to l	building and
	ATTACH A SHEET WITH DIAGRAM OF Water W	en, un	ter supply,	if available
	attach a sheet with dimensions showing the water water septic system plot or draw the proposed construction site with dimensions showing the water water specific system plot or draw the proposed construction site with dimensions showing the water water water specific specific specific system plot or draw the proposed construction site with dimensions showing the water water water specific specific specific system plot or draw the proposed construction site with dimensions showing the water water water specific specific specific system plot or draw the proposed construction site with dimensions showing the water water water specific specific specific system plot or draw the proposed construction site with dimensions showing the water water water specific spec	ury wa	, , ,	
	sentic system plot or draw the proposed of contamination.			
	y lines, sewer lines, septic tanks and other sources.  y lines, sewer lines, septic tanks and other sources.  The is an existing well on the property, indicate status.			
ft unc	are is an existing well on the pro-		1	

for office use only	ONLY	USE	office	FOR
---------------------	------	-----	--------	-----

FIPS Code Number Y (Well Permit Number) Year Date Approved By

White Copy -III. Dept. Yellow Copy - ..... Contractor Blue Copy - Well Owner

1. Type of Well

FILL IN ALL PERTINENT INFORMATION REGI ED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

### ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

-				. Depth <u>175</u> ft.						
	b. Driven Drive Pipe Diamin. Depth c. Drilled Finished in Drift In Rock									
			cked <u>x</u> .	*** ***********************************						
	d. Grout:									
		(KIND)	FROM (Ft.)	TO (Ft.)						
		Grout	0	20						
	•									
_	_									
2.	Distance to Ne									
	Building			eld						
	Cess Pool		•	iron)						
	Privy									
	Septic Tank		•							
	Leaching Pit _									
3.				esNox_						
4.	Date well comp	leted11,	/28/84							
5.				No						
			peLoca							
	Capacity 3000	gpm. Depth of	Setting	Ft.						
6.	Well Top Seale	d? YesNo	Туре							
7.			es No							
	- Manufacturer	!	Model Numl	oer						
8.	Well Disinfecte	d? Yes	No							
.9.	Pump and Equi	pment Disinfect	ed? Yes	No						
10.	Pressure Tank	Sizegal.	Туре							
	Location									
l L	Water Sample S	ubmitted? Yes	No							
RE	MARKS:									

Big	Froh rearing	well
-----	--------------	------

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

CommonwealthEdison-	Wall No	search Pro	ojec
Address Carbondale,	Il.		
Driller Grosch Irrigati	on License No. 102	<u>-002540</u>	
11. Permit No. 115930	Date <u>11/21/</u>	84	
12. Water from	13. County Roc	k Island	
at depth toft.  14. Screen: Diam18in.	Sec. $\frac{18.29}{20N}$	X	
Length: 68 ft. Slot 050	Rge. <u>2E</u>		
,	Elev		

15. Casing and Liner Pipe

	•			
Diem. (in.)	Kind and Weight	From (Ft.)	To (F1.)	SHOW IN
18 .	Johnson steel sc	een 0	18	SECTION PLAT 18" Plain steel 57-
18	Plain steel	18	27	18" Steel screen78-
18	Steel screen	27	57	18" Plain steel 98-
16 Si L	lala balaw againg:	in		SW NE NE

16. Size Hole below casing:\_\_\_ 17. Static level 40 It. below casing top which is\_ above ground level. Pumping level 71 ft. when pumping at 3000 gpm for 24 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top soil	0	2
Medium sand to medium gravel	2	65
Brown clay	65	68
Medium sand to medium gravel	68	97
Grav clay	97	121
Coarse sand to medium gravel	121	151
Grav clav	151	160
Gray clay w/gravel layers	160	178
Limestone	178	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SEND TO

### **FACSIMILIE COVER SHEET**

GROSCH IRRIGATION CO., INC. 13590 N. SR 29 Mason City, II. 82664

Phone no. 217/482-5479 E-Mail suc-n-suc@abelink.com Fax no. 217/482-3863

Exclon Nuclear	PROM
PHONE NO.	Sue
FAX NU. 309/227	-2265 DATE
	5/6/03
	TY IONE NUMBER
Attn: Mark Stuhlman	217/482-5479
Urgant/ Reply ASAI	P/ Please Comment/ Please Review/ X For your information/
Total pages, including cover sneet:	<u>2</u>
COMMENIS	
Well Information:	175 ft. Well - Listed top to bollom
***************************************	77 ft. of 18" Plain steel casing
	20 ft. of 18" Stainless steel screen
	21 ft. of 18" Plain steel casing
	30 ft. of 18" Stainless steel screen
	9 ft. of 18" Plain steel casing
	18 ft. of 18" Stainless steel screen
	Sue
, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	

### **FACSIMILIE COVER SHEET**

GROSCH IRRIGATION CO., INC. 13590 N. SR 29 Mason City, II. 62664

217/482-5479 Phone по. E-Mail sue-n-suc@abclink.com 217/482-3863 **Fax по.** 

SEND TO	
Exelon Nuclear	FROM
PHONE NO.	Sue
FAX NO. 309/227-2265	DAYF
	5/5/03
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PHONE NUMBER
Attn: Mark Stahlman	217/482-5479
Urgent/ Reply ASAP/	Please Comment/ Please Review/ 🗷 For your information/
Total pages, Including cover sheet: 1	
Mark <sup>.</sup>	
Hope this is what you need.	
High his is what you heed.	Test pump results:
	Static water level 40 ft.
	3000gpm @ 71 ft.
	31 ft. drawdown
	Pump set at 80 ft.
If you need anything else, please give me a	all. That's what I'm here for.
	Sue
	objectively



TESTON

Date.

ame Mad City Figheries Address Carbondale, Il.

ocation

	TEST LOG	_
Footage	Description	_ :
0-2	Tep. soil	 
2-65	Medium sand to medium gravel	<u>.</u> .
65-68	Brown Clay	٠,٠
68-97-	Medium sand to medium gravel	
97-121	Gray clay	
121-151	Coarse sand to medium gravel	
151-160	Cray clay	
160-178	Grav clav w/gravel lavers	<u>.</u> .
178	Limestone	<u> </u>
		$\supset \lambda$
		,
		<u>~</u> !}
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Q. 1198		<u> </u>
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	The second secon	<del></del> ,
A STATE OF THE STA		<u></u> .
10 mm 10 mm		<u>.</u>
		···· <del>*</del> .

Customer's Signature

3645-0008z



Walcott, IA 52773

### Purchase Order

明神神神神

Southern	Illinois	University	at Carbondal
arbonda	de, Illine	ois 62901	

uad Cities Fisharies Investigations-Commonweal 6-23645 STAT See Belon M5133 REST 536-7761 Bettye Doerr

the first

ZIP CODE TYPE CODE 01 420959030 52773 VENDOR OR PAYEE Winolow Drilling Company RR #1.

MARK ALL SHIPMENTS WITH THIS ORDER NUMBER SHEAL (1) A.S. BUYER 17 Store 14 19 DATE 2-27-8° BID OPENING DATE 19750/BC 2 DELIVERY PROMISE An Pagrant of SHIP VIA SHIP FROM TERMS let FOB POINT . ob 8300

N

APPROPRIATION ACCOUNT CODE NO. CELICATION NUMBER LIQ. CUSAS CODE MIN. OBJ. SOURCE OF FUNDS

1223 05 26 86 00UNIT PRICE AMOUNT JESCRIPTION UNIT QUANTITY Furnish and install a water well, test it, and install pump, at the Quad Cities Nuclear Power Station, Sondova, Illinois, according to the Following Specific cations. Test drilling has been completed at the site and the results are available. Design of the well: 50' 8" Plastic Cased Well 8" x 10' Johnson Stainless Steel Screen, 15 slot. 511 sq. in. open area 40' 2 1/2" Black Drop Pipe 50' Wire 150HO5 Gowlis Submersible Turbine TDH at 100' produces 150 GPM (specifications attached) Seal and Permits Installation, Water Supply, Drilling Fluid 5,269,00 Mell, pump, and testing sofal. | . . .

LIQUIDATION ENCUMBRANCE BALANCE OR BALANCE PASSED BALANCE PASSED OR ADJUSTMENT

FAX:13193323770

20409--08 2 7h 99-4

Estimate

WINDY JOK.		
PONDOUA NUCLEAR PLANT  PROJECT  JOHNSON HO EQUIPM	ENT	
CERTIFIED PUMP INSTALLATION CON	NTRACTOR	
4350 Hopewell Avenue O Bettendorf, lov	WB 52/22	Vell Data
Phone (563) 332-6820	Depth -	74,
ate $\frac{4-13}{200}$ , $200$	Static Level -	<u>w'</u>
ame VALLEY GNSTAUCTION C/O BILL NOSS	Pumping Level_	
·	Pump Setting _	<u> 65'                                   </u>
ddress	Casing Size -	
	Casing Depth - Driller -	
hone	Dittei -	
ump System	•	<b>7</b> 4 <b>7</b> 5 5
	,	2,470.00
		460101
75 X-3 W/6/COM		162.15
Drug Pine 63 2 GALVAURED		570.15
Pisture Admiton		
Well Seal Or Cap .6"		31.00
ressure System		
Pressure Tank		
Pressure Switch		
Pressure Gauge		
Air Release.  Check Valves (Z.) Z' Bross - Beovines By R.T. Co. Never	71 DS PT.	173.40
Check Valves (2) . 7. Bross - Lead Met Dy		113.40
Aerator		والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم والمتعادم
Piping Piping		
Well To Tank Pipe For Offset		150.00
Valves, Fittings, Electrical And Miscellaneous items		70 0700
O. H		
Jiner Hems		120 00
V O Down - VALIE	· · · · · · · · · · · · · · · · · · ·	125,00
WE'VE TIGHT ENCLUSIVE / PUMP CONTROL		125.00 102.00
WEYER TIGHT ENCLOSURE / PUMP CONTROL		/25.00 
WEYER TIGHT ENCLUSIONE / PUMP CONTROL		JOZ .O ()
WEYER TIGHT ENCLINEDE / PUMP CONTROL  TOTAL MATERIALS	s	4,278,30
WEYER TIGHT ENCLOSURE / PUMP CONTROL  TOTAL MATERIALS  Histories Sales Tax	s	4,278,30
WEYER TIGHT ENCLINEDE / PUMP CONTROL  TOTAL MATERIALS  Illinois Sales Tax	\$	4,278,30 564.00
TOTAL MATERIALS  Illinois Sales Tax  Labor  Trenching or Backhoe.	\$	4,278,30 564.00
TOTAL MATERIALS  Maree Tight Enchange   Purple Control  TOTAL MATERIALS  Minois Sales Tax  Labor  Trenching or Backhoe.  **Rough Grade Finish. No Rock, Frost, Sand, Water, Debris.	\$	102.00 4,278,30 564.00
TOTAL MATERIALS  Thinois Sales Tax  Labor  Trenching or Backhoe.  * Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.	\$	102.00 4,278,30 564.00
TOTAL MATERIALS  Illinois Sales Tax  Labor  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Demois 21 County Punt Tust Refeat / Perutt	\$	102.00 4,278,30 564.00
TOTAL MATERIALS  Illinois Sales Tax  Lahor  Trenching or Backhoe.  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Pump Tast. Refeat   fermit  SUB TOTAL	\$	102.00 4,278,30 564.00 NC
TOTAL MATERIALS  Illinois Sales Tax  Labor  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Punt Tust. Refeat   fermit  SUB TOTAL  Lava Sales Tax	s	102.00 4,278,30 564.00 NC 4,942.30
TOTAL MATERIALS  Minois Sales Tax  Labor  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Punt Tust. Refeat   fermit  SUB TOTAL  Lava Sales Tax	s	102.00 4,278,30 564.00 NC 4,942.30
TOTAL MATERIALS  Illinois Sales Tax  Labor  Trenching or Backhoe.  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Pump That Refer for feeling  SUB TOTAL  Lowa Sales Tax  ESTIMATED TOTAL	\$	102.00 4,278.30 564.00 NC 1,342.30
TOTAL MATERIALS  Illinois Sales Tax  Labor  Trenching or Backhoe. *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.T. County Punk Tust. Refeat   ferent  SUB TOTAL  Lowa Sales Tax  ESTIMATED TOTAL  NOTES:  © Some items may vary due to changes in well desired.	\$	102.00 4,278,30 564.00 NC 4,742.30 842.30 materials used
TOTAL MATERIALS  Illinois Sales Tax  Labor  Trenching or Backhoe.  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Pump Inst. Refert) feethet  SUB TOTAL  Lowa Sales Tax  ESTIMATED TOTAL  NOTES:   Some items may vary due to changes in well desired.	\$	102.00 4,278,30 564.00 NC 4,742.30 842.30 materials used
TOTAL MATERIALS  Illinois Sales Tax  Labor  Trenching or Backhoe.  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.I. County Punt Inst. Refert) from SUB TOTAL  Lowa Sales Tax  ESTIMATED TOTAL  NOTES:  9 Some items may vary due to changes in well desired to the superior of the superior o	S 4, lata, location, and	102.00 4,278.30 564.00 NC 4,342.30 materials used
TOTAL MATERIALS  Illinois Sales Tax  Lahor  Trenching or Backhoe.  *Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.  Welding  Permits. P.T. County Point That Reflect   female  SUB TOTAL  Iowa Sales Tax  ESTIMATED TOTAL  NOTES:   O Some items may vary due to changes in well desired.	S 4, lata, location, and  Peror To Aport	102.00 4,278.30 564.00 NC 4,342.30 materials used

Proposals are for work done according to the original specifications. If, through a change in specifications by customer, additional work or equipment is required, such additions will be billed at current rates for work completed. All prices subject to change without notice. TERMS: Due in 10 days. Service Charge, 2% per Month, 24% Annually on Unpaid Balance.

#### **Revision 1**

#### APPENDIX B

MONITORING WELL LOGS



Page 1 of 1

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-1

DATE COMPLETED: January 8, 2002

DRILLING METHOD: 4-1/2" HSA

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL		1	SAMP		
11 000	GROUND SURFAC TOP OF RISE			NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	not sampled			+-	=		-	
2			Concrete					
4			Bentonite Chips  2" Ø PVC Well Casing					
•								
6								
3			Bentonite					
10		584.10	Chips					
	CL-CLAY, some fine sand, trace fine gravel, brown, dry	583.60		1SS	X		>90	0
12	SW-SAND, fine to medium grained, brown, dry	•	2" Ø PVC Well Casing					
14		••						
16	- damp at 16.0ft BGS	• •	424 422 	2SS	$\setminus$		88	0
4.0		:						
18	• • • • • • • • • • • • • • • • • • • •	•						
20		•	2" Ø PVC Well Screen	200			74	1 /
22	v · v · v · v · v · v · v · v · v · v	•		3SS			74	1.4
24		• •	Sand Pack					
24	- saturated at 25.0ft BGS	•	Saliu Fack					
26		•		4SS	X		64	0
28	END OF BOREHOLE @ 27.5ft BGS	566.60	WELL DETAILS					
30			Screened interval: 577.10 to 567.10ft AMSL					
			17.00 to 27.00ft BGS					
32			Length: 10ft Diameter: 2in					
34			Slot Size: 10 Material: PVC					
36			Sand Pack: 579.10 to 566.60ft AMSL					
			15.00 to 27.50ft BGS					
38								
40								
12								
4.4								
<del>1</del> 4								
38 40 42 44 46								
48								



Page 1 of 1

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-2

DATE COMPLETED: January 9, 2002

DRILLING METHOD: 4-1/2" HSA

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	3	ELEV. ft	MONITORING WELL		SS 88 >8		_	
1 603			AMSL		3ER	\\	(%)	LUE	PM)
	GROUND S TOP (	SURFACE OF RISER	593.70 592.90		NUMBER	INTER	REC	N' VA	PID (PPM)
	asphalt and gravel	000	592.70						
2	not sampled		002.70	Concrete Z					
				8" Borehole					
5									
3				Bentonite Chips					
0				Chips					
_									
2	SW-SAND, trace fine gravel, fine to medium	****	581.70	2" Ø PVC Well Casing					
4	grained, brown, dry	****		Bentonite Chips  2" Ø PVC Well Casing	1SS	$\times$		88	0
		****							
6		****							
8									
20	dama at 20.04 DCC	* * * * * *		2# @ DVG	2SS	$\times$		>83	0
.0	- damp at 20.0ft BGS			2" Ø PVC Well Screen					
2									
24	- gray, wet at 23.0ft BGS	****		Sand Pack	3SS			\ <u>.</u> 50	0
24		• • • • • • • • • • • • • • • • • • • •		Salid Fack	333			250	U
26		****							
28	END OF BOREHOLE @ 27.5ft BGS		566.20						
	END OF BOILEHOLE & EN.OR BOO			WELL DETAILS Screened interval:					
30				576.70 to 566.70ft AMSL					
32				17.00 to 27.00ft BGS Length: 10ft					
_				Diameter: 2in Slot Size: 10					
34				Material: PVC					
36				Sand Pack: 578.70 to 566.20ft AMSL					
				15.00 to 27.50ft BGS					
38									
10									
12									
14									
.									
16									
38 40 42 44 46 48									



Page 1 of 1

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-3

DATE COMPLETED: January 9, 2002

DRILLING METHOD: 4-1/2" HSA

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL			SAM		
. 603		AMSL		3ER	\\	(%)	LUE	Мď
	GROUND SURFACE TOP OF RISER			NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	gravel	592.80						
!	not sampled	002.00	Concrete					
			Oli Parahala					
			8" Borehole					
			Bentonite Chips					
0	SW-SAND, fine to medium grained, brown,	583.80						
2	dry	•	2" Ø PVC Well Casing					
4		•	8" Borehole  Bentonite Chips  2" Ø PVC Well Casing	1SS			76	0.3
4		•		133			76	0.0
6		•						
8	- trace fine rounded gravel at 18.0ft BGS	•						
		•	Oli di Di Co	2SS	X		63	0.7
0		•	2" Ø PVC Well Screen					
2	••••	•						
24	- gray, saturated at 23.0ft BGS	•	Sand Pack	3SS	$\setminus$		40	1.1
		•						
:6		•						
:8	END OF BOREHOLE @ 27.5ft BGS	566.30	WELL DETAILS					
80			Screened interval: 576.80 to 566.80ft AMSL					
			17.00 to 27.00ft BGS Length: 10ft					
2			Diameter: 2in					
34			Slot Size: 10 Material: PVC					
6			Sand Pack: 578.80 to 566.30ft AMSL					
			15.00 to 27.50ft BGS					
88								
0								
2								
-								
38 40 42 44 46 48								
6								
la								
·								



Page 1 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-101I

DATE COMPLETED: May 3, 2006
DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: P. KLICK

ELEV. SAMPLE DEPTH STRATIGRAPHIC DESCRIPTION & REMARKS MONITORING WELL ft ft BGS AMSL VALUE NTERVAL NUMBER % TOP OF RISER 597.10 REC **GROUND SURFACE** 594.58 ž 594.28 FILL-coarse gravel Concrete not sampled - 2 4 6 - 8 2" Ø PVC Well Casing -10 584.58 SP-SAND, fine grained, loose, brown, slightly 1SS 6 70 moist -12 255 70 8 - 14 3SS 75 8 <del>-</del> 16 Bentonite - trace medium and coarse sand and fine 4SS 60 11 gravel at 17.0ft BGS 18 - percent of medium and coarse grained sand 5SS 75 9 and fine gravel decreases at 18.0ft BGS - 20 6SS 65 7 - saturated at 22.0ft BGS - 22 8" Borehole **7SS** 65 9 - dense at 24.0ft BGS 24 855 25 40 - 26 - loose to compact at 26.0ft BGS 10 9SS 50 -28 10SS 25 18 30 11SS 20 10 32 Bentonite Chips 12SS 35 18 - 34 13SS 45 9 2" Ø PVC - 36 Well Screen 14SS 40 14 90/2/9 -38 Sand Pack 555 78 15SS DOLOMITE, fractured, clayey, yellow-tan 20 78 CORP.GDT -40 554.58 END OF BOREHOLE @ 40.0ft BGS WELL DETAILS Screened interval: -42 559.58 to 554.58ft AMSL 8 45136-28.GPJ CRA C Notes: 35.00 to 40.00ft BGS Auger refusal at 40.0 ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 561.58 to 554.58ft AMSL -48 OVERBURDEN LOG 33.00 to 40.00ft BGS Material: 20/40 SAND NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-101S

DATE COMPLETED: May 3, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: P. KLICK

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV ft	MONITORING WELL		1	SAM	
	TOP OF RISE GROUND SURFAC		4181	NUMBER	INTERVAL	REC (%)	'N' VALUE
				ž	Ξ	~	ž
-2 -4 -6	FILL-coarse gravel not sampled	594.22	Concrete				
- 8	SP-SAND, fine grained, loose, brown, slightly	584.52	Bentonite Grout  8" Borehole  Bentonite Chips				
- 12 - 14	moist		8" Borehole  Bentonite Chips				
-16							
-18	trace medium and coarse sand and fine gravel at 17.0ft BGS     percent of medium and coarse grained sand		2" Ø PVC Well Casing				
-20	and fine gravel decreases at 18.0ft BGS		2" Ø PVC Well Screen				
22	- saturated at 22.0ft BGS - dense at 24.0ft BGS						
-26	- loose to compact at 26.0ft BGS		Sand Pack				
-28		565.52					
30	END OF BOREHOLE @ 29.0ft BGS		WELL DETAILS Screened interval: 576.52 to 566.52ft AMSL				
-32 -34			18.00 to 28.00ft BGS Length: 10ft Diameter: 2in				
36			Slot Size: 10 Material: PVC Sand Pack:				
-38			579.02 to 565.52ft AMSL 15.50 to 29.00ft BGS Material: 20/40 SAND				
-40							
- 42 - 44							
-46							
-48							
	NOTES: MEASURING POINT ELEVATIONS MAY CHANGE	REFER TO	CURRENT ELEVATION TABLE				



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102I

DATE COMPLETED: May 5, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: T. PRANGER

EPTH t BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAME		
	TOP OF F GROUND SUR	597.14 594.76	481	NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
5	not sampled		Concrete		_		-	
10 —	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist - very dense, moist at 12.0ft BGS - trace clay at 14.0ft BGS - very hard, some dolomite rock at 17.0ft BGS	584.76	TELETRICIE TELETRICIES	1SS 2SS 3SS 4SS		75 100 80 50	39 59 55 >50	0.0 0.0 0.0
20	<ul> <li>dense at 20.0ft BGS</li> <li>coarse sand with gravel, very dense, saturated at 22.0ft BGS</li> <li>dense at 24.0ft BGS</li> <li>fine to medium grained, compact at 26.0ft BGS</li> </ul>		Bentonite Grout	5SS 6SS 7SS 8SS 9SS		50 100 75 50 50	>50 34 62 41 16	0.0 0.0 0.0 0.0
35	- coarse sand with gravel at 32.0ft BGS  - no recovery from 36.0 to 38.0ft BGS  - loose, no recovery from 38.0 to 40.0ft BGS		8" Borehole  Bentonite Pellets	10SS 11SS 12SS 13SS 14SS 15SS		50 25 40 40 0	11 10 13 12 12 8	0.0 0.0 0.0 0.0
45 50 —	- compact at 40.0ft BGS  - dense, some large rock at 46.0ft BGS	544.76	Pellets  2" Ø PVC Well Casing  2" Ø PVC Well Screen  Sand Pack	16SS 17SS 18SS 19SS 20SS		40 60 50 25 50	23 29 23 40 30	0.0 0.0 0.0 0.0
55	END OF BOREHOLE @ 50.0ft BGS		WELL DETAILS Screened interval: 550.76 to 545.76ft AMSL 44.00 to 49.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 553.76 to 544.76ft AMSL 41.00 to 50.00ft BGS Material: 20/40 SAND					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102S

DATE COMPLETED: May 8, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: T. PRANGER

EPTH t BGS	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING WELL			SAME		
I BGS	TOP O	F RISER	AMSL 596.83	4-1	NUMBER	INTERVAL	REC (%)	N' VALUE	
	GROUND SI		594.69		NON	INTE	RE	<u> </u>	
5	not sampled			Concrete  Bentonite Grout					
10 –	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist - very dense, moist at 12.0ft BGS - trace clay at 14.0ft BGS		584.69	8" Borehole  Bentonite Pellets					
20	<ul> <li>very hard, some dolomite rock at 17.0ft BGS</li> <li>dense at 20.0ft BGS</li> </ul>			Pellets  2" Ø PVC  Well Casing					
	- coarse sand with gravel, very dense, saturated at 22.0ft BGS - dense at 24.0ft BGS			2" Ø PVC Well Screen					
25	- fine to medium grained, compact at 26.0ft BGS			Sand Pack					
30 –	END OF BOREHOLE @ 30.0ft BGS		564.69	WELL DETAILS Screened interval: 575.69 to 565.69ft AMSL 19.00 to 29.00ft BGS Length: 10ft					
33				Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 577.69 to 564.69ft AMSL					
40				17.00 to 30.00ft BGS Material: 20/40 SAND					
45									
50									



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102D

DATE COMPLETED: June 20, 2006

DRILLING METHOD: 4-1/2" HSA

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV.	MONITOR	RING WELL			SAM	PLE	
ft BGS			AMSL			NUMBER	INTERVAL	REC (%)	N' VALUE	(Mdc
	GROUND S	F RISER SURFACE	597.27 594.80			NOM	INTE	REC	/\ \\\\	PID (PPM)
	not sampled				Concrete					
2				8 8						
4										
6										
8										
10			584.80							
	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist									
12	- very dense, moist at 12.0ft BGS			77						
14	- trace clay at 14.0ft BGS									
16										
18	- very hard, some dolomite rock at 17.0ft BGS			X X						
20	- dense at 20.0ft BGS									
-22	- coarse sand with gravel, your danse									
22	<ul> <li>coarse sand with gravel, very dense, saturated at 22.0ft BGS</li> </ul>									
24	- dense at 24.0ft BGS									
26	fine to madium grained, compact at 26 Off									
20	<ul> <li>fine to medium grained, compact at 26.0ft BGS</li> </ul>									
28										
00										
30					Bentonite					
32	- coarse sand with gravel at 32.0ft BGS				Grout					
24					011 D 1					
34					8" Borehole					
36	- no recovery from 36.0 to 38.0ft BGS									
-38	- loose, no recovery from 38.0 to 40.0ft BGS									
	OTES: MEASURING POINT ELEVATIONS MAY CH/			N N						



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102D

DATE COMPLETED: June 20, 2006 DRILLING METHOD: 4-1/2" HSA

EPTH t BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL		1	SAMI		
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	- compact at 40.0ft BGS				_			
42 44			2" Ø PVC Well Casing					
46 48	- dense, some large rock at 46.0ft BGS							
50			70000000000000000000000000000000000000					
52								
54	SW-SAND, fine to coarse grained, dense, gray brown, wet  SP-SAND, some fine to coarse gravel, trace	541.80 540.80		1SS	X	100	65	0.1
56	clay, fine to medium grained, brown, wet		<b>4</b>					
58		) 경 ()	<b>X</b>	2SS		100	74	0.2
50								
62			Bentonite Pellets			7		
64			Sand Pack	3SS	X	70	111	0.1
66 68			2" Ø PVC Well Screen					
	END OF DODELLOLE @ 70 94 DOG	524.80		4SS	X	68	>100	0.2
70 -	END OF BOREHOLE @ 70.0ft BGS  Notes:		WELL DETAILS Screened interval: 529.80 to 524.80ft AMSL					
74	Auger refusal at 70.0 ft BGS		65.00 to 70.00ft BGS Length: 5ft Diameter: 2in					
72 74 76			Slot Size: 10 Material: PVC Sand Pack: 531.80 to 524.80ft AMSL					
78			63.00 to 70.00ft BGS Material: NATURAL SAND					
	OTES: MEASURING POINT ELEVATIONS MAY CHANGE;	DEFED TO	CURRENT ELEVATION TARLE					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-103I

DATE COMPLETED: May 10, 2006

DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: N. ZIEGLER

no no no no no no no no no no no no no n	TOP OF RISE GROUND SURFAC ot sampled  P-SAND, trace gravel, fine grained, ompact, brown, damp		MONITORING WELL  Concrete  8" Borehole  Bentonite	NUMBER	INTERVAL	REC (%)	'N' VALUE	(Mdd) 0Id
-2 -4 -6 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	ot sampled  P-SAND, trace gravel, fine grained, ompact, brown, damp	594.39	Concrete  8" Borehole  Bentonite		INTEL		-	
-2 -4 -6 -8 -10 SI cc -14 -16 -1	P-SAND, trace gravel, fine grained, ompact, brown, damp	584.39	8" Borehole  Bentonite	155				
-10 SI cc -12 -14 -16 -1	ompact, brown, damp	584.39	# Bentonite	155				
-12 -14 -16 -1	ompact, brown, damp	584.39	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	1SS				
-14	loose at 16 Off BGS	전 경 대 제	Bentonite		$/ \setminus$	50	16	0
	loose at 16 Oft RGS	- 1	Grout	2SS	X	50	12	0
18	10000 at 10.0it DOO		778777	3SS	$\langle \rangle$	50	14	0
		왕 집	7.738.75	4SS 5SS	$\Diamond$	50 50	8	0
	wet at 20.0ft BGS		77.7.7.7.7.	6SS	$\Rightarrow$	66	13	0
22		다 연 원	7777777 28477777	7SS	X	42	7	0
26			Bentonite Pellets	8SS	$\times$	50	3	0
28			2" Ø PVC	9SS 10SS	$\bigotimes$	50	11	0
30			Well Casing	1155	$\Diamond$	50	6	0
32		왕 경 성	2" Ø PVC Well Screen	12SS	$\Rightarrow$	50	5	0
34 36	ND OF BOREHOLE @ 35.0ft BGS	559.39	Sand Pack WELL DETAILS	13SS				0
38			Screened interval: 564.39 to 559.39ft AMSL 30.00 to 35.00ft BGS					
40			Length: 5ft Diameter: 2in Slot Size: 10					
42			Material: PVC Sand Pack: 567.39 to 559.39ft AMSL					
44			27.00 to 35.00ft BGS Material: 20/40 SAND					
46 48								



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-104S

DATE COMPLETED: May 11, 2006 DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING WELL			SAMI		
II BGS	TOP O GROUND SI	F RISER JRFACE	596.08 594.07	41	NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
2	not sampled			Concrete	2	2		٢	<u> </u>
0 —	SW-SAND, trace fine gravel, medium to coarse grained sand, subangular to subrounded gravel, compact brown, damp		584.07	Bentonite Grout 8" Borehole	1SS 2SS	X	50	27	0
6 8				Bentonite Pellets  2" Ø PVC Well Casing	3SS 4SS		62	22 15	0
0 2	- wet at 20.0ft BGS			2" Ø PVC Well Screen	5SS 6SS 7SS	X	50 62 62	40 26 23	0 0
6 8	- very dense at 26.0ft BGS			Sand Pack	9SS 10SS		50 100 50	28 55 83	0
30 — 32 34 36 38	END OF BOREHOLE @ 30.0ft BGS		564.07	WELL DETAILS Screened interval: 576.07 to 566.07ft AMSL 18.00 to 28.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 578.07 to 566.07ft AMSL 16.00 to 28.00ft BGS	1033		30		U
88 00 22 44 66 88 NC				Material: 20/40 SAND					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-105I

DATE COMPLETED: May 9, 2006 DRILLING METHOD: 4-1/2" HSA FIELD PERSONNEL: T. PRANGER

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING WELL			SAME	PLE	
t BGS			AMSL		BER	3VAL	(%)	'N' VALUE	(Mdc
	GROUND S	F RISER URFACE	595.36 593.11		NUMBER	INTERVAL	REC (%)	, N	PID (PPM)
	not sampled			Concrete					
5									
10	CD CAND fire to medium grained come	2 50.5	583.11						
	SP-SAND, fine to medium grained, some coarse grains, very loose to loose, brown/tan, moist				1SS	$\bowtie$	70	4	0.0
	moist				2SS	$\triangleright$	50	2	0.0
15					3SS 4SS	$\Diamond$	50 70	2 8	0.0
					5SS		60	3	0.0
20				Bentonite Grout	6SS		50	16	0.0
	- dense from 22.0 to 24.0ft BGS			Slout Slout	7SS		50	30	0.0
25					8SS		50	9	0.0
	- compact at 28.0ft BGS				9SS	X	40	1	0.0
30	- compact at 26.0ft BGS				10SS	$\times$	40	11	0.0
					11SS	$\times$	40	10	0.0
				8" Borehole	12SS	$\bowtie$	25	10	0.0
35					13SS	$\triangleright$	25	8	0.0
					14SS 15SS	$\triangleright$	20 50	12	0.0
40	- no recovery from 40.0 to 42.0ft BGS			Bentonite Pellets	16SS		0	8	0.0
					17SS		50	15	0.0
45	- large rock at 44.0ft BGS			2" Ø PVC Well Casing	18SS		8	12	0.0
				2" Ø PVC Well Screen	19SS		45	19	0.0
50			543.11		20SS		40	14	0.0
50	END OF BOREHOLE @ 50.0ft BGS		343.11	WELL DETAILS Sand Pack					
				Screened interval: 548.11 to 543.11ft AMSL					
55				45.00 to 50.00ft BGS Length: 5ft Diameter: 2in					
				Slot Size: 10 Material: PVC					
60				Sand Pack: 551.11 to 543.11ft AMSL					
				42.00 to 50.00ft BGS Material: 20/40 SAND					
	IOTES: MEASURING POINT ELEVATIONS MAY CHA			25, 15 0, 112					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-106I

DATE COMPLETED: May 10, 2006 DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: T. PRANGER

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	S	ELEV. ft	MONITORING WELL		1	SAME		
BGS	TOD	OF RISER	AMSL 596.19	4	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	GROUND:		594.00		NON	INTE	REC	N.	) OIA
	not sampled			Concrete					
0			584.00	2" Ø PVC Well Casing					
0	SP-SAND, very loose to loose, medium grained, fine to coarse grained, brown/tan,		304.00		1SS	$\times$	50	6	0.0
2	moist				2SS		50	12	0.0
4					233		30	12	0.0
			1	Bentonite	3SS	X	75	8	0.0
6				Grout	4SS	$\times$	75	7	0.0
8					5SS		75	5	0.0
0	- saturated at 20.0ft BGS		]		333		73	5	0.0
2					6SS	X	75	4	0.
_					7SS	$\times$	40	3	0.0
4					8SS		40	5	0.0
6			1		033		40	5	0.0
8				8" Borehole	9SS	X	40	6	0.0
°					10SS	$\setminus$	40	5	0.0
0	- loose to compact at 30.0ft BGS		]	Bentonite	1100	$\langle \cdot \rangle$	25	4.	0.4
2				Pellets	11SS		35	11	0.0
					12SS	X	25	6	0.0
4					13SS		30	15	0.0
6			1	2" Ø PVC Well Screen	1100	$\langle \cdot \rangle$			
8					14SS	$\triangle$	30	21	0.0
	- large rock or bedrock at 39.0ft BGS			Sand Pack	15SS	X	100	>50	0.0
0	END OF BOREHOLE @ 40.0ft BGS	1	554.00	WELL DETAILS Screened interval:					
2				559.00 to 554.00ft AMSL					
4				35.00 to 40.00ft BGS Length: 5ft					
				Diameter: 2in Slot Size: 10					
8 — — — — — — — — — — — — — — — — — — —				Material: PVC Sand Pack:					
8				562.00 to 554.00ft AMSL					
				32.00 to 40.00ft BGS Material: 20/40 SAND					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-106S

DATE COMPLETED: May 10, 2006

DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: T. PRANGER

DEPTH   ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING WELL			SAMI	
11 11 11 11 11	TOP OF	RISER	AMSL 596.24	4,5	NUMBER	INTERVAL	REC (%)	N' VALUE
	GROUND SUI		593.79		N N	INTE	REC	<u>z</u>
2	not sampled			Concrete				
4				8" Borehole				
6 8				Bentonite Grout				
10	SP-SAND, very loose to loose, medium grained, fine to coarse grained, brown/tan,		583.79	7//////////////////////////////////////				
12 14	moist			Bentonite Pellets				
16				2" Ø PVC				
18				Well Casing				
20	- saturated at 20.0ft BGS			2" Ø PVC Well Screen				
22				Sand Pack				
26			500 70					
28	END OF BOREHOLE @ 27.0ft BGS	•	566.79	WELL DETAILS Screened interval:				
30				576.79 to 566.79ft AMSL 17.00 to 27.00ft BGS Length: 10ft				
32 34				Diameter: 2in Slot Size: 10 Material: PVC Sand Pack:				
36				578.79 to 566.79ft AMSL 15.00 to 27.00ft BGS				
38				Material: 20/40 SAND				
40 42								
44								
46								
48								



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-107I

DATE COMPLETED: May 2, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: P. KLICK

PTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAM	PLE
BGS		AMSL		3ER	:VAL	(%)	LUE
	TOP OF RISER GROUND SURFACE	609.05 606.62		NUMBER	INTERVAL	REC (%)	'N' VALUE
	grass and topsoil	606.12	© d Concrete				
2	not sampled		oonerete e				
_							
4							
6							
В							
			2" Ø PVC Well Casing				
10			l light same				
12	SP-SAND, fine grained, loose, brown, slightly	595.62		1SS		65	6
12	moist		Bentonite	133		00	6
14			Grout	2SS		75	7
					$\langle \cdot \rangle$	,	
16				3SS	$\times$	75	7
		]	8" Borehole		$\langle \cdot \rangle$	•	
18	SW-SAND, fine to medium grained, trace	588.62		4SS	X	60	11
	coarse grained, brown, moist	587.62			$\langle \cdot \rangle$		
20	SP-SAND, fine grained, loose, brown, moist	]		5SS	X	60	6
22	- wet at 20.0ft BGS			6SS		75	8
22	- compact at 23.0ft BGS			033		/5	$  ^{\circ}  $
24	- compact at 20.0it BGO			7SS		65	10
			Bentonite Pellets	, , , ,	$\langle \cdot \rangle$	, ,	.
26			Pellets	8SS	$\times$	75	10
	- trace coarse gravel at 27.0ft BGS				$\longleftrightarrow$	•	
28			1	9SS	X	75	11
		1			$\langle \cdot \rangle$	<b>)</b>	
30				10SS	X	70	13
32	- saturated at 31.0ft BGS	]		11SS		85	18
J2 _	- weathered dolomite, tan (2" layer) at 32.8ft	573.62		1133		00	16
34	\ BGS \ \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	572.42		12SS		70	69
	SW-SAND, fine to coarse grained, brown, saturated	372.42	2" Ø PVC		$\longleftrightarrow$	,	
36	DOLOMITE, weathered, clayey, gray,	1	Well Screen	13SS	$\times$	70	66
	saturated - tan at 34.6ft BGS				$\langle \cdot \rangle$	•	
38	tan at 64.01 BGG	1	Sand Pack	14SS	X	25	28
40 F	END OF BOREHOLE @ 39.0ft BGS	567.62				1	
38 40 42			WELL DETAILS Screened interval:				
42	Notes:		577.62 to 567.62ft AMSL				
72	Auger refusal at 39.0 ft BGS		29.00 to 39.00ft BGS				
44			Length: 10ft Diameter: 2in				
46			Slot Size: 10				
46			Material: PVC				
			Sand Pack: 580.62 to 567.62ft AMSL				
48 <u>N</u>			26.00 to 39.00ft BGS				
1			Material: 20/40 SAND				



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

**MW-QC-108S** HOLE DESIGNATION:

DATE COMPLETED: May 15, 2006 DRILLING METHOD: 4-1/2" HSA FIELD PERSONNEL: T. PRANGER

ELEV. SAMPLE DEPTH STRATIGRAPHIC DESCRIPTION & REMARKS MONITORING WELL ft ft BGS AMSL NTERVAL VALUE PID (PPM) NUMBER % TOP OF RISER 608 64 REC **GROUND SURFACE** 606.64 not sampled Concrete - 2 4 8" Borehole 6 - 8 2" Ø PVC Well Casing <del>--</del> 10 596.64 SP-SAND, fine to medium grained, trace 1SS 2 75 2.8 gravel, very loose, brown, dry -12 50 3 2.9 255 Bentonite - 14 Grout 3SS 60 1 5.5 <del>-</del> 16 - loose, moist at 16.0ft BGS 4SS 60 7 4.6 18 - with coarse sand, compact at 18.0ft BGS 5SS 60 10 4.2 -20 - no coarse sand, trace gravel at 20.0ft BGS 6SS 70 10 2.1 - fine grained at 22.0ft BGS - 22 **7SS** 75 10 2.8 - loose at 24.0ft BGS 24 855 50 8 4.0 - 26 - compact at 26.0ft BGS Bentonite Pellets 9SS 50 14 4.2 -28 - trace gravel at 28.0ft BGS 10SS 50 23 3.2 30 11SS 20 60 4.2 32 - saturated at 32.0ft BGS 12SS 50 15 -34 - gravel, coarse sand, loose at 34.0ft BGS 2" Ø PVC Well Screen 13SS 75 4 2.4 - 36 1455 75 6 3.1 90/2/9 -38 Sand Pack 15SS 65 11 29 CORP.GDT -40 566 64 END OF BOREHOLE @ 40.0ft BGS WELL DETAILS Screened interval: -42 577.14 to 567.14ft AMSL 45136-28.GPJ CRA 29.50 to 39.50ft BGS Length: 10ft 44 Diameter: 2in Slot Size: 10 -46 Material: PVC Sand Pack: 579 14 to 566 64ft AMSI -48 OVERBURDEN LOG 27.50 to 40.00ft BGS Material: 20/40 SAND

NOTES:

MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



Page 1 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-108I

DATE COMPLETED: June 13, 2006

DRILLING METHOD: 4-1/2" HSA

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	 S	ELEV.	MONITOR	RING WELL			SAMF	PLE	
ft BGS		OF RISER	AMSL 608.54	4 1		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	GROUND S		606.41			N N	INTE	RE	Ż Ż	PID
-2	not sampled			A (12.1/18)	— Concrete					
-6					8" Borehole					
8   10 	SP-SAND, fine to medium grained, trace		596.41		— 2" Ø PVC Well Casing					
- 12 - - - 14	gravel, very loose, brown, dry			711W11711W117						
- <del></del> 16 -	- loose, moist at 16.0ft BGS			7//M///						
- 18 - -	- with coarse sand, compact at 18.0ft BGS									
-20	- no coarse sand, trace gravel at 20.0ft BGS									
-22 - -	- fine grained at 22.0ft BGS									
24 - - -	- loose at 24.0ft BGS									
26  	- compact at 26.0ft BGS				— Bentonite Grout					
28  	- trace gravel at 28.0ft BGS									
-30 - - -										
-32 - - -	- saturated at 32.0ft BGS									
-34 - - -	- gravel, coarse sand, loose at 34.0ft BGS									
<del></del> 36 - - -				W. 17.2.12.						



Page 2 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-108I

DATE COMPLETED: June 13, 2006

DRILLING METHOD: 4-1/2" HSA

EPTH t BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL			SAM		
I BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
40 — 42	SW-SAND, trace medium gravel, fine to coarse grained, brown, wet	566.41	TRITUTE TRITUTE					
14				1SS	X	0	12	NR
18			N. 17 W. 17	2SS		80	15	0
50			WY72/11/18/17.					J
54			Bentonite Pellets  Sand Pack	3SS	X	75	15	0
58			2" Ø PVC Well Screen	4SS		100	17	0.2
52 —	END OF BOREHOLE @ 62.0ft BGS	544.41	WELL DETAILS Screened interval:					
66			550.41 to 545.41ft AMSL 56.00 to 61.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10					
70			Material: PVC Sand Pack: 552.41 to 544.41ft AMSL 54.00 to 62.00ft BGS Material: NATURAL SAND					
72								
74	OTES: MEASURING POINT ELEVATIONS MAY CHANGE;	DEEE TO	CURRENT ELEVATION TAS: 7					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109I

DATE COMPLETED: July 13, 2006 DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	<u>~</u>		SAM		
	GROUND SURFACE TOP OF RISER	593.93		NUMBER	INTERVAL	REC (%)	'N' VALUE	
	not sampled		Concrete		-			
2								
4			8" Borehole					
6			[MIII]					
8			2" Ø PVC Well Casing					
10			Well Casing					
12								
14			1311313 1311313					
16			Bentonite Grout					
18								
-20								
- 22			81.11.75. 1.11.11.81					
24			[H117]					
- 26								
- 28								
-30			Bentonite Pellets					
-32			Pellets					
-34								
-36			2" Ø PVC Well Screen					
-38		554.93	Sand Pack					
	END OF BOREHOLE @ 39.0ft BGS	554.95						



Page 2 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109I

DATE COMPLETED: July 13, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL			SAMI		
11 11 11 11 11 11 11 11 11 11 11 11 11		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	
- 42			WELL DETAILS Screened interval: 559.93 to 554.93ft AMSL 34.00 to 39.00ft BGS					
- 44			Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC					
46			Sand Pack: 561.93 to 554.93ft AMSL 32.00 to 39.00ft BGS					
48			Material: 20/40 SAND					
50								
52								
56								
58								
60								
62								
64								
- 66								
- 68								
70								
·72								
-74								
-76								
78								
 NO	TES: MEASURING POINT ELEVATIONS MAY CHANGE;	REFER TO	L CURRENT ELEVATION TABLE					



Page 1 of 1

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109S

DATE COMPLETED: July 12, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: N. ZIEGLER

DEPTH	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING WELL			SAMI	PLE	
ft BGS			AMSL		ZER	VAL	(%)	M' VALUE	
	GROUND SL TOP OF	RFACE	593.93 593.72		NUMBER	INTERVAL	REC (%)	N'VA	
	not sampled			Concrete		_			
-2									
4				8" Borehole					
6									
-8				Bentonite Grout					
-10				2" Ø PVC					
-12				Well Casing					
-14									
-16				Bentonite Pellets					
-18									
- 20				Sand Pack					
- 22									
- 24									
- 26				2" Ø PVC Well Screen					
-28			564.43	vven screen					
30	END OF BOREHOLE @ 29.5ft BGS		001.10	WELL DETAILS Screened interval: 574.43 to 564.43ft AMSL					
-32				19.50 to 29.50ft BGS Length: 10ft Diameter: 2in					
34				Slot Size: 10 Material: PVC Sand Pack:					
-36				576.43 to 564.43ft AMSL 17.50 to 29.50ft BGS Material: 20/40 SAND					
38				INGLETIAL 20/40 SAIND					



Page 1 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-110I

DATE COMPLETED: July 11, 2006 DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	3	ELEV.	MONITORING WELL			SAM		
	GROUND : TOP (	SURFACE OF RISER	AMSL 605.20 604.85		NUMBER	INTERVAL	REC (%)	6 20 16 21	PID (PPM)
-2	not sampled			Concrete				-	
- 4				8" Borehole					
6				78/1/17/1/18					
10				2" Ø PVC Well Casing					
12									
14	SP-SAND, coarse grained, trace medium grained sand and fine subangular to subrounded gravel, brown, damp, loose		591.20		155	X	50	16	0
18				N. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.					
20				Bentonite	2SS	X	50	8	0
22				Grout					
26				778.1.171.171.171.171.171.171.171.171.17	3SS	X	75	20	0
28				1/1/77/1784			,		
30					4SS	X	75	21	0
34	- wet at 33.0ft BGS						,		
- 36				7.77.77.77.77.77.77.77.77.77.77.77.77.7	5SS	X	75	9	0



Page 2 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-110I

DATE COMPLETED: July 11, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: N. ZIEGLER

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAMI	PLE	
t BGS	CTATALON THE BESSELL HOW A RELIABILITY	AMSL	MONTO NELL	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
40			Bentonite Pellets	6SS		75	12	0
44 46	- increasing fine gravel at 45.0ft BGS		Sand Pack	7SS		75	14	0
48 50 –		555.20	2" Ø PVC Well Screen	8SS	×	85	18	0
52	END OF BOREHOLE @ 50.0ft BGS		WELL DETAILS Screened interval: 560.20 to 555.20ft AMSL 45.00 to 50.00ft BGS					
54			Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC					
56			Sand Pack: 563.20 to 555.20ft AMSL 42.00 to 50.00ft BGS Material: 20/40 SAND					
60								
62								
64								
66								
68								
70								
72								
74								
	IOTES: MEASURING POINT ELEVATIONS MAY CHANGE							



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-111I

DATE COMPLETED: July 12, 2006

DRILLING METHOD: 4-1/2" HSA FIELD PERSONNEL: J. Close

ELEV. SAMPLE DEPTH ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS MONITORING WELL ft BGS 'N' VALUE NTERVAL PID (PPM) NUMBER %) TOP OF RISER 618.97 REC ( GROUND SURFACE 616.74 not sampled Concrete -2 8" Borehole -6 - 8 2" Ø PVC Well Casing -10 - 12 603.24 SW-SAND, medium-coarse sand, loose, well -- 14 graded, medium-light brown, damp-moist 1SS 85 12 0 601.24 SP-SAND, medium grained, poorly graded, loose, light brown, dry -16 - 18 85 0 - 20 Bentonite - 22 Grout - 24 3SS 75 13 0 - coarse grained at 25.5ft BGS - 26 -28 - wet at 28.0ft BGS 8/10/06 4SS 60 11 0 45136-28.GPJ CRA\_CORP.GDT - 30 -32 -34 555 50 13 0 -36 **OVERBURDEN LOG** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE NOTES:



Page 2 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-1111

DATE COMPLETED: July 12, 2006 DRILLING METHOD: 4-1/2" HSA

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL			SAM	PLE	
t BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
40	- trace fine gravel at 38.5ft BGS		SKLITKIILIS SKLITKIILIS	6SS	X	55	17	0
12 14 16	- trace coarse gravel at 45.5ft BGS		Bentonite Pellets  Sand Pack	7SS		50	17	0
18		566.74	2" Ø PVC Well Screen	8SS	X	15	8	0
52	END OF BOREHOLE @ 50.0ft BGS	333.74	WELL DETAILS Screened interval: 571.74 to 566.74ft AMSL 45.00 to 50.00ft BGS					
54			Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC					
56 58			Sand Pack: 573.74 to 566.74ft AMSL 43.00 to 50.00ft BGS Material: #7 SAND					
60								
62								
64								
66   68   70								
70								
'2 '4								
4								



**OVERBURDEN LOG** 

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-112I

DATE COMPLETED: July 10, 2006

DRILLING METHOD: 4-1/2" HSA FIELD PERSONNEL: J. Close

ELEV. SAMPLE DEPTH ft AMSL STRATIGRAPHIC DESCRIPTION & REMARKS MONITORING WELL ft BGS 'N' VALUE NTERVAL PID (PPM) NUMBER %) TOP OF RISER 604.90 601.99 REC ( GROUND SURFACE not sampled Concrete -2 8" Borehole -6 - 8 2" Ø PVC Well Casing -10 -12 588.49 SP-SAND, loose, poorly graded, medium -- 14 grained, slightly moist 1SS 50 7 0 - some coarse sand at 15.0ft BGS -16 -18 - coarse grained at 18.5ft BGS 2SS 0 50 11 - 20 Bentonite Grout - 22 - wet at 23.5ft BGS - 24 3SS 65 0 - 26 8/10/06 -28 4SS 70 12 0 NR 555 0 8

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-112I

DATE COMPLETED: July 10, 2006 DRILLING METHOD: 4-1/2" HSA

ft BGS		AMSL		BER	.val	(%)	]	Σ
-40				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
1	- trace fine gravel at 38.5ft BGS		Bentonite Pellets	6SS	X	0	5	NR
42			Pellets  Sand Pack					
46			2" Ø PVC Well Screen	7SS	X	35	9	0
- 48				8SS		25	9	0
50	END OF BOREHOLE @ 50.0ft BGS	551.99	WELL DETAILS Screened interval: 557.99 to 552.99ft AMSL					
54			44.00 to 49.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10					
56			Material: PVC Sand Pack: 559.99 to 551.99ft AMSL 42.00 to 50.00ft BGS					
-60			Material: #7 SAND					
62								
64								
- 66								
70								
·72								
-74								



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-113I

DATE COMPLETED: July 11, 2006 DRILLING METHOD: 4-1/2" HSA

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS		ELEV. ft	MONITORING	WELL			SAMF		
1 603	TOP OF GROUND SL	F RISER JRFACE	AMSL 605.23 603.49	4 <sub>11</sub>		NUMBER	INTERVAL	REC (%)	'N' VALUE	(Mdd) (IId
	not sampled					Z	<u> </u>	<u> </u>	Z	۵
	not sumpled			a   a   ← C	oncrete					
2										
1										
				8	" Borehole					
6										
3										
				2	" Ø PVC /ell Casing					
10					/ell Casing					
12										
14	SW-SAND, loose, medium-coarse grained,	****	589.99							
14	well graded, slightly moist	****		W///		1SS	X	75	6	0
16										
		****								
18		****								
						2SS	$\bigvee$	70	4	0
20	- 1/4" coarse sand layer at 20.0ft BGS	****			entonite					
22				G	irout					
22		****								
24	SP-SAND, trace medium sand and fine gravel,	****	579.99							
	loose, coarse grained, poorly graded, moist					3SS	X	75	9	0
26										
				78/17/						
28										
20				4777		4SS	X	65	11	0
30										
28 30 32										
34	- increase in fine gravel, wet at 33.5ft BGS					Ecc		35	7	0
						5SS		33	7	U
36										



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-113I

DATE COMPLETED: July 11, 2006 DRILLING METHOD: 4-1/2" HSA

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft	MONITORING WELL		1	SAMI	PLE	
BGS		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
40 42			Bentonite Pellets	6SS	X	35	6	0
6	- layer of fine gravel at 45.5ft BGS		Sand Pack	7SS	X	50	7	0
18 50 -	END OF BOREHOLE @ 50.0ft BGS	553.49	2" Ø PVC Well Screen	8SS	X	0	13	NR
52	2.13 6. BONELIGEE 6 00.000 BOO		WELL DETAILS Screened interval: 558.99 to 553.99ft AMSL 44.50 to 49.50ft BGS Length: 5ft					
54			Diameter: 2in Slot Size: 10 Material: PVC Sand Pack:					
58			560.49 to 553.49ft AMSL 43.00 to 50.00ft BGS Material: #7 SAND					
60								
52								
64								
66 68 70								
70								
<b>7</b> 2								
72 74								



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-114I

DATE COMPLETED: July 10, 2006 DRILLING METHOD: 4-1/2" HSA

FIELD PERSONNEL: N. ZIEGLER

EPTH BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	;	ELEV. ft	MONITOR	ING WELL			SAME		
. 500	TOP C GROUND S	OF RISER SURFACE	AMSL 607.30 604.22		— Concrete	NUMBER	INTERVAL	REC (%)	'N' VALUE	(MAG) (III
2	not sampled			W///// 3 6 5	— Concrete				-	
i				(()   V (	— 8" Borehole					
0	FILL, wood, sand, gravel, black coarse sand, loose, dry		594.22	W.1.W.1.W.1.10	— 2" Ø PVC Well Casing	1SS	X	40	8	0
4	SP-SAND, coarse grained, loose, trace fine subangular-subrounded gravel, brown, damp		592.22	711781178117 2117811781178						
6				TIKTI LETITIK		2SS	X	85	6	(
0								,		
2					— Bentonite Grout	3SS	X	75	9	C
6				TRITEGIER TRITEGIER		4SS		75	13	C
8				7071/W1072						
2	- wet at 32.0ft BGS					5SS	X	70	14	(
4	.,			78/1/77/1/87						
8				7.7.7.1.W.1.7.7.7.7.7.7.7.7.7.7.7.7.7.7.		6SS	X	75	7	C
				70807						



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-1141

DATE COMPLETED: July 10, 2006 DRILLING METHOD: 4-1/2" HSA FIELD PERSONNEL: N. ZIEGLER

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAM	PLE	
t BGS		AMSL	mormrormto WEEE	NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
42			Bentonite Pellets	7SS	X	75	8	0
46			Sand Pack	8SS	X	75	5	0
48			2" Ø PVC Well Screen					
50 52	END OF BOREHOLE @ 50.0ft BGS	554.22	WELL DETAILS Screened interval: 559.22 to 554.22ft AMSL					
54			45.00 to 50.00ft BGS Length: 5ft Diameter: 2in					
56			Slot Size: 10 Material: PVC Sand Pack: 562.22 to 554.22ft AMSL					
58			42.00 to 50.00ft BGS Material: 20/40 SAND					
60								
62								
64								
66 68								
70 72 74 76 78								
74								
76								
78								



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-115S

DATE COMPLETED: July 13, 2006 DRILLING METHOD: 4-1/2" HSA

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARK	S	ELEV. ft AMSL	MONITOR	RING WELL	<u>~</u>		SAMF		
	TOP GROUND	OF RISER SURFACE	609.89 607.23			NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
2	not sampled			* 0 * 0 V////	— Concrete					
6				MULLUMULLUM AUTUUMULLUM						
10					—— 2" Ø PVC Well Casing					
12	SP-SAND, loose, medium grained, poorly graded, light brown, dry		593.73		Bentonite Grout	155		90	9	0
16				TIMINATIVATIVATI						
20	- trace coarse sand at 20.2ft BGS					2SS	X	75	7	0
24						3SS		80	7	0
28	SW-SAND, medium-coarse grained, loose, well graded, brown, dry		578.73		Bentonite Pellets  Sand Pack	4SS		70	9	0
	OTES: MEASURING POINT ELEVATIONS MAY CH		FEER TO C	IRRENT ELE	/ATION TARI F					



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PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-115S

DATE COMPLETED: July 13, 2006
DRILLING METHOD: 4-1/2" HSA
FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL			SAMI		
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	(Mdd) Old
34	- moist at 33.5ft BGS - wet at 35.0ft BGS			5SS	X	60	16	0
36				6SS		80	7	0
- 38	- thin layer of gravel at 37.0ft BGS		2" Ø PVC Well Screen					
40	END OF BOREHOLE @ 40.0ft BGS	567.23	WELL DETAILS Screened interval:					
42			577.23 to 567.23ft AMSL 30.00 to 40.00ft BGS Length: 10ft Diameter: 2in					
44			Slot Size: 10 Material: PVC Sand Pack: 579.23 to 567.23ft AMSL					
46			28.00 to 40.00ft BGS Material: #7 SAND					
48								
50								
52								
54								
- 56								
- 58								
60								
62								
	DTES: MEASURING POINT ELEVATIONS MAY CHANGE; I							



Page 1 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

PROJECT NUMBER: 45136-28

CLIENT: EXELON GENERATION COMPANY LLC

LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-116S

DATE COMPLETED: July 13, 2006 DRILLING METHOD: 4-1/2" HSA

EPTH	STRATIGRAPHIC DESCRIPTION & REMARKS	3	ELEV. ft	MONITO	RING WELL			SAMF	PLE	
BGS			AMSL			NUMBER	INTERVAL	(%)	\LUE	(Mdc
	GROUND S	OF RISER SURFACE	612.33 609.58			NOM	INTE	REC (%)	'N' VALUE	PID (PPM)
	not sampled			0 0	Concrete					
2					001101010					
1										
					8" Borehole					
5										
3										
					2" Ø PVC					
0					Well Casing					
12										
14	SP-SAND, medium grained, poorly graded,		596.08							
	loose, brown, dry					1SS	X	80	5	0
6					Bentonite Grout					
					Ciout					
18	- trace coarse sand at 18.5ft BGS							,		
20				N N		2SS	X	90	10	0
	SW-SAND, medium-coarse grained, loose, well graded, brown, dry	****	589.08							
22	well graded, brown, dry	****								
.								7		
24						3SS	X	75	6	0
26										
		****								
28		*****						,		
30		****				4SS	X	80	10	0
50				RIVERIMENT.	Bentonite					
32		****			Pellets	5SS	X	80	9	0
	- trace fine gravel at 33.5ft BGS	*****			Sand Pack					
34	Table into graver at 60.01t DO0					6SS	$\setminus$	90	14	0
26		8000					$\swarrow$			
36							/			
38	- wet at 38.0ft BGS				2" Ø PVC	7SS	X	90	11	0
		****			Well Screen		<u> </u>	1		



Page 2 of 2

PROJECT NAME: QUAD CITIES GENERATING STATION

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DATE COMPLETED: July 13, 2006 DRILLING METHOD: 4-1/2" HSA

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV.	MONITORING WELL	-		SAMI		
		AMSL		NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
- 42 - 44 - 46 - 48 - 50 - 52 - 54 - 56 - 58 - 60 - 62 - 64 - 66 - 68 - 70 - 72	END OF BOREHOLE @ 44.0ft BGS	565.58	WELL DETAILS Screened interval: 575.58 to 565.58ft AMSL 34.00 to 44.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 577.58 to 565.58ft AMSL 32.00 to 44.00ft BGS Material: #7 SAND	MUN	INTE	REC	N.N.	) QIA
-76								
78								

## APPENDIX C

QUALITY ASSURANCE PROGRAM - TELEDYNE BROWN ENGINEERING, INC.



# **Quality Assurance Manual**

For

# Teledyne Brown Engineering

## **Environmental Services**

2508 Quality Lane

Knoxville, Tennessee 37931-3133

865-690-6819

Generated by: Symul Verry
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Approved by: Keith Jeter, Operations Manager

Сору Мо..

Issued To: 6

Date:

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## **REVISION HISTORY**

Revision 7 Complete re-write January 1, 2005 Bill Meyer

Revision 8 Updated organization chart, minor change to 1.0, 4.4, 7.5.3.2, 10.2.3, and 12.3

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#### 1.0 Knoxville QAM Section Introduction

This Quality Assurance Manual (QAM) and related Procedures describes the Knoxville Environmental Services Laboratory's QA system. This system is designed to meet multiple quality standards imposed by Customers and regulatory agencies including:

NRC's 10 CFR 50 Appendix B NRC's Regulatory Guide 4.15 DOE's Order 414.1 DOE's QSAS ANSI N 42.23 ANSI N 13.30 NELAC Standard, Chapter 5

The Environmental Services (ES) Laboratory does low level radioactivity analyses for Power Plants and other customers. It primarily analyzes environmental samples (natural products from around plants such as milk), in-plant samples (air filters, waters), bioassay samples from customer's employees, and waste disposal samples (liquids and solids).

Potable and non-potable water samples are tested using methods based on EPA standards as cited in State licenses (see Procedure 4010). The listing [current as of initial printing of this Manual – see current index for revision status and additions / deletions] of implementing Procedures (SOPs) covering Administration, Methods, Counting Instruments, Technical, Miscellaneous, and LIMS is shown in Table 1-1. Reference to these Procedures by number is made throughout this QAM.

Table 1-1

Number	Title
Part 1	Administrative Procedures
1001	Validation and Verification of Computer Programs for Radiochemistry Data Reduction
1002	Organization and Responsibility
1003	Control, Retention, and Disposal of Quality Assurance Records
1004	Definitions
1005	Data Integrity
1006	Job Descriptions
1007	Training and Certifications
1008	Procedure and Document Control
1009	Calibration System
1010	Nonconformance Controls
1011	10CFR21 Reporting
1012	Corrective Action and Preventive Action

Number	Title
1013	Internal Audits and Management Reviews
1014	RFP, Contract Review, and Order Entry (formerly 4001)
1015	Procurement Controls
Part 2	Method Procedures
2001	Alpha Isotopic and Plutonium-241
2002	Carbon-14 Activity in Various Matrices
2003	Carbon-14 and Tritium in Soils, Solids, and Biological Samples; Harvey Oxidizer Method
2004	Cerium-141 and Cerium-144 by Radiochemical Separation
2005	Cesium-137 by Radiochemical Separation
2006	Iron-55 Activity in Various Matrices
2007	Gamma Emitting Radioisotope Analysis
2008	Gross Alpha and/or Gross Beta Activity in Various Matrices
2009	Gross Beta Minus Potassium-40 Activity in Urine and Fecal Samples
2010	Tritium and Carbon-14 Analysis by Liquid Scintillation
2011	Tritium Analysis in Drinking Water by Liquid Scintillation
2012	Radioiodine in Various Matrices
2013	Radionickel Activity in Various Matrices
2014	Phosphorus-32 Activity in Various Matrices
2015	Lead-210 Activity in Various Matrices
2016	Radium-226 Analysis in Various Matrices
2017	Total Radium in Water Samples
2018	Radiostrontium Analysis by Chemical Separation
2019	Radiostrontium Analysis by Ion Exchange
2020	Sulfur-35 Analysis
2021	Technetium-99 Analysis by Eichrom Resin Separation
2022	Total Uranium Analysis by KPA
2023	Compositing of Samples
2024	Dry Ashing of Environmental Samples
2025	Preparation and Standardization of Carrier Solutions
2026	Radioactive Reference Standard Solutions and Records
2027	Glassware Washing and Storage
2028	Moisture Content of Various Matrices
2029	Polonium-210 Activity in Various Matrices
2030	Promethium-147 Analysis

Number	Title
Part 3	Instrument Procedures
3001	Calibration and Control of Gamma-Ray Spectrometers
3002	Calibration of Alpha Spectrometers
3003	Calibration and Control of Alpha and Beta Counting Instruments
3004	Calibration and Control of Liquid Scintillation Counters
3005	Calibration and Operation of pH Meters
3006	Balance Calibration and Check
3008	Negative Results Evaluation Policy
3009	Use and Maintenance of Mechanical Pipettors
3010	Microwave Digestion System Use and Maintenance
Part 4	Technical Procedures
4001	Not Used
4002	QC Checks on Data
4003	Sample Regent and Control
4004	Data Package Preparation and Reporting
4005	Blank, Spike, and Duplicate Controls
4006	Inter-Laboratory Comparison Study Process
4007	Method Basis and Initial Validation Process
4008	Not Used
4009	MDL Controls
4010	State Certification Process
4011	Accuracy, Precision, Efficiency, and Bias Controls and Data Quality Objectives
4012	Not Used
4013	Not Used
4014	Facility Operation and Control
4015	Documentation of Analytical Laboratory Logbooks (formerly 1002)
4016	Total Propagated Uncertainty (formerly 1004)
4017	LIMS Operation
4018	Instrument Calibration System
4019	Radioactive Reference Material Standards
Part 5	Miscellaneous Procedures
5001	Laboratory Hood Operations
5002	Operation and Maintenance of Deionized Water System
5003	Waste Management
5004	Acid Neutralization and Purification System Operation Procedure

Part 6	LIMS
6001	LIMS Raw Data Processing and Reporting
6002	Software Development and/or Pilots of COTS Packages
6003	Software Change and Version Control
6004	Backup of Data and System Files
6005	Disaster Recovery Plan
6006	LIMS Hardware
6007	LIMS User Access
6008	LIMS Training
6009	LIMS Security

#### 2.0 QUALITY SYSTEM

The TBE-ES QA system is designed to comply with multiple customer- and regulatory agency-imposed specifications related to quality. This quality system applies to all activities of TBE-ES that affect the quality of analyses performed by the laboratory.

### 2.1 Policy

The TBE quality policy, given in Company Policy P-501, is "TBE will continually improve our processes and effectiveness in providing products and services that exceed our customer's expectations."

This policy is amplified by this Laboratory's commitment, as attested to by the title page signatures, to perform all work to good professional practices and to deliver high quality services to our customers with full data integrity. (See Section 4.0 and Procedure 1005).

### 2.2 **Quality System Structure**

The Quality System is operated by the organizations described in Section 3.0 of this Manual. The Quality System is described in this Manual and in the Procedures Manual, both of which are maintained by the QA Manager. Procedures are divided into 6 sections – Administrative, Methods, Equipments, Technical, Miscellaneous, and LIMS. This Manual is structured as shown in the Table of Contents and refers to Procedures when applicable. Cross references to the various imposed quality specifications are contained in Appendices to this Manual.

### 2.3 Quality System Objectives

The Quality System is established to meet the objective of assuring all operations are planned and executed in accordance with system requirements. The Quality System also assures that performance evaluations are performed (see Procedure 4006), and that appropriate verifications are performed (see Procedures in the 1000 and 4000 series) to further assure compliance. Verification includes

examination of final reports (prior to submittal to customers) to determine their quality (see Procedure 4004).

To further these objectives, various in-process assessments of data, as well as assessments of the system, via internal audits and management reviews, are performed. Both internal experts and customer / regulatory agencies perform further assessments of the system and compliance to requirements.

## 2.4 <u>Personnel Orientation, Training, and Qualification</u>

TBE provides indoctrination and training to employees and performs proficiency evaluation of technical personnel. This effort is described in Section 4.0.

#### 3.0 ORGANIZATION, AUTHORITY, AND RESPONSIBILITY

TBE has established an effective organization for conducting laboratory analyses at the Knoxville Environmental Services Laboratory. The basic organization is shown in Figure 3-1. Detail organization charts with names, authorities, and responsibilities are given in Procedure 1002. Job descriptions are given in Procedure 1006.

This organization provides clearly established Quality Assurance authorities, duties, and functions. QA has the organizational freedom needed to:

- (1) Identify problems
- (2) Stop nonconforming work
- (3) Initiate investigations
- (4) Recommend corrective and preventive actions
- (5) Provide solutions or recommend solutions
- (6) Verify implementation of actions

All Laboratory personnel have the authority and resources to do their assigned duties and have the freedom to act on problems. The QA personnel have direct, independent access to Company management as shown in Figure 3-1.

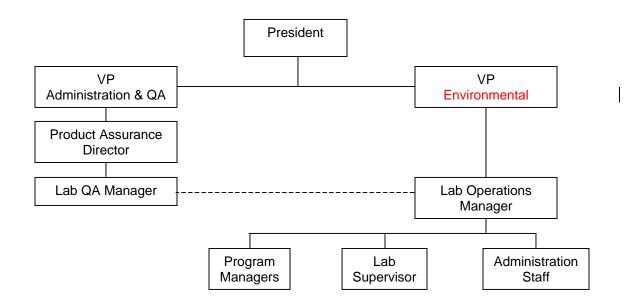


Figure 3.1. Laboratory Organization

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# 4.0 PERSONNEL ORIENTATION, DATA INTEGRITY, TRAINING, AND QUALIFICATION

### 4.1 **Orientation**

All laboratory personnel must receive orientation to the quality program if their work can affect quality. Orientation includes a brief review of customer- and regulatory agency-imposed quality requirements, the structure of the QAM, and the implementing procedures. The goal of orientation is to cover the nature and goals of the QA program.

## 4.2 **Data Integrity**

The primary output of the Laboratory is data. Special emphasis and training in data integrity is given to all personnel whose work provides or supports data delivery. The Laboratory Data Integrity Procedure (Procedure 1005) describes training, personnel attestations, and monitoring operations. Annual reviews are required.

#### 4.3 Training

The Quality Assurance Manager (QAM) maintains a training matrix indicating which laboratory personnel need training in which specific Procedures. This matrix is updated when personnel change or change assignments. All personnel are trained per these requirements and procedures. This training program is described in Procedure 1007. The assigned responsibilities for employees are described in Procedure 1002 (See Section 3.0) on Organization and in Procedure 1006, Job Descriptions. Refresher training or re-training is given annually as appropriate.

#### 4.4 Qualification

Personnel are qualified as required by their job description. Management and non-analysts are evaluated based on past experience, education, and management's assessment of their capabilities. Formal qualification is required of analysts and related technical personnel who perform laboratory functions. Each applicable person is given training and then formally evaluated by the Operations Manager (or his designees) and by QA. Each analyst must initially demonstrate capability to perform each assigned analytical effort. Each year, thereafter, he or she must perform similar analyses on Interlab Comparison Samples (see Procedure 4006) or on equivalent blanks and spikes samples. Acceptable results extend qualifications (certification). Unacceptable results require retraining in the subject method / Procedures. (See Procedure 1007 for added information, records, forms, etc. used.)

#### 4.5 Records

Records of training subjects, contents, attendees, instructors, and certifications are maintained by QA.

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#### 5.0 CUSTOMER INTERFACES

#### 5.1 Interface Personnel

The Laboratory has designated Program Managers as the primary interface with all customers. Other interfaces may be the QA Manager or the Lab Operations Manager.

#### 5.2 **Bid Requests and Tenders**

The Program Managers respond to customer requests for bids and proposals per Procedure 1014 for bids, proposals, and contract reviews. They clarify customer requests so both the customer and the lab staff understand requests. As responses are developed, internal reviews are conducted to ensure that requirements are adequately defined and documented and to verify that the Laboratory has adequate resources in physical capabilities, personal skills, and technical information to perform the work. Accreditation needs are reviewed. If subcontracts are required to perform any analysis, the subcontractor is similarly evaluated and the client notified in writing of the effort. Most qualifications are routine with standard pricing and the review of these quotes is performed by the Program Manager. Larger or more complex quotes are reviewed by the Operations Manager and the QA Manager (or designees). Evidence of review is by initialing and dating applicable papers, signatures on quotations, or by memo.

### 5.3 Contracts

The Program Manager's receive contract awards (oral or written) and generate the work planning for initiation preparation (charge numbers, data structure or contents in LIMS, etc.). They review contracts for possible differences from quotations and, if acceptable, contracts are processed. Documentation of the review is by initials and date as a minimum. Contract changes receive similar reviews and planning.

#### 5.4 TBE's Expectation of Customers

TBE expects customers to provide samples suitable for lab analysis. These expectations include:

- Accurate and unambiguous identification of samples
- Proper collection and preservation of samples
- Use of appropriate containers free from external and internal contamination
- Integrity preservation during shipment and timely delivery of samples that are age sensitive
- Adequate sized samples that allow for retest, if needed
- Specification of unique MOA/MDC requirements
- Alerting the lab about abnormal samples (high activity, different chemical contents, etc.)
- Chain of custody initiation, when required.

## 5.5 <u>Customer Satisfaction</u>

TBE's quality policy centers on customer satisfaction (See 2.0). TBE will work to satisfy customers through full compliance with contract requirements, providing accurate data and properly responding to any questions or complaints. Customers are provided full cooperation in their monitoring of Laboratory performance. Customers are notified if any applicable State Accreditation is withdrawn, revoked, or suspended.

#### **5.5.1 Customer Complaints**

Any customer complaints are documented and tracked to closure. Most complaints concern analysis data and are received by Program Managers. They log each such complaint, order retests for verification, and provide documented results to customers. Complaints may also be received by QA or Operations.

If complaints are other than re-test type, the nonconformance and corrective action systems (Sections 12 and 13) are used to resolve them and record all actions taken.

#### **5.5.2 Customer Confidentiality**

All laboratory personnel maintain confidentiality of customer-unique information.

#### 6.0 DOCUMENTATION GENERATION & CONTROL

#### 6.1 General

The documentation generation and control system is detailed in Procedure 1008. An overview is given below. The basic quality system documents are described in Section 2.0.

#### 6.2 New Documentation

Each Procedure and this QAM is written by appropriate personnel, validated if applicable (see Section 7.0), reviewed for adequacy, completeness, and correctness, and, if acceptable, accepted by the authorized approver [QA Manager, Operations Manager (or their designee)]. Both approvals are required if a Procedure affects both QA and Operations. (See Responsibilities in Section 3.0). These procedures control the quality measurements and their accuracy.

Each document carries a unique identification number, a revision level, dates, page numbers and total page count, and approver identification and sign off. If TBE writes code for software, the software is version identified and issued after Verification and Validation per Section 7.0.

#### 6.3 <u>Documentation Changes</u>

Each change is reviewed in the same manner and by the same people as new documentation. Revision identifications are updated and changes indicated by side bars, italicized words, or by revision description when practical. Obsolete revisions are maintained by QA after being identified as obsolete.

#### 6.4 Documentation Lists and Distributions

Computer indexes of documents are maintained by Quality showing the current authorized revision level of each document. These revisions are placed on the Laboratory server and obsolete ones are removed so that all personnel have only the current documents. If hard copies are produced and distributed, separate distribution lists are maintained indicating who has them and their revision level(s). Copies downloaded off the server are uncontrolled unless verified by the user (on the computer) to be the latest revision.

#### 6.5 Other Documentation

In addition to TBE-generated documentation, QA maintains copies of applicable specifications, regulations, and standard methods.

### 6.6 <u>Documentation Reviews</u>

Each issued document is reviewed at least every third year by the approving personnel. This review determines continued suitability for use and compliance with requirements.

#### 7.0 DESIGN OF LABORATORY CONTROLS

#### 7.1 General

The Laboratory and its operating procedures are designed specifically for low level (environmental and in-plant) radioactive sample analysis. The various aspects of the laboratory design include the following which are discussed in subsequent paragraphs of this Section:

- (a) Facility
- (b) Technical Processes and Methods
- (c) Verification of Design of Processes, Methods, and Software.
- (d) Design of Quality Controls
- (e) Counting Instrument Controls

### 7.2 Facility

The facility was designed and built in 2000 to facilitate correct performance of operations in accordance with good laboratory practices and regulatory requirements. It provides security for operations and samples. It separates sample storage areas based on activity levels, separates wet chemistry from counting instrumentation for contamination control, and provides space and electronic systems for documentation, analysis, and record storage. Procedure 4014 describes the facility, room uses, layouts, etc.

#### 7.3 Technical Processes and Methods

#### 7.3.1 Operational Flow

The laboratory design provides for sample receipt and storage (including special environmental provisions for perishable items) where samples are received from clients and other labs (see Section 9.0). The samples are logged into the computer based Laboratory Information Management System (LIMS) and receive unique identification numbers and bar code labels. (See Procedure 4017 for LIMS description and user procedures). The Program Managers then plan the work and assure LIMS contains any special instructions to analysts. Samples then go to sample preparation, wet chemistry (for chemical separation), and counting based on the radionuclides. See Procedures in the 2000 and 3000 series. Analysts perform the required tasks with data being entered into logbooks, LIMS, and counting equipment data systems as appropriate. Results are collected and reviewed by the Operations Manager and Program Managers and reports to clients are generated (See Section 14.0). All records (electronic or hard copy) are maintained in files or in back-up electronic copies (see Section 15.0). After the required hold periods and client notification and approval, samples are disposed of in compliance with regulatory requirements (see Procedures 5003 and 5004).

#### 7.3.2 Methods

The laboratory methods documented in the 2000 and 3000 series of Procedures were primarily developed by senior TBE laboratory personnel based on years of experience at our prior facility in New Jersey. They have been improved, supplemented and implemented here. Where EPA or other accepted national methods exist (primarily for water analyses under State certification programs - see Procedure 4010), the TBE methods conform to the imposed requirements or State accepted alternate requirements. Any method modifications are documented and described in the Procedure. There are no nationally recognized methods for most other analysis methods but references to other method documents are noted where applicable.

#### 7.3.3 <u>Data Reduction and Analysis</u>

Whenever possible automatic data capture and computerized data reduction programs are used. Calculations are either performed using commercial software (counting system operating systems) or TBE developed and validated software is used (see 7.4 below). Analysis of reduced data is performed as described in Section 14.0 and Procedure 4004.

## 7.4 <u>Verification of Technical Processes, Methods, and Software</u>

#### 7.4.1 **Operational Flow Verification**

The entire QA Manual and related procedures describe the verification of elements of the technical process flow and the establishment of quality check points, reviews, and controls.

#### 7.4.2 Method Verifications

Methods are verified and validated per Procedure 4007 prior to use unless otherwise agreed to by the client. For most TBE methods initial validation occurred well in the past. New or significantly revised Methods receive initial validation by demonstration of their performance using known analytes (NIST traceable) in appropriate matrices. Sufficient samples are run to obtain statistical data that provides evidence of process capability and control, establishes detection levels (see procedure 4009), bias and precision data (see Procedure 4011). All method procedures and validation data are available to respective clients. Also see Section 7.5 below for the Demonstration of Capability program.

### 7.4.3 <u>Data Reduction and Analysis Verification</u>

Data reduction and analysis verification is performed by personnel who did not generate the data. (See Section 14.0).

#### 7.5 Design of Quality Controls

#### 7.5.1 General

There are multiple quality controls designed into the laboratory operations. Many of these are described elsewhere in this manual and include personnel qualification (Section 4.0), Document control (6.0), Sample identification and control (9.0), Use of reference standards (10.0), intra- and inter- laboratory tests (10.0), etc. This Section describes the basic quality control systems used to verify Method capability and performance.

### 7.5.2 <u>Demonstration of Capability (D of C)</u>

The demonstration of capability system verifies and documents that the method, analyst, and the equipment can perform within acceptable limits. The D of C is certified for each combination of analyte, method, and instrument type. D of C's are certified based on objective evidence at least annually. This program is combined with the analyst D of C program (See Section 4.0). Initial D of C's use the method validation effort as covered above. Subsequent D of C's use Inter-Laboratory samples (Procedure 4006) or, if necessary, laboratory generated samples using NIST traceable standards. If results are outside of control limits, redemonstration is required after investigation and corrective action is accomplished (See Sections 12.0 and 13.0)

#### 7.5.3 Process Control Checks

Process control checks are designed to include Inter-Lab samples, Intra-lab QC check samples, and customer provided check samples. 10% of laboratory analysis samples are for process control purposes.

**7.5.3.1 Inter- Lab Samples.** Inter-lab samples are procured or obtained from sources providing analytes of interest in matrices similar to normal client samples. These samples may be used for Demonstration of Capability of analyst's, equipment and methods. They also provide for independent insight into the lab's process capabilities. Any value reported as being in the warning zone (over 2 sigma) is reviewed and improvements taken. Any value failing (over 3 sigma) is documented on an NCR and formal investigation per Section 12.0 and 13.0 is performed. If root causes are not clearly understood and fixed, re-tests are required using lab prepared samples (See Procedure 4006).

**7.5.3.2 QC Samples.** QC samples, along with Inter-lab samples and customer check samples, are 10% of the annual lab workload for the applicable analyte and method. If batch processing is used, some specifications require specific checks with each batch or each day rather than as continuous process controls. (See Procedure 4005)

QC samples consist of multiple types of samples including:

- (a) Method blanks
- (b) Blank spikes
- (c) Matrix spikes

- (d) Duplicates
- (e) Tracers and carriers

Acceptance limits for these samples are given in Procedures or in lab standards. The number, frequency, and use of these sample types varies with the method, matrix, and supplemental requirements. The patterns of use versus method and the use of the resulting test data is described in Procedure 4005.

**7.5.3.3 Customer Provided Check Samples.** Customers may provide blind check samples and duplicates to aid in their evaluation of the Laboratory. When the lab is notified that samples are check samples their results are included in the QC sample percentage counts. Any reported problems are treated as formal complaints and investigated per Section 5.

### 7.6 Counting Instrument Controls

The calibration of instruments is their primary control and is described in Section 11.0. In addition, counting procedures (3000 series) also specify use of background checks (method blank data is not used for this) to evaluate possible counting equipment contamination. Instrument calibration checks using a lab standard from a different source than the one used for calibration are also used. Background data can be used to adjust client and test data. Checks with lab standards indicate potential calibration changes.

#### 8.0 PURCHASING AND SUBCONTRACT CONTROLS

### 8.1 General

Procurement and Subcontracts efforts use the Huntsville-based Cost Point computer system to process orders. The Laboratory-generated Purchase Requisitions are electronically copied into Purchase Orders in Huntsville. The Laboratory also specifies sources to be used. Procured items and services are received at the Laboratory where receiving checks and inspections are made. Laboratory Procedure 1015 provides details on the procurement control system at the Laboratory and references the Huntsville procedures as applicable.

### 8.2 <u>Source Selection</u>

Sources for procurements of items and services are evaluated and approved by QA as described in Procedure 1015. Nationally recognized catalog item sources are approved by the QA Manager based on reputation. Maintenance services by an approved distributor or the equipment manufacturing company are pre-approved. Sources for other services are evaluated by QA, based on service criticality to the quality system, by phone, mail out, or site visit.

Subcontract sources for laboratory analysis services are only placed with accredited laboratories (by NELAP, NUPIC, State, Client, etc.) as applicable for the type of analysis to be performed. QA maintains lists of approved vendors and records of evaluations performed.

### 8.3 Procurement of Supplies and Support Services

#### 8.3.1 Catalog Supplies

The Laboratory procures reagents, processing chemicals, laboratory "glassware," consumables, and other catalog items from nationally known vendors and to applicable laboratory grades, purities, concentrations, accuracy levels, etc. Purchase Requisitions for these items specify catalog numbers or similar call-outs for these off-the-shelf items. Requisitions are generated by the personnel in the lab needing the item and are approved by the Operations or Production Manager. Reagents are analytical reagent grade only.

### 8.3.2 **Support Services**

Purchase Requisitions for support services (such as balance calibration, equipment maintenance, etc.) are processed as in 8.3.1 but technical requirements are specified and reviewed before approvals are given.

#### 8.3.3 Equipment and Software

Purchase Requisitions for new equipment, software programs, and major facility modifications affecting the quality system are reviewed and approved by the Operations Manager and the QA Manager.

### 8.4 **Subcontracting of Analytical Services**

When necessary, the Laboratory may subcontract analytical services required by a client. This may be because of special needs, infrequency of analysis, etc. Applicable quality and regulatory requirements are imposed in the Purchase Requisition and undergo a technical review by QA. TBE reserves the right of access by TBE and our client for verification purposes.

### 8.5 Acceptance of Items or Services

Items and services affecting the quality system are verified at receipt based on objective evidence supplied by the vendor. Supply items are reviewed by the requisitioner and, if acceptable, are accepted via annotation on the vendor packing list or similar document. Similarly, equipment services are accepted by the requisitioning lab person. Calibration services are accepted by QA based on certification reviews. (See Section 11.0.)

Data reports from analytical subcontractors are evaluated by Program Managers and subsequently by the Operations Manager (or designee) as part of client report reviews.

Items are not used until accepted and if items or services are rejected, QA is notified and nonconformance controls per Section 12.0 are followed. Vendors may be removed from the approved vendor's list if their performance is unacceptable.

#### 9.0 TEST SAMPLE IDENTIFICATION AND CONTROL

#### 9.1 Sample Identification

Incoming samples are inspected for customer identification, container condition, chain of custody forms, and radioactivity levels. If acceptable, the sample information is entered into LIMS which generates bar coded labels for attachment to the sample(s). The labels are attached and samples stored in the assigned location. If environmental controls are needed (refrigeration, freezing, etc.), the samples are placed in these storage locations. If not acceptable, the Program Manager is notified, the customer contacted, and the problem resolved (return of sample, added data receipts, etc.). See Procedure 4003 for more information on sample receipt.

#### 9.2 <u>LIMS</u>

The LIMS is used to schedule work, provide special information to analysts, and record all actions taken on samples. See Procedure 4017 and the 6000 series of procedures for more information on LIMS operations.

#### 9.3 Sample Control

The sample, with its bar coded label, is logged out to the applicable lab operation where the sample is processed per the applicable methods (Procedures 2000 and 3000). The LIMS-assigned numbers are used for identification through all operations to record data. Data is entered into LIMS, log books (kept by the analysts) or equipment data systems to record data. The combination of LIMS, logbooks, and equipment data systems provide the Chain of Custody data and document all actions taken on samples. Unused sample portions are returned to its storage area for possible verification use. Samples are discarded after required time limits are passed and after client notification and approval, if required.

#### 10.0 SPECIAL PROCESSES, INSPECTION, AND TEST

#### 10.1 **Special Processes**

The Laboratory's special processes are the methods used to analyze a sample and control equipment. These methods are defined in Procedures in the 2000 and 3000 series. These processes are performed to the qualified methods (see Section 7.0) by qualified people (see 4.0).

#### 10.2 Inspections and Tests

The quality of the process is monitored by indirect means. This program involves calibration checks on counting equipments (see Section 11.0), intralaboratory checks, and inter-laboratory checks. In addition, some customers submit quality control check samples (blinds, duplicates, external reference standards). All generated data gets independent reviews.

#### 10.2.1 Intra Laboratory Checks (QC Checks)

The quantity and types of checks varies with the method, but basic checks which may include blanks, spiked blanks, matrix spikes, matrix spike duplicates, and duplicates are used as appropriate for customer samples. This process is described in Procedure 4005 and in Section 7.0.

#### 10.2.2 <u>Inter Laboratory Checks</u>

TBE participates in Inter-lab performance evaluation (check) programs with multiple higher level labs. These programs provide blind matrices for the types of matrix/analyte combinations routinely processed by the Lab, if available. This program is described in Procedure 4006.

#### 10.2.3 Data Reviews

Raw data and reports are reviewed by the Operations Manager, or designees. This review checks for data logic, expected results, procedure compliance, etc. (See Section 14.0).

#### 10.3 Control of Sampling of Samples

Samples for analysis are supplied by customers preferably in quantities sufficient to allow re-verification analyses if needed. The samples are prepared for analysis by analysts and then an aliquot (partial sample extraction) is taken from the homogeneous customer sample for the initial analysis. Methods specify standard volumes of sample material required. Sampling data is recorded in LIMS and/or logbooks.

#### 10.4 Reference Standards / Material

#### 10.4.1 Weights and Temperatures

Reference standards are used by the Laboratory's calibration vendor to calibrate the Labs working instruments measuring weights and thermometers.

#### 10.4.2 Radioactive Materials

Reference radioactive standards, traceable to NIST, are procured from higher level laboratories. These reference materials are maintained in the standards area and are diluted down for use by laboratory analysts. All original and diluted volumes are fully traceable to source, procedure, analyst, dilution, and acquisition dates. See Section 11.0 and Procedure 1009.

#### 11.0 EQUIPMENT MAINTENANCE AND CALIBRATION

#### 11.1 General

There are two types of equipment used by the Laboratory: support equipment (scales, glassware, weights, thermometers, etc.) and instruments for counting. Standards traceable to NIST are used for calibration and are of the needed accuracy for laboratory operations. Procedures 1009, 4018, and 4019 describe the calibration and maintenance programs.

#### 11.2 Support Equipment

Analytical support equipment is purchased with the necessary accuracies and appropriate calibration data. If needed, initial calibration by the Laboratory or its calibration vendor is performed. Recalibration schedules are established and equipment recalibrated by the scheduled date by a calibration vendor or by Laboratory personnel. Maintenance is performed, as needed, per manufacturer's manuals or lab procedures.

In addition to calibrations and recalibrations, checks are made on the continued accuracy of items as described in Procedure 1009. Records are maintained of calibration and specified checks.

#### 11.3 <u>Instruments</u>

Instruments receive initial calibration using radioactive sources traceable to NIST. The initial calibration establishes statistical limits of variation that are used to set control limits for future checks and recalibration. This process is described in Procedure 4018. Instruments are maintained per Instrument Manual requirements. Recalibrations are performed per the Procedure.

Between calibrations, check sources are used to assure no significant changes have occurred in the calibration of items. Background checks are performed to check for possible radioactive contamination. Background values are used to adjust sample results. Hardware and software are safeguarded from adjustments that could invalidate calibrations or results.

#### 11.4 Nonconformances and Corrective Actions

If calibrations or checks indicate a problem, the nonconformance system (Section 12.0) and corrective action system (Section 13.0) are initiated to document the problem and its resolution. Equipment is promptly removed from service if questionable.

#### 11.5 Records

Records of calibrations are maintained. Calibration certificates from calibration vendors are maintained by QA. Other calibration data and check data is maintained in log books, LIMS, or instrument software as appropriate and as described in Procedures 1009, 4018, and 4019.

#### 12.0 NONCONFORMANCE CONTROLS

#### 12.1 General

The nonconformance control system is implemented whenever a nonconforming condition on any aspect of Laboratory analysis, testing, or results exist. The system takes graded actions based on the nature and severity of the nonconformance. Nonconforming items or processes are controlled to prevent inadvertent use. Nonconformances are documented and dispositioned. Notification is made to affected organizations, including clients. Procedure 1010 describes the procedures followed. Sample results are only reported after resolution.

#### 12.2 Responsibility and Authority

Each Laboratory employee has the responsibility to report nonconformances and the authority to stop performing nonconforming work or using nonconforming equipment. Laboratory supervision can disposition and take corrective actions on minor problems. Any significant problem is documented by QA using the Laboratory's NCR system per Procedure 1010. QA conducts or assures the conduct of cause analyses, disposition of items or data, and initiation of corrective action if the nonconformance could recur.

#### 12.3 <u>10CFR21 Reporting</u>

The QA Manager reviews NCRs for possible need of customer and/or NRC notification per the requirements of 10CFR21. Procedure 1011 is followed in this review and for any required reporting.

#### 13.0 CORRECTIVE AND PREVENTIVE ACTIONS

#### 13.1 General

The Laboratory takes corrective actions on significant nonconformances (see Section 12.0). It also initiates preventive and improvement actions per the Company Quality Policy (see Section 2.0). The procedures for Corrective Action/Preventive Action systems are contained in Procedure 1012.

#### 13.2 Corrective Actions

Corrective actions are taken by Operations and Quality to promptly correct significant conditions adverse to quality. The condition is identified and cause analysis is performed to identify root causes. Solutions are evaluated and the optimum one selected that will prevent recurrence, can be implemented by the Laboratory, allows the Laboratory to meet its other goals, and is commensurate with the significance of the problem. All steps are documented, action plans developed for major efforts, and reports made to Management. QA verifies the implementation effectiveness. Procedure 1012 provides instructions and designates authorities and responsibilities.

#### 13.3 Preventive Actions

Preventive actions are improvements intended to reduce the potential for nonconformances. Possible preventive actions are developed from suggestions from employees and from analysis of Laboratory technical and quality systems by management. If preventive actions or improvements are selected for investigation, the issues, investigation, recommendations, and implementation actions are documented. Follow up verifies effectiveness.

Page 29 of 32

#### 14.0 RESULTS ANALYSIS AND REPORTING

#### 14.1 General

The Laboratory's role is to provide measurement-based information to clients that is technically valid, legally defensible, and of known quality.

#### 14.2 Results Review

The results obtained from analytical efforts are collected and reviewed by the Operations Manager and the Program Manager. This review verifies the reasonableness and consistency of the results. It includes review of sample and the related QC activity data. Procedure 4002 describes the process. Any deficiencies are corrected by re-analyses, recalculations, or corrective actions per Sections 12.0 and 13.0. Use of the LIMS with its automatic data loading features (see Procedure 4017) minimizes the possibility of transcription or calculation errors.

#### 14.3 Reports

Reports range from simple results reporting to elaborate analytical reports based on the client requirements and imposed specifications and standards. (See Procedure 4004.) Reports present results accurately, clearly, unambiguously, objectively, and as required by the applicable Method(s). Reports include reproduction restrictions, information on any deviations from methods, and any needed data qualifiers based on QC data. If any data is supplied by analytical subcontractors (see Section 8.0), it is clearly identified and attributed to that Laboratory by either name or accreditation number.

If results are faxed or transmitted electronically, confidentiality statements are included in case of receipt by other than the intended client.

Reports are approved by the Program Manager and Operations Manager and record copies kept in file (See Section 15.0).

#### 15.0 RECORDS

#### 15.1 General

The Laboratory collects generated data and information related to quality or technical data and maintains them as records. Records are identified, prepared, reviewed, placed in storage, and maintained as set forth in Procedure 1003.

#### 15.2 Type of Records

All original observations, calculations, derived data, calibration data, and test reports are included. In addition QA data such as audits, management reviews, corrective and preventive actions, manuals, and procedures are included.

#### 15.3 Storage and Retention

Records are stored in files after completion in the lab. Files are in specified locations and under the control of custodians. Filing systems provide for retrieval. Electronic files are kept on Company servers (with regular back up) or on media stored in fireproof file cabinets. Records are kept in Laboratory files for at least 2 years after the last entry and then in Company files for another year as a minimum. Some customers specify larger periods – up to 7 years – which is also met. Generic records supporting multiple customers are kept for the longest applicable period.

#### 15.4 <u>Destruction or Disposal</u>

Records may be destroyed after the retention period and after client notification and acceptance, if required. If the Laboratory closes, records will go in to company storage in Huntsville unless otherwise directed by customers. If the Laboratory is sold, either the new owner will accept record ownership or the records will go into Company storage as stated above.

#### 16.0 ASSESSMENTS

#### 16.1 General

Assessments consist of internal audits and management reviews as set forth in Procedure 1013.

#### 16.2 **<u>Audits</u>**

Internal audits are planned, performed at least annually on all areas of the quality system, and are performed by qualified people who are as independent as possible from the activity audited. (The Laboratory's small size inhibits full independence in some technical areas.) Audits are coordinated by the Quality Manager who assures audit plans and checklists are generated and the results documented. Reports include descriptions of any findings and provide the auditor's assessment of the effectiveness of the audited activity. Report data includes personnel contacted.

Audit findings are reviewed with management and corrective actions agreed to and scheduled. Follow up is performed by QA to verify accomplishment and effectiveness of the corrective action.

#### 16.3 Management Reviews

The Annual Quality Assurance Report, prepared for some clients, is the Management Review vehicle. These reports cover audit results, corrective and preventive actions, external assessments, and QC and inter-laboratory performance checks. The report is reviewed with Management by the QA Manager for the continued suitability of the Quality Program and its effectiveness. Any needed improvements are defined, documented, and implemented. Follow ups are made to verify implementation and effectiveness.

#### **Revision 1**

#### APPENDIX D

LABORATORY ANALYTICAL REPORTS



2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L28818
Exelon
June 12, 2006



2508 Quality Lane Knoxville, TN 37931-3133

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

#### Case Narrative - L28818 EX001-3ESPQUAD-06

06/12/2006 10:36

#### Sample Receipt

The following samples were received on June 2, 2006 in good condition, unless otherwise noted.

Tritium results were requested on a 2 day turn around. CRA revised the chain of custody on June 7 and the samples IDs were updated in the Teledyne database.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)	
WG-QC-MW-QC-102I-053106-JH-016	L28818-1		
WG-QC-MW-QC-102I-053106-JH-017	L28818-2		
WG-QC-MW-QC-102S-053106-JH-018	L28818-3		
WG-QC-MW-QC-102S-053106-JH-019	L28818-4		
	WG-QC-MW-QC-102I-053106-JH-016 WG-QC-MW-QC-102I-053106-JH-017 WG-QC-MW-QC-102S-053106-JH-018	WG-QC-MW-QC-102I-053106-JH-016 L28818-1 WG-QC-MW-QC-102I-053106-JH-017 L28818-2 WG-QC-MW-QC-102S-053106-JH-018 L28818-3	WG-QC-MW-QC-102I-053106-JH-016 L28818-1 WG-QC-MW-QC-102I-053106-JH-017 L28818-2 WG-QC-MW-QC-102S-053106-JH-018 L28818-3

Analytical Method Cross Reference Table

	11,700,770,000,000,000	
Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3	TBE-2010	EPA 906.0
TOTAL SR	TBE-2018	EPA 905.0
	H-3	Radiological Parameter TBE Knoxville Method Gamma Spectrometry TBE-2007 H-3 TBE-2010



2508 Quality Lane Knoxville, TN 37931-3133

#### Case Narrative - L28818 EX001-3ESPQUAD-06

06/12/2006 10:36

#### **Gamma Spectroscopy**

#### **Quality Control**

Quality control samples were analyzed as WG4094.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID WS-LS-SW-LS-104<u>Laboratory ID</u> L28801-1 <u>QC Sample #</u> WG4094-8

3-L3-3W-L3-104

052506-NK-008

#### <u>H-3</u>

#### **Quality Control**

Quality control samples were analyzed as WG4080.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID WG-QC-MWQC102I- Laboratory ID L28818-1 QC Sample #

053106-ЛН-016

WG4080-3



2508 Quality Lane Knoxville, TN 37931-3133

#### Case Narrative - L28818 EX001-3ESPQUAD-06

06/12/2006 10:36

#### TOTAL SR

#### **Quality Control**

Quality control samples were analyzed as WG4133.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### **Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	Laboratory ID	QC Sample #
WG-DN-DSP-121-	L28821-1	WG4133-4
052606-JH-014		

#### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter	
Operations Manager	

## Sample Receipt Summary

06/02/06 10:26

## Teledyne Brown Engineering Sample Receipt Verification/Variance Report

SR #: SR08688

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L28818

	ted By: PMARSHALL t Date: 06/02/06 Receive Date: 06/02/	'06			
	Notification	on of Var	riance		
Person	Notified:	Contacte	ed By:		
No	tify Date:				
	fy Method:				
Notif	y Comment:				
	Client Resp	onse			
Person	n Responding:				
	esponse Date:				
	ponse Method:				
Resp	onse Comment				
Cr	riteria	Yes No NA	Comment		
1	Shipping container custody seals present and intact.	NA			
2	Sample container custody seals present and intact.	NA	and the second s		
3	Sample containers received in good condition	Y			
4	Chain of custody received with samples	Y			
5	All samples listed on chain of custody received	Y			
6	Sample container labels present and legible.	Y	And the second s		
7	Information on container labels correspond with chain of custody	Y			
8	Sample(s) properly preserved and in appropriate container(s)	NA		PH < 2	
9	Other (Describe)	NA			

CONESTOGA-ROVERS & ASSOCIATES 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631	SHIPPED TO (Laboratory Name)	: Te	(											3818 	)	
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1 28818

**RP-AA-600-1005**Revision 7

Page 8 of 16

# ATTACHMENT 2 DOT Exempt Shipment Checklist Page 1 of 1

Radioactive Mate	rial Shipment N	umber: <u> </u>	<u>6-40√</u> Date	: <u>6-1</u>	-06
1. Describe the S	hipment: <u> </u>	ATER SA	HAPLES		
2. Complete:	Destination:	TELE DYNE	- DROWN &	ENG.	
	Contact:	SAMPLE	CUSTOD 14	<u>v.</u>	
3. Verify the Reco	eiver can receive	e the quantity, ty	oe and form of ra	adioactive	material.
			$\mathcal{L}$	<i>D</i> /	6-1-06
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6-2-06

TELEDYNE BROWN ENGINEERING 2508 Quality Lane Knoxville, TN 37931-3133

### ACKNOWLEDGEMENT This is not an invoice

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, CT 06062 June 02, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 02, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 05, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely, Rebecca Charles Project Manager (865)934-0379

Project ID:

EX001-3ESPQUAD-06

P.O. #:

00411203

Release #:

Contract#:

00411203

Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Start Collect End Collect Price Date/Time Date/Time
WG-QC-MWQC1021-05310	6-ЈН-016 L28818-1	05/31/06:1600
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00
WG-QC-MWQC1021-05310	06-JH-017 L28818-2	05/31/06:1610
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00
WG-QC-MWQC102S-05310	06-JH-018 L28818-3	05/31/06:1615
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00
WG-QC-MWQC102S-0531	06-JH-019 L28818-4	05/31/06:1640
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00

#### Charles, Rebecca

From: Shaw, Kathy [kshaw@craworld.com]

Sent: Wednesday, June 07, 2006 5:26 PM

To: Charles, Rebecca

Cc: Larry.Walton@exeloncorp.com

Subject: 45136-28 Quad Cities

#### Hi Rebecca,

I have revised the COCs for the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

#### **Kathy Shaw - Chemist**

Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, Connecticut 06062 PH 860 747-1800 Fax 860 747-1900 CRAWORLD.COM



L28818

(773)380-9933 phone (773)380-6421 fax  CHAIN-OF-CUSTODY RECORD  REFERENCE NUMBER: PROJECT NAME: PROJ	
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3TIME: 4	TIME:
METHOD OF SHIPMENT:  AIR BILL No.	
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Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy  August Dunck  DATE:	101 (7

1001-00(SOURCE)GN-CO004

Nate Ziecher

# Internal Chain of Custody

Teledyne Brown Engineering
Internal Chain of Custody

\* Containernum 1 Sample # L28818-1 Analyst Prod H-3DW ЕJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/02/2006 00:00 Donna Webb 030854 Sample Custodian 099999 06/02/2006 12:34 099999 Sample Custodian Donna Webb 06/02/2006 12:34 030854 \* Containernum 2 Sample # L28818-1 Analyst Prod DWH-3 ΕJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/02/2006 00:00 \* Containernum 1 Sample # L28818-2 Analyst Prod DW H-3EJGELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/02/2006 00:00 Donna Webb 030854 Sample Custodian 099999 06/02/2006 12:34 Sample Custodian Donna Webb 099999 06/02/2006 12:34 030854 \* Containernum 2 Sample # L28818-2 Analyst Prod H-3DW ЕJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/02/2006 00:00 \* Containernum 1 Sample # L28818-3 Analyst Prod DWH-3ΕJ GELI SR-90 (FAST) LCB Received By Relinquish Date Relinquish By Sample Custodian 099999 06/02/2006 00:00 Donna Webb 030854 Sample Custodian 099999 06/02/2006 12:34 099999 Sample Custodian Donna Webb 030854 06/02/2006 12:34

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28818-3

SR-90 (FAST)

Teledyne Brown Engineering
Internal Chain of Custody

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28818-3 Containernum 2

Prod Analyst

H-3 DW EJ

Relinquish Date Relinquish By Received By

LCB

06/02/2006 00:00 099999 Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28818-4 Containernum 1

Prod Analyst H-3 DW EJ

SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By

06/02/2006 00:00 099999 Sample Custodian

06/02/2006 12:34 099999 Sample Custodian 030854 Donna Webb

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28818-4 Containernum 2

Prod Analyst

H-3 DW

SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By

06/02/2006 00:00 099999 Sample Custodian

06/12/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

#### L28818

		L28818		
******	*****	*******	******	******
L28818-1	WG	WG-QC-MW-QC-102I-053	106-ЈН-016	
Process step	Prod		<u>Analyst</u>	Date
Login			RCHARLES	06/02/06
Aliquot	H-3		D₩	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		KPW	06/08/06
Count Room	H-3		KOJ	06/03/06
Count Room		(FAST)	KOJ	06/12/06
****	*****	*****	*****	*******
L28818-2	WG	WG-QC-MW-QC-102I-053	3106-ЈН-017	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	H-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVM	06/08/06
Count Room	Н-3		KOJ	06/03/06
Count Room		(FAST)	KOJ	06/12/06
*****	*****	*****	*****	******
L28818-3	WG	WG-QC-MW-QC-102S-05	3106-ЈН-018	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	н-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		KPW	06/08/06
Count Room	н-3		KOJ	06/03/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****				
	*****		*****	******
L28818-4	******* WG			
L28818-4 Process step		*****		
	WG	*****	3106-ЈН-019	*******
Process step	WG	*****	3106-JH-019 <u>Analyst</u>	**************************************
Process step Login Aliquot	WG Prod	*****	3106-JH-019 Analyst RCHARLES	**************************************
Process step Login Aliquot Aliquot	WG Prod H-3	**************************************	3106-JH-019 Analyst RCHARLES DW	<u>Date</u> 06/02/06 06/02/06
Process step Login Aliquot	WG Prod H-3 GELI	**************************************	3106-JH-019 Analyst RCHARLES DW EJ	Date 06/02/06 06/02/06 06/06/06
Process step Login Aliquot Aliquot Aliquot	WG Prod H-3 GELI SR-90	**************************************	3106-JH-019 Analyst RCHARLES DW EJ LCB	Date 06/02/06 06/02/06 06/06/06 06/09/06
Process step Login Aliquot Aliquot Aliquot Count Room	WG Prod H-3 GELI SR-90 GELI	**************************************	3106-JH-019 Analyst RCHARLES DW EJ LCB MVW	Date 06/02/06 06/02/06 06/06/06 06/09/06 06/08/06

# Analytical Results Summary



#### L28818

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-102I-053106-JH-016

Collect Start: 05/31/2006 16:00

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Receive Date: 06/02/2006

% Moisture:

Description:

LIMS Number: L2  Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units		g Values
11.2	2010	3.26E+04	9.77E+02	7.64E+02	pCi/L		2	ml		06/03/06	135	M	+   I	ligh
H-3 TOTAL SR	2018	3.35E-01	4.54E-01	7.25E-01	pCi/L		450	ml	05/31/06 16:00	06/12/06	400	M	U	
	2007	-1.14E-01	1.83E+00	2.98E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
MN-54 CO-58	2007	-5.76E-01	1.93E+00	3.12E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
FE-59	2007	3.47E+00	3.83E+00	6.49E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
CO-60	2007	1.88E-01	1.93E+00	3.20E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
ZN-65	2007	7.42E+00		7.00E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U*	No
NB-95	2007	9.54E-01	1.92E+00	3.20E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
ZR-95	2007	-2.48E+00	1	5.50E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
	2007	6.86E+00	4.50E+00	3.59E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U*	No
CS-134	2007	1.04E+00	1.97E+00	3.30E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
CS-137	2007	4.89E+00	1.01E+01	1.67E+01	pCi/L	Ì	3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No
BA-140 LA-140	2007	2.07E+00		5.53E+00	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U	No

Comment:

ID corrected 6/8/06

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification \_ Spec

Low recovery

High recovery

Page 1 of 4

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

#### BROWN ENGINEERING, INC. A Teledyne Technologies Company

#### L28818

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06 Kathy Shaw

WG-QC-MW-QC-102I-053106-JH-017 Sample ID:

Collect Start: 05/31/2006 16:10

Volume:

Matrix: Ground Water

(WG)

Station: Description: Collect Stop:

Receive Date: 06/02/2006

% Moisture:

LIMS Number: 1.28818-2

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Fla	g Values
I-3	2010	3.18E+04	9.72E+02	7.69E+02	pCi/L		2	ml		06/03/06	135	M	+ I	ligh
TOTAL SR	2018	-5.49E-02	5.35E-01	8.86E-01	pCi/L		450	ml	05/31/06 16:10	06/12/06	400	M	U	
K-40	2007	8.45E+01	3.73E+01	3.59E+01	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	+	Yes
N-40 MN-54	2007	3.51E-01	2.16E+00	3.58E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
CO-58	2007	-8.97E-01	2.21E+00	3.59E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
FE-59	2007	-1.24E-01	4.45E+00	7.35E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
CO-60	2007	1.65E+00		3.79E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
ZN-65	2007	2.59E+00	-	7.88E+00	pCi/L	1	3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
NB-95	2007	2.59E+00		3.91E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
ZR-95	2007	-2.63E+00		6.31E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
CS-134	2007	7.00E+00		3.82E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U*	No
CS-134	2007	2.35E+00		3.88E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
BA-140	2007	-2.26E+00		1.86E+01	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
LA-140	2007	-8.74E-01		6.26E+00	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U	No
AC-228	2007	2.15E+01		1.21E+01	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	+	Yes

Flag Values

Compound/Analyte not detected or less than 3 sigma U

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification = Spec Low recovery

High recovery

Page 2 of 4

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted



#### L28818

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-102S-053106-JH-018 Sample ID:

Collect Start: 05/31/2006 16:15

Ground Water Matrix:

(WG)

Station:

Collect Stop:

Volume:

% Moisture:

Description:

LIMS Number: L28818-3

Receive Date: 06/02/2006

Radionuclide	SOP#	Activity	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
Radionuciide	301#	Conc	2 Sigina			1				06/03/06	135	M	+ High
H-3	2010	9.41E+03	6.55E+02	7.64E+02	pCi/L		2	ml	05/01/06 16 15		400	M	U
TOTAL SR	2018	1.60E-01	4.01E-01	6.50E-01	pCi/L		450	ml	05/31/06 16:15	06/12/06			
MN-54	2007	-3.68E-01	1.61E+00	2.70E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	
CO-58	2007	-2.51E+00	1.65E+00	2.63E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
FE-59	2007	2.96E+00		5.74E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CO-60	2007	1.18E+00		2.78E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
	2007	4.03E+00		5.96E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
ZN-65		-1.60E-01	1.66E+00	2.80E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
NB-95	2007		2.93E+00	4.94E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
ZR-95	2007	-4.91E-01	,				3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CS-134	2007	3.34E+00		3.03E+00	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CS-137	2007	3.64E-01	1.70E+00	2.91E+00	pCi/L	-			05/31/06 16:15	06/08/06	42013	Sec	U No
BA-140	2007	6.82E+00		1.54E+01	pCi/L	-	3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
LA-140	2007	1.72E+00	2.74E+00	4.91E+00	pCi/L	1	3232.84	ml	103/31/00 10.13	+ 00/00/00	72013		

Comment:

1

ID corrected 6/8/06

Flag Values

Compound/Analyte not detected or less than 3 sigma U

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification = Spec Low recovery

High recovery

Page 3 of 4

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted



#### L28818

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-102S-053106-JH-019

Collect Start: 05/31/2006 16:40

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

ID corrected 6/8/06

Receive Date: 06/02/2006

% Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Va	lues
H-3	2010	9.64E+03	6.60E+02	7.66E+02	pCi/L		2	ml		06/03/06	135	M	+ High	
TOTAL SR	2018	4.04E-01	4.33E-01	6.86E-01	pCi/L		450	ml	05/31/06 16:40	06/12/06	400	M	U	
MN-54	2007	3.56E-01	1.54E+00	2.57E+00	pCi/L	T	3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
CO-58	2007	-3.22E-01	1.67E+00	2.74E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
FE-59	2007	3.68E+00	3.19E+00	5.53E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
CO-60	2007	1.05E+00	1.57E+00	2.66E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
ZN-65	2007	5.86E+00	3.25E+00	5.76E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U*	No
NB-95	2007	1.01E+00	1.61E+00	2.74E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
ZR-95	2007	-2.31E-01	2.97E+00	4.82E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
CS-134	2007	2.69E+00	2.83E+00	2.89E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
CS-137	2007	1.48E+00	1.66E+00	2.80E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
	2007	1.46E+00	8.08E+00	1.35E+01	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No
BA-140 LA-140	2007	3.65E+00	2.61E+00	4.62E+00	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U	No

Flag	Values
------	--------

Comment:

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification \_\_ Spec

Low recovery =

High recovery

Page 4 of 4

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

In Process Sample#	Analysis		<u>ix</u>		******	***			
In Process	QC								
Sample #	<u>Analysis</u>	Matr							
*****	******	*****	*****	*****	******	***			
Missing ga	mma nuclide	es							
Sample #	Nuclide								
*********** Spec/High		*****	*****	*****	*****	***			
Sample#	Analysis			Flag	J				
L28818-1	H-3	H-3 HIGH							
L28818-2	H-3	H-3 HIGH							
L28818-3	H-3	H-3 HIGH							
L28818-4	H-3	H-3							
*****	*****	******	*****	******	*****	***			
QC Failur	es								
Qc Sample	Analysis		QC	type	Passfail				
*****	*****	******	******	****	*****	***			
Recoverie	s			_					
Sample#	Analysis		F.	lag					
****	*****	******	****	*****	******	***			
Comments Sample#	Analysis	Seq	Comments						

# QC Results Summary

### **QC Summary Report**

L28818 for

6/12/2006

10:01:18AM



H\_3

				H-3			
				Method Blank Summ	ary		
TBE Sample ID WG4080-1	Radionuclide H-3	<u>Matrix</u> WO	Count Date/Time 06/03/2006 6:57		Blank Result < 1.530E+00	<u>Units</u> pCi/Total	<u>Qualifier</u> <u>P/F</u> U P
				LCS Sample Summa	ıry		
TBE Sample ID WG4080-2	Radionuclide H-3	<u>Matrix</u> WO	Count Date/Time 06/03/2006 9:16	Spike Value 5.05E+002	LCS Result 4.650E+02	Units Spike Recovery pCi/Total 92.1	Range Qualifier P/F 70-130 + P
Spike ID: 3H-04 Spike conc: 5.05E Spike Vol: 1.00E	+002						
				<b>Duplicate Summar</b>	$\mathbf{y}$		
TBE Sample ID WG4080-3 L28818-1	Radionuclide H-3	<u>Matrix</u> WG	Count Date/Time 06/03/2006 11:35	Original Result 3.260E+04	<u>DUP Result</u> 3.220E+04	Units RPD pCi/L 1.2	Range Qualifier P/F <30 + P

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity

Pass Fail

Not evaluated NE

### **QC Summary Report**

for L28818

6/12/2006

10:01:18AM

L28818

H-3

Associated Samples for	WG4080
SAMPLENUM	CLIENTID
L28818-1	WG-QC-MW-QC-102I-053106-JH-016
L28818-2	WG-QC-MW-QC-102I-053106-JH-017
L28818-3	WG-QC-MW-QC-102S-053106-JH-018
L28818-4	WG-QC-MW-QC-102S-053106-JH-019



Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity

Pass Fail

Not evaluated NE

Page: 2

### QC Summary Report

L28818 for

6/12/2006

10:01:18AM



#### TOTAL SR

				TOTAL SK			
				Method Blank Summa	ary		
TBE Sample ID WG4133-1	<u>Radionuclide</u> TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/12/2006 8:10		Blank Result < 4.830E-01	<u>Units</u> pCi/Total	<u>Qualifier</u> <u>P/F</u> U P
				LCS Sample Summa	ry		
TBE Sample ID WG4133-2	<u>Radionuclide</u> TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/11/2006 23:28	Spike Value 5.84E+001	LCS Result 6.620E+01	<u>Units</u> <u>Spike Recovery</u> pCi/Total 113.4	Range Qualifier P/F 70-130 + P
Spike ID: 90SR- Spike conc: 2.34E Spike Vol: 2.50E	E+002						
				Duplicate Summar	y		
TBE Sample ID WG4133-4 L28821-1	<u>Radionuclide</u> TOTAL SR	<u>Matrix</u> WG	Count Date/Time 06/12/2006 8:10	Original Result < 6.910E-01	DUP Result 1.110E+00	Units RPD pCi/L	Range Qualifier P/F <30 * NE

Positive Result

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass F Fail

Not evaluated NE

### QC Summary Report

L28818 for

6/12/2006

10:01:18AM



SR-90 (FAST)

**Associated Samples for** 

WG4133

<b>SAMPLENUM</b>	<u>CLIENTID</u>
L28818-1	WG-QC-MW-QC-102I-053106-JH-016
L28818-2	WG-QC-MW-QC-102I-053106-JH-017
L28818-3	WG-QC-MW-QC-102S-053106-JH-018
L28818-4	WG-QC-MW-QC-102S-053106-JH-019

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass P Fail F

Not evaluated NE



Page: 4

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## Raw Data

### Raw Data Sheet (rawdata) Jun 12 2006, 10:12 am

Work Order: <u>L28818</u>

Customer: Exelon

Page: 1

Nuclide: H-3	Pr	oject : <u>EX001-3</u>	ESPQUAD-06											Decay &	
Sample ID Run Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Count Date/time	Counter ID	counts	Sample dt(min)		Bkg dt(min)		Ingrowth Factor	Analyst
Client ID # L28818-1 H-3 WG-QC-MW-QC-102I-05310	Date/ cime	2 ml			0		03-jun-06 13:53	LS5	6570	135	6.17	135	.29	¥	
Activity: 3.26E+04 * Error: L28818-2 H-3 WG-QC-MW-QC-102I-05310		MDC: 7.64E+02	<u> </u>		0	war and a second	03-jun-06 16:12	LS5	6398	135	6.17	135	.29	2	DW
Activity: 3.18E+04 * Error: L28818-3 H-3 WG-QC-MW-QC-102S-05310		MDC: 7.69E+02			0		03-jun-06 18:31	LS5	2491	135	6.17	135	.29	4	D₩
Activity: 9.41E+03 * Error: 128818-4 H-3 WG-QC-MW-QC-102S-05310 Activity: 9.64E+03 * Error:		MDC: 7.64E+02  2 ml  MDC: 7.66E+02			0		03-jun-06 20:49	LS5	2526	135	6.17	135	.29	3	DW

#### Raw Data Sheet (rawdata) Jun 12 2006, 10:12 am

Work Order: <u>L28818</u> Customer: <u>Exelon</u> Page: 2

Nuclide: SR-90 (FAST) Project : EX001-3ESPQUAD-06

Nuclide: SR-90 (FAST) Project : EAUUI-	SESPQUAD-06										Decay &	
Sample ID Run Analysis Reference Volume/	Scavenge Milking	Mount		Count	Counter	Total	Sample	Bkg	Bkg	Eff.	Ingrowth	Analyst
Client ID # Date/time Aliquot	Date/time Date/time	Weight	Recovery	Date/time	ID	counts	dt (min)	counts	dt (min)		Factor	
L28818-1 TOTAL SR 31-may-06	11-jun-06	0		12-jun-06	YlB	315	400	279	400	.35	1 .999	LCB
WG-QC-MW-QC-102I-05310 16:00 450 ml	13:00		76.61	08:16								
Activity: 3.35E-01 Error: 4.54E-01 MDC: 7.25E-01	<b>+</b>											
L28818-2 TOTAL SR 31-may-06	11-jun-06	0		12-jun-06	Y1C	295	400	300	400	.34	5 .999	LCB
WG-QC-MW-QC-102I-05310 16:10 450 ml	13:00		66.13	08:16								
Activity: -5.49E-02 Error: 5.35E-01 MDC: 8.86E-01	t-											
L28818-3 TOTAL SR 31-may-06	11-jun-06	0		12-jun-06	Y1D	325	400	305	400	.36	2 .999	LCB
WG-QC-MW-QC-102S-05310 16:15 450 ml	13:00		86.56	08:16								
Activity: 1.6E-01 Error: 4.01E-01 MDC: 6.5E-01	<b>*</b>											
L28818-4 TOTAL SR 31-may-06	11-jun-06	0		12-jun-06	Y2A	326	400	280	400	.34	9 .999	LCB
WG-QC-MW-QC-102S-05310 16:40 450 ml	13:00		81.72	08:16								
Activity: 4.04E-01 Error: 4.33E-01 MDC: 6.86E-01	*											

Sec. Review: Analyst:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:08:09.40 TBE14 P-10933A HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 8-JUN-2006 16:25:29.03

LIMS No., Customer Name, Client ID: WG L28818-1 QUAD CITY

Sample ID : 14L28818-1 Smple Date: 31-MAY-2006 16:10:00.

Sample Type : WG Geometry : 1435L091304 Quantity : 3.48660E+00 L BKGFILE: 14BG060306MT

Start Channel: 90 Energy Tol: 1.00000 Real Time : 0 11:42:33.99 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 11:42:27.05 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	65.93	739	1810	2.75	132.85	4.42E-01	1.75E-02	11.6	6.28E+00
2	1	92.55*	73	1160	1.30	186.23	1.15E+00	1.73E-03	98.4	3.83E-01
3	1	139.90	329	1318	1.35	281.17	1.67E+00	7.81E-03	20.6	4.02E-01
4	1	174.96	179	992	1.24	351.43	1.67E+00	4.25E-03	31.4	8.37E-01
5	1	185.87*	55	1337	2.05	373.30	1.64E+00	1.31E-033	149.4	4.06E-01
6	1	198.70*	308	1313	1.38	399.02	1.60E+00	7.30E-03	25.7	9.65E-01
7	1	238.76*	31	1028	1.34	479.26	1.47E+00	7.33E-042	225.9	9.72E-01
8	1	295.52	276	790	1.78	592.91	1.29E+00	6.54E-03	20.6	1.09E+00
9	1	352.17*	186	560	1.69	706.31	1.14E+00	4.41E-03	32.5	1.35E+00
10	1	582.38	142	395	3.06	1166.57	7.92E-01	3.37E-03	31.0	1.67E+00
11	1	595.88	230	361	2.33	1193.54	7.79E-01	5.45E-03	18.8	1.20E+00
12	1	609.23*	229	325	1.91	1220.19	7.66E-01	5.43E-03	21.5	2.17E+00
13	1	1120.28*	42	145	2.73	2238.69	4.81E-01	9.94E-04	77.1	6.65E-01
14	1	1461.02*	74	126	1.93	2915.48	3.93E-01	1.75E-03	51.1	1.48E+00
15	1	1765.90*	67	72	2.48	3519.49	3.44E-01	1.59E-03	40.9	2.77E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĊi/L	%Error
K-40	1460.81	74	10.67*	3.927E-01	3.230E+01	3.230E+01	102.15
RA-226	186.21	55	3.28*	1.640E+00	1.888E+01	1.888E+01	298.75
TH-228	238.63	31	44.60*	1.468E+00	8.674E-01	8.746E-01	451.87
	240.98		3.95	1.461E+00	Lir	ne Not Found	
U-235	143.76		10.50*	1.680E+00	Lir	ne Not Found	
	163.35		4.70	1.685E+00	Lir	ne Not Found	
	185.71	55	54.00	1.640E+00	1.147E+00	1.147E+00	298.75
	205.31		4.70	1.582E+00	Lir	ne Not Found	

Flag: "\*" = Keyline

Summary of Nuclide Activity Sample ID : 14L28818-1 Page: 2

Acquisition date : 8-JUN-2006 16:25:29

Total number of lines in spectrum 15

Number of unidentified lines 11
Number of lines tentatively identified by NID 4 26.67%

Nuclide Type : natural

			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĈi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	3.230E+01	3.230E+01	3.299E+01	102.15	
RA-226	1600.00Y	1.00	1.888E+01	1.888E+01	5.641E+01	298.75	
TH-228	1.91Y	1.01	8.674E-01	8.746E-01	39.52E-01	451.87	
U-235	7.04E+08Y	1.00	1.147E+00	1.147E+00	3.426E+00	298.75	K

Total Activity : 5.320E+01 5.320E+01

Grand Total Activity : 5.320E+01 5.320E+01

Flags: "K" = Keyline not found
"E" = Manually edited "M" = Manually accepted

"A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID : 14L28818-1

Page: 3 Acquisition date : 8-JUN-2006 16:25:29

26.67%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.93	739	1810	2.75	132.85	126	11	1.75E-02	23.2	4.42E-01	
1	92.55	73	1160	1.30	186.23	183	8	1.73E-03	****	1.15E+00	
1	139.90	329	1318	1.35	281.17	277	9	7.81E-03	41.2	1.67E+00	
1	174.96	179	992	1.24	351.43	348	8	4.25E-03	62.8	1.67E+00	
1	198.70	308	1313	1.38	399.02	393	11	7.30E-03	51.4	1.60E+00	
1	295.52	276	790	1.78	592.91	588	11	6.54E-03	41.1	1.29E+00	
1	352.17	186	560	1.69	706.31	702	11	4.41E-03	65.0	1.14E+00	
1	582.38	142	395	3.06	1166.57	1160	14	3.37E-03	62.0	7.92E-01	T
1	595.88	230	361	2.33	1193.54	1186	14	5.45E-03	37.7	7.79E-01	
1	609.23	229	325	1.91	1220.19	1214	12	5.43E-03	43.0	7.66E-01	
1	1120.28	42	145	2.73	2238.69	2233	13	9.94E-04	***	4.81E-01	
1	1765.90	67	72	2.48	3519.49	3513	16	1.59E-03	81.9	3.44E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 15 Number of unidentified lines 11
Number of lines tentatively identified by NID 4

Nuclide Type : natural

			Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĊi/L	2-Sigma Error	%Error Flag	gs
K-40	1.28E+09Y	1.00	3.230E+01	3.230E+01	3.299E+01	102.15	
RA-226	1600.00Y	1.00	1.888E+01	1.888E+01	5.641E+01	298.75	
TH-228	1.91Y	1.01	8.674E-01	8.746E-01	39.52E-01	451.87	
	Total Acti	.vity :	5.205E+01	5.206E+01			

Grand Total Activity: 5.205E+01 5.206E+01

Flags: "K" = Keyline not found
"E" = Manually edited "M" = Manually accepted

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.230E+01	3.299E+01	2.804E+01	0.000E+00	1.152
RA-226	1.888E+01	5.641E+01	7.351E+01	0.000E+00	0.257
TH-228	8.746E-01	3.952E+00	5.507E+00	0.000E+00	0.159

Nuclide		I.L. Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.781E+00	1.642E+01	2.714E+01	0.000E+00	0.066
NA-24	-1.808E-02	9.316E-03		too short	
CR-51	-3.038E+01	1.912E+01	3.034E+01	0.000E+00	-1.001
MN-54	-1.143E-01	1.832E+00	2.981E+00	0.000E+00	-0.038
CO-57	-2.165E-01	1.887E+00	3.126E+00	0.000E+00	-0.069
CO-58	-5.764E-01	1.928E+00	3.118E+00	0.000E+00	-0.185
FE-59	3.465E+00	3.831E+00	6.492E+00	0.000E+00	0.534
CO-60	1.878E-01	1.932E+00	3.195E+00	0.000E+00	0.059
ZN-65	7.420E+00	4.679E+00	7.002E+00	0.000E+00	1.060
SE-75	-4.003E-01	2.520E+00	4.158E+00	0.000E+00	-0.096
SR-85	1.993E+01	2.265E+00	4.341E+00	0.000E+00	4.590
Y-88	-1.573E+00	2.122E+00	3.329E+00	0.000E+00	-0.473
NB-94	3.954E-01	1.743E+00	2.894E+00	0.000E+00	0.137
NB-95	9.537E-01	1.918E+00	3.196E+00	0.000E+00	0.298
ZR-95	-2.481E+00	3.433E+00	5.500E+00	0.000E+00	-0.451
MO-99	-1.003E+02	1.040E+02	1.654E+02	0.000E+00	-0.607
RU-103	1.412E+00	2.138E+00	3.572E+00	0.000E+00	0.395
RU-106	-1.489E+01	1.781E+01	2.815E+01	0.000E+00	-0.529
AG-110m	-1.118E-01	1.792E+00	2.962E+00	0.000E+00	-0.038
SN-113	1.990E+00	2.530E+00	4.178E+00	0.000E+00	0.476
SB-124	-2.472E-01	4.798E+00	3.274E+00	0.000E+00	-0.075
SB-125	8.344E-01	5.286E+00	8.794E+00	0.000E+00	0.095
TE-129M	3.095E+01	2.361E+01	4.024E+01	0.000E+00	0.769
I-131	-5.945E-01	3.813E+00	6.187E+00	0.000E+00	-0.096
BA-133	7.942E+00	3.086E+00	4.585E+00	0.000E+00	1.732
CS-134	6.855E+00	4.501E+00	3.589E+00	0.000E+00	1.910
CS-136	1.329E+00	2.739E+00	4.547E+00	0.000E+00	0.292
CS-137	1.038E+00	1.966E+00	3.304E+00	0.000E+00	0.314
CE-139	-1.295E+00	1.988E+00	3.115E+00	0.000E+00	-0.416
BA-140	4.886E+00	1.006E+01	1.668E+01	0.000E+00	0.293
LA-140	2.070E+00	3.240E+00	5.529E+00	0.000E+00	0.374
CE-141	4.843E+00	4.312E+00	6.185E+00	0.000E+00	0.783
CE-144	-5.791E+00	1.690E+01	2.359E+01	0.000E+00	-0.246
EU-152	-9.003E+00	7.148E+00	9.456E+00	0.000E+00	-0.952
EU-154	-2.139E-01	3.894E+00	6.455E+00	0.000E+00	-0.033
AC-228	3.827E+00	7.561E+00	1.158E+01	0.000E+00	0.331
TH-232	3.817E+00	7.541E+00	1.155E+01	0.000E+00	0.331
U-235	2.975E+01	1.697E+01	2.466E+01	0.000E+00	1.207
U-238	1.086E+02	1.928E+02	3.244E+02	0.000E+00	0.335
AM-241	-1.414E+01	2.904E+01	4.025E+01	0.000E+00	-0.351

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C, K-40
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C, RA-226
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C, TH-228
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-0.351

C,AM-241

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-1.414E+01,

Sec. Review: Analyst: LIMS: \_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:08:27.50 TBE15 P-10635B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 8-JUN-2006 16:27:44.56

LIMS No., Customer Name, Client ID: WG L28818-2 EXELON QUAD

Sample ID : 15L28818-2 Smple Date: 31-MAY-2006 16:10:00.

 Sample Type
 : WG
 Geometry
 : 1535L090104

 Quantity
 : 3.30750E+00 L
 BKGFILE
 : 15BG060306MT

 Start Channel
 : 40
 Energy Tol
 : 1.50000
 Real Time
 : 0 11:40:32.80

End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 11:40:28.54 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.39	190	1091	1.21	120.25	4.37E-01	4.52E-03	29.9	1.27E+00
2	1	139.69	279	1030	1.20	267.66	1.48E+00	6.64E-03	20.7	4.10E-01
3	1	198.21	260	912	1.54	385.35	1.37E+00	6.19E-03	21.7	1.35E+00
4	1	294.11	103	650	1.85	578.19	1.05E+00	2.46E-03	47.0	1.21E+00
5	1	351.94*	106	495	2.02	694.45	9.16E-01	2.52E-03	49.3	2.27E+00
6	1	595.25	143	224	2.10	1183.56	5.98E-01	3.41E-03	22.5	1.22E+00
7	1	608.46	167	253	2.00	1210.10	5.87E-01	3.97E-03	20.7	8.69E-01
8	1	911.02	129	121	3.84	1818.08	4.23E-01	3.07E-03	18.1	1.12E+01
9	1	1460.22*	135	56	2.76	2921.04	2.91E-01	3.21E-03	22.1	2.05E+00
10	1	1763.77	60	56	2.95	3530.31	2.54E-01	1.42E-03	30.2	1.45E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĈi/L	%Error
K-40	1460.81	135	10.67*	2.908E-01	8.448E+01	8.448E+01	44.17
AC-228	835.50		1.75	4.539E-01	Lir	ne Not Found	
	911.07	129	27.70*	4.232E-01	2.140E+01	2.146E+01	36.11

Flag: "\*" = Keyline

Summary of Nuclide Activity

Page: 2

Sample ID: 15L28818-2 Acquisition date: 8-JUN-2006 16:27:44

Total number of lines in spectrum 10

Number of unidentified lines 8

Number of lines tentatively identified by NID 2 20.00%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma
Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags

K-40 1.28E+09Y 1.00 8.448E+01 8.448E+01 3.732E+01 44.17 AC-228 5.75Y 1.00 2.140E+01 2.146E+01 0.775E+01 36.11

Total Activity: 1.059E+02 1.059E+02

Grand Total Activity: 1.059E+02 1.059E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID: 15L28818-2 Page: 3
Acquisition date: 8-JUN-2006 16:27:44

20.00%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1	66.39 139.69 198.21 294.11 351.94 595.25 608.46 1763.77	190 279 260 103 106 143 167 60	1091 1030 912 650 495 224 253 56	1.21 1.20 1.54 1.85 2.02 2.10 2.00 2.95	1210.10	689 1179 1204	8 9 10 11 12 12	4.52E-03 6.64E-03 6.19E-03 2.46E-03 2.52E-03 3.41E-03 3.97E-03 1.42E-03	41.4 43.4 94.0 98.5 44.9 41.4	4.37E-01 1.48E+00 1.37E+00 1.05E+00 9.16E-01 5.98E-01 5.87E-01 2.54E-01	) ) ) L L

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 10
Number of unidentified lines 8
Number of lines tentatively identified by NID 2

Nuclide Type : natural

 Wtd Mean
 Wtd Mean
 Wtd Mean
 Uncorrected
 Decay Corr
 Decay Corr
 2-Sigma

 Nuclide
 Hlife
 Decay
 pCi/L
 pCi/L
 2-Sigma Error
 %Error Flags

 K-40
 1.28E+09Y
 1.00
 8.448E+01
 8.448E+01
 3.732E+01
 44.17

 AC-228
 5.75Y
 1.00
 2.140E+01
 2.146E+01
 0.775E+01
 36.11

 Total Activity:
 1.059E+02
 1.059E+02

Grand Total Activity : 1.059E+02 1.059E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.448E+01	3.732E+01	3.588E+01	0.000E+00	2.355
AC-228	2.146E+01	7.750E+00	1.212E+01	0.000E+00	1.771

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
NUCLLUC	(PCT/ T/		, <u>T</u>		

	0 6055 00	1.110E-02	Half-Life t	too short	
NA-24	-2.695E-02	2.067E+01	3.371E+01	0.000E+00	-0.371
CR-51	-1.251E+01	2.067E+01 2.161E+00	3.582E+00	0.000E+00	0.098
MN-54	3.506E-01	2.156E+00	3.251E+00	0.000E+00	0.024
CO-57	7.714E-02	2.136E+00 2.213E+00	3.590E+00	0.000E+00	-0.250
CO-58	-8.969E-01	4.453E+00	7.351E+00	0.000E+00	-0.017
FE-59	-1.238E-01	4.453E+00 2.235E+00	3.794E+00	0.000E+00	0.435
CO-60	1.650E+00		7.875E+00	0.000E+00	0.329
ZN-65	2.587E+00	4.651E+00	4.640E+00	0.000E+00	0.213
SE-75	9.896E-01	2.850E+00		0.000E+00	3.452
SR-85	1.657E+01	2.522E+00	4.802E+00 4.059E+00	0.000E+00	0.088
Y-88	3.561E-01	2.428E+00		0.000E+00	-0.129
NB-94	-4.549E-01	2.198E+00	3.540E+00	0.000E+00	0.663
NB-95	2.592E+00	2.265E+00	3.910E+00		-0.417
ZR-95	-2.632E+00	3.912E+00	6.314E+00	0.000E+00	-0.133
MO-99	-2.785E+01	1.267E+02	2.086E+02	0.000E+00	0.759
RU-103	3.119E+00	2.386E+00	4.110E+00	0.000E+00	-0.149
RU-106	-4.775E+00	1.980E+01	3.212E+01	0.000E+00	
AG-110m	7.546E-01	2.075E+00	3.430E+00	0.000E+00	0.220
SN-113	1.081E+00	2.777E+00	4.589E+00	0.000E+00	0.235
SB-124	3.132E+00	4.583E+00	3.674E+00	0.000E+00	0.852
SB-125	1.353E+00	5.996E+00	9.817E+00	0.000E+00	0.138
TE-129M	6.584E-01	2.796E+01	4.531E+01	0.000E+00	0.015
I-131	3.055E-01	4.119E+00	6.776E+00	0.000E+00	0.045
BA-133	1.541E+00	3.229E+00	4.589E+00	0.000E+00	0.336
CS-134	6.995E+00	3.643E+00	3.817E+00	0.000E+00	1.833
CS-136	1.219E-01	3.126E+00	5.163E+00	0.000E+00	0.024
CS-137	2.351E+00	2.296E+00	3.882E+00	0.000E+00	0.606
CE-139	8.536E-01	1.958E+00	3.262E+00	0.000E+00	0.262
BA-140	-2.259E+00	1.134E+01	1.860E+01	0.000E+00	-0.121
LA-140	-8.740E-01	3.866E+00	6.259E+00	0.000E+00	-0.140
CE-141	1.796E+00	4.378E+00	6.291E+00	0.000E+00	0.286
CE-144	-3.190E+00	1.702E+01	2.422E+01	0.000E+00	-0.132
EU-152	-2.851E+00	7.687E+00	1.060E+01	0.000E+00	-0.269
EU-154	1.963E+00	4.470E+00	6.789E+00	0.000E+00	0.289
RA-226	-4.989E+01	5.751E+01	8.183E+01	0.000E+00	-0.610
TH-228	-5.360E-01	4.366E+00	6.213E+00	0.000E+00	-0.086
TH-232	2.140E+01 +	7.729E+00	1.412E+01	0.000E+00	1.516
U-235	2.161E+01	1.683E+01	2.471E+01	0.000E+00	0.875
U-238	1.132E+02	2.376E+02	3.947E+02	0.000E+00	0.287
AM-241	-2.180E+01	2.479E+01	3.848E+01	0.000E+00	-0.567
₩1. 7.4.T	2.1001.01				

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                                             ,06/06/2006 10:43,1535L090104
                     ,LIBD
B,15L28818-2
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C, K-40
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                                    7.750E+00,
C, AC-228
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                      2.140E+01,
                                     7.729E+00,
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             , NO
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                      2.161E+01,
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                                     2.376E+02,
                      1.132E+02,
 C, U-238
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-2.180E+01,

C, AM-241

,NO,

3.848E+01,,

-0.567

Sec. Review: Analyst: LIMS: \_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:08:41.04 TBE23 03017322 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 8-JUN-2006 16:27:45.43

LIMS No., Customer Name, Client ID: WG L28818-3 EXELON QUAD

Sample ID : 23L28818-3 Smple Date: 31-MAY-2006 16:15:00.

Sample Type : WG Geometry : 2335L090704
Quantity : 3.23280E+00 L BKGFILE : 23BG060306MT
Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 11:40:41.85
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 11:40:12.93

MDA Constant : 0.00 Library Used: LIBD

Pk	Ιt	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	6	33.82*	138	82	1.19	67.97	9.44E-02	3.29E-03	25.9	1.07E+01
2	0	63.08*	56	1736	0.96	126.45	9.34E-01	1.32E-031	L56.2	
3	0	66.17	170	1091	0.91	132.61	1.03E+00	4.04E-03	31.9	
4	0	140.14*	179	1648	0.96	280.44	2.05E+00	4.25E-03	46.8	
5	0	198.14*	66	1143	0.92	396.37	1.90E+00	1.56E-033	104.7	
6	0	238.42*	0	960	0.98	476.87	1.73E+00	2.95E-06	****	
7	0	595.51	133	288	1.54	1190.70	8.74E-01	3.16E-03	25.4	
8	0	608.61*	44	297		1216.90	8.60E-01	1.05E-031	103.5	
9	0	911.44*	14	237		1822.41	6.38E-01	3.28E-042	282.2	
10	0	1119.92*	17	87		2239.35	5.53E-01	3.94E-043	157.0	
11	0	1646.40	23	88		3292.59	4.22E-01	5.36E-043	103.2	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	z-sigma
Nuclide	Energy	Area	%Abn	%Eff		pCi/L	%Error
AC-228	835.50		1.75	6.790E-01	Li	ne Not Found	
	911.07	14			1.549E+00	1100 III.00	
TH-228	238.63	0	44.60*	1.725E+00	3.203E-03	3.230E-0311	2767.99
	240.98		3.95	1.714E+00	Lj	ne Not Found	

Flag: "\*" = Keyline

Page : Summary of Nuclide Activity Sample ID: 23L28818-3

Acquisition date : 8-JUN-2006 16:27:45

11 Total number of lines in spectrum 9

Number of unidentified lines Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

2-Sigma Uncorrected Decay Corr Decay Corr 2-Sigma Error %Error Flags pCi/L pCi/L Hlife Decay Nuclide 8.768E+00 564.42

\_\_\_\_\_

1.554E+00 AC-228 5.75Y 1.00 1.549E+00 3642.E-03112767.99 1.01 3.203E-03 3.230E-03 TH-228 1.91Y

> 1.557E+00 1.552E+00 Total Activity:

1.557E+00 Grand Total Activity: 1.552E+00

"M" = Manually accepted Flags: "K" = Keyline not found

\_\_\_\_\_

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 23L28818-3

Page: 3 Acquisition date : 8-JUN-2006 16:27:45

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6 0 0 0 0 0	33.82 63.08 66.17 140.14 198.14 595.51 608.61 1119.92	138 56 170 179 66 133 44	82 1736 1091 1648 1143 288 297 87	1.19 0.96 0.91 0.96 0.92 1.54 1.70		122 131 276 393 1186 1212 2235	9 6 9 8 10 12	3.94E-04	**** 63.7 93.6 *** 50.8 ****	9.44E-02 9.34E-03 1.03E+00 2.05E+00 1.90E+00 8.74E-03 8.60E-03	1 0 0 0 1 1
0	1646.40	23	88	3.68	3292.59	3280	19	5.36E-04	***	4.22E-0	Т

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

11 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID

18.18%

Nuclide Type : natural

Nuclide AC-228 TH-228	Hlife 5.75Y 1.91Y	Decay 1.00	Wtd Mean Uncorrected pCi/L 1.549E+00 3.203E-03	Wtd Mean Decay Corr pCi/L 1.554E+00 3.230E-03	Decay Corr 2-Sigma Error 8.768E+00 3642.E-0311	%Error 564.42	
	Total Acti	vity:	1.552E+00	1.557E+00			

1.557E+00 Grand Total Activity: 1.552E+00

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
AC-228	1.554E+00	8.768E+00	9.384E+00	0.000E+00	0.166
TH-228	3.230E-03	3.642E+00	5.155E+00	0.000E+00	0.001

---- Non-Identified Nuclides ----

	key-Line			N (I ) 7)	MIDA OXXOX	Act/MDA
	Activity	К.Ь.	Act error	MDA	MDA error	ACC/ NDA
Muglido	(nCi/I)	hah T		(pCi/L)		

DH H	-4.902E+00	1.505E+01	2.492E+01	0.000E+00	-0.197
BE-7 NA-24	-7.101E-03	7.611E-03	Half-Life t		
NA-24 K-40	-1.178E+01	2.799E+01	4.809E+01	0.000E+00	-0.245
CR-51	-2.199E+01	1.716E+01	2.817E+01	0.000E+00	-0.781
MN-54	-3.678E-01	1.611E+00	2.699E+00	0.000E+00	-0.136
MN-54 CO-57	-1.432E+00	1.852E+00	3.061E+00	0.000E+00	-0.468
CO-57	-2.506E+00	1.650E+00	2.631E+00	0.000E+00	-0.953
FE-59	2.959E+00	3.221E+00	5.737E+00	0.000E+00	0.516
	1.180E+00	1.565E+00	2.777E+00	0.000E+00	0.425
CO-60	4.029E+00	3.874E+00	5.958E+00	0.000E+00	0.676
ZN-65	-4.554E-01	2.380E+00	4.010E+00	0.000E+00	-0.114
SE-75	1.588E+01	1.983E+00	3.847E+00	0.000E+00	4.127
SR-85	-1.037E+00	1.682E+00	2.808E+00	0.000E+00	-0.369
Y-88	4.718E-01	1.567E+00	2.683E+00	0.000E+00	0.176
NB-94	-1.598E-01	1.661E+00	2.804E+00	0.000E+00	-0.057
NB-95	-4.908E-01	2.927E+00	4.935E+00	0.000E+00	-0.099
ZR-95	-4.948E+01	9.241E+01	1.538E+02	0.000E+00	-0.322
MO-99	-3.982E-01	1.911E+00	3.169E+00	0.000E+00	-0.126
RU-103 RU-106	-7.791E-01	1.489E+01	2.533E+01	0.000E+00	-0.031
AG-110m	2.760E-01	1.532E+00	2.624E+00	0.000E+00	0.105
SN-113	-2.725E-01	2.183E+00	3.653E+00	0.000E+00	-0.075
SB-124	-2.899E-04	3.817E+00	2.799E+00	0.000E+00	0.000
SB-124 SB-125	6.297E-01	4.670E+00	7.849E+00	0.000E+00	0.080
TE-129M	-3.466E+00	2.134E+01	3.552E+01	0.000E+00	-0.098
I-131	-4.963E-01	3.429E+00	5.743E+00	0.000E+00	-0.086
BA-133	-1.832E-01	2.334E+00	3.915E+00	0.000E+00	-0.047
CS-134	3.342E+00	2.812E+00	3.032E+00	0.000E+00	1.102
CS-134 CS-136	-6.384E-01	2.295E+00	3.845E+00	0.000E+00	-0.166
CS-137	3.642E-01	1.701E+00	2.914E+00	0.000E+00	0.125
CE-139	-7.115E-01	1.876E+00	3.094E+00	0.000E+00	-0.230
BA-140	6.821E+00	9.064E+00	1.543E+01	0.000E+00	0.442
LA-140	1.717E+00	2.744E+00	4.910E+00	0.000E+00	0.350
CE-141	1.844E+00	4.300E+00	6.115E+00	0.000E+00	0.302
CE-141 CE-144	-1.704E+01	1.693E+01	2.347E+01	0.000E+00	-0.726
EU-152	-1.449E+01	5.352E+00	8.489E+00	0.000E+00	-1.707
EU-152	-2.399E+00	3.817E+00	6.317E+00	0.000E+00	-0.380
RA-226	-1.767E+01	5.345E+01	7.565E+01	0.000E+00	-0.234
TH-232	1.549E+00	+ 8.744E+00	1.100E+01	0.000E+00	0.141
U-235	1.036E+01	1.830E+01	2.419E+01	0.000E+00	0.428
U-233	1.753E+02	2.013E+02	3.179E+02	0.000E+00	0.552
AM-241	3.132E+01	1.136E+01	1.673E+01	0.000E+00	1.872
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3.132E+01,

C, AM-241

, NO

Sec. Review: Analyst: LIMS:  $-\frac{4}{3}$ 

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:07:29.38 TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 8-JUN-2006 18:00:52.13

LIMS No., Customer Name, Client ID: WG L28818-4 EXELON QUAD

Sample ID : 07L28818-4 Smple Date: 31-MAY-2006 16:40:00.

Sample Type : WG Geometry : 073L082504
Quantity : 3.06610E+00 L BKGFILE : 07BG060306MT
Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 10:06:34.81
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 10:06:27.57

MDA Constant : 0.00 Library Used: LIBD

Cts/Sec %Err Fit %Eff FWHM Channel Area Bkgnd Pk It Energy 8.12E-01 9.61E-03 20.4 2.73E+00 1.38 133.56 350 1248 66.49\* 1 1 2.36E+00 7.79E-03 24.0 2.89E+00 1.09 280.61 1036 283 2 139.96\* 1 2.24E+00 8.76E-03 21.2 5.09E+00 1.58 397.98 905 319 3 1 198.61\* 1.10E+00 3.39E-03 25.1 1.94E+00 1.47 1192.63 123 264 4 595.73 1 1.09E+00 3.28E-03 40.2 1.79E+00 1.88 1219.53 345 119 5 609.18\* 1 9.54E-01 2.90E-03 45.8 2.91E+00 9.41 1460.78 106 358 6 729.77 1 6.55E-01 1.45E-03 46.5 9.90E-01 2.10 2477.49 119 53 7 1 1238.16 5.83E-01 2.73E-03 37.3 3.97E+00 2.55 2923.62 100 98 1461.32\* 8 1

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

2-Sigma Uncorrected Decay Corr pCi/L %Error pCi/L %Eff %Abn Area Energy Nuclide 74.64 3.877E+01 3.877E+01 5.826E-01 10.67\* 100 1460.81 K-40

Flag: "\*" = Keyline

Summary of Nuclide Activity Page: 2

Acquisition date : 8-JUN-2006 18:00:52 Sample ID : 07L28818-4

Total number of lines in spectrum Number of unidentified lines 7

Number of lines tentatively identified by NID 1 12.50%

\_\_\_\_\_

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife pCi/L pCi/L 2-Sigma Error %Error Flags Decay

K-40 1.28E+09Y 1.00 3.877E+01 3.877E+01 2.894E+01 74.64

> \_\_\_\_\_\_ Total Activity: 3.877E+01 3.877E+01

Grand Total Activity: 3.877E+01 3.877E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit Unidentified Energy Lines Page: 3 Acquisition date : 8-JUN-2006 18:00:52 Sample ID : 07L28818-4

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.49	350	1248	1.38	133.56	129	9	9.61E-03	40.7	8.12E-01	
1	139.96	283	1036	1.09	280.61	276	9	7.79E-03	47.9	2.36E+00	1
1	198.61	319	905	1.58	397.98	393	10	8.76E-03	42.4	2.24E+00	1
1	595.73	123	264	1.47	1192.63	1189	9	3.39E-03	50.2	1.10E+00	•
1	609.18	119	345	1.88	1219.53	1213	13	3.28E-03	80.4	1.09E+00	)
1	729.77	106	358	9.41	1460.78	1447	21	2.90E-03	91.7	9.54E-01	
1	1238.16	53	119	2.10	2477.49	2472	14	1.45E-03	93.0	6.55E-01	•

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 8 Number of unidentified lines 7 Number of lines tentatively identified by NID 1

12.50%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma pCi/L 2-Sigma Error %Error Flags Nuclide Hlife Decay pCi/L 1.00 3.877E+01 K - 401.28E+09Y 3.877E+01 2.894E+01 74.64 \_\_\_\_\_ \_\_\_\_\_\_

3.877E+01

Grand Total Activity: 3.877E+01 3.877E+01

Flags: "K" = Keyline not found "M" = Manually accepted

3.877E+01

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Total Activity:

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.877E+01	2.894E+01	2.399E+01	0.000E+00	1.616
Non-To					

#### Non-Identified Nuclides

IVOII LUC	illitited Nuclides				
Nuclide	Key-Line Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	9.648E+00	1.388E+01	2.307E+01	0.000E+00	0.418
NA-24	-2.237E-02	7.623E-03	Half-Life to	oo short	
CR-51	-1.831E+01	1.560E+01	2.531E+01	0.000E+00	-0.723
MN-54	3.564E-01	1.541E+00	2.568E+00	0.000E+00	0.139

		1.500E+00	2.445E+00	0.000E+00	-0.096
CO-57	-2.353E-01	1.667E+00	2.741E+00	0.000E+00	-0.117
CO-58	-3.218E-01	3.189E+00	5.530E+00	0.000E+00	0.665
FE-59	3.678E+00	1.574E+00	2.657E+00	0.000E+00	0.395
CO-60	1.049E+00		5.760E+00	0.000E+00	1.018
ZN-65	5.864E+00	3.246E+00	3.374E+00	0.000E+00	-0.461
SE-75	-1.556E+00	2.100E+00	4.071E+00	0.000E+00	5.047
SR-85	2.055E+01	2.070E+00	2.863E+00	0.000E+00	0.134
Y-88	3.826E-01	1.707E+00	2.505E+00	0.000E+00	-0.250
NB-94	-6.263E-01	1.555E+00	2.738E+00	0.000E+00	0.370
NB-95	1.013E+00	1.613E+00	4.816E+00	0.000E+00	-0.048
ZR-95	-2.305E-01	2.974E+00	1.509E+02	0.000E+00	0.155
MO-99	2.345E+01	1.062E+02	2.955E+00	0.000E+00	0.294
RU-103	8.691E-01	1.794E+00		0.000E+00	-0.050
RU-106	-1.190E+00	1.485E+01	2.404E+01	0.000E+00	-0.005
AG-110m	-1.256E-02	1.550E+00	2.540E+00	0.000E+00	0.159
SN-113	5.375E-01	2.044E+00	3.390E+00	0.000E+00	-1.037
SB-124	-2.792E+00	4.166E+00	2.692E+00	0.000E+00	-0.048
SB-125	-3.393E-01	4.319E+00	7.062E+00	0.000E+00	0.313
TE-129M	1.032E+01	1.989E+01	3.294E+01	0.000E+00	-0.196
I-131	-9.608E-01	2.995E+00	4.912E+00	0.000E+00	1.258
BA-133	4.632E+00	2.118E+00	3.681E+00		0.930
CS-134	2.691E+00	2.826E+00	2.892E+00	0.000E+00	-0.066
CS-136	-2.478E-01	2.262E+00	3.727E+00	0.000E+00	0.530
CS-137	1.484E+00	1.659E+00	2.799E+00	0.000E+00	0.216
CE-139	5.324E-01	1.471E+00	2.469E+00	0.000E+00	0.093
BA-140	1.256E+00	8.077E+00	1.347E+01	0.000E+00	0.791
LA-140	3.648E+00	2.613E+00	4.615E+00	0.000E+00	0.671
CE-141	3.298E+00	3.479E+00	4.918E+00	0.000E+00	-0.536
CE-144	-9.907E+00	1.361E+01	1.850E+01	0.000E+00	-2.138
EU-152	-1.637E+01	4.984E+00	7.655E+00	0.000E+00	0.093
EU-154	4.743E-01	3.100E+00	5.080E+00	0.000E+00	-0.360
RA-226	-2.254E+01	4.087E+01	6.258E+01	0.000E+00	
AC-228	-1.514E+00	6.953E+00	1.000E+01	0.000E+00	-0.151
TH-228	4.178E+00	3.236E+00	5.029E+00	0.000E+00	0.831
TH-232	-1.510E+00	6.934E+00	9.973E+00	0.000E+00	-0.151
U-235	1.750E+01	1.365E+01	1.946E+01	0.000E+00	0.900
U-238	1.617E+02	1.672E+02	2.838E+02	0.000E+00	0.570
AM-241	-2.142E+01	1.630E+01	2.263E+01	0.000E+00	-0.947
131.1 C. T. L.					

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                     4.743E-01,
                                    3.100E+00,
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C, TH-228
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C,TH-232
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C, U-235
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C, U-238
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2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L28834 R1
Exelon
June 23, 2006



A Teledyne Technologies Company 2508 Quality Lane Knoxville, TN 37931-3133

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

#### Case Narrative - L28834 EX001-3ESPQUAD-06

06/23/2006 08:58

#### Sample Receipt

The following samples were received on June 5, 2006 in good condition, unless otherwise noted.

Only tritium was requested on the COC for WG-QC-MW-BFN-060106-JH-007, WG-QC-MW-STP-060106-JH-007, WG-QC-MW-101S-060106-JH-007. Gamma and Strontium were also analyzed per client request.

CRA supplied revised chain of custodies with revised client IDs.

Revision #1 - Strontium result for L28834-10 is being reported.

Cross Reference Table

	Cross Rejerence Tubi	ie –
Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-BFW-060106-JH-007	L28834-1	
WG-QC-MW-QC-STP-060106-JH-008	L28834-2	·
WG-QC-MW-QC-101S-060106-JH-026	L28834-3	
WG-QC-MW-QC-WELL #5-060106-JH-010	L28834-4	
WG-QC-MW-QC-WELL #1-060106-JH-009	L28834-5	
WG-QC-MW-QC-DCS-060106-JH-006	L28834-6	
WG-QC-MW-QC-FHW-053106-JH-004	L28834-7	
WS-QC-SW-QC-001-053106-JH-002	L28834-8	
WG-QC-MW-2-060106-JH-023	L28834-9	
WG-QC-MW-1-060106-JH-022	L28834-10	
WG-QC-MW-QC-1031-060106-JH-021	L28834-11	
WS-QC-SW-QC-002-053106-JH-003	L28834-12	777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 - 1777 -
WG-QC-MW-QC-LFW-053106-JH-005	L28834-13	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3	TBE-2010	EPA 906.0
TOTAL SR	TBE-2018	EPA 905.0



2508 Quality Lane Knoxville, TN 37931-3133

#### Case Narrative - L28834 EX001-3ESPQUAD-06

06/23/2006 08:58

#### Gamma Spectroscopy

#### **Quality Control**

Quality control samples were analyzed as WG4096, WG4097.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	Laboratory ID	QC Sample #
WG-ZN-MW-ZN-01U-052606-DS-05	L28833-13	WG4096-3
WG-QC-MW-QC-107I-053106-JH-011	L28837-2	WG4097-3

#### <u>H-3</u>

#### **Quality Control**

Quality control samples were analyzed as WG4089, WG4099.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### **Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	QC Sample #
WG-QC-MW-QC-103I-060106-JH-021	L28834-11	WG4099-3
WG-QC-MW-QC-103I-060106-JH-020	L28837-3	WG4089-3



A Teledyne Technologies Company 2508 Quality Lane Knoxville, TN 37931-3133

#### Case Narrative - L28834 EX001-3ESPQUAD-06

06/23/2006 08:58

#### TOTAL SR

#### **Quality Control**

Quality control samples were analyzed as WG4138,WG4170.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### **Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	<u>Laboratory ID</u>	QC Sample #
WG-QC-MW-QC-BFW-060106-JH-007	L28834-1	WG4138-3
RB-TMI-RB7-061206-MMM-062	L28973-1	WG4170-3

#### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter

Operations Manager

# Sample Receipt Summary

06/13/06 13:39

## Teledyne Brown Engineering L28834 R1 6 of 122 Sample Receipt Verification/Variance Report

SR #: SR08706

Client: Exelon

Project #: EX001-3ESPQUAD-06 LIMS #:L28834

Initiated By: RCHARLES  Init Date: 06/05/06 Receive Date: 06/05/0	06
IIII bacc. 00/03/00	on of Variance
	Contacted By:
Person Notified:	Contractor 21.
Notify Date:	
Notify Method:	
Notify Comment:	
Client Respo	onse
Person Responding:	
Response Date:	
Response Method:	
Response Comment	
	T. W. W. Commont
Criteria	Yes No NA Comment
1 Shipping container custody seals present and intact.	: NA
2 Sample container custody seals present and intact.	NA
3 Sample containers received in good condition	Y
4 Chain of custody received with samples	Y
5 All samples listed on chain of custody received	Y
6 Sample container labels present and legible.	Y
7 Information on container labels correspond with chain of custody	Y
8 Sample(s) properly preserved and in appropriate container(s)	NA >H <z< td=""></z<>
9 Other (Describe)	N
WG-QC-MW-BFN-060106-JH-007, WG-QC-MW-STP-060106-JH-007, WG-QC-MW-101S-060106-JH-007,	Does not match program analysis Does not match program analysis Does not match program analysis

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## Charles, Rebecca

From:

Shaw, Kathy [kshaw@craworld.com]

Wednesday, June 07, 2006 5:26 PM Sent:

Charles, Rebecca To:

Cc: Larry.Walton@exeloncorp.com

Subject: 45136-28 Quad Cities

## Hi Rebecca,

I have revised the COCs for the the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

## Kathy Shaw - Chemist

Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, Connecticut 06062 PH 860 747-1800 Fax 860 747-1900 CRAWORLD.COM

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## Charles, Rebecca

From:

Shaw, Kathy [kshaw@craworld.com]

Sent:

Tuesday, June 06, 2006 11:10 AM

To:

Charles, Rebecca; Larry.Walton@exeloncorp.com

Cc:

Reid, James; Klick, Pat

Subject: RE: Rush tritium from Quad Cities

Hi Rebecca,

This is from the our station PM:

Please let the lab know for BFN, STP, and 101S that the samples should be run for strontium and gamma spec in addition to tritium.

Please let me know if you have any more questions.

Thanks, Kathy

From: Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]

**Sent:** Mon 6/5/2006 4:41 PM **To:** Larry.Walton@exeloncorp.com

Cc: Shaw, Kathy

Subject: RE: Rush tritium from Quad Cities

Larry,

I finally matched up all the COC information and SR, Gamma, and H-3 is requested for all of the Quad Cities samples except for BFN, STP and 101S. These samples are only being requested for tritium. We received both containers for these samples. Should we run all of the analyses?

Rebecca Charles
Teledyne Brown Engineering
Project Manager
(865) 934-0379
(865) 934-0396 (fax)

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----Original Message----

From: Larry.Walton@exeloncorp.com [mailto:Larry.Walton@exeloncorp.com]

Sent: Monday, June 05, 2006 4:32 PM

To: Charles, Rebecca

Subject: RE: Rush tritium from Quad Cities

107S & 107I 104S & 104I ----Original Message----

From: Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]

Sent: Monday, June 05, 2006 3:32 PM

To: Walton, Larry

**Cc:** Karpa, Zigmund A; Tomlinson, Joyce **Subject:** Rush tritium from Quad Cities

Larry,

We cannot complete all of the tritiums by tomorrow. Do you have some that are higher priority than others? There are 23 samples for tritium.

There are also 4 samples that only request strontium and gamma and only the cubitainer was sent (not the glass tritium jar).

The Sr and gamma samples are: WG-QC-SW-QC-002-053106-JH-003, WG-QC-SW-QC-001-053106-JH-002, Wg-QC-MW-QC-LFH-053106-JH-005 WG-QC-MW-QC-FHN-053106-JH-004

There are several samples that only request tritium and we only received the small glass jars

There are three samples which only request tritium and we received both the glass jars and the cubitainer.

wG-QC-MW-QC-BFN-060106-JH-007 WG-QC-MW-QC-STP-060106-JH-008 WG-QC-MW-QC-101S-060106-JH-026

Rebecca Charles
Teledyne Brown Engineering
Project Manager
(865) 934-0379
(865) 934-0396 (fax)

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6/6/06

TELEDYNE BROWN ENGINEERING 2508 Quality Lane Knoxville, TN 37931-3133

# ACKNOWLEDGEMENT This is not an invoice

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, CT 06062

June 06, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 05, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 12, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Repeace

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely, Rebecca Charles Project Manager (865)934-0379

Project ID: EX001-3ESPQUAD-06

P.O. #: 00411203

Release #:

Contract#: 00411203

Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Start Collect End Collect Price Date/Time Date/Time
WG-QC-MW-QC-BFW-060	L06-JH-00 L28834-1	06/01/06:0850
WG	GELI	108.00
WG	H-3	108.00
WG	SR-90 (FAST)	210.00
WG-QC-MW-QC-STP-0601	.06-JH-00 <b>L28834</b> -2	06/01/06:0905
WG	GELI	108.00
WG	H-3	162.00
WG	SR-90 (FAST)	140.00
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WG	GELI	108.00
WG	H-3	162.00
WG	SR-90 (FAST)	140.00
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WG	GELI	108.00
WG	H-3	162.00
WG	SR-90 (FAST)	140.00
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WG	GELI	108.00
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# Internal Chain of Custody

06/05/2006 00:00

Teledyne Brown Engineering
Internal Chain of Custody

Internal Chain of Custody \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-1 Containernum 1 Analyst Prod H-3 ΕJ LCB SR-90 (FAST) ΕJ **GELI** Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-1 Containernum 2 Analyst Prod H-3 ЕJ LCB SR-90 (FAST) GELI EJ Relinquish Date Relinquish By Received By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-2 Containernum 1 Prod Analyst H-3 ΕJ ЕJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-2 Containernum 2 Analyst Prod H-3 ΕJ GELI EJ SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-3 Containernum Analyst Prod H-3ΕJ ЕJ GELI LCB SR-90 (FAST) Relinquish Date Relinquish By Received By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-3 Analyst Prod H-3 EJ EJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By

\*\*\*\*\*\*\*\*\*\*\*\*\*

099999

Sample Custodian

06/23/06 08:15

Teledyne Brown Engineering Internal Chain of Custody

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28834-4

Containernum 1

Prod

Analyst

H-3

ΕJ

SR-90 (FAST)

LCB

**GELI** 

EJ

Relinquish Date Relinquish By

Received By

06/05/2006 00:00

099999

Sample Custodian

Sample # L28834-4

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2

Prod

Analyst

H-3

ΕJ

SR-90 (FAST)

LCB

**GELI** 

ΕJ

Relinquish Date Relinquish By 06/05/2006 00:00

Received By

099999

Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-5

Containernum 1

Analyst

Prod H-3

ЕJ

SR-90 (FAST)

LCB

GELI

ЕJ

Relinquish Date Relinquish By

06/05/2006 00:00

Received By

099999

Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-5

Containernum 2

Analyst

Prod H-3

ΕJ

SR-90 (FAST)

LCB

GELI

ΕJ

Relinquish Date Relinquish By

Received By

06/05/2006 00:00

099999

Sample Custodian

\* Sample # L28834-6

Containernum

Prod

Analyst

H-3

ЕJ

SR-90 (FAST)

LCB

GELI

Prod

E.T

Relinquish Date Relinquish By

Received By

099999

Sample Custodian

06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Containernum 2

Sample # L28834-6

Analyst

H-3

ΕJ

SR-90 (FAST)

LCB

GELI

E.T

Relinquish Date Relinquish By

06/05/2006 00:00

Received By

Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

099999

Teledyne Brown Engineering
Internal Chain of Custody

Internal Chain of Custody \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L28834-7 Analyst Prod H-3 ΕJ ЕJ GELI SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \* Containernum 2 Sample # L28834-7 Analyst Prod H-3ЕJ **GELI** ΕJ LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L28834-8 Analyst Prod H-3 EJ LCB SR-90 (FAST) ЕJ **GELI** Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-8 Analyst Prod ΕJ H-3 LCB SR-90 (FAST) **GELI** ЕJ Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L28834-9 Analyst Prod ЕJ H-3LCB SR-90 (FAST) ΕJ **GELI** Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-9 Analyst Prod H-3ΕJ LCB SR-90 (FAST)

Received By

Sample Custodian

099999

EJ

\*\*\*\*\*\*\*\*\*\*\*

GELI

06/05/2006 00:00

Relinquish Date Relinquish By

Relinquish Date Relinquish By

06/05/2006 00:00

Teledyne Brown Engineering

Internal Chain of Custody \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L28834-10 Analyst Prod ЕJ H-3 SR-90 (FAST) CJF GELI EJ Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-10 Containernum 2 Analyst Prod H-3ΕJ SR-90 (FAST) CJF GELI E.T Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L28834-11 Analyst Prod H-3 ЕJ LCB SR-90 (FAST) ΕJ **GELI** Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-11 Prod Analyst ΕJ H-3 LCB SR-90 (FAST) GELI E.T Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28834-12 Containernum 1 Analyst Prod H-3ЕJ ΕJ GELI SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-12 Analyst Prod H-3 EJ ЕJ GELI LCB SR-90 (FAST) Received By

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

099999

Sample Custodian

L28834 R1 33 of 122

06/23/06 08:15

Teledyne Brown Engineering Internal Chain of Custody

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L28834-13

Containernum 1

Prod

Analyst

H-3

ΕJ

**GELI** 

ΕJ

SR-90 (FAST)

LCB

Relinquish Date Relinquish By

Received By

06/05/2006 00:00

099999

Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L28834-13

Prod H-3

Analyst

ЕJ

GELI

ΕJ

SR-90 (FAST)

06/05/2006 00:00

LCB

Relinquish Date Relinquish By

Received By

099999

Sample Custodian

Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

		1,28834		******
L28834-1	WG			
		WG-QC-MW-QC-BFW-0601		Date
<u>Process step</u> Login	Prod		Analyst RCHARLES	<u>Date</u> 06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		ILL	06/09/06
Count Room	н-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	*****	*****	*******
L28834-2	WG	WG-QC-MW-QC-STP-0603	106-ЈН-008	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		WVM	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	*****	*****	*******
L28834-3	WG	WG-QC-MW-QC-101S-060	0106-ЈН-026	
Process step	Prod		Analyst	Date
Login	** 0		RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI	(57.65)	EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3	(	KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
				******
L28834-4	WG	WG-QC-MW-QC-WELL #5		Data
Process step	Prod		Analyst	<u>Date</u>
Login	11 2		RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06 06/08/06
Aliquot	GELI	(EACH)	EJ	06/09/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/07/06
Count Room	H-3	(Encm)	KPW	
Count Room	SR-90	(FAST)	KOJ	06/12/06
				*****
L28834-5	WG	WG-QC-MW-QC-WELL #1		Date
Process step	<u>Prod</u>		Analyst	<u>Date</u>
Login	נו כ		RCHARLES	06/05/06 06/06/06
Aliquot	H-3		EJ	
Aliquot	GELI	/ E7 Cm \	EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06

Page 2 of 3

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

L28834-5	WG	WG-QC-MW-QC-WELL #1-	060106-ЈН-009	
Count Room	Н-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/13/06
*****	*****	******	******	******
L28834-6	WG	WG-QC-MW-QC-DCS-0601	06-ЈН-006	
Process step	Prod		<u>Analyst</u>	Date
Login			RCHARLES	06/05/06
Aliquot	н-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	******	*****	******
L28834-7	WG	WG-QC-MW-QC-FHW-0531	06-ЈН-004	
Process step	Prod		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	******	*****	*******
L28834-8	WG	WS-QC-SW-QC-001-0531		
L28834-8 Process step	<b>WG</b> Prod	WS-QC-SW-QC-001-0531	.06-JH-002 Analyst	<u>Date</u>
		WS-QC-SW-QC-001-0531		06/05/06
Process step		WS-QC-SW-QC-001-0531	<u>Analyst</u>	
Process step Login	Prod	WS-QC-SW-QC-001-0531	Analyst RCHARLES	06/05/06
Process step Login Aliquot	Prod H-3	WS-QC-SW-QC-001-0531 (FAST)	Analyst RCHARLES EJ	06/05/06 06/06/06
Process step Login Aliquot Aliquot	Prod H-3 GELI		Analyst RCHARLES EJ EJ	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06
Process step Login Aliquot Aliquot Aliquot	Prod H-3 GELI SR-90		Analyst RCHARLES EJ EJ LCB	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST)	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST)	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST)	Analyst RCHARLES EJ LCB KPW KPW KOJ	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST) (FAST) *******	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 *******	(FAST) (FAST) *******	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 *******	(FAST) (FAST) *******	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod	(FAST) (FAST) *******	Analyst RCHARLES EJ EJ LCB KPW KOJ ***********************************	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3	(FAST) (FAST) *******	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI	(FAST) (FAST) ************************************	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI SR-90	(FAST) (FAST) ************************************	Analyst RCHARLES EJ EJ LCB KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI SR-90 GELI	(FAST) (FAST) ************************************	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ********** L28834-9 Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST)  (FAST)  ***********************************	Analyst RCHARLES EJ EJ LCB KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ********** L28834-9 Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room Count Room Count Room Count Room	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI SR-90 GELI H-3 SR-90	(FAST)  (FAST)  ***********************************	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ******* WG Prod H-3 GELI SR-90 GELI H-3 SR-90 ******	(FAST)  (FAST)  ***********************************	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/06/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************
Process step Login Aliquot Aliquot Aliquot Count Room Count Room ***********************************	Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG Prod H-3 GELI SR-90 GELI H-3 SR-90 ****** WG	(FAST)  (FAST)  ***********************************	Analyst RCHARLES EJ EJ LCB KPW KPW KOJ ***********************************	06/05/06 06/05/06 06/08/06 06/09/06 06/09/06 06/07/06 06/12/06 ************************************

06/23/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

L28834-10	WG	WG-QC-MW-1-060106-JF	I-022	
Aliquot	Н-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	CJF	06/21/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/22/06
*****	*****	*****	******	********
L28834-11	WG	WG-QC-MW-QC-103I-060	0106-ЈН-021	
Process step	Prod		<u>Analyst</u>	Date
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		WVM	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room		(FAST)	KOJ	06/12/06
****	*****	*****	*****	*********
L28834-12	WG	WS-QC-SW-QC-002-053	106-JH-003	
Process step	Prod		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room		(FAST)	KOJ	06/12/06
********	*****	******	*****	*********
L28834-13	WG	WG-QC-MW-QC-LFW-053		
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90	(FAST)	KOJ	06/12/06

# Analytical Results Summary

06/23/06 08:18



#### L28834

#### Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-BFW-060106-JH-007 Sample ID:

Collect Start: 06/01/2006 08:50

Matrix: Ground Water

(WG)

Station:

Volume:

Collect Stop: Receive Date: 06/05/2006

% Moisture:

Description:

LIMS Number: 1.28834-1

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	Values
H-3	2010	7.40E+02	1.52E+02	1.86E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	8.72E-01	7.18E-01	1.26E+00	pCi/L		450	ml	06/01/06 08:50	06/12/06	200	M	U	
MN-54	2007	1.15E-01	2.90E+00	4.78E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
CO-58	2007	3.08E+00	2.86E+00	5.04E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
FE-59	2007	3.16E+00	6.18E+00	1.05E+01	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
CO-60	2007	4.10E-01	2.83E+00	4.74E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
ZN-65	2007	3.15E+00	6.48E+00	1.10E+01	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
NB-95	2007	2.68E+00	2.89E+00	5.06E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
ZR-95	2007	-4.24E+00	5.25E+00	8.28E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
CS-134	2007	2.79E+00	4.93E+00	5.26E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
CS-137	2007	-1.63E+00	3.24E+00	4.99E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
BA-140	2007	-8.23E+00	1.45E+01	2.35E+01	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No
LA-140	2007	-1.16E+00	5.20E+00	8.45E+00	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

High Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification Spec Low recovery

High recovery

Page 1 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-STP-060106-JH-008

Collect Start: 06/01/2006 09:05

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-2

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag V	alues
H-3	2010	1.81E+02	1.17E+02	1.75E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	1.67E-01	7.73E-01	1.45E+00	pCi/L		450	ml	06/01/06 09:05	06/12/06	200	M	U	
MN-54	2007	-8.71E-01	3.05E+00	4.87E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
CO-58	2007	-1.96E-01	3.47E+00	5.67E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
FE-59	2007	6.95E+00	6.57E+00	1.18E+01	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
CO-60	2007	1.41E+00	3.32E+00	5.68E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
ZN-65	2007	-6.90E+00	6.60E+00	9.87E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
NB-95	2007	4.97E-01	3.22E+00	5.35E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
ZR-95	2007	3.32E+00	5.83E+00	9.97E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
CS-134	2007	-1.85E+00	4.34E+00	5.89E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
CS-137	2007	9.85E-01	3.52E+00	5.93E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
BA-140	2007	1.33E+01	1.70E+01	2.89E+01	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No
LA-140	2007	3.35E+00	5.39E+00	9.56E+00	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U	No

Flag Values

U = Compound/Analyte not detected or less than 3 sigma

+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

High = Activity concentration exceeds customer reporting value

Spec = MDC exceeds customer technical specification L = Low recovery

H = High recovery

Page 2 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-101S-060106-JH-026

Collect Start: 06/01/2006 14:20

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-3

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	y Values
H-3	2010	1.56E+02	1.22E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	U	
TOTAL SR	2018	8.59E-01	7.13E-01	1.25E+00	pCi/L		450	ml	06/01/06 14:20	06/12/06	200	M	U	
MN-54	2007	-2.96E-01	2.76E+00	4.50E+00	pCi/L	-	3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CO-58	2007	-6.30E-02	2.52E+00	4.15E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
FE-59	2007	3.18E+00	6.10E+00	9.91E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CO-60	2007	2.23E+00	2.80E+00	4.94E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
ZN-65	2007	8.18E+00	6.11E+00	1.00E+01	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
NB-95	2007	7.16E-01	2.76E+00	4.65E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
ZR-95	2007	-1.27E+00	5.06E+00	8.25E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CS-134	2007	-2.23E+00	3.37E+00	4.40E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CS-137	2007	-9.96E-02	2.74E+00	4.45E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
BA-140	2007	2.75E+00	1.33E+01	2.22E+01	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
LA-140	2007	-4.42E+00	4.85E+00	7.10E+00	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 3 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



(WG)

#### L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-WELL #5-060106-JH-010

Station:

Description: LIMS Number: L28834-4 Collect Start: 06/01/2006 09:30

Collect Stop:

Receive Date: 06/05/2006

Matrix: Ground Water

Volume:

% Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	FI:	ag Values
H-3	2010	6.31E+01	1.19E+02	1.89E+02	pCi/L		10	ml		06/07/06	60	М	U	
TOTAL SR	2018	4.70E-01	7.15E-01	1.30E+00	pCi/L		450	ml	06/01/06 09:30	06/12/06	200	M	U	
MN-54	2007	1.49E+00	2.56E+00	4.29E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
CO-58	2007	1.21E-01	2.58E+00	4.22E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
FE-59	2007	3.15E+00	5.34E+00	9.01E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
CO-60	2007	6.36E-01	2.45E+00	4.10E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
ZN-65	2007	6.97E+00	5.47E+00	9.52E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
NB-95	2007	-8.61E-01	2.70E+00	4.37E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
ZR-95	2007	-1.47E+00	4.91E+00	7.95E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
CS-134	2007	2.84E+00	4.87E+00	4.79E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
CS-137	2007	1.78E+00	2.61E+00	4.44E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
BA-140	2007	-7.35E+00	1.38E+01	2.21E+01	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No
LA-140	2007	8.00E-02	4.17E+00	6.91E+00	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec Low recovery

High recovery

Page 4 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



## L28834

#### Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-WELL #1-060106-JH-009

Collect Start: 06/01/2006 09:15

Ground Water

(WG)

Station:

Collect Stop:

Matrix: Volume:

Description:

Receive Date: 06/05/2006

06

% Moisture:

LIMS Number: L28834-5

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Fla	g Values
H-3	2010	1.32E+02	1.21E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	U	
TOTAL SR	2018	-1.19E-02	7.92E-01	1.58E+00	pCi/L		450	ml	06/01/06 09:15	06/13/06	150	M	U	
MN-54	2007	-1.15E+00	2.81E+00	4.52E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
CO-58	2007	-6.44E-01	2.79E+00	4.55E+00	pCi/L	1	3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
FE-59	2007	4.96E-01	5.53E+00	9.23E+00	pCi/L	T	3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
CO-60	2007	2.11E+00	2.88E+00	4.99E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
ZN-65	2007	5.59E+00	5.78E+00	1.02E+01	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
NB-95	2007	1.64E+00	2.85E+00	4.87E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
ZR-95	2007	-1.78E+00	4.90E+00	7.96E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
CS-134	2007	9.46E+00	5.45E+00	5.13E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U*	No
CS-137	2007	3.19E+00	2.94E+00	5.08E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
BA-140	2007	5.66E-01	1.51E+01	2.49E+01	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No
LA-140	2007	1.07E-04	4.73E+00	7.82E+00	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U	No

Flag Values

U = Compound/Analyte not detected or less than 3 sigma

+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

High = Activity concentration exceeds customer reporting value

Spec = MDC exceeds customer technical specification

L = Low recovery

H = High recovery

Page 5 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



(WG)

#### L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-DCS-060106-JH-006

Collect Start: 06/01/2006 08:20

Ground Water

Station:

Collect Stop:

Matrix:

Volume:

Description:

LIMS Number: L28834-6

Receive Date: 06/05/2006

% Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	4.09E+01	1.16E+02	1.87E+02	pCi/L	T	10	ml		06/07/06	60	M	U
TOTAL SR	2018	1.15E-01	6.24E-01	1.17E+00	pCi/L		450	ml	06/01/06 08:20	06/12/06	200	M	U
K-40	2007	1.06E+02	3.37E+01	4.20E+01	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	+ Yes
MN-54	2007	1.17E+00	2.68E+00	4.32E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CO-58	2007	-9.19E-01	2.73E+00	4.37E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
FE-59	2007	4.09E+00	5.85E+00	1.00E+01	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CO-60	2007	9.47E-01	3.00E+00	5.15E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U Yes
ZN-65	2007	-2.59E+00	5.67E+00	8.96E+00	pCi/L	1	3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
NB-95	2007	1.66E+00	2.67E+00	4.54E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
ZR-95	2007	-5.86E+00	4.47E+00	6.71E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CS-134	2007	5.11E+00	5.24E+00	4.54E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CS-137	2007	9.83E-01	2.69E+00	4.55E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
BA-140	2007	7.74E+00	1.34E+01	2.26E+01	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
LA-140	2007	2.58E+00	4.68E+00	8.11E+00	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No

Flag Values

Compound/Analyte not detected or less than 3 sigma

= Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

= MDC exceeds customer technical specification Spec Low recovery

High recovery

Page 6 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



#### L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-FHW-053106-JH-004 Sample ID:

Collect Start: 05/31/2006 09:10

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-7

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Fla	g Values
H-3	2010	1.70E+01	1.13E+02	1.84E+02	pCi/L		10	ml		06/07/06	60	M	U	AAA AAA AAA AAA AAA AAA AAA AAA AAA AA
TOTAL SR	2018	5.80E-01	6.47E-01	1.16E+00	pCi/L		450	ml	05/31/06 09:10	06/12/06	200	M	U	
MN-54	2007	7.96E-01	2.23E+00	3.75E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
CO-58	2007	-2.81E+00	2.42E+00	3.76E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
FE-59	2007	4.43E+00	4.64E+00	8.13E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
CO-60	2007	5.39E-01	2.30E+00	3.81E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
ZN-65	2007	1.01E+01	5.89E+00	9.38E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U*	No
NB-95	2007	1.87E+00	2.39E+00	4.13E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
ZR-95	2007	-2.56E+00	4.32E+00	6.79E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
CS-134	2007	6.75E+00	4.69E+00	4.67E+00	pCi/L	:	3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
CS-137	2007	1.20E+00	2.49E+00	4.17E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
BA-140	2007	9.08E-01	1.26E+01	2.09E+01	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No
LA-140	2007	2.07E+00	4.07E+00	6.96E+00	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U	No

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Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery High recovery

Page 7 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WS-QC-SW-QC-001-053106-JH-002

Collect Start: 05/31/2006 08:20

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-8

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	Values
H-3	2010	5.50E+02	1.43E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	1.23E+00	7.75E-01	1.33E+00	pCi/L		450	ml	05/31/06 08:20	06/12/06	200	M	U	
MN-54	2007	2.20E+00	2.35E+00	4.06E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
CO-58	2007	1.87E-02	2.56E+00	4.23E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
FE-59	2007	4.47E+00	5.29E+00	9.15E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
CO-60	2007	8.13E-01	2.57E+00	4.34E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
ZN-65	2007	3.12E+00	5.42E+00	9.22E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
NB-95	2007	1.79E+00	2.52E+00	4.32E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
ZR-95	2007	1.92E-01	4.48E+00	7.46E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
CS-134	2007	6.75E+00	4.31E+00	4.12E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U*	No
CS-137	2007	-5.94E-01	2.70E+00	4.17E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
BA-140	2007	2.09E+00	1.26E+01	2.11E+01	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No
LA-140	2007	2.24E+00	4.61E+00	7.92E+00	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U	No

Flag Values

U = Compound/Analyte not detected or less than 3 sigma

+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

High = Activity concentration exceeds customer reporting value

Spec = MDC exceeds customer technical specification L = Low recovery

H = High recovery

Page 8 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



#### L28834

## Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-OC-MW-2-060106-JH-023 Collect Start: 06/01/2006 10:18

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-9

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	Values
H-3	2010	2.50E+02	1.26E+02	1.82E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	5.72E-01	4.78E-01	8.45E-01	pCi/L		450	ml	06/01/06 10:18	06/12/06	200	M	U	
ζ-40	2007	1.45E+02	5.05E+01	4.09E+01	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	+	Yes
MN-54	2007	2.86E+00	2.33E+00	4.27E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
CO-58	2007	3.79E-01	2.61E+00	4.52E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
FE-59	2007	3.39E+00	5.10E+00	9.24E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
CO-60	2007	3.70E-01	2.42E+00	4.28E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
ZN-65	2007	3.96E+00	5.22E+00	9.50E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
NB-95	2007	1.62E+00	2.58E+00	4.58E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
ZR-95	2007	-2.44E+00	4.49E+00	7.50E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
CS-134	2007	1.21E+00	4.81E+00	4.92E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
CS-137	2007	-1.26E-01	2.67E+00	4.60E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
3A-140	2007	8.81E+00	1.37E+01	2.38E+01	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No
A-140	2007	2.31E+00	4.07E+00	7.55E+00	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U	No

Page 9 of 13

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery

No = Peak not identified in gamma spectrum Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis

unless otherwise noted

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-1-060106-JH-022 Sample ID:

Collect Start: 06/01/2006 09:17

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-10

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	y Values
H-3	2010	1.75E+02	1.22E+02	1.83E+02	pCi/L	1	10	ml		06/07/06	60	М	U	
TOTAL SR	2018	4.28E-01	5.17E-01	9.79E-01	pCi/L		450	ml	06/01/06 09:17	06/22/06	120	M	U	
MN-54	2007	-1.46E+00	2.91E+00	4.61E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
CO-58	2007	1.69E-01	3.14E+00	5.17E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
FE-59	2007	3.71E+00	6.03E+00	1.04E+01	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
CO-60	2007	-2.06E+00	2.80E+00	4.27E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
ZN-65	2007	5.77E+00	6.35E+00	1.11E+01	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
√B-95	2007	1.43E+00	3.02E+00	5.10E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
ZR-95	2007	8.86E-01	5.46E+00	9.06E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
CS-134	2007	2.25E+00	6.08E+00	5.46E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
CS-137	2007	-1.94E+00	2.84E+00	4.50E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
3A-140	2007	8.36E-01	1.52E+01	2.47E+01	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No
A-140	2007	-5.78E+00	5.54E+00	8.34E+00	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec Low recovery

High recovery

Page 10 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

06/23/06 08:18



(WG)

L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-103I-060106-JH-021 Sample ID:

Collect Start: 06/01/2006 08:30

Matrix: Ground Water

Station:

Volume:

Collect Stop: Receive Date: 06/05/2006

% Moisture:

Description:

LIMS Number: 1.28834-11

Radionuclide H-3	SOP#	Activity Conc	Uncertainty 2 Sigma 1.21E+02	MDC 1.81E+02	Units pCi/L		Aliquot Volume	· -	Reference Date	Count Date 06/07/06	Count Time	Count Units M	Flag Values	
							10						+	
TOTAL SR	2018	5.12E-02	6.39E-01	1.21E+00	pCi/L		450	ml	06/01/06 08:30	06/12/06	200	M	U	
MN-54	2007	1.19E+00	2.14E+00	3.65E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
CO-58	2007	-1.71E+00	2.44E+00	3.85E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
FE-59	2007	4.03E+00	4.58E+00	8.08E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
CO-60	2007	-1.62E+00	2.50E+00	3.84E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
ZN-65	2007	3.74E+00	5.06E+00	8.79E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
NB-95	2007	-1.73E+00	2,44E+00	3.86E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
ZR-95	2007	-7.83E-01	4.30E+00	7.05E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
CS-134	2007	-5.80E-01	2.85E+00	3.89E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
CS-137	2007	8.80E-01	2.33E+00	3.88E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
BA-140	2007	1.99E+00	1.15E+01	1.92E+01	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No
LA-140	2007	2.36E+00	4.14E+00	7.16E+00	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U	No

Page 11 of 13

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery Η

\*\*\*\* Results are reported on an as received basis

unless otherwise noted

No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

Yes = Peak identified in gamma spectrum

### Report of Analysis



(WG)

### L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WS-QC-SW-QC-002-053106-JH-003 Sample ID:

Collect Start: 05/31/2006 08:50

Matrix: Ground Water

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28834-12

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values	s
H-3	2010	4.97E+02	1.40E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	6.33E-02	6.31E-01	1.19E+00	pCi/L		450	ml	05/31/06 08:50	06/12/06	200	M	U	-
K-40	2007	9.73E+01	4.46E+01	3.49E+01	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	+ Y	es
MN-54	2007	-9.36E-02	2.24E+00	3.65E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U N	lo l
CO-58	2007	-7.72E-01	2.32E+00	3.73E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	lo
FE-59	2007	3.46E+00	4.91E+00	8.36E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	10
CO-60	2007	1.66E-01	2.69E+00	4.11E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	lo
ZN-65	2007	2.50E+00	5.71E+00	8.15E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U N	lo
NB-95	2007	2.10E+00	2.31E+00	3.97E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	10
ZR-95	2007	3.99E-01	4.29E+00	7.09E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	10
CS-134	2007	2.90E+00	4.69E+00	3.74E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U	lo l
CS-137	2007	3.87E-01	2.27E+00	3.79E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	Vo.
BA-140	2007	-3.04E+00	1.22E+01	1.97E+01	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	No.
LA-140	2007	7.05E-01	4.34E+00	7.27E+00	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	UN	10

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

High Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 12 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

### Report of Analysis

06/23/06 08:18



### L28834

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-LFW-053106-JH-005 Sample ID:

Collect Start: 05/31/2006 09:40

Matrix: Ground Water

(WG)

Station: Description:

Collect Stop:

Receive Date: 06/05/2006

% Moisture:

Volume:

LIMS Number: L28834-13

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Fla	g Values
H-3	2010	3.71E+02	1.34E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+	
TOTAL SR	2018	-1.34E-01	5.50E-01	1.06E+00	pCi/L		450	ml	05/31/06 09:40	06/12/06	200	M	U	
MN-54	2007	1.60E+00	1.98E+00	3.38E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
CO-58	2007	6.17E-01	2.06E+00	3.45E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
FE-59	2007	6.19E+00	4.15E+00	7.38E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
CO-60	2007	1.66E-01	1.88E+00	3.09E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
ZN-65	2007	5.28E+00	4.01E+00	7.08E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
NB-95	2007	-2.89E-01	2.11E+00	3.48E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
ZR-95	2007	-2.48E+00	3.77E+00	5.94E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
CS-134	2007	6.89E+00	4.09E+00	3.62E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U*	No
CS-137	2007	-1.67E-01	2.08E+00	3.40E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
BA-140	2007	-6.84E-01	1.08E+01	1.79E+01	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No
LA-140	2007	-7.42E-01	3.52E+00	5.70E+00	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec Low recovery

High recovery

Page 13 of 13

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

for L28834

6/23/2006

8:17:20AM



H-3

				Method Blank Sumn	1 Sh PW					
TBE Sample ID WG4089-1	Radionuclide H-3	<u>Matrix</u> WO	Count Date/Time 06/06/2006 4:08	ialethog Digilk Sanin	Blank Result < 1.900E+00	<u>Units</u> pCi/Total		2	<b>Dualifier</b> U	<u>P/F</u> P
WG4099-1		WO	06/06/2006 23:51		< 1.890E+00	pCi/Total			U	P
				LCS Sample Summ	ary		W. W. W. W. W. W. W. W. W. W. W. W. W. W			
TBE Sample ID WG4089-2	Radionuclide H-3	<u>Matrix</u> WO	Count Date/Time 06/06/2006 5:12	Spike Value 5.05E+002	LCS Result 5.010E+02	<u>Units</u> <u>S</u> pCi/Total	Spike Recovery 99.3	Range (70-130	<u>)ualifier</u> +	<u>P/F</u> P
Spike ID: 3H-041 Spike conc: 5.05E- Spike Vol: 1.00E- WG4099-2	+002	WO	06/07/2006 0:55	5.05E+002	4.770E+02	pCi/Total	94.5	70-130	+	P
Spike ID: 3H-041 Spike conc: 5.05E- Spike Vol: 1.00E-	+002									
				Duplicate Summa	ry					
TBE Sample ID WG4089-3 L28837-3	Radionuclide H-3	<u>Matrix</u> WG	Count Date/Time 06/06/2006 14:20	Original Result < 1.690E+02	<u><b>DUP Result</b></u> < 1.780E+02	<u>Units</u> pCi/L	RPD	<u>Range</u> <u>(</u>	<u>Jualifier</u> **	P/F NE
<b>WG4099-3</b> L28834-11		WG	06/07/2006 1:14	1.870E+02	< 1.870E+02	pCi/L		<30	*	NE

+	Positive .	Resul
---	------------	-------

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity

Pass Fail

Not evaluated NE

### QC Summary Report

L28834 for

6/23/2006

8:17:20AM

### L28834

H-3

Associated Samples for	WG4089
SAMPLENUM	CLIENTID
L28834-1	WG-QC-MW-QC-BFW-060106-JH-007
L28834-2	WG-QC-MW-QC-STP-060106-JH-008
L28834-3	WG-QC-MW-QC-101S-060106-JH-026
L28834-4	WG-QC-MW-QC-WELL #5-060106-JH-010
L28834-5	WG-QC-MW-QC-WELL #1-060106-JH-009
L28834-6	WG-QC-MW-QC-DCS-060106-JH-006
L28834-7	WG-QC-MW-QC-FHW-053106-JH-004
L28834-8	WS-QC-SW-QC-001-053106-JH-002
L28834-9	WG-QC-MW-2-060106-JH-023
L28834-10	WG-QC-MW-1-060106-JH-022
Associated Samples for	WG4099
<u>SAMPLENUM</u>	CLIENTID
L28834-11	WG-QC-MW-QC-103I-060106-JH-021
L28834-12	WS-QC-SW-QC-002-053106-JH-003
L28834-13	WG-QC-MW-QC-LFW-053106-JH-005

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity

Pass F Fail

Not evaluated NE

A Teledyne Technologies Company

### QC Summary Report

L28834 for

6/23/2006

8:17:20AM



### TOTAL SR

				IOIALS							
				Metho	d Blank Summ	ary					
TBE Sample ID WG4138-1	<u>Radionuclide</u> TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/12/2006 21:51			Blank Result < 8.060E-01	<u>Units</u> pCi/Total		<u>Q</u>	<b>Dualifier</b> U	P/F P
WG4170-1		WO	06/22/2006 16:17			< 6.870E-01	pCi/Total			U	P
				LCS	Sample Summa	ary					
TBE Sample ID WG4138-2	<u>Radionuclide</u> TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/12/2006 21:51	Spike Value 5.84E+001		LCS Result 6.480E+01	<u>Units</u> 9 pCi/Total	Spike Recovery 111.0	Range (70-130	<u>)ualifier</u> +	<u>P/F</u> P
Spike ID: 90SR-Spike conc: 2.34E Spike Vol: 2.50E WG4170-2	E+002	WO	06/22/2006 16:17	5.84E+001		6.510E+01	pCi/Total	111.5	70-130	+	P
Spike ID: 90SR- Spike conc: 2.34E Spike Vol: 2.50E	E+002								and the second s		
				Dur	olicate Summar	y					
TBE Sample ID WG4138-3 L28834-1	Radionuclide TOTAL SR	<u>Matrix</u> WG	Count Date/Time 06/12/2006 21:51		Original Result < 1.260E+00	<u><b>DUP Result</b></u> < 1.180E+00	Units pCi/L	RPD	<u>Range</u> <u>4</u> <30	Qualifier **	P/F NE
<b>WG4170-3</b> L28973-1		WG	06/22/2006 16:17		< 1.570E+00	< 1.030E+00	pCi/L		<30	**	NE

+	Positiv	e Resul

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

L28834 R1 54 of. 122

Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass F Fail

Not evaluated NE

## Raw Data

### Raw Data Sheet (rawdata) Jun 23 2006, 08:33 am

Customer: Exelon Work Order: L28834\_\_\_\_

Nuclide: <u>H-3</u>

Project : <u>EX001-3ESPQUAD-06</u>

	3		<del></del>								Decay &	
Sample ID Run Analysis Re	ference Volume/	Scavenge	Milking	Mount	Count	Counter	Total	Sample	Bkg	Bkg	Eff. Ingrowth	Analyst
	te/time Aliquot	Date/time	Date/time	Weight	Recovery Date/time	ID	counts	dt (min)			Factor	
L28834-1 H-3				0	07-jun-06	LS7	332	60	2.08	60	.211	EJ
WG-OC-MW-OC-BFW-060106	10 ml				02:18							
Activity: 7.4E+02 * Error: 1.5	2E+02 MDC: 1.86E+02	2										· · · · · · · · · · · · · · · · · · ·
L28834-2 H-3				0	07-jun-06	LS7	179	60	2.08	60	.224	EJ
WG-QC-MW-QC-STP-060106	10 ml				04:25							
Activity: 1.81E+02 * Error: 1.1	7E+02 MDC: 1.75E+02	2								***************************************		
L28834-3 H-3				0	07-jun-06	LS7	169	60	2.08	60	.211	EJ
WG-OC-MW-OC-101S-06010	10 ml				09:44							
Activity: 1.56E+02 Error: 1.22	E+02 MDC: 1.85E+02	*							<u> </u>			
L28834-4 H-3				0	07-jun-06	LS7	142	60	2.08	60	.207	EJ
WG-QC-MW-QC-WELL #5-06	10 ml				10:47							
Activity: 6.31E+01 Error: 1.19	E+02 MDC: 1.89E+02	*										
L28834-5 H-3				0	07-jun-06	LS7	162	60	2.08	60	.211	EJ
WG-OC-MW-OC-WELL #1-06	10 ml				11:51							
Activity: 1.32E+02 Error: 1.21	E+02 MDC: 1.85E+02	*										
L28834-6 H-3		···		0	07-jun-06	LS7	136	60	2.08	60	.209	EJ
WG-OC-MW-QC-DCS-060106	10 ml				12:55							
Activity: 4.09E+01 Error: 1.16	E+02 MDC: 1.87E+02	*										
L28834-7 H-3				0	07-jun-06	LS7	130	60	2.08	60	.213	EJ
WG-QC-MW-QC-FHW-053106	10 ml				13:59							
Activity: 1.7E+01 Error: 1.13		*										
L28834-8 H-3				0	07-jun-06	LS7	280	60	2.08	60	.212	EJ
WS-QC-SW-QC-001-053106	10 ml				06:32							
Activity: 5.5E+02 * Error: 1.4		2										
L28834-9 H-3				0	07-jun-06	LS7	196	60	2.08	60	.214	EJ
WG-OC-MW-2-060106-JH-0	10 ml				08:40							
Activity: 2.5E+02 * Error: 1.2	6E+02 MDC: 1.82E+02	2										
L28834-10 H-3				0	07-jun-06	LS7	175	60	2.08	60	.214	EJ
WG-QC-MW-1-060106-JH-0	10 ml				07:36							
Activity: 1.75E+02 Error: 1.22	E+02 MDC: 1.83E+02	*										
L28834-11 H-3				0	07-jun-06	LS7	179	60	2.08	60	.217	EJ
WG-QC-MW-QC-103I-06010	10 ml				03:22							
Activity: 1.87E+02 * Error: 1.2	1E+02 MDC: 1.81E+0	2										
L28834-12 H-3				0	07 - jun - 06	LS7	265	60	2.08	60	.211	ej
WS-QC-SW-QC-002-053106	10 ml			-	05:29							
Activity: 4.97E+02 * Error: 1.4		2										
L28834-13 H-3				0	07-jun-06	LS7	229	60	2.08	60	.212	EJ
WG-OC-MW-OC-LFW-053106	10 ml			-	15:03							
Activity: 3.71E+02 * Error: 1.3		2										
MULTULLY: J. / ILTUZ " BLIUT: I	THEOL PHO. I. CHAPTO.											

### Raw Data Sheet (rawdata) Jun 23 2006, 08:33 am

Work Order: L28834 Customer: Exelon

Nuclide: SR-90 (FAST) Project : EX001-3ESPQUAD-06

Nucliuc. Divisor (11121)												Decay &	
Sample ID Run Analysis Referen	ce Volume/	Scavenge Milking	Mount		Count	Counter	Total	Sample	Bkg	Bkg	Eff.	Ingrowth	Analyst
Client ID # Date/ti		Date/time Date/time		Recovery	Date/time	ID	counts	dt (min)	counts	dt (min)		Factor	
L28834-1 TOTAL SR 01-ju		12-jun-06	0		12-jun-06	X1A	194	200	308	400	.346	.999	LCB
WG-QC-MW-QC-BFW-060106 08:50	450 ml	15:00	_	66.40	21:46								
Activity: 8.72E-01 Error: 7.18E-01	MDC: 1.26E+00 *												
L28834-2 TOTAL SR 01-ju:		12-jun-06	0		12-jun-06	X1B	178	200	342	400	.343	.999	LCB
WG-QC-MW-QC-STP-060106 09:05	450 ml	15:00		61.29	21:46								
Activity: 1.67E-01 Error: 7.73E-01	MDC: 1.45E+00 *												
L28834-3 TOTAL SR 01-ju		12-jun-06	0		12-jun-06	X1C	183	200	289	400	.354	.999	LCB
WG-OC-MW-OC-101S-06010 14:20	450 ml	15:00		63.44	21:46								
Activity: 8.59E-01 Error: 7.13E-01	MDC: 1.25E+00 *												
L28834-4 TOTAL SR 01-ju		12-jun-06	0		12-jun-06	X1D	177	200	312	400	.344	.999	LCB
WG-QC-MW-QC-WELL #5-06 09:30	450 ml	15:00		65.05	21:46								
Activity: 4.7E-01 Error: 7.15E-01	MDC: 1.3E+00 *												
L28834-5 TOTAL SR 01-ju	4	12-jun-06	0		13-jun-06	Y1D	114	150	305	400	.362	.999	LCB
WG-QC-MW-QC-WELL #1-06 09:15	450 ml	15:00		58.33	01:17								
Activity: -1.19E-02 Error: 7.92E-01	MDC: 1.58E+00 *												
L28834-6 TOTAL SR 01-ju		12-jun-06	0		12-jun-06	X2B	150	200	289	400	.345	.999	LCB
WG-OC-MW-OC-DCS-060106 08:20	450 ml	15:00		69.35	21:46								
Activity: 1.15E-01 Error: 6.24E-01	MDC: 1.17E+00 *												
L28834-7 TOTAL SR 31-ma		12-jun-06	0		12-jun-06	X2C	166	200	277	400	.344	.999	LCB
WG-OC-MW-OC-FHW-053106 09:10	450 ml	15:00		69.09	21:46								
Activity: 5.8E-01 Error: 6.47E-01	MDC: 1.16E+00 *												
L28834-8 TOTAL SR 31-ma		12-jun-06	0		12-jun-06	X2D	207	200	307	400	.343	.999	LCB
WS-OC-SW-QC-001-053106 08:20	450 ml	15:00		63.44	21:46								
Activity: 1.23E+00 Error: 7.75E-01	MDC: 1.33E+00 *	:											
L28834-9 TOTAL SR 01-ju	n-06	12-jun-06	0		12-jun-06	X3A	224	200	363	400	.335	.999	LCB
WG-OC-MW-2-060106-JH-0 10:18	450 ml	15:00		111.02	21:46								
Activity: 5.72E-01 Error: 4.78E-01	MDC: 8.45E-01 *	•											
L28834-10 TOTAL SR 01-ju	n-06	22-jun-06	0		22-jun-06	X4C	109	120	299	400	.35	.999	CJF
WG-OC-MW-1-060106-JH-0 09:17	450 ml	11:45		107.53	16:17								
Activity: 4.28E-01 Error: 5.17E-01	MDC: 9.79E-01 *	•											
L28834-11 TOTAL SR 01-ju	n-06	12-jun-06	0		12-jun-06	хзв	163	200	321	. 400	.343	.999	LCB
WG-OC-MW-OC-103I-06010 08:30	450 ml	15:00		71.24	21:46								
Activity: 5.12E-02 Error: 6.39E-01	MDC: 1.21E+00 *	•											
L28834-12 TOTAL SR 31-ma	v-06	12-jun-06	0		12-jun-06	x3C	150	200	294	400	.345	.999	LCB
WS-OC-SW-OC-002-053106 08:50	450 ml	15:00		68.82	21:46								
Activity: 6.33E-02 Error: 6.31E-01	MDC: 1.19E+00 *											·····	
L28834-13 TOTAL SR 31-ma		12-jun-06	0		12-jun-06	X4A	135	200	284	400	.358	.999	LCB
WG-OC-MW-OC-LFW-053106 09:40	450 ml	15:00		73.12	21:46								
Activity: -1.34E-01 Error: 5.5E-01	MDC: 1.06E+00 *												
2002-1207: -1:0-01 01 01-01 0:01-01													

LIMS: Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 12-JUN-2006 00:46:17.63 TBE13 P-10727B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:23:22.33

LIMS No., Customer Name, Client ID: WG L28834-1 EXELON/QUAD

Sample ID : 13L28834-1 Smple Date: 1-JUN-2006 08:50:00.0

Geometry : 133L082404 Sample Type : WG BKGFILE: 13BG060306MT : 3.02950E+00 L Quantity End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:29:23.97 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec %Err	Fit
1	1	46.26*	94	328	1.80	92.64	1.53E-01	7.51E-03 38.2	9.20E-01
2	1	66.65	103	295	1.07	133.39	8.41E-01	8.20E-03 28.2	2.81E+00
3	1	77.42*	15	302	0.94	154.91	1.26E+00	1.17E-03214.6	3.02E+00
4	1	139.69*	109	503	1.97	279.37	2.27E+00	8.68E-03 42.5	1.19E+00
5	1	185.54*	53	315	1.28	371.02	2.18E+00	4.23E-03 70.2	2.41E+00
6	1	198.29*	92	369	1.03	396.50	2.12E+00	7.28E-03 42.6	6.55E-01
7	1	238.24*	25	184	1.23	476.37	1.94E+00	2.00E-03109.3	5.98E+00
8	1	295.10*	17	242	1.33	590.03	1.70E+00	1.33E-03188.5	1.25E+00
9	1	584.58	187	130	1.55	1168.83	1.04E+00	1.49E-02 14.5	8.05E+01
10	1	596.21	52	96	1.79	1192.09	1.02E+00	4.17E-03 38.7	1.61E+00
11	1	608.92*	59	93	1.66	1217.51	1.01E+00	4.66E-03 39.5	5.88E-01
12	1	911.83*	16	46	2.63	1823.39	7.36E-01	1.31E-03104.3	2.01E+00
13	1	969.26*	23	45	1.57	1938.28	7.01E-01	1.82E-03 69.6	1.06E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

	1 L				Uncorrected	Decav Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
RA-226	186.21	53	3.28*	2.180E+00	5.280E+01	5.280E+01	140.35
AC-228	835.50		1.75	7.877E-01	Lin	ne Not Found	
	911.07	16	27.70*	7.356E-01	5.714E+00	5.729E+00	208.64
TH-228	238.63	25	44.60*	1.940E+00	2.064E+00	2.081E+00	218.53
	240.98		3.95	1.927E+00	Lir	ne Not Found	
TH-232	583.14	187	30.25	1.038E+00	4.232E+01	4.232E+01	28.90
	911.07	16	27.70*	7.356E-01	5.714E+00	5.714E+00	208.64
	969.11	23	16.60	7.013E-01	1.394E+01	1.394E+01	139.21
U-235	143.76		10.50*	2.278E+00	Lin	ne Not Found	
	163.35		4.70	2.256E+00	Lir	ne Not Found	
	185.71	53	54.00	2.180E+00	3.207E+00	3.207E+00	140.35
	205.31		4.70	2.093E+00	Lir	ne Not Found	

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity Sample ID: 13L28834-1

Acquisition date : 9-JUN-2006 13:23:22

13 Total number of lines in spectrum

Number of unidentified lines 8 Number of lines tentatively identified by NID 5 38.46%

Nuclide Type : natural

			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĈi/L	2-Sigma Error	%Error	Flags
RA-226	1600.00Y	1.00	5.280E+01	5.280E+01	7.411E+01	140.35	
AC-228	5.75Y	1.00	5.714E+00	5.729E+00	11.95E+00	208.64	
TH-228	1.91Y	1.01	2.064E+00	2.081E+00	4.547E+00	218.53	
TH-232	1.41E+10Y	1.00	5.714E+00	5.714E+00	11.92E+00	208.64	
U-235	7.04E+08Y	1.00	3.207E+00	3.207E+00	4.501E+00	140.35	K

Total Activity : 6.950E+01 6.953E+01

Grand Total Activity: 6.950E+01 6.953E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 13L28834-1

Page: 3 Acquisition date: 9-JUN-2006 13:23:22

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1	46.26 66.65 77.42 139.69 198.29 295.10 596.21 608.92	94 103 15 109 92 17 52 59	328 295 302 503 369 242 96 93	1.80 1.07 0.94 1.97 1.03 1.33 1.79		147 274 392 586 1186	6 12 11 10 10	7.51E-03 8.20E-03 1.17E-03 8.68E-03 7.28E-03 1.33E-03 4.17E-03 4.66E-03	56.4 **** 85.1 85.2 ****	1.53E-0 8.41E-0 1.26E+0 2.27E+0 2.12E+0 1.70E+0 1.02E+0 1.01E+0	1 0 0 0 0 0

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

13 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 5 38.46%

Nuclide Type : natural

Macifia	- 1 P - 1		Wtd Mean Uncorrected	Wtd Mean Decay Corr	Decay Corr	2-Sigma	
Nuclide RA-226 TH-228 TH-232	Hlife 1600.00Y 1.91Y 1.41E+10Y	Decay 1.00 1.01 1.00	pCi/L 5.280E+01 2.064E+00 7.968E+00	pCi/L 5.280E+01 2.081E+00 7.968E+00	2-Sigma Error 7.411E+01 4.547E+00 10.16E+00	%Error Fl 140.35 218.53 127.49	.ags
	Total Act:	ivity :	6.283E+01	6.285E+01			

Grand Total Activity: 6.283E+01 6.285E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

Interfe	ring	Interi	ered
Nuclide	Line	Nuclide	Line
TH-232	911.07	AC-228	911.07

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	5.280E+01	7.411E+01	1.011E+02	0.000E+00	0.522
TH-228	2.081E+00	4.547E+00	7.569E+00	0.000E+00	0.275
TH-232	7.968E+00	1.016E+01	1.711E+01	0.000E+00	0.466

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
7. T	1.019E+01	2.522E+01	4.200E+01	0.000E+00	0.243
BE-7	1.619E-02	1.532E-02	Half-Life to	short	
NA-24	-2.458E+00	4.296E+01	8.012E+01	0.000E+00	-0.031
K-40	-2.458E+00 -1.777E+01	2.833E+01	4.490E+01	0.000E+00	-0.396
CR-51	1.152E-01	2.895E+00	4.779E+00	0.000E+00	0.024
MN-54	-4.844E-01	2.507E+00	4.159E+00	0.000E+00	-0.116
CO-57	3.082E+00	2.857E+00	5.042E+00	0.000E+00	0.611
CO-58	3.155E+00	6.178E+00	1.054E+01	0.000E+00	0.299
FE-59	4.101E-01	2.834E+00	4.743E+00	0.000E+00	0.086
CO-60	3.152E+00	6.479E+00	1.101E+01	0.000E+00	0.286
ZN-65	-1.045E+00	3.764E+00	6.147E+00	0.000E+00	-0.170
SE-75	1.589E+01	3.640E+00	6.848E+00	0.000E+00	2.320
SR-85	-3.286E-01	3.411E+00	5.523E+00	0.000E+00	-0.059
Y-88	-4.010E+00	2.830E+00	4.211E+00	0.000E+00	-0.952
NB-94	2.683E+00	2.888E+00	5.059E+00	0.000E+00	0.530
NB-95	-4.238E+00	5.248E+00	8.279E+00	0.000E+00	-0.512
ZR-95	-1.288E+01	1.679E+02	2.781E+02	0.000E+00	-0.046
MO-99	9.761E-01	3.200E+00	5.286E+00	0.000E+00	0.185
RU-103	-1.487E+01	2.713E+01	4.327E+01	0.000E+00	-0.344
RU-106	-4.433E-01	2.873E+00	4.661E+00	0.000E+00	-0.095
AG-110m	-7.013E-01	3.655E+00	6.006E+00	0.000E+00	-0.117
SN-113	2.466E+00	6.324E+00	5.062E+00	0.000E+00	0.487
SB-124	1.483E+00	7.646E+00	1.270E+01	0.000E+00	0.117
SB-125	1.736E+01	3.572E+01	5.987E+01	0.000E+00	0.290
TE-129M	-1.199E-01	5.456E+00	9.082E+00	0.000E+00	-0.013
I-131	-7.983E-01	3.682E+00	6.091E+00	0.000E+00	-0.131
BA-133	2.792E+00	4.925E+00	5.257E+00	0.000E+00	0.531
CS-134	-2.680E+00	4.165E+00	6.576E+00	0.000E+00	-0.408
CS-136	-1.627E+00	3.235E+00	4.985E+00	0.000E+00	-0.326
CS-137	1.366E+00	2.650E+00	4.410E+00	0.000E+00	0.310
CE-139	-8.226E+00	1.453E+01	2.345E+01	0.000E+00	-0.351
BA-140	-1.161E+00	5.201E+00	8.445E+00	0.000E+00	-0.137
LA-140	2.243E+00	5.783E+00	8.348E+00	0.000E+00	0.269
CE-141	-2.510E+01	2.333E+01	3.178E+01	0.000E+00	-0.790
CE-144 EU-152	-1.422E+01	8.970E+00	1.352E+01	0.000E+00	-1.052
	-1.201E-01	5.248E+00	8.746E+00	0.000E+00	-0.014
EU-154	5.729E+00	1.195E+01	1.894E+01	0.000E+00	0.302
AC-228 U-235	2.304E+00	2.336E+01	3.294E+01	0.000E+00	0.070
U-235 U-238	6.420E+00	3.337E+02	5.360E+02	0.000E+00	0.012
	-3.646E+01	2.268E+01	3.570E+01	0.000E+00	-1.022
AM-241	J.040D101				

```
3.030E+00,WG L28834-1 EX
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A,13L28834-1
                                             ,08/05/2005 08:16,133L082404
B,13L28834-1
                     ,LIBD
                                                   1.011E+02,,
                                                                     0.522
                     5.280E+01,
                                    7.411E+01,
C, RA-226
            , YES,
                                                   7.569E+00,,
                                                                     0.275
                     2.081E+00,
                                    4.547E+00,
C, TH-228
            ,YES,
                                                   1.711E+01,,
                                                                     0.466
            , YES,
                     7.968E+00,
                                    1.016E+01,
C, TH-232
                                                                     0.243
                                    2.522E+01,
                                                   4.200E+01,,
                     1.019E+01,
C, BE-7
            , NO
                                                   8.012E+01,,
                                                                   -0.031
                                    4.296E+01,
                    -2.458E+00,
C, K-40
            , NO
                                                   4.490E+01,,
                                                                   -0.396
                                    2.833E+01,
C, CR-51
            , NO
                    -1.777E+01
                                                   4.779E+00,,
                                                                     0.024
C, MN-54
            , NO
                     1.152E-01,
                                    2.895E+00,
                                    2.507E+00,
                                                   4.159E+00,,
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                    -4.844E-01,
C, CO-57
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                                                   5.042E+00,,
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                     3.082E+00,
C, CO-58
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                                    6.178E+00,
            , NO
C, FE-59
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                                                   4.743E+00,,
            ,NO
                     4.101E-01,
                                    2.834E+00,
C, CO-60
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C, ZN-65
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                                                   6.147E+00,,
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                    -1.045E+00,
                                    3.764E+00,
C,SE-75
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                                                   6.848E+00,,
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C,SR-85
            , NO
                     1.589E+01,
                                                   5.523E+00,,
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                                    3.411E+00,
                    -3.286E-01,
            , NO
C, Y-88
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                                                   4.211E+00,,
                                    2.830E+00,
C, NB-94
            , NO
                    -4.010E+00,
                                                                     0.530
                                                   5.059E+00,,
C, NB-95
            , NO
                     2.683E+00,
                                    2.888E+00,
                                                   8.279E+00,,
                                                                    -0.512
                    -4.238E+00,
                                    5.248E+00,
C, ZR-95
            , NO
                                    1.679E+02,
                                                   2.781E+02,,
                                                                    -0.046
                    -1.288E+01,
C, MO-99
            , NO
                                                   5.286E+00,,
                                                                     0.185
                                    3.200E+00,
                     9.761E-01,
C, RU-103
            , NO
                                                   4.327E+01,,
                                                                    -0.344
                                    2.713E+01,
C, RU-106
            , NO
                    -1.487E+01,
                                                                    -0.095
                                                   4.661E+00,,
                    -4.433E-01,
                                    2.873E+00,
C, AG-110m
            , NO
                                                   6.006E+00,,
                                                                    -0.117
                    -7.013E-01,
                                    3.655E+00,
            , NO
C, SN-113
                                    6.324E+00,
                                                   5.062E+00,,
                                                                     0.487
                     2.466E+00,
C,SB-124
            , NO
                                                   1.270E+01,,
                                                                     0.117
            , NO
                                     7.646E+00,
                     1.483E+00,
C,SB-125
                                                                     0.290
                                                    5.987E+01,,
                                    3.572E+01,
            , NO
                     1.736E+01,
C, TE-129M
                                                    9.082E+00,,
                                                                    -0.013
            , NO
                    -1.199E-01,
                                     5.456E+00,
C, I-131
                                     3.682E+00,
                                                    6.091E+00,,
                                                                    -0.131
                    -7.983E-01,
C,BA-133
            , NO
                                                    5.257E+00,,
                                                                     0.531
                     2.792E+00,
                                     4.925E+00,
C, CS-134
            , NO
                                                    6.576E+00,,
                                                                    -0.408
                                     4.165E+00,
            , NO
                    -2.680E+00,
C, CS-136
                                                    4.985E+00,,
                                                                    -0.326
                                     3.235E+00,
C, CS-137
            , NO
                    -1.627E+00,
                                                                     0.310
                                                    4.410E+00,,
C, CE-139
                                     2.650E+00,
            , NO
                     1.366E+00,
                                                                    -0.351
                                     1.453E+01,
                                                    2.345E+01,,
            ,NO
                    -8.226E+00,
C, BA-140
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                                                                    -0.137
                                     5.201E+00,
                    -1.161E+00,
C, LA-140
            , NO
                                     5.783E+00,
                                                    8.348E+00,,
                                                                     0.269
                     2.243E+00,
C, CE-141
            , NO
                                                    3.178E+01,,
                                                                    -0.790
                                     2.333E+01,
C, CE-144
            , NO
                    -2.510E+01,
                                                    1.352E+01,,
                                                                    -1.052
                     -1.422E+01,
                                     8.970E+00,
C, EU-152
            , NO
                                                                    -0.014
                                                    8.746E+00,,
                                     5.248E+00,
C, EU-154
            , NO
                     -1.201E-01,
                                                                     0.302
                                                    1.894E+01,,
                                     1.195E+01,
C, AC-228
            , NO
                     5.729E+00,
                                                                     0.070
                                     2.336E+01,
                                                    3.294E+01,,
                     2.304E+00,
C, U-235
            , NO
                                                    5.360E+02,,
                                                                     0.012
            , NO
                      6.420E+00,
                                     3.337E+02,
C, U-238
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2.268E+01,

-3.646E+01,

C, AM-241

, NO

3.570E+01,,

-1.022

LIMS: ^ Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 17:13:07.19 TBE11 P-20610B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:53:42.81

\_\_\_\_\_

LIMS No., Customer Name, Client ID: WG L28834-2 EXELON/QUAD

Smple Date: 1-JUN-2006 09:05:00.0 : 11L28834-2 Sample ID

Geometry : 113L082304 : WG Sample Type : 11BG060306MT BKGFILE : 3.16880E+00 L Quantity Start Channel: 40 Energy Tol: 1.00000 Real Time: 0 03:19:16.30 End Channel: 4090 Pk Srch Sens: 5.00000 Live time: 0 03:19:12.10 MDA Constant: 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9	0 0 0 0 0	66.31 139.63* 185.63* 198.16 351.87* 609.31* 1460.79* 1728.39 1750.68	126 92 69 79 58 42 8 9	623 368 290 340 157 62 40 10	3.28 1.43	131.63 278.69 370.94 396.07 704.19 1219.88 2922.09 3455.97 3500.42	1.90E+00 1.80E+00 1.75E+00 1.20E+00 7.90E-01 3.92E-01 3.44E-01	1.05E-02 7.68E-03 5.77E-03 6.59E-03 4.86E-03 3.49E-03 7.10E-042 7.79E-04 1.35E-03	43.4 55.7 46.7 53.5 45.3 203.4 71.2	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Type: natura	3.1			Uncorrected	Decay Corr	2-Sigma
Nuclide K-40 RA-226 U-235	Energy 1460.81 186.21 143.76 163.35 185.71 205.31	Area 8 69  69	%Abn 10.67* 3.28* 10.50* 4.70 54.00 4.70	%Eff 3.919E-01 1.799E+00 1.906E+00 1.876E+00 1.799E+00 1.718E+00	pCi/L 1.447E+01 8.341E+01 Li 5.067E+00	pCi/L 1.447E+01 8.342E+01 ne Not Found ne Not Found 5.067E+00 ne Not Found	%Error 406.89 111.31  111.31
	200.01						

Flaq: "\*" = Keyline

Summary of Nuclide Activity
Sample ID: 11L28834-2

Acquisition date: 9-JUN-2006 13:53:42

Total number of lines in spectrum 9
Number of unidentified lines 7
Number of lines tentatively identified by NID 2 22.22%

Nuclide Type : natural

RA-226	Hlife 1.28E+09Y 1600.00Y 7.04E+08Y	Decay 1.00 1.00	Uncorrected pCi/L 1.447E+01 8.341E+01 5.067E+00	Decay Corr pCi/L 1.447E+01 8.342E+01 5.067E+00	2-Sigma Error 5.889E+01 9.285E+01	2-Sigma %Error 406.89 111.31	
0-235	,		1.030E+02	1.030E+02			

Grand Total Activity: 1.030E+02 1.030E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Page: 3

Unidentified Energy Lines Sample ID : 11L28834-2

Acquisition date : 9-JUN-2006 13:53:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0	66.31 139.63 198.16 351.87 609.31 1728.39 1750.68	126 92 79 58 42 9	623 368 340 157 62 10	1.76 1.94 1.14 3.24 1.53 1.43	704.19 1219.88 3455.97	392 696 1214 3448	11 11 16 11 10	1.05E-02 7.68E-03 6.59E-03 4.86E-03 3.49E-03 7.79E-04 1.35E-03	86.8 93.3 **** 90.6 ****	6.87E-01 1.90E+00 1.75E+00 1.20E+00 7.90E-01 3.44E-01	) ) ) 1 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 2 22.22%

Nuclide Type : natural

Nuclide	Type: natu	raı	Wtd Mean Uncorrected	Wtd Mean Decay Corr	Decay Corr	2-Sigma	
Nuclide K-40 RA-226	Hlife 1.28E+09Y 1600.00Y	Decay 1.00 1.00	pCi/L 1.447E+01	pCi/L 1.447E+01 8.342E+01	2-Sigma Error 5.889E+01 9.285E+01	%Error 406.89 111.31	Flags
	Total Acti	vity :	9.789E+01	9.789E+01			

9.789E+01 Grand Total Activity: 9.789E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Identified Nuclides ----

10011011					
Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40 RA-226	1.447E+01 8.342E+01	5.889E+01 9.285E+01	4.899E+01 1.239E+02	0.000E+00 0.000E+00	0.295 0.673
Non-Ide	entified Nuclides				
	Key-Line Activity K.L.	Act error	MDA	MDA error	Act/MDA

Nuclide	Activity K.L. (pCi/L) Ided		MDA (pCi/L)	MDA CITOI	1100/11011
BE-7	-2.159E+00	2.895E+01	4.704E+01	0.000E+00	-0.046
NA-24	9.510E-03	1.694E-02	Half-Life too	o short	

### L28834 R1 66 of 122

	E 004E 01	3.368E+01	5.210E+01	0.000E+00	-1.014
CR-51	-5.284E+01	3.046E+00	4.874E+00	0.000E+00	-0.179
MN-54	-8.710E-01	3.160E+00	5.323E+00	0.000E+00	0.454
CO-57	2.417E+00	3.469E+00	5.665E+00	0.000E+00	-0.035
CO-58	-1.963E-01	6.569E+00	1.183E+01	0.000E+00	0.587
FE-59	6.947E+00	3.318E+00	5.675E+00	0.000E+00	0.249
CO-60	1.411E+00	6.598E+00	9.871E+00	0.000E+00	-0.699
ZN-65	-6.896E+00		7.455E+00	0.000E+00	0.180
SE-75	1.340E+00	4.431E+00	7.435E+00 7.516E+00	0.000E+00	1.887
SR-85	1.419E+01	4.023E+00	5.764E+00	0.000E+00	-0.033
Y-88	-1.927E-01	3.525E+00	4.991E+00	0.000E+00	-0.129
NB-94	-6.423E-01	3.067E+00	5.348E+00	0.000E+00	0.093
NB-95	4.973E-01	3.217E+00	9.974E+00	0.000E+00	0.333
ZR-95	3.324E+00	5.828E+00	2.909E+02	0.000E+00	-0.309
MO-99	-8.982E+01	1.833E+02		0.000E+00	0.084
RU-103	5.315E-01	3.861E+00	6.338E+00	0.000E+00	-0.471
RU-106	-2.198E+01	2.953E+01	4.665E+01	0.000E+00	0.121
AG-110m	6.658E-01	3.274E+00	5.485E+00	0.000E+00	0.261
SN-113	1.773E+00	4.049E+00	6.803E+00	0.000E+00	-0.844
SB-124	-4.734E+00	4.395E+00	5.608E+00		-0.553
SB-125	-8.574E+00	9.889E+00	1.551E+01	0.000E+00	0.331
TE-129M	2.337E+01	4.191E+01	7.055E+01	0.000E+00	0.156
I-131	1.686E+00	6.475E+00	1.080E+01	0.000E+00	0.138
BA-133	8.937E-01	5.140E+00	7.254E+00	0.000E+00	-0.314
CS-134	-1.847E+00	4.338E+00	5.887E+00	0.000E+00	-0.314
CS-136	-3.712E-01	4.864E+00	7.928E+00	0.000E+00	0.166
CS-137	9.849E-01	3.524E+00	5.930E+00	0.000E+00	
CE-139	3.118E-01	3.260E+00	5.352E+00	0.000E+00	0.058
BA-140	1.327E+01	1.696E+01	2.888E+01	0.000E+00	0.460
LA-140	3.352E+00	5.392E+00	9.564E+00	0.000E+00	0.351
CE-141	7.136E+00	7.069E+00	1.030E+01	0.000E+00	0.693
CE-144	-1.428E+01	2.758E+01	3.759E+01	0.000E+00	-0.380
EU-152	-5.464E-01	1.187E+01	1.653E+01	0.000E+00	-0.033
EU-154	6.839E+00	6.493E+00	1.102E+01	0.000E+00	0.620
AC-228	-1.450E+00	1.368E+01	2.127E+01	0.000E+00	-0.068
TH-228	3.636E+00	6.666E+00	1.074E+01	0.000E+00	0.339
TH-232	-1.447E+00	1.365E+01	2.121E+01	0.000E+00	-0.068
U-235	2.652E+01	2.848E+01	4.131E+01	0.000E+00	0.642
U-238	2.165E+02	3.353E+02	5.867E+02	0.000E+00	0.369
AM-241	3.563E+01	4.947E+01	6.943E+01	0.000E+00	0.513

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                                             ,06/07/2006 09:40,113L082304
                     , LIBD
B,11L28834-2
                                                                    0.295
                                                   4.899E+01,,
                                    5.889E+01,
           ,YES,
                     1.447E+01,
C, K-40
                                                                    0.673
                                                   1.239E+02,,
                                    9.285E+01,
                     8.342E+01,
           , YES,
C, RA-226
                                                                   -0.046
                                                   4.704E+01,,
                                    2.895E+01,
           , NO
                   -2.159E+00,
C, BE-7
                                                   5.210E+01,,
                                                                   -1.014
                                    3.368E+01,
                   -5.284E+01,
            , NO
C, CR-51
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                                                                   -0.179
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           , NO
                   -8.710E-01,
C, MN-54
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                                    3.160E+00,
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C, CO-57
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                                    3.469E+00,
C, CO-58
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C, FE-59
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                     1.411E+00,
C, CO-60
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                                                   9.871E+00,,
                    -6.896E+00,
                                    6.598E+00,
C, ZN-65
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                                                   7.455E+00,,
                                    4.431E+00,
                     1.340E+00,
            , NO
C, SE-75
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                                                                    1.887
                                    4.023E+00,
                     1.419E+01,
C, SR-85
            , NO
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                                                                   -0.033
                                    3.525E+00,
                    -1.927E-01,
C, Y-88
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                                                                   -0.129
                                                   4.991E+00,,
                                    3.067E+00,
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C, NB-94
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                                                                     0.093
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                     4.973E-01,
                                    3.217E+00,
            , NO
C, NB-95
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                                                   9.974E+00,,
                     3.324E+00,
C, ZR-95
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                                    1.833E+02,
                    -8.982E+01,
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C, MO-99
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                                    3.861E+00,
                                                   6.338E+00,,
                     5.315E-01,
C, RU-103
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                                                   4.665E+01,,
                                    2.953E+01,
C, RU-106
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                    -2.198E+01,
                                                                     0.121
                                                   5.485E+00,,
            , NO
                     6.658E-01,
                                    3.274E+00,
C, AG-110m
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                                                   6.803E+00,,
            , NO
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C, SN-113
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                                    4.395E+00,
                                                   5.608E+00,,
                    -4.734E+00,
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C,SB-124
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                                    9.889E+00,
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C, TE-129M
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                                                   1.080E+01,,
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                     1.686E+00,
C, I-131
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                                                   7.254E+00,,
                     8.937E-01,
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C, BA-133
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                                    4.338E+00,
                                                   5.887E+00,,
                                                                    -0.314
                    -1.847E+00,
            , NO
C, CS-134
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                                                                    -0.047
                                    4.864E+00,
                    -3.712E-01,
C, CS-136
            , NO
                                                   5.930E+00,,
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                                    3.524E+00,
            , NO
                     9.849E-01,
C, CS-137
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                                                   5.352E+00,,
                     3.118E-01,
                                    3.260E+00,
C, CE-139
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                                                                     0.460
                                                   2.888E+01,,
                     1.327E+01,
                                    1.696E+01,
            , NO
C, BA-140
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                                                   9.564E+00,,
                                     5.392E+00,
                     3.352E+00,
C, LA-140
            , NO
                                                   1.030E+01,,
                                                                     0.693
                                     7.069E+00,
                     7.136E+00,
            , NO
C, CE-141
                                                                    -0.380
                                                    3.759E+01,,
                                     2.758E+01,
            , NO
                    -1.428E+01,
C, CE-144
                                                                    -0.033
                                                   1.653E+01,,
                    -5.464E-01,
                                     1.187E+01,
            , NO
C, EU-152
                                                                     0.620
                                     6.493E+00,
                                                    1.102E+01,,
                      6.839E+00,
            , NO
C, EU-154
                                                                    -0.068
                                                    2.127E+01,,
                                     1.368E+01,
            , NO
                    -1.450E+00,
C, AC-228
                                                    1.074E+01,,
                                                                     0.339
                                     6.666E+00,
                      3.636E+00,
C, TH-228
            , NO
                                                                    -0.068
                                                    2.121E+01,,
                                     1.365E+01,
                    -1.447E+00,
 C, TH-232
            , NO
                                                    4.131E+01,,
                                                                     0.642
                                     2.848E+01,
                      2.652E+01,
 C, U-235
             , NO
                                                    5.867E+02,,
                                                                     0.369
                                     3.353E+02,
                      2.165E+02,
 C, U-238
            , NO
                                                                     0.513
                                     4.947E+01,
                                                    6.943E+01,,
                      3.563E+01,
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C, AM-241

, NO

Sec. Review:

Analyst: LIMS;

\_\_\_\_\_ VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 17:15:13.26 TBE15 P-10635B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:53:50.16 -------

LIMS No., Customer Name, Client ID: WG L28834-3 EXELON/QUAD

: 15L28834-3 Sample ID

Smple Date: 1-JUN-2006 14:20:00.0

Sample Type : WG

Geometry : 153L082604

Quantity : 3.06440E+00 L

: 15BG060306MT BKGFILE

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
2 3 4	1 1	198.00 608.67 1112.06 1460.05* 1763.75	65 41 24 24 28	73 24 8	2.15 2.29 2.87	1210.53 2221.93 2920.69	2.44E+00 9.91E-01 5.89E-01 4.70E-01 4.07E-01	3.39E-03 1.95E-03 1.95E-03	39.7 48.7 49.2	2.63E+00 1.73E+00 1.66E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

1100 = ================================	2 1			Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area 24	%Abn 10.67*		pCi/L 3.431E+01	%Error 98.50

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity
Sample ID: 15L28834-3

Acquisition date: 9-JUN-2006 13:53:50

5

Total number of lines in spectrum Number of unidentified lines

Number of lines tentatively identified by NID 1 20.00%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma
Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags
K-40 1.28E+09Y 1.00 3.431E+01 3.431E+01 3.379E+01 98.50

Total Activity: 3.431E+01 3.431E+01

Grand Total Activity: 3.431E+01 3.431E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Page: 3

Unidentified Energy Lines Sample ID: 15L28834-3

Acquisition date: 9-JUN-2006 13:53:50

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff Fla	gs
1 1	198.00 608.67 1112.06 1763.75	65 41 24 28	73 24	2.15 2.29	1210.53 2221.93	1207 2214	9 13	3.39E-03 1.95E-03	79.3 97.4	2.44E+00 9.91E-01 5.89E-01 4.07E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 5
Number of unidentified lines 4
Number of lines tentatively identified by NID 1 20.00%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma pCi/L 2-Sigma Error %Error Flags Decay pCi/L Nuclide Hlife 3.379E+01 98.50 K - 401.28E+09Y 1.00 3.431E+01 3.431E+01 \_\_\_\_\_ \_\_\_\_\_

3.431E+01

Grand Total Activity: 3.431E+01 3.431E+01

Total Activity: 3.431E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

CO-58

FE-59

No interference correction performed

-6.296E-02

3.178E+00

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.431E+01	3.379E+01	4.296E+01	0.000E+00	0.799
Non-Ider	ntified Nuclides	5			
Nuclide	Key-Line Activity K.L. (pCi/L) Ideo		MDA (pCi/L)	MDA error	Act/MDA
BE-7 NA-24	-2.996E-02 -1.443E-02	2.143E+01 1.016E-02	3.565E+01 Half-Life too	0.000E+00 short	-0.001
CR-51 MN-54	1.537E+01 -2.959E-01	2.304E+01 2.755E+00	3.923E+01 4.502E+00 3.415E+00	0.000E+00 0.000E+00 0.000E+00	0.392 -0.066 -0.352
CO - 57	-1.203E+00	2.191E+00	3.4I3D+UU	0.0005+00	-0.334

2.519E+00

6.100E+00

4.148E+00

9.912E+00

0.000E+00

0.000E+00

-0.015

0.321

			4 0207.00	0 0007.00	0.452
CO-60	2.230E+00	2.802E+00	4.938E+00	0.000E+00 0.000E+00	0.452
ZN-65	8.178E+00	6.112E+00	1.003E+01	-	-0.210
SE-75	-1.060E+00	3.176E+00	5.056E+00	0.000E+00	1.690
SR-85	9.468E+00	2.977E+00	5.601E+00	0.000E+00	
Y-88	5.314E-01	3.038E+00	5.140E+00	0.000E+00	0.103
NB-94	1.380E+00	2.336E+00	3.956E+00	0.000E+00	0.349
NB-95	7.162E-01	2.755E+00	4.645E+00	0.000E+00	0.154
ZR-95	-1.265E+00	5.060E+00	8.247E+00	0.000E+00	-0.153
MO-99	-2.031E+01	1.371E+02	2.253E+02	0.000E+00	-0.090
RU-103	3.611E+00	2.750E+00	4.889E+00	0.000E+00	0.739
RU-106	1.580E+01	2.264E+01	3.882E+01	0.000E+00	0.407
AG-110m	-1.541E+00	2.550E+00	3.980E+00	0.000E+00	-0.387
SN-113	-1.520E+00	3.171E+00	5.053E+00	0.000E+00	-0.301
SB-124	-7.173E+00	3.674E+00	4.204E+00	0.000E+00	-1.706
SB-125	-4.803E+00	6.867E+00	1.072E+01	0.000E+00	-0.448
TE-129M	-6.639E+00	3.316E+01	5.308E+01	0.000E+00	-0.125
I-131	-3.243E+00	4.812E+00	7.636E+00	0.000E+00	-0.425
BA-133	-1.270E+00	3.361E+00	5.429E+00	0.000E+00	-0.234
CS-134	-2.233E+00	3.366E+00	4.399E+00	0.000E+00	-0.508
CS-136	-1.328E+00	3.668E+00	5.874E+00	0.000E+00	-0.226
CS-137	-9.963E-02	2.739E+00	4.451E+00	0.000E+00	-0.022
CE-139	-8.674E-01	2.125E+00	3.466E+00	0.000E+00	-0.250
BA-140	2.746E+00	1.325E+01	2.216E+01	0.000E+00	0.124
LA-140	-4.424E+00	4.851E+00	7.103E+00	0.000E+00	-0.623
CE-141	-3.393E+00	4.248E+00	6.894E+00	0.000E+00	-0.492
CE-144	-1.456E+01	1.670E+01	2.716E+01	0.000E+00	-0.536
EU-152	-1.032E+01	7.393E+00	1.137E+01	0.000E+00	-0.907
EU-154	-2.065E+00	4.502E+00	7.034E+00	0.000E+00	-0.294
RA-226	2.232E+01	5.709E+01	9.382E+01	0.000E+00	0.238
AC-228	3.458E+00	9.480E+00	1.597E+01	0.000E+00	0.217
TH-228	-2.211E-01	4.344E+00	6.861E+00	0.000E+00	-0.032
TH-232	3.449E+00	9.455E+00	1.593E+01	0.000E+00	0.217
U-235	-1.343E+01	1.662E+01	2.698E+01	0.000E+00	-0.498
U-238	3.984E+02	2.908E+02	5.270E+02	0.000E+00	0.756
AM-241	-1.674E+01	2.251E+01	3.635E+01	0.000E+00	-0.460
THI ZIL	1.0/11/01	2.2012.01		3	

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C, K-40
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3.635E+01,

-0.460

-1.674E+01,

C, AM-241

,NO ,

Sec. Review: Analyst:

Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 20:59:23.69

TBE14 P-10933A HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 14:19:12.45

LIMS No., Customer Name, Client ID: WG L28834-4 EXELON/QUAD

Sample ID : 14L28834-4 Smple Date: 1-JUN-2006 09:30:00.0

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1	66.31 92.39* 139.76 198.54* 238.49* 295.79 351.90* 595.67 609.34* 1461.37*	348 98 178 206 14 60 57 79 28	1044 854 681 647 609 355 341 139 263 98	3.05	133.62 185.92 280.88 398.68 478.71 593.46 705.78 1193.12 1220.42 2916.17	1.27E+00 1.89E+00 1.83E+00 1.68E+00 1.45E+00 1.28E+00 8.48E-01 8.33E-01 4.36E-01	7.41E-03 8.58E-03 5.90E-04 2.51E-03 2.37E-03 3.29E-03 1.15E-03 5.11E-04	63.4 27.3 26.6 371.8 58.2 74.9 27.7 144.6	6.01E-01 1.98E+00 9.51E-01 8.17E-01 2.83E+00 8.18E-01 3.39E+00 1.89E+00 2.78E+00
11	1	1765.91*	24	41	3.32	3519.50	3.79E-01	9.84E-04	00.9	1.235+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nucrrae	Type: nacur	2.1			Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	12	10.67*	4.361E-01	9.785E+00	9.785E+00	515.41
TH-228	238.63	14			7.037E-01	7.096E-01	743.57
	240.98		3.95	1.666E+00	Li	ne Not Found	

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date : 9-JUN-2006 14:19:12 Sample ID : 14L28834-4

11

Total number of lines in spectrum

Number of unidentified lines

Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

pCi/L 2-Sigma Error %Error Flags pCi/L Nuclide Hlife Decay

\_\_\_\_\_

9.785E+00 50.43E+00 515.41 K-40 1.28E+09Y 1.00 9.785E+00 52.76E-01 743.57 7.096E-01 1.91Y 1.01 7.037E-01 TH-228

> Total Activity : 1.049E+01 1.049E+01

Grand Total Activity: 1.049E+01 1.049E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Act/MDA

MDA error

Unidentified Energy Lines Sample ID: 14L28834-4 Page: 3
Acquisition date: 9-JUN-2006 14:19:12

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff Fl	ags
1 1 1 1 1 1 1	66.31 92.39 139.76 198.54 295.79 351.90 595.67 609.34 1765.91	348 98 178 206 60 57 79 28 24	1044 854 681 647 355 341 139 263 41	2.56 2.34 0.87 1.74 2.11 1.65 1.34 1.86 3.32	133.62 185.92 280.88 398.68 593.46 705.78 1193.12 1220.42 3519.50	181 277 393 589 701 1190 1215	11 9 11 9 11 8 14	1.45E-02 4.09E-03 7.41E-03 8.58E-03 2.51E-03 2.37E-03 3.29E-03 1.15E-03 9.84E-04	*** 54.7 53.2 *** 55.4 ***	5.11E-01 1.27E+00 1.89E+00 1.83E+00 1.45E+00 1.28E+00 8.48E-01 8.33E-01 3.79E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 11
Number of unidentified lines 9
Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

			Wtd Mean Uncorrected		Decay Corr		
Nuclide K-40 TH-228	Hlife 1.28E+09Y 1.91Y		pCi/L 9.785E+00 7.037E-01	pCi/L 9.785E+00 7.096E-01	2-Sigma Error 50.43E+00 52.76E-01	%Error 515.41 743.57	rtags
	Total Act	ivity :	1.049E+01	1.049E+01			

Grand Total Activity : 1.049E+01 1.049E+01

Flags: "K" = Keyline not found "M" = Manually accepted

K.L. Act error

Ided

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

Nuclide

No interference correction performed

Activity

(pCi/L)

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40 TH-228	9.785E+00 7.096E-01	5.043E+01 5.276E+00	3.746E+01 7.140E+00	0.000E+00 0.000E+00	0.261 0.099
Non-Ide	entified Nuclide	es			
	Key-Line				7 (7 677 7

MDA

(pCi/L)

### L28834 R1 76 of 122

				1120054 KI	70 OL 122
	0 5415.01	2.339E+01	3.699E+01	0.000E+00	-0.741
3E-7	-2.741E+01	1.340E-02	Half-Life too	short	
NA-24	-8.351E-03	2.506E+01	4.109E+01	0.000E+00	0.008
CR-51	3.154E-01	2.562E+00	4.290E+00	0.000E+00	0.348
MN-54	1.493E+00	2.473E+00	4.194E+00	0.000E+00	0.668
CO-57	2.801E+00	2.473E+00 2.577E+00	4.219E+00	0.000E+00	0.029
CO-58	1.211E-01	5.343E+00	9.011E+00	0.000E+00	0.350
FE-59	3.151E+00	2.450E+00	4.101E+00	0.000E+00	0.155
CO-60	6.357E-01	5.469E+00	9.520E+00	0.000E+00	0.732
ZN-65	6.972E+00	3.282E+00	5.237E+00	0.000E+00	-0.889
SE-75	-4.658E+00		5.957E+00	0.000E+00	3.447
SR-85	2.053E+01	3.102E+00	4.397E+00	0.000E+00	-0.402
Y-88	-1.767E+00	2.824E+00	3.973E+00	0.000E+00	0.258
NB-94	1.024E+00	2.367E+00	4.369E+00	0.000E+00	-0.197
NB-95	-8.614E-01	2.701E+00	7.947E+00	0.000E+00	-0.184
ZR-95	-1.466E+00	4.905E+00	2.500E+02	0.000E+00	-0.119
MO-99	-2.979E+01	1.534E+02	5.019E+00	0.000E+00	0.427
RU-103	2.144E+00	2.983E+00	3.769E+01	0.000E+00	-0.065
RU-106	-2.445E+00	2.438E+01	4.012E+00	0.000E+00	-0.007
AG-110m	-2.819E-02	2.424E+00	5.304E+00	0.000E+00	-0.241
SN-113	-1.280E+00	3.312E+00	4.598E+00	0.000E+00	-0.808
SB-124	-3.714E+00	7.252E+00	1.178E+01	0.000E+00	0.216
SB-125	2.546E+00	7.027E+00	5.418E+01	0.000E+00	-0.431
TE-129M	-2.336E+01	3.358E+01	8.300E+00	0.000E+00	-0.098
I-131	-8.118E-01	5.122E+00	5.936E+00	0.000E+00	0.803
BA-133	4.765E+00	4.113E+00	4.788E+00	0.000E+00	0.592
CS-134	2.837E+00	4.872E+00	5.713E+00	0.000E+00	-0.373
CS-136	-2.130E+00	3.605E+00	4.436E+00	0.000E+00	0.401
CS-137	1.779E+00	2.607E+00	4.436E+00 4.041E+00	0.000E+00	0.391
CE-139	1.580E+00	2.431E+00	2.213E+01	0.000E+00	-0.332
BA-140	-7.354E+00	1.380E+01	6.912E+00	0.000E+00	0.012
LA-140	8.004E-02	4.170E+00	7.862E+00	0.000E+00	-0.051
CE-141	-4.032E-01	5.627E+00	7.862E+00 3.093E+01	0.000E+00	0.213
CE-144	6.574E+00	2.180E+01	1.275E+01	0.000E+00	-0.005
EU-152	-6.448E-02	9.256E+00		0.000E+00	0.686
EU-154	5.980E+00	5.138E+00	8.714E+00	0.000E+00	-0.009
RA-226	-9.091E-01	6.505E+01	1.001E+02	0.000E+00	0.128
AC-228	2.081E+00	1.017E+01	1.632E+01	0.000E+00	0.128
TH-232	2.076E+00	1.014E+01	1.627E+01	0.000E+00	0.538
U-235	1.699E+01	2.203E+01	3.156E+01	0.000E+00	0.643
U-238	3.264E+02	2.931E+02	5.075E+02	0.000E+00	-0.233
AM-241	-1.217E+01	3.767E+01	5.225E+01	0.0005+00	0.200

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                                                  7.140E+00,,
                                    5.276E+00,
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           , NO
C, SR-85
                                                                   -0.402
                    -1.767E+00,
                                    2.824E+00,
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C, Y-88
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                                    2.367E+00,
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C, NB-94
                                                   4.369E+00,,
                                                                   -0.197
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C, NB-95
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                                                   7.947E+00,,
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C, ZR-95
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C, MO-99
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                                    2.983E+00,
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C, RU-103
                                    2.438E+01,
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                                                                   -0.065
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C, RU-106
                                                   4.012E+00,,
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C, AG-110m , NO
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C,SB-124
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C,SB-125
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                    -8.118E-01,
C, I-131
            , NO
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C,BA-133
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                                    4.872E+00,
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C, CS-134
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                                    3.605E+00,
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            , NO
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C,CS-136
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                                                   4.436E+00,,
                                                                    0.401
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            , NO
C, CS-137
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C, CE-139
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                                    1.380E+01,
                    -7.354E+00,
C,BA-140
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                                                                    0.012
                                                   6.912E+00,,
            , NO
                     8.004E-02,
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C, LA-140
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                                                   7.862E+00,,
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C, CE-141
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                     6.574E+00,
C, CE-144
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                                                   1.275E+01,,
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                                    9.256E+00,
            , NO
                    -6.448E-02,
C, EU-152
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                                                   8.714E+00,,
            , NO
                     5.980E+00,
                                    5.138E+00,
C, EU-154
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                    -9.091E-01,
C, RA-226
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                                                   1.632E+01,,
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                     2.081E+00,
C,AC-228
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                                                                     0.128
                                                   1.627E+01,,
                     2.076E+00,
                                    1.014E+01,
            ,NO
C, TH-232
                                                                     0.538
                                                   3.156E+01,,
                                    2.203E+01,
                     1.699E+01,
C, U-235
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                                                   5.075E+02,,
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                                    2.931E+02,
C, U-238
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3.767E+01,

-1.217E+01,

, NO

C, AM-241

5.225E+01,,

-0.233

Sec. Review: Analyst; LIMS: =

\_\_\_\_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:57:15.11 TBE10 12892256 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 16:43:59.06 

LIMS No., Customer Name, Client ID: WG L28834-5 QUAD CITY

Sample ID : 10L28834-5 Smple Date: 1-JUN-2006 09:15:00.0

Sample Type : WG Geometry : 103L083004 Quantity : 3.00370E+00 L BKGFILE : 10BG060306MT Start Channel: 80 Energy Tol: 1.00000 Real Time : 0 05:13:10.27 End Channel : 4090 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 05:13:07.20 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2	1 1	66.67* 139.88	86 165	669 699	1.47	132.45 278.93		4.59E-03 8.81E-03		
3	1	198.88	212	559	2.15	396.99		1.13E-02		
4	1	238.59*	31	333	1.53	476.44	1.54E+00	1.64E-031	122.0	3.56E-01
5	1	352.03*	61	213	1.75	703.45	1.17E+00	3.25E-03	55.6	9.92E-01
6	1	596.17	69	130	1.98	1192.02	7.85E-01	3.70E-03	37.2	1.31E+00
7	1	609.69*	61	107	1.96	1219.08	7.72E-01	3.24E-03	41.7	1.45E+00
8	1	1848.53	16	6	1.89	3699.11	3.29E-01	8.57E-04	37.9	1.12E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĈi/L	%Error
TH-228	238.63	31	44.60*	1.538E+00	2.147E+00	2.165E+00	243.98
	240.98		3.95	1.529E+00	Li	ne Not Found	

Flag: "\*" = Keyline

Page: 2 Summary of Nuclide Activity

Acquisition date : 9-JUN-2006 16:43:59 Sample ID : 10L28834-5

Total number of lines in spectrum Number of unidentified lines 7

Number of lines tentatively identified by NID 1 12.50%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags

1.91Y 1.01 2.147E+00 2.165E+00 5.281E+00 243.98 Nuclide

TH-228

Total Activity : 2.147E+00 2.165E+00

Grand Total Activity: 2.147E+00 2.165E+00

"M" = Manually accepted Flags: "K" = Keyline not found

"M" = Manually accepted
"A" = Nuclide specific abn. limit "E" = Manually edited

Jnidentified Energy Lines Sample ID: 10L28834-5

Page : Acquisition date : 9-JUN-2006 16:43:59

Jann	710 10	-						1	0 ==	%Eff	Flags
Ιt	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	2DIT	11490
1 1 1 1 1	66.67 139.88 198.88 352.03 596.17 609.69 1848.53	86 165 212 61 69 61 16	669 699 559 213 130 107	1.47 1.27 2.15 1.75 1.98 1.96	1219.08	273 392 698 1185 1213	12 11 12 14 12	4.59E-03 8.81E-03 1.13E-02 3.25E-03 3.70E-03 3.24E-03 8.57E-04	66.2 43.8 **** 74.4 83.3	7.40E-0 1.91E+0 1.71E+0 1.17E+0 7.85E-0 7.72E-0 3.29E-0	0 0 0 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

8 Total number of lines in spectrum 7 Number of unidentified lines Number of lines tentatively identified by NID 12.50% 1

Nuclide Type : natural

Wtd Mean Wtd Mean 2-Sigma Decay Corr Uncorrected Decay Corr 2-Sigma Error %Error Flags pCi/L pCi/L Decay Hlife Nuclide 243.98 5.281E+00 2.165E+00 2.147E+00 1.01 1.91Y TH-228 \_\_\_\_\_

2.165E+00 2.147E+00 Total Activity :

Grand Total Activity: 2.147E+00 2.165E+00

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

Identi	fied Nuclides				/ ·
Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
TH-228	2.165E+00	5.281E+00	8.371E+00	0.000E+00	0.259
Non-Id	dentified Nuclide	S			
Nuclide	Key-Line Activity K.I (pCi/L) Ide	. Act error	MDA (pCi/L)	MDA error	Act/MDA

Nuclide 0.034 0.000E+00 4.182E+01 2.515E+01 1.441E+00 BE-7 Half-Life too short 1.589E-02 1.674E-03 -0.03€ NA-24 0.000E+00 7.466E+01 4.178E+01 -2.703E+00 -0.31° K-400.000E+00 4.652E+01 2.877E+01 -1.475E+01 CR-51

					•
√N-54	-1.148E+00	2.806E+00	4.522E+00	0.000E+00	-0.254
TO-54	-1.093E+00	2.763E+00	4.530E+00	0.000E+00	-0.241
	-6.437E-01	2.793E+00	4.553E+00	0.000E+00	-0.141
CO-58	4.959E-01	5.528E+00	9.230E+00	0.000E+00	0.054
FE-59	2.107E+00	2.880E+00	4.994E+00	0.000E+00	0.422
CO-60	5.592E+00	5.781E+00	1.019E+01	0.000E+00	0.549
ZN-65	4.452E-01	4.001E+00	6.655E+00	0.000E+00	0.067
SE-75	2.122E+01	3.601E+00	7.004E+00	0.000E+00	3.030
SR-85	2.255E+00	3.228E+00	5.344E+00	0.000E+00	0.422
Y-88	1.737E-01	2.689E+00	4.389E+00	0.000E+00	0.040
NB-94	1.638E+00	2.845E+00	4.865E+00	0.000E+00	0.337
NB-95	-1.780E+00	4.901E+00	7.960E+00	0.000E+00	-0.224
ZR-95		1.637E+02	2.671E+02	0.000E+00	-0.200
MO-99	-5.329E+01	3.271E+00	5.393E+00	0.000E+00	-0.064
RU-103	-3.425E-01	2.620E+01	4.398E+01	0.000E+00	0.584
RU-106	2.567E+01	2.786E+00	4.631E+00	0.000E+00	0.213
AG-110m	9.875E-01	3.903E+00	6.446E+00	0.000E+00	0.203
SN-113	1.309E+00	6.894E+00	4.937E+00	0.000E+00	0.182
SB-124	9.001E-01	8.293E+00	1.336E+01	0.000E+00	-0.125
SB-125	-1.665E+00	3.611E+01	5.892E+01	0.000E+00	-0.272
TE-129M	-1.600E+01	5.974E+00	9.845E+00	0.000E+00	0.120
I-131	1.179E+00		7.097E+00	0.000E+00	1.242
BA-133	8.814E+00	4.680E+00	5.129E+00	0.000E+00	1.845
CS-134	9.460E+00	5.449E+00	6.678E+00	0.000E+00	-0.201
CS-136	-1.343E+00	4.121E+00	5.076E+00	0.000E+00	0.629
CS-137	3.192E+00	2.942E+00	4.806E+00	0.000E+00	-0.167
CE-139	-8.003E-01	2.953E+00	2.490E+01	0.000E+00	0.023
BA-140	5.659E-01	1.507E+01	7.817E+00	0.000E+00	0.000
LA-140	1.071E-04	4.729E+00	9.095E+00	0.000E+00	0.247
CE-141	2.248E+00	6.438E+00	3.519E+01	0.000E+00	0.029
CE-144	1.026E+00	2.509E+01	1.446E+01	0.000E+00	-0.755
EU-152	-1.092E+01	1.100E+01		0.000E+00	-0.466
EU-154	-4.323E+00	5.708E+00	9.282E+00	0.000E+00	-0.035
RA-226	-4.013E+00	7.409E+01	1.160E+02	0.000E+00	-0.072
AC-228	-1.244E+00	1.104E+01	1.720E+01	0.000E+00	-0.072
TH-232	-1.241E+00	1.101E+01	1.715E+01		0.642
U-235	2.343E+01	2.534E+01	3.647E+01	0.000E+00	0.733
U-238	3.901E+02	3.006E+02	5.323E+02	0.000E+00	-1.204
AM-241	-4.595E+01	2.799E+01	3.815E+01	0.000E+00	-1.204

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3.004E+00, WG L28834-5 QU
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B,10L28834-5
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C, TH-228
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                                    2.515E+01,
C, BE-7
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           , NO
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                                    4.178E+01,
C, K-40
                                    2.877E+01,
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                                                                   -0.317
                    -1.475E+01,
C, CR-51
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                                                   4.522E+00,,
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C, MN-54
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                                                                   -0.241
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C, CO-57
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C, CO-58
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C, BA-140
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                                    6.438E+00,
                                                   9.095E+00,,
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C, CE-141
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C, CE-144
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            , NO
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C, EU-154
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                                    7.409E+01,
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C, RA-226
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C, AC-228
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                                                   5.323E+02,,
C, U-238
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2.799E+01,

3.815E+01,,

-1.204

-4.595E+01,

C, AM-241

,NO ,

Analyst: LIMS: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:55:25.31 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:18.94 \_\_\_\_\_\_

LIMS No., Customer Name, Client ID: WG L28834-6 QUAD CITY

Smple Date: 1-JUN-2006 08:20:00.0 Sample ID : 04L28834-6

Geometry : 043L082004 Sample Type : WG BKGFILE : 04BG060306MT Quantity : 3.00120E+00 L Real Time : 0 04:48:55.91 Start Channel: 90 Energy Tol : 1.00000 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:48:53.00 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec %Err	Fit
1.	1	66.22*	113	449	1.46	132.91	6.60E-01	6.52E-03 35.3 2.	51E+00
2	1	140.02	148	436	1.50	280.48	2.04E+00	8.54E-03 26.7 2.	60E+00
3	1	198.69*	95	289	1.54	397.79	1.86E+00	5.50E-03 38.8 1.	99E+00
4	1	238.91*	12	277	1.22	478.24	1.68E+00	6.66E-04298.6 2.	18E+00
5	1	351.81*	27	168	1.47	703.98	1.28E+00	1.57E-03100.8 2.	14E+00
6	1	596.63	61	102	1.78	1193.50	8.62E-01	3.53E-03 33.7 1.	44E+00
7	1	609.85*	67	124	1.95	1219.92	8.48E-01	3.89E-03 43.9 1.	.13E+00
8	1	849.36	117	88	11.37	1698.76	6.56E-01	6.73E-03 24.0 1.	.59E+00
9	1	911.68*	14	55	1.94	1823.35	6.21E-01	8.12E-04119.3 3.	.71E+00
10	1	922.01	39	13	1.77	1844.00	6.15E-01	2.25E-03 18.5	
11	1	1173.82*	9	33	2.66	2347.36	5.08E-01	5.33E-04158.3 1.	.07E+00
12	1	1461.81	94	27	3.04	2922.98	4.29E-01	5.41E-03 15.8 2.	14E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	94	10.67*	4.294E-01	1.063E+02	1.063E+02	31.67
AC-228	835.50		1.75	6.649E-01	Li	ne Not Found	
	911.07	14	27.70*	6.208E-01	4.251E+00	4.262E+00	238.56
TH-228	238.63	12	44.60*	1.678E+00	8.008E-01	8.075E-01	597.29
	240.98		3.95	1.669E+00	Lin	ne Not Found	

Nuclide Type: activation

Uncorrected Decay Corr 2-Sigma %Abn %Eff pCi/L pCi/L %Error Nuclide Area Energy 9.470E-01 9 100.00 5.083E-01 9.441E-01 316.63 CO-60 1173.22 1332.49 ----- 100.00\* 4.604E-01 ----- Line Not Found

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date : 9-JUN-2006 17:06:18 Sample ID : 04L28834-6

12

Total number of lines in spectrum

Number of unidentified lines Number of lines tentatively identified by NID

4 33.33%

Nuclide Type : natural

			Uncorrected		Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĈi/L	2-Sigma Error	%Error Fl	ags
K-40	1.28E+09Y	1.00	1.063E+02	1.063E+02	0.337E+02	31.67	
AC-228	5.75Y	1.00	4.251E+00	4.262E+00	10.17E+00	238.56	
TH-228	1.91Y	1.01	8.008E-01	8.075E-01	48.23E-01	597.29	

Total Activity : 1.114E+02 1.114E+02

Nuclide Type : activation

Nuclide CO-60	Hlife 5.27Y	-	4	Decay Corr 2-Sigma Error 29.98E-01	%Error	Flags

Total Activity : 9.441E-01 9.470E-01

Grand Total Activity: 1.123E+02 1.123E+02

Flags: "K" = Keyline not found

"M" = Manually accepted
"A" = Nuclide specific abn. limit "E" = Manually edited

Page: 3

Unidentified Energy Lines Sample ID: 04L28834-6

Acquisition date : 9-JUN-2006 17:06:18

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.22	113	449	1.46	132.91	130	8	6.52E-03	70.6	6.60E-01	
1	140.02	148	436	1.50	280.48	276	9	8.54E-03	53.5	2.04E+00	
1	198.69	95	289	1.54	397.79	393	9	5.50E-03	77.6	1.86E+00	
1	351.81	27	168	1.47	703.98	700	9	1.57E-03	***	1.28E+00	
1	596.63	61	102	1.78	1193.50	1189	10	3.53E-03	67.5	8.62E-01	
1	609.85	67	124	1.95	1219.92	1215	16	3.89E-03	87.8	8.48E-01	
1	849.36	117	88	11.37	1698.76	1688	27	6.73E-03	48.0	6.56E-01	
1	922.01	39	13	1.77	1844.00	1817	30	2.25E-03	37.0	6.15E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 12
Number of unidentified lines 8
Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

	2750 . 22000		Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĊi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	1.063E+02	1.063E+02	0.337E+02	31.67	_
AC-228	5.75Y	1.00	4.251E+00	4.262E+00	10.17E+00	238.56	
TH-228	1.91Y	1.01	8.008E-01	8.075E-01	48.23E-01	597.29	
	Total Acti	vity:	1.114E+02	1.114E+02			

Nuclide Type : activation

			Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error	Flags
CO-60	5.27Y	1.00	9.441E-01	9.470E-01	29.98E-01	316.63	

Total Activity: 9.441E-01 9.470E-01

Grand Total Activity: 1.123E+02 1.123E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.063E+02	3.368E+01	4.201E+01	0.000E+00	2.531

0.000E+00

5.151E+00

0.184

CO-60	9.470E-01	2.998E+00	5.151E+00	0.000E+00	0.287
AC-228	4.262E+00	1.017E+01	1.484E+01		0.107
TH-228	8.075E-01	4.823E+00	7.535E+00	0.000E+00	0.107
Non-I	dentified Nuclides				
	Key-Line		N 4 T - 71	MDA error	Act/MDA
	Activity K.L.	Act error	MDA	MDA CITOI	1100/11011
Nuclide	(pCi/L) Ided		(pCi/L)		
			2 0600.01	0.000E+00	0.300
BE-7	1.158E+01	2.282E+01	3.860E+01 Half-Life to		<b>313</b> 3
NA-24	-1.781E-02	1.540E-02	4.198E+01	0.000E+00	-0.024
CR-51	-9.995E-01	2.554E+01		0.000E+00	0.272
MN-54	1.173E+00	2.678E+00	4.316E+00	0.000E+00	0.589
CO-57	2.209E+00	2.183E+00	3.753E+00	0.000E+00	-0.210
CO-58	-9.194E-01	2.730E+00	4.370E+00	0.000E+00	0.408
FE-59	4.089E+00	5.847E+00	1.001E+01		-0.289
ZN-65	-2.585E+00	5.671E+00	8.959E+00	0.000E+00	-0.246
SE-75	-1.355E+00	3.352E+00	5.503E+00	0.000E+00	3.180
SR-85	2.076E+01	3.291E+00	6.528E+00	0.000E+00	-0.414
Y-88	-1.786E+00	2.838E+00	4.314E+00	0.000E+00	
NB-94	-2.826E-01	2.367E+00	3.885E+00	0.000E+00	-0.073
NB-95	1.662E+00	2.666E+00	4.540E+00	0.000E+00	0.366
ZR-95	-5.864E+00	4.474E+00	6.707E+00	0.000E+00	-0.874
MO-99	-3.259E+01	1.586E+02	2.580E+02	0.000E+00	-0.126
RU-103	6.843E-01	2.994E+00	4.986E+00	0.000E+00	0.137
RU-106	-8.338E+00	2.798E+01	3.964E+01	0.000E+00	-0.210
AG-110m	-6.000E-01	2.452E+00	4.015E+00	0.000E+00	-0.149
SN-113	2.931E+00	3.248E+00	5.494E+00	0.000E+00	0.533
SB-124	4.040E+00	5.664E+00	4.702E+00	0.000E+00	0.859
SB-125	-1.080E+00	6.890E+00	1.139E+01	0.000E+00	-0.095
TE-129M	-7.561E+00	3.347E+01	5.491E+01	0.000E+00	-0.138
I-131	-2.123E+00	5.212E+00	8.365E+00	0.000E+00	-0.254
BA-133	5.042E+00	4.170E+00	6.180E+00	0.000E+00	0.816
CS-134	5.114E+00	5.244E+00	4.538E+00	0.000E+00	1.127
CS-136	1.156E+00	3.811E+00	6.348E+00	0.000E+00	0.182
CS-137	9.830E-01	2.689E+00	4.552E+00	0.000E+00	0.216
CE-139	6.376E-01	2.304E+00	3.833E+00	0.000E+00	0.166
BA-140	7.741E+00	1.339E+01	2.262E+01	0.000E+00	0.342
LA-140	2.583E+00	4.677E+00	8.110E+00	0.000E+00	0.319
CE-141	1.906E+00	5.175E+00	7.460E+00	0.000E+00	0.255
CE-141 CE-144	2.434E+00	2.000E+01	2.869E+01	0.000E+00	0.085
	-1.128E+00	8.836E+00	1.260E+01	0.000E+00	-0.090
EU-152	5.059E+00	4.558E+00	7.849E+00	0.000E+00	0.645
EU-154	-3.588E+00	6.289E+01	9.888E+01	0.000E+00	-0.036
RA-226	4.251E+00 +	1.014E+01	1.644E+01	0.000E+00	0.259
TH-232	1.656E+01	1.983E+01	2.914E+01	0.000E+00	0.568
U-235		2.577E+02	4.566E+02	0.000E+00	0.584
U-238	2.666E+02	2.536E+01	3.934E+01	0.000E+00	-0.404
AM-241	-1.588E+01	2.0000101	J.J. 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		

2.998E+00

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3.001E+00,WG L28834-6 QU
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                                             ,06/02/2006 09:04,043L082004
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B,04L28834-6
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                                                  4.201E+01,,
                                    3.368E+01,
                     1.063E+02,
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C, K-40
                                                                    0.184
                                                   5.151E+00,,
                                    2.998E+00,
                     9.470E-01,
C, CO-60
            , YES,
                                                                    0.287
                                                   1.484E+01,,
                                    1.017E+01,
                     4.262E+00,
C, AC-228
            , YES,
                                                                    0.107
                                                   7.535E+00,,
                                    4.823E+00,
                     8.075E-01,
            , YES,
C, TH-228
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                    -8.338E+00,
C, RU-106
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                    -6.000E-01,
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C,SB-124
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                                     5.244E+00,
                      5.114E+00,
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                                     4.558E+00,
 C, EU-154
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                                                    9.888E+01,,
                                     6.289E+01,
                     -3.588E+00,
             , NO
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                      4.251E+00,
 C, TH-232
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                                     1.983E+01,
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             ,NO
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                      2.666E+02,
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                                     2.536E+01,
                     -1.588E+01,
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C, AM-241

,NO ,

LIMS: Sec. Review: Analyst:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:55:38.58 TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:21.78

\_\_\_\_\_\_

LIMS No., Customer Name, Client ID: WG L28834-7 QUAD CITY

: 07L28834-7 Smple Date: 31-MAY-2006 09:10:00. Sample ID

Sample Type : WG Geometry : 073L082504 Quantity : 3.01860E+00 L BKGFILE : 07BG060306MT 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.29*	144	450	1.44	133.16	8.04E-01	8.27E-03	28.8	1.03E+00
2	1	139.70*	117	422	1.43	280.09	2.36E+00	6.75E-03	34.8	4.90E+00
3	1	198.30*	122	362	1.42	397.36	2.25E+00	7.02E-03	32.9	1.92E+00
4	1	295.09*	145	336	3.26	591.08	1.81E+00	8.37E-03	28.5	1.83E+00
5	1	584.26*	214	139	1.47	1169.68	1.12E+00	1.23E-02	14.2	6.09E+01
6	1	596.04	111	135	1.86	1193.25	1.10E+00	6.40E-03	23.0	7.83E-01
7	1	609.30*	153	138	1.57	1219.78	1.09E+00	8.81E-03	19.2	8.90E-01
8	1	1120.42*	45	64	1.54	2242.07	7.03E-01	2.62E-03	42.4	4.13E-01
9	1	1730.35	23	16	1.53	3461.33	5.19E-01	1.35E-03	41.9	2.21E+00
10	1	1764.39*	55	13	4.51	3529.37	5.12E-01	3.16E-03	25.2	4.01E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flaq: "\*" = Keyline

Summary of Nuclide Activity Page: 2

Sample ID : 07L28834-7 Acquisition date : 9-JUN-2006 17:06:21

Total number of lines in spectrum 10
Number of unidentified lines 10
Number of lines tentatively identified by NID 0
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

0.00%

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit "M" = Manually accepted

Unidentified Energy Lines Sample ID : 07L28834-7

Page: 3 Acquisition date : 9-JUN-2006 17:06:21

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff F	lags
1 1 1 1 1 1 1 1 1 1 1 1	66.29 139.70 198.30 295.09 584.26 596.04 609.30 1120.42 1730.35	144 117 122 145 214 111 153 45 23	450 422 362 336 139 135 138 64 16	1.44 1.43 1.42 3.26 1.47 1.86 1.57 1.54	1193.25 1219.78	1163 1187 1214 2236 3454	8 9 13 15 12 11 12 13	8.27E-03 6.75E-03 7.02E-03 8.37E-03 1.23E-02 6.40E-03 8.81E-03 2.62E-03 1.35E-03 3.16E-03	69.6 65.8 57.0 28.4 45.9 38.4 84.8 83.8	8.04E-01 2.36E+00 2.25E+00 1.81E+00 1.12E+00 1.10E+00 7.03E-01 5.19E-01 5.12E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 10 Number of unidentified lines 10 Number of lines tentatively identified by NID 0 0.00% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

# ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	8.202E+00		2.112E+01	3.496E+01	0.000E+00	0.235
NA-24	-6.866E-02		4.142E-02	Half-Life t	oo short	
K-40	2.702E-01		3.253E+01	5.597E+01	0.000E+00	0.005
CR-51	-2.502E+01		2.363E+01	3.802E+01	0.000E+00	-0.658
MN-54	7.958E-01		2.227E+00	3.750E+00	0.000E+00	0.212
CO-57	-2.086E-01		2.168E+00	3.534E+00	0.000E+00	-0.059
CO-58	-2.809E+00		2.419E+00	3.757E+00	0.000E+00	-0.748
FE-59	4.431E+00		4.637E+00	8.125E+00	0.000E+00	0.545
CO-60	5.392E-01		2.295E+00	3.813E+00	0.000E+00	0.141
ZN-65	1.011E+01		5.894E+00	9.376E+00	0.000E+00	1.079
SE-75	3.393E-01		3.139E+00	5.142E+00	0.000E+00	0.066
SR-85	2.275E+01		2.998E+00	6.012E+00	0.000E+00	3.785
Y-88	-3.770E+00		2.606E+00	3.764E+00	0.000E+00	-1.002
NB-94	-9.473E-01		2.316E+00	3.706E+00	0.000E+00	-0.256
NB-95	1.865E+00		2.394E+00	4.130E+00	0.000E+00	0.452
ZR-95	-2.563E+00		4.320E+00	6.786E+00	0.000E+00	-0.378
MO-99	5.020E+01		1.791E+02	2.956E+02	0.000E+00	0.170
RU-103	3.186E+00		2.699E+00	4.597E+00	0.000E+00	0.693

# L28834 R1 91 of 122

RU-106 AG-110m SN-113 SB-124 SB-125 TE-129M I-131 BA-133 CS-134 CS-136 CS-137 CE-139 BA-140 LA-140 CE-141 CE-144 EU-152 EU-154 RA-226 AC-228 TH-232 U-235	3.778E+00 -8.635E-02 1.307E+00 -4.572E-01 3.683E-01 4.803E+00 -6.635E-01 6.309E+00 6.746E+00 1.430E+00 2.467E+00 9.078E-01 2.072E+00 1.718E+00 2.176E+00 -2.590E+01 -1.533E+00 -1.304E+01 -8.561E-01 7.828E+00 -8.534E-01 3.140E+01	2.237E+01 2.335E+00 3.063E+00 5.792E+00 6.410E+00 2.978E+01 4.987E+00 3.238E+00 4.686E+00 3.457E+00 2.490E+00 2.239E+00 1.255E+01 4.068E+00 5.243E+00 1.973E+01 7.534E+00 4.509E+00 5.743E+01 9.384E+00 4.673E+00 9.355E+00 1.994E+01 2.447E+02	3.707E+01 3.820E+00 5.123E+00 4.020E+00 1.053E+01 4.893E+01 8.207E+00 5.690E+00 4.669E+00 5.847E+00 3.832E+00 2.090E+01 6.955E+00 7.321E+00 2.745E+01 1.110E+01 7.302E+00 9.341E+01 1.478E+01 7.882E+00 1.473E+01 2.912E+01 3.973E+02	O.000E+00 O.000E+00	0.102 -0.023 0.255 -0.114 0.035 0.098 -0.081 1.109 1.445 0.244 0.287 0.644 0.043 0.298 0.235 0.079 -2.333 -0.210 -0.140 -0.058 0.993 -0.058 1.078 -0.047
U-235 U-238 AM-241	3.140E+01 -1.873E+01 -3.815E+01	1.994E+01 2.447E+02 2.336E+01			- 1

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NO,

C, AM-241

LIMS: 💆 Analyst: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 12-JUN-2006 00:50:51.01 TBE13 P-10727B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:27.48

LIMS No., Customer Name, Client ID: WG L28834-8 QUAD CITY

Smple Date: 31-MAY-2006 08:20:00. : 13L28834-8 Sample ID

Geometry : 133L082404 Sample Type : WG BKGFILE : 13BG060306MT : 3.03660E+00 L Quantity Energy Tol : 1.50000 Real Time : 0 04:51:27.64 Start Channel: 25 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:51:22.72 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1 1	65.53 85.23* 92.65* 139.58* 185.61* 198.02* 351.86* 595.88 609.37* 911.88*	76 12 52 65 19 117 41 135 77	374 897 767 436 429 379 177 124 116	0.91 3.51 1.42 1.48 1.13 1.29 2.48 1.94 2.07	131.16 170.54 185.37 279.16 371.17 395.96 703.50 1191.43 1218.41 1823.48	7.96E-01 1.52E+00 1.74E+00 2.27E+00 2.18E+00 2.13E+00 1.51E+00 1.02E+00	4.36E-03 6.86E-045 2.95E-03 3.72E-03 1.08E-032 6.67E-03 2.34E-03 7.75E-03 4.38E-03 1.87E-03	40.1 555.2 120.6 62.8 225.0 33.0 74.3 20.3 36.8	6.97E+00 4.36E+00 4.30E+00 3.48E+00 1.56E+00 1.95E+00 2.44E+00 1.35E+00
10 11	1 1	1147.21	33 25	51	1.99	2294.34	,	1.45E-03		1.42E+00
12 13	1	1461.64* 1478.12	25 410	23 28	2.37 5.08		5.14E-01 5.10E-01	1.43E-03 2.35E-02	78.0	9.50E-01 3.07E+02
14	1	2003.12	20	13	3.25	4008.00	4.26E-01	1.14E-03	39.9	1.58E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

				Uncorrected	Decay Corr	z-Sigma
Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
1460.81	25	10.67*	5.141E-01	2.317E+01	2.317E+01	156.01
186.21	19	3.28*	2.179E+00	1.345E+01	1.345E+01	450.04
835.50		1.75	7.877E-01	Lir	ne Not Found	
911.07	33	27.70*	7.356E-01	8.185E+00	8.211E+00	125.75
143.76		10.50*	2.278E+00	Li	ne Not Found	
163.35		4.70	2.256E+00	Liı	ne Not Found	
185.71	19	54.00	2.179E+00	8.170E-01	8.170E-01	450.04
205.31		4.70	2.093E+00	Li	ne Not Found	
	1460.81 186.21 835.50 911.07 143.76 163.35 185.71	1460.81 25 186.21 19 835.50 911.07 33 143.76 163.35 185.71 19	1460.81     25     10.67*       186.21     19     3.28*       835.50      1.75       911.07     33     27.70*       143.76      10.50*       163.35      4.70       185.71     19     54.00	1460.81 25 10.67* 5.141E-01 186.21 19 3.28* 2.179E+00 835.50 1.75 7.877E-01 911.07 33 27.70* 7.356E-01 143.76 10.50* 2.278E+00 163.35 4.70 2.256E+00 185.71 19 54.00 2.179E+00	Energy Area %Abn %Eff pCi/L 1460.81 25 10.67* 5.141E-01 2.317E+01 186.21 19 3.28* 2.179E+00 1.345E+01 835.50 1.75 7.877E-01 Lir 911.07 33 27.70* 7.356E-01 8.185E+00 143.76 10.50* 2.278E+00 Lir 163.35 4.70 2.256E+00 Lir 185.71 19 54.00 2.179E+00 8.170E-01	1460.81       25       10.67*       5.141E-01       2.317E+01       2.317E+01         186.21       19       3.28*       2.179E+00       1.345E+01       1.345E+01         835.50        1.75       7.877E-01        Line Not Found         911.07       33       27.70*       7.356E-01       8.185E+00       8.211E+00         143.76        10.50*       2.278E+00        Line Not Found         163.35        4.70       2.256E+00        Line Not Found         185.71       19       54.00       2.179E+00       8.170E-01       8.170E-01

The second at a d Dogott Coros

2 Ciama

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date: 9-JUN-2006 17:06:27 Sample ID : 13L28834-8

14 Total number of lines in spectrum Number of unidentified lines 11

Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

			Uncorrected	Decay Corr	<b>4</b>	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.614E+01	156.01	
RA-226	1600.00Y	1.00	1.345E+01	1.345E+01	6.053E+01	450.04	
AC-228	5.75Y	1.00	8.185E+00	8.211E+00	10.32E+00	125.75	
U-235	7.04E+08Y	1.00	8.170E-01	8.170E-01	36.77E-01	450.04	K

Total Activity: 4.562E+01 4.564E+01

Grand Total Activity: 4.562E+01 4.564E+01

Flags: "K" = Keyline not found

"M" = Manually accepted
"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 13L28834-8

Page: 3 Acquisition date : 9-JUN-2006 17:06:27

21.43%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1 1 1	65.53 85.23 92.65 139.58 198.02 351.86 595.88 609.37 1147.21 1478.12 2003.12	76 12 52 65 117 41 135 77 25 410 20	374 897 767 436 379 177 124 116 51 28 13	0.91 3.51 1.42 1.48 1.29 2.48 1.94 2.07 1.99 5.08 3.25	131.16 170.54 185.37 279.16 395.96 703.50 1191.43 1218.41 2294.34 2956.66 4008.00	165 180 275 392 699 1184 1213 2288	12 8 8 10 15 13 12	4.36E-03 6.86E-04 2.95E-03 3.72E-03 6.67E-03 2.34E-03 7.75E-03 4.38E-03 1.45E-03 2.35E-02	80.2 **** **** 66.0 **** 40.5 73.6 **** 6.0 79.9	7.96E-01 1.52E+00 1.74E+00 2.27E+00 2.13E+00 1.51E+00 1.02E+00 1.01E+00 6.15E-01 4.26E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 14 Number of unidentified lines 11 Number of lines tentatively identified by NID 3

Nuclide Type : natural

Nuclide	Type: naci	lrai	Wtd Mean	Wtd Mean			
				Decay Corr	Decay Corr		
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error		Flags
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.614E+01	156.01	
RA-226	1600.00Y	1.00	1.345E+01	1.345E+01	6.053E+01	450.04	
AC-228	5.75Y	1.00	8.185E+00	8.211E+00	10.32E+00	125.75	
	Total Act:	ivity :	4.480E+01	4.483E+01			

Grand Total Activity: 4.480E+01 4.483E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.317E+01	3.614E+01	3.812E+01	0.000E+00	0.608
RA-226	1.345E+01	6.053E+01	8.525E+01	0.000E+00	0.158
AC-228	8.211E+00	1.032E+01	1.434E+01	0.000E+00	0.573

<sup>----</sup> Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.898E+01	2.141E+01	3.627E+01	0.000E+00	0.523
NA-24	5.586E-03	4.472E-02	Half-Life to		
CR-51	-2.411E+01	2.438E+01	3.827E+01	0.000E+00	-0.630
MN-54	2.199E+00	2.347E+00	4.063E+00	0.000E+00	0.541
CO-57	-6.318E-01	2.138E+00	3.542E+00	0.000E+00	-0.178
CO-58	1.874E-02	2.561E+00	4.229E+00	0.000E+00	0.004
FE-59	4.474E+00	5.292E+00	9.153E+00	0.000E+00	0.489
CO-60	8.130E-01	2.570E+00	4.341E+00	0.000E+00	0.187
ZN-65	3.120E+00	5.422E+00	9.216E+00	0.000E+00	0.339
SE-75	1.177E+00	3.079E+00	5.141E+00	0.000E+00	0.229
SR-85	1.772E+01	3.126E+00	5.956E+00	0.000E+00	2.976
Y-88	-6.489E-01	2.802E+00	4.487E+00	0.000E+00	-0.145
NB-94	-4.055E-02	2.296E+00	3.734E+00	0.000E+00	-0.011
NB-95	1.787E+00	2.516E+00	4.324E+00	0.000E+00	0.413
ZR-95	1.918E-01	4.483E+00	7.462E+00	0.000E+00	0.026
MO-99	4.399E+01	1.829E+02	3.081E+02	0.000E+00	0.143
RU-103	-2.242E-01	2.783E+00	4.510E+00	0.000E+00	-0.050
RU-106	-6.357E+00	2.219E+01	3.545E+01	0.000E+00	-0.179
AG-110m	-6.709E-01	2.309E+00	3.723E+00	0.000E+00	-0.180
SN-113	6.689E-01	3.097E+00	5.173E+00	0.000E+00	0.129
SB-124	4.799E+00	4.672E+00	4.155E+00	0.000E+00	1.155
SB-125	7.300E+00	6.624E+00	1.137E+01	0.000E+00	0.642
TE-129M	-1.176E+01	3.179E+01	5.123E+01	0.000E+00	-0.230
I-131	1.593E+00	4.977E+00	8.388E+00	0.000E+00	0.190
BA-133	3.614E+00	3.452E+00	5.184E+00	0.000E+00	0.697
CS-134	6.748E+00	4.310E+00	4.119E+00	0.000E+00	1.638
CS-136	1.103E+00	3.653E+00	6.129E+00	0.000E+00	0.180
CS-137	-5.939E-01	2.702E+00	4.167E+00	0.000E+00	-0.143
CE-139	5.404E-01	2.145E+00	3.538E+00	0.000E+00	0.153
BA-140	2.086E+00	1.256E+01	2.107E+01	0.000E+00	0.099
LA-140	2.240E+00	4.608E+00	7.919E+00	0.000E+00	0.283
CE-141	5.013E+00	4.759E+00	7.289E+00	0.000E+00	0.688
CE-144	-1.607E+01	1.880E+01	2.598E+01	0.000E+00	-0.618
EU-152	-6.934E+00	8.473E+00	1.159E+01	0.000E+00	-0.598
EU-154	-5.768E-01	4.383E+00	7.285E+00	0.000E+00	-0.079
TH-228	-9.237E-01	4.694E+00	7.518E+00	0.000E+00	-0.123
TH-232	8.185E+00 +	1.029E+01	1.617E+01	0.000E+00	0.506
U-235	7.128E+00	1.930E+01	2.706E+01	0.000E+00	0.263
U-238	-3.920E+01	2.875E+02	4.475E+02	0.000E+00	-0.088
AM-241	4.461E+00	2.071E+01	3.001E+01	0.000E+00	0.149

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C, SE-75
            , NO
                     1.177E+00,
                                    3.079E+00,
                                                   5.141E+00,,
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C, SR-85
            , NO
                     1.772E+01,
                                    3.126E+00,
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C, Y-88
                    -6.489E-01,
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C, NB-94
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                    -4.055E-02,
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C, NB-95
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C, ZR-95
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C,MO-99
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C, RU-103
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C, RU-106
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C, AG-110m
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C, SN-113
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C, SB-124
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C,SB-125
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C, TE-129M
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C, I-131
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                     1.593E+00,
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C, BA-133
                     3.614E+00,
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                                    3.452E+00,
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C, CS-134
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                     6.748E+00,
                                    4.310E+00,
                                                   4.119E+00,,
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C, CS-136
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C, CS-137
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C, BA-140
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C, LA-140
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C, CE-141
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                                    8.473E+00,
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C, EU-154
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C, TH-228
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C, U-235
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                    7.128E+00,
                                    1.930E+01,
                                                   2.706E+01,,
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C, U-238
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                                    2.875E+02,
                                                   4.475E+02,,
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C, AM-241
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2.071E+01,

3.001E+01,,

0.149

4.461E+00,

Analyst: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:59:05.21 TBE23 03017322 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:28.37 

LIMS No., Customer Name, Client ID: WG L28834-9 QUAD CITY

Smple Date: 1-JUN-2006 10:18:00.0 : 23L28834-9 Sample ID

Geometry : 233L082404 : WG Sample Type BKGFILE : 23BG060306MT : 3.01490E+00 L Quantity Start Channel: 50 Energy Tol: 1.50000 Real Time: 0 04:52:24.60 End Channel: 4090 Pk Srch Sens: 5.00000 Live time: 0 04:52:12.57 MDA Constant: 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11	4 4 5 5 0 0 0 0 0 0	33.72* 35.21* 63.02* 66.03 139.57* 198.55* 294.87* 351.58* 582.78* 595.51 608.92* 1460.61*	68 8 127 171 99 73 120 12 31 42 29 154	21 139 481 626 595 482 373 267 88 128 196 54	1.55	1190.71 1217.52	1.05E-01 1.03E+00 1.15E+00 2.32E+00 2.11E+00 1.64E+00 9.72E-01 9.56E-01 9.41E-01	3.87E-03 4.64E-044 7.22E-03 9.75E-03 5.67E-03 4.15E-03 6.85E-03 6.64E-04 1.75E-03 2.40E-03 1.65E-03 8.78E-03	474.0 35.2 28.9 46.8 59.9 36.3 301.6 71.0 50.9 122.3	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Uncorrected Decay Corr 2-Sigma pCi/L %Abn %Eff %Error pCi/L Area Energy Nuclide 34.89 1.448E+02 10.67\* 5.096E-01 1.448E+02 154 K-40 1460.81

Flag: "\*" = Keyline

Summary of Nuclide Activity Page :

Acquisition date : 9-JUN-2006 17:06:28 Sample ID: 23L28834-9

Total number of lines in spectrum 12 Number of unidentified lines 10

Number of lines tentatively identified by NID 2 16.67%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma
Decay pCi/L pCi/L 2-Sigma Error %Error
1.00 1.448E+02 1.448E+02 0.505E+02 34.89 2-Sigma Error %Error Flags Nuclide Hlife

K-40 1.28E+09Y 1.00 1.448E+02

Total Activity: 1.448E+02 1.448E+02

Grand Total Activity: 1.448E+02 1.448E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

9.72E-01

9.56E-01

9.41E-01

Т

Unidentified Energy Lines Sample ID: 23L28834-9

Page: 3
Acquisition date: 9-JUN-2006 17:06:28

Ιt Energy Bkqnd FWHM Area Channel Left Pw Cts/Sec %Err %Eff Flags 4 33.72 68 21 1.15 67.76 65 19 3.87E-03 60.8 8.15E-02 4 35.21 8 139 1.76 70.75 65 19 4.64E-04 \*\*\*\* 1.05E-01 5 63.02 127 481 1.28 126.32 122 16 7.22E-03 70.4 1.03E+00 5 66.03 171 626 1.67 132.33 122 16 9.75E-03 57.8 1.15E+00 0 139.57 99 595 1.05 279.31 276 8 5.67E-03 93.6 2.32E+000 198.55 73 482 1.29 397.20 393 9 4.15E-03 \*\*\*\* 2.11E+00 0 294.87 120 373 2.47 589.71 582 13 6.85E-03 72.5 1.64E+00 0 351.58 12 267 1.18 703.07 697 11 6.64E-04 \*\*\*\* 1.44E+00

1165.26 1160 10 1.75E-03 \*\*\*\*

1190.71 1187 9 2.40E-03 \*\*\*\*

1217.52 1210 17 1.65E-03 \*\*\*\*

Flags: "T" = Tentatively associated

31

42

29

Summary of Nuclide Activity

Total number of lines in spectrum 12
Number of unidentified lines 10

88

128

196

Number of lines tentatively identified by NID 2 16.67%

1.88

1.55

1.66

Nuclide Type : natural

0

0

0

582.78

595.51

608.92

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife pCi/L Decay pCi/L 2-Sigma Error %Error Flags K - 401.28E+09Y 1.00 1.448E+02 0.505E+02 1.448E+02 34.89 \_\_\_\_\_ \_\_\_\_\_\_

Total Activity: 1.448E+02 1.448E+02

Grand Total Activity : 1.448E+02 1.448E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.448E+02	5.051E+01	4.093E+01	0.000E+00	3.537

---- Non-Identified Nuclides ----

Key-Line
Activity K.L. Act error MDA MDA error Act/MDA
Nuclide (pCi/L) Ided (pCi/L)

D 17 17	7 4007 01	0 0000			
BE-7	1.402E+01	2.297E+01	3.981E+01	0.000E+00	0.352
NA-24	1.137E-02	1.319E-02	Half-Life		
CR-51	-4.934E+00	2.651E+01	4.479E+01	0.000E+00	-0.110
MN-54	2.859E+00	2.326E+00	4.272E+00	0.000E+00	0.669
CO-57	-1.251E-03	2.745E+00	4.604E+00	0.000E+00	0.000
CO-58	3.791E-01	2.614E+00	4.522E+00	0.000E+00	0.084
FE-59	3.385E+00	5.101E+00	9.243E+00	0.000E+00	0.366
CO-60	3.695E-01	2.422E+00	4.276E+00	0.000E+00	0.086
ZN-65	3.958E+00	5.222E+00	9.496E+00	0.000E+00	0.417
SE-75	6.259E-01	3.595E+00	6.155E+00	0.000E+00	0.102
SR-85	1.898E+01	3.132E+00	6.229E+00	0.000E+00	3.046
Y-88	-3.170E-01	2.415E+00	4.272E+00	0.000E+00	-0.074
NB-94	7.978E-01	2.299E+00	4.027E+00	0.000E+00	0.198
NB-95	1.623E+00	2.583E+00	4.581E+00	0.000E+00	0.354
ZR-95	-2.440E+00	4.486E+00	7.497E+00	0.000E+00	-0.325
MO-99	5.049E+00	1.478E+02	2.549E+02	0.000E+00	0.020
RU-103	9.005E-01	2.843E+00	4.866E+00	0.000E+00	0.185
RU-106	8.207E+00	2.431E+01	4.094E+01	0.000E+00	0.200
AG-110m	-3.102E-01	2.382E+00	4.086E+00	0.000E+00	-0.076
SN-113	1.071E-01	3.366E+00	5.715E+00	0.000E+00	0.019
SB-124	1.017E+00	6.248E+00	4.765E+00	0.000E+00	0.213
SB-125	-1.074E-01	7.218E+00	1.222E+01	0.000E+00	-0.009
TE-129M	4.997E+00	3.283E+01	5.588E+01	0.000E+00	0.089
I-131	1.483E-01	5.385E+00	9.141E+00	0.000E+00	0.016
BA-133	4.524E+00	4.200E+00	6.340E+00	0.000E+00	0.713
CS-134	1.209E+00	4.805E+00	4.922E+00	0.000E+00	0.246
CS-136	-1.566E+00	3.507E+00	5.880E+00	0.000E+00	-0.266
CS-137	-1.255E-01	2.672E+00	4.597E+00	0.000E+00	-0.027
CE-139	3.002E+00	2.782E+00	4.742E+00	0.000E+00	0.633
BA-140	8.806E+00	1.368E+01	2.376E+01	0.000E+00	0.371
LA-140	2.312E+00	4.069E+00	7.550E+00	0.000E+00	0.306
CE-141	4.624E+00	6.321E+00	9.162E+00	0.000E+00	0.505
CE-144	-2.028E+01	2.493E+01	3.459E+01	0.000E+00	-0.586
EU-152	3.004E-01	9.450E+00	1.360E+01	0.000E+00	0.022
EU-154	-8.406E-01	5.671E+00	9.485E+00	0.000E+00	-0.089
RA-226	-5.229E+01	7.227E+01	1.128E+02	0.000E+00	-0.464
AC-228	7.183E+00	9.821E+00	1.596E+01	0.000E+00	0.450
TH-228	4.729E-01	5.318E+00	8.426E+00	0.000E+00	0.056
TH-232	7.164E+00	9.794E+00	1.592E+01	0.000E+00	0.450
U-235	-1.930E+00	2.583E+01	3.566E+01	0.000E+00	-0.054
U-238	1.764E+02	2.909E+02	4.996E+02	0.000E+00	0.353
AM-241	3.077E+01	1.691E+01	2.511E+01	0.000E+00	1.225
	0.0,72,01	1.00101	2.01111701	0.0001100	1.447

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                                                                 3.015E+00,WG L28834-9 QU
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                                             ,06/01/2006 10:14,233L082404
C, K-40
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                                    5.051E+01,
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C, CR-51
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C, MN-54
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C, Y-88
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C, SN-113
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C, BA-140
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C, CE-141
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C, CE-144
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                   -2.028E+01,
                                    2.493E+01,
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                                                                   -0.586
C, EU-152
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                                                                   -0.089
            , NO
C, RA-226
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                                    7.227E+01,
                                                   1.128E+02,,
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C, AC-228
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                                                   8.426E+00,,
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C, TH-232
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                                    9.794E+00,
                                                   1.592E+01,,
                                                                    0.450
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                   -1.930E+00,
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                                                   3.566E+01,,
                                                                   -0.054
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                                                   4.996E+02,,
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C, AM-241
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1.691E+01,

2.511E+01,,

1.225

Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 14:02:51.06 TBE11 P-20610B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:19:29.87

LIMS No., Customer Name, Client ID: WG L28834-10 EXELON QUAD

Sample ID : 11L28834-10 Smple Date: 1-JUN-2006 09:17:00.0

Sample Type : WG Geometry : 113L082304

Quantity : 3.02010E+00 L BKGFILE : 11BG060306MT Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:37:11.74 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:37:05.82

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM Chann	el %Eff	Cts/Sec %Err	Fit
1	0	139.98*	83	533	1.52 279.	39 1.90E+00	5.02E-03 55.7	
2	0	198.82	65	432	1.03 397.		3.89E-03 59.2	
3	0	238.66*	5	404	1.37 477.	28 1.58E+00	2.95E-04879.7	
4	0	295.24*	17	173	1.04 590.	70 1.37E+00	1.04E-03146.3	
5	0	352.36*	32	267	1.00 705.	18 1.20E+00	1.90E-03114.4	
6	0	596.20	32	162	0.90 1193.	63 8.03E-01	1.91E-03 82.3	
7	0	609.24*	87	138	1.44 1219.	74 7.90E-01	5.24E-03 34.5	
8	0	1460.37*	36	45	1.62 2921.	25 3.92E-01	2.14E-03 57.4	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĊi/L	%Error
K-40	1460.81	36	10.67*	3.920E-01	4.581E+01	4.581E+01	114.89
TH-228	238.63	5	44.60*	1.577E+00	3.757E-01	3.788E-01	1759.45
	240.98		3.95	1.567E+00	Li	ne Not Found	

Flag: "\*" = Keyline

Summary of Nuclide Activity Page: 2 Sample ID : 11L28834-10 Acquisition date : 9-JUN-2006 17:19:29

Total number of lines in spectrum 8 Number of unidentified lines 6 Number of lines tentatively identified by NID 2 25.00%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma pCi/L pCi/L Nuclide 2-Sigma Error %Error Flags Hlife Decay 8E+09Y 1.00 4.581E+01 4.581E+01 5.263E+01 114.89 1.91Y 1.01 3.757E-01 3.788E-01 66.66E-01 1759.45 K-40 1.28E+09Y TH-228 4.618E+01 4.619E+01 Total Activity:

Grand Total Activity: 4.618E+01 4.619E+01

Flags: "K" = Keyline not found

"M" = Manually accepted "A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 11L28834-10

Page : Acquisition date : 9-JUN-2006 17:19:29

25.00%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	139.98	83	533	1.52	279.39	274	10	5.02E-03	****	1.90E+00	
0	198.82	65	432	1.03	397.40	392	9	3.89E-03	* * * *	1.75E+00	
0	295.24	17	173	1.04	590.70	587	7	1.04E-03	***	1.37E+00	
0	352.36	32	267	1.00	705.18	699	12	1.90E-03	***	1.20E+00	
0	596.20	32	162	0.90	1193.63	1187	12	1.91E-03	***	8.03E-01	
0	609.24	87	138	1.44				5.24E-03		7.90E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 8 Number of unidentified lines 6 Number of lines tentatively identified by NID

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 4.581E+01 4.581E+01 5.263E+01 114.89 TH-228 1.91Y 1.01 3.757E-01 3.788E-01 66.66E-01 1759.45

4.619E+01

Grand Total Activity: 4.618E+01 4.619E+01

Total Activity: 4.618E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

BE-7

NA-24

CR-51

No interference correction performed

6.547E+00

4.245E-03

-1.217E+01

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40 TH-228	4.581E+01 3.788E-01	5.263E+01 6.666E+00	4.666E+01 8.587E+00	0.000E+00 0.000E+00	0.982
Non-Ide	ntified Nuclio	des			
Nuclide	. **	.L. Act error ded	MDA (pCi/L)	MDA error	Act/MDA

2.720E+01

1.784E-02

3.069E+01

4.487E+01

5.010E+01

Half-Life too short

0.000E+00

0.000E+00

0.146

-0.243

MN-54	-1.456E+00	2.905E+00	4.606E+00	0.000E+00	-0.316
CO-57	-8.411E-01	2.926E+00	4.790E+00	0.000E+00	-0.176
CO-58	1.693E-01	3.144E+00	5.171E+00	0.000E+00	0.033
FE-59	3.707E+00	6.026E+00	1.040E+01	0.000E+00	0.356
CO-60	-2.058E+00	2.803E+00	4.274E+00	0.000E+00	-0.482
ZN-65	5.773E+00	6.349E+00	1.114E+01	0.000E+00	0.518
SE-75	2.034E-01	4.041E+00	6.735E+00	0.000E+00	0.030
SR-85	2.010E+01	3.756E+00	7.208E+00	0.000E+00	2.788
Y-88	1.924E+00	3.549E+00	6.146E+00	0.000E+00	0.313
NB-94	1.049E+00	2.813E+00	4.732E+00	0.000E+00	0.222
NB-95	1.432E+00	3.018E+00	5.099E+00	0.000E+00	0.281
ZR-95	8.863E-01	5.459E+00	9.063E+00	0.000E+00	0.098
MO-99	-3.179E+01	1.758E+02	2.864E+02	0.000E+00	-0.111
RU-103	3.741E+00	3.404E+00	5.821E+00	0.000E+00	0.643
RU-106	2.860E+01	2.753E+01	4.641E+01	0.000E+00	0.616
AG-110m	-1.527E+00	2.678E+00	4.283E+00	0.000E+00	-0.356
SN-113	1.768E+00	3.845E+00	6.437E+00	0.000E+00	0.275
SB-124	-3.049E+00	7.927E+00	5.241E+00	0.000E+00	-0.582
SB-125	7.033E-01	8.539E+00	1.404E+01	0.000E+00	0.050
TE-129M	4.498E+00	3.900E+01	6.405E+01	0.000E+00	0.070
I-131	4.220E-01	5.847E+00	9.660E+00	0.000E+00	0.044
BA-133	7.975E+00	4.673E+00	7.127E+00	0.000E+00	1.119
CS-134	2.247E+00	6.075E+00	5.464E+00	0.000E+00	0.411
CS-136	-1.707E+00	4.405E+00	7.045E+00	0.000E+00	-0.242
CS-137	-1.944E+00	2.839E+00	4.503E+00	0.000E+00	-0.432
CE-139	-6.076E-01	3.057E+00	4.978E+00	0.000E+00	-0.122
BA-140	8.358E-01	1.519E+01	2.474E+01	0.000E+00	0.034
LA-140	-5.782E+00	5.539E+00	8.342E+00	0.000E+00	-0.693
CE-141	2.462E+00	6.774E+00	9.560E+00	0.000E+00	0.257
CE-144	-1.618E+01	2.634E+01	3.595E+01	0.000E+00	-0.450
EU-152	-1.569E+01	1.134E+01	1.466E+01	0.000E+00	-1.070
EU-154	2.918E+00	6.012E+00	1.002E+01	0.000E+00	0.291
RA-226	2.928E+01	7.738E+01	1.227E+02	0.000E+00	0.239
AC-228	-8.064E-01	1.339E+01	2.028E+01	0.000E+00	-0.040
TH-232	-8.041E-01	1.335E+01	2.022E+01	0.000E+00	-0.040
U-235	2.169E+01	2.685E+01	3.847E+01	0.000E+00	0.564
U-238	-8.392E+01	3.119E+02	5.091E+02	0.000E+00	-0.165
AM-241	-7.423E+01	3.921E+01	6.119E+01	0.000E+00	-1.213

-1.213

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C, TH-228
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LIMS: Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:58:49.48 TBE15 P-10635B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:19:33.63

LIMS No., Customer Name, Client ID: WG L28834-11 QUAD CITY

Sample ID : 15L28834-11 Smple Date: 1-JUN-2006 08:30:00.0

Sample Type : WG Geometry : 153L082604 Quantity : 3.01660E+00 L BKGFILE : 15BG060306MT 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	139.36	78	548	2.22	266.99	2.70E+00	4.65E-03	59.6	3.15E+00
2	1	198.08	135	329	1.75	385.09	2.44E+00			
3	1	351.93*	73	170	1.68	694.43	1.59E+00			
4	1	608.57	93	82	2.23	1210.33	9.91E-01			
5	1	1460.38*	51	27	3.40	2921.35	4.69E-01			
6	1	1764.15	19	19	1.51	3531.07	4.07E-01			

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Uncorrected Decay Corr 2-Sigma Area %Abn %Eff Nuclide Energy pCi/L pCi/L %Error K-40 1460.81 51 10.67\* 4.695E-01 5.401E+01 5.401E+01 69.05

Flag: "\*" = Keyline

Summary of Nuclide Activity Page: 2
Sample ID: 15L28834-11 Acquisition date: 9-JUN-2006 17:19:33

Total number of lines in spectrum 6
Number of unidentified lines 5
Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags

K-40 1.28E+09Y 1.00 5.401E+01 5.401E+01 3.729E+01 69.05

Total Activity : 5.401E+01 5.401E+01

Grand Total Activity: 5.401E+01 5.401E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID : 15L28834-11

Page: 3 Acquisition date : 9-JUN-2006 17:19:33

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff F	'lags
1	139.36	78	548	2.22	266.99	263	11	4.65E-03	***	2.70E+00	
1	198.08	135	329	1.75	385.09	381	9	8.07E-03	51.3	2.44E+00	
1	351.93	73	170	1.68	694.43	691	10	4.37E-03	77.9	1.59E+00	
1	608.57	93	82	2.23						9.91E-01	
1	1764.15	19	19	1.51						4.07E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 6 Number of unidentified lines 5 Number of lines tentatively identified by NID

1 16.67%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide pCi/L pCi/L Hlife Decay 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 5.401E+01 5.401E+01 3.729E+01 69.05 Total Activity: 5.401E+01 5.401E+01

Grand Total Activity : 5.401E+01 5.401E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	5.401E+01	3.729E+01	3.990E+01	0.000E+00	1.354
Non-Ider	ntified Nuclides				
	Key-Line				

Nuclide	Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7 NA-24	1.465E+01 -1.587E-02	1.922E+01 1.510E-02	3.310E+01 Half-Life too	0.000E+00 short	0.443
CR-51 MN-54	-2.671E+01	2.037E+01	3.200E+01	0.000E+00	-0.835
MN-54 CO-57	1.189E+00 -2.472E-01	2.137E+00 1.910E+00	3.648E+00	0.000E+00	0.326
CO-58	-1.711E+00	2.442E+00	2.995E+00 3.854E+00	0.000E+00 0.000E+00	-0.083 -0.444

4.032E+00	4.584E+00	8.078E+00	0.000E+00	0.499
-1.615E+00	2.500E+00	3.835E+00	0.000E+00	-0.421
3.740E+00	5.062E+00	8.788E+00	0.000E+00	0.426
2.230E+00	2.699E+00	4.492E+00	0.000E+00	0.496
1.082E+01	2.537E+00	4.857E+00	0.000E+00	2.228
-1.184E+00	2.661E+00	4.195E+00	0.000E+00	-0.282
-9.762E-01	2.100E+00	3.309E+00	0.000E+00	-0.295
-1.733E+00	2.435E+00	3.864E+00	0.000E+00	-0.448
-7.826E-01	4.300E+00	7.053E+00	0.000E+00	-0.111
-9.146E+01	1.335E+02	2.123E+02	0.000E+00	-0.431
9.739E-01	2.381E+00	4.028E+00	0.000E+00	0.242
5.525E+00	2.112E+01	3.505E+01	0.000E+00	0.158
-1.142E+00	2°.169E+00	3.424E+00	0.000E+00	-0.333
5.854E-01	2.909E+00	4.796E+00	0.000E+00	0.122
-5.988E+00	3.097E+00	3.655E+00	0.000E+00	-1.638
6.398E+00	6.036E+00	1.030E+01	0.000E+00	0.621
1.544E+01	2.906E+01	4.824E+01	0.000E+00	0.320
3.623E+00	4.147E+00	7.060E+00	0.000E+00	0.513
5.670E-01	3.338E+00	4.705E+00	0.000E+00	0.121
-5.795E-01	2.853E+00	3.893E+00	0.000E+00	-0.149
6.420E-01	3.225E+00	5.389E+00	0.000E+00	0.119
8.799E-01	2.328E+00	3.879E+00	0.000E+00	0.227
4.457E-01	1.848E+00	3.076E+00	0.000E+00	0.145
1.989E+00	1.152E+01	1.920E+01	0.000E+00	0.104
2.359E+00	4.138E+00	7.164E+00	0.000E+00	0.329
6.981E-01	4.018E+00	5.756E+00	0.000E+00	0.121
2.317E+00	1.660E+01	2.384E+01	0.000E+00	0.097
-8.736E+00	7.041E+00	9.784E+00	0.000E+00	-0.893
-2.549E+00	3.975E+00	6.140E+00	0.000E+00	-0.415
3.403E+00	5.060E+01	8.069E+01	0.000E+00	0.042
3.578E+00	8.069E+00	1.361E+01	0.000E+00	0.263
6.438E-01	3.820E+00	5.965E+00	0.000E+00	0.108
3.568E+00	8.046E+00	1.357E+01		0.263
7.424E+00	1.546E+01	2.244E+01	0.000E+00	0.331
8.031E+01	2.435E+02	4.058E+02		0.198
-3.650E+01	1.999E+01	3.147E+01	0.000E+00	-1.160
	-1.615E+00 3.740E+00 2.230E+00 1.082E+01 -1.184E+00 -9.762E-01 -1.733E+00 -7.826E-01 -9.146E+01 9.739E-01 5.525E+00 -1.142E+00 5.854E-01 -5.988E+00 6.398E+00 1.544E+01 3.623E+00 5.670E-01 -5.795E-01 6.420E-01 8.799E-01 4.457E-01 1.989E+00 2.359E+00 6.981E-01 2.317E+00 -8.736E+00 -2.549E+00 3.403E+00 3.578E+00 6.438E-01 3.568E+00 7.424E+00 8.031E+01	-1.615E+00 3.740E+00 5.062E+00 2.230E+00 2.699E+00 1.082E+01 2.537E+00 -1.184E+00 2.661E+00 -9.762E-01 2.100E+00 -1.733E+00 2.435E+00 -7.826E-01 4.300E+00 -9.146E+01 9.146E+01 5.525E+00 -1.142E+00 5.854E-01 -5.988E+00 6.398E+00 6.398E+00 1.544E+01 3.623E+00 5.670E-01 3.338E+00 5.795E-01 6.420E-01 8.799E-01 4.457E-01 1.989E+00 6.981E-01 2.317E+00 -2.549E+00 3.975E+00 -2.549E+00 -2.546E+01 -2.435E+01	-1.615E+00	-1.615E+00

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3.147E+01,,

-1.160

C, AM-241

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Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:32:29.47

TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:10:47.99 \_\_\_\_\_\_

LIMS No., Customer Name, Client ID: WG L28834-12 QUAD CITY

Smple Date: 31-MAY-2006 08:50:00. Sample ID : 04L28834-12

Sample Type : WG Quantity : 3.02220E+00 L  $\texttt{Geometry} \quad : \quad \texttt{043L082004}$ BKGFILE : 04BG060306MT 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.36*	236	679	1.30	133.19	6.65E-01	9.84E-03	22.0	1.47E+00
2	1	139.89	218	628	1.14	280.21	2.04E+00	9.08E-03	21.7	1.63E+00
3	1	198.49*	55	492	1.24	397.41	1.86E+00	2.27E-03	86.6	2.80E+00
4	1	295.23	73	342	1.34	590.84	1.45E+00	3.03E-03	47.3	1.49E+00
5	1	351.94*	116	299	1.56	704.25	1.28E+00	4.84E-03	35.5	7.54E-01
6	1	583.74*	41	150	1.21	1167.72	8.77E-01	1.69E-03	69.0	2.13E+00
7	1	596.16	115	148	1.91	1192.54	8.63E-01	4.80E-03	23.1	5.50E-01
8	1	609.80*	149	149	1.62	1219.81	8.48E-01	6.20E-03	22.5	9.63E-01
9	1	911.70*	9	84	1.69	1823.38	6.21E-01	3.74E-042	246.1	1.16E+00
10	1	1120.97	55	78	2.30	2241.71	5.27E-01	2.29E-03	35.4	2.30E+00
11	1	1174.40	40	47	2.22	2348.52	5.08E-01	1.66E-03	36.0	1.14E+00
12	1	1461.64	120	95	3.08	2922.65	4.29E-01	4.99E-03	22.9	3.06E+00
13	1	1765.98	32	48	0.83	3530.88	3.77E-01	1.35E-03	49.6	5.26E+00

Flaq: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

	* *				Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĊi/L	%Error
K-40	1460.81	120	10.67*	4.294E-01	9.731E+01	9.731E+01	45.84
AC-228	835.50		1.75	6.649E-01	Li	ne Not Found	
	911.07	9	27.70*	6.208E-01	1.947E+00	1.953E+00	492.26
TH-232	583.14	41	30.25	8.766E-01	5.707E+00	5.707E+00	138.00
	911.07	9	27.70*	6.208E-01	1.947E+00	1.947E+00	492.26
	969.11		16.60	5.916E-01	Li	ne Not Found	

Flag: "\*" = Keyline

Summary of Nuclide Activity Page: 2
Sample ID: 04L28834-12 Acquisition date: 9-JUN-2006 22:10:47

Total number of lines in spectrum 13
Number of unidentified lines 10
Number of lines tentatively identified by NID 3 23.08%

Nuclide Type : natural

			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	9.731E+01	9.731E+01	4.460E+01	45.84	
AC-228	5.75Y	1.00	1.947E+00	1.953E+00	9.615E+00	492.26	
TH-232	1.41E+10Y	1.00	1.947E+00	1.947E+00	9.584E+00	492.26	
	Total Acti	vity:	1.012E+02	1.012E+02			

Grand Total Activity: 1.012E+02 1.012E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines Page: 3 Sample ID : 04L28834-12 Acquisition date : 9-JUN-2006 22:10:47

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.36	236	679 628	1.30	133.19	130	_	9.84E-03		6.65E-01	
1	139.89 198.49	218 55	628 492	$1.14 \\ 1.24$	280.21 397.41	276 393	_	9.08E-03 2.27E-03		2.04E+00 1.86E+00	
1	295.23	73	342	1.34	590.84	587	_	3.03E-03		1.45E+00	
1	351.94	116	299	1.56	704.25	698	13	4.84E-03	70.9	1.28E+00	)
1	596.16	115	148	1.91	1192.54	1187	12	4.80E-03	46.1	8.63E-01	•
1	609.80	149	149	1.62	1219.81	1213	13	6.20E-03	45.0	8.48E-01	-
1	1120.97	55	78	2.30	2241.71	2235	13	2.29E-03	70.9	5.27E-01	
1	1174.40	40	47	2.22	2348.52	2344	10	1.66E-03	72.0	5.08E-01	<u>.</u>
1	1765.98	32	48	0.83	3530.88	3521	15	1.35E-03	99.2	3.77E-01	_

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 13 Number of unidentified lines 10 Number of lines tentatively identified by NID 3 23.08%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 9.731E+01 9.731E+01 4.460E+01 45.84 TH-232 1.41E+10Y 1.00 4.191E+00 4.191E+00 6.085E+00 145.17 \_\_\_\_\_\_ \_\_\_\_\_ Total Activity : 1.015E+02 1.015E+02

Grand Total Activity : 1.015E+02 1.015E+02

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit

Interference Report

Interfering Interfered Nuclide Line Nuclide Line TH-232 911.07 AC-228 911.07

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	9.731E+01	4.460E+01	3.488E+01	0.000E+00	2.790
TH-232	4.191E+00	6.085E+00	1.257E+01	0.000E+00	0.333

---- Non-Identified Nuclides ----

Nuclide	<b>4</b>	K.L. Act error Ided	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.239E+01	1.925E+01	3.098E+01	0.000E+00	-0.400
NA-24	-1.211E-02	5.674E-02	Half-Life		
CR-51	-1.524E+01	2.270E+01	3.659E+01	0.000E+00	-0.416
MN - 54	-9.363E-02	2.242E+00	3.649E+00	0.000E+00	-0.026
CO-57	-2.493E-02	1.927E+00	3.225E+00	0.000E+00	-0.008
CO-58	-7.716E-01	2.321E+00	3.727E+00	0.000E+00	-0.207
FE-59	3.455E+00	4.910E+00	8.363E+00	0.000E+00	0.413
CO-60	1.655E-01	2.689E+00	4.112E+00	0.000E+00	0.040
ZN-65	2.501E+00	5.714E+00	8.146E+00	0.000E+00	0.307
SE-75	-2.370E+00	2.791E+00	4.531E+00	0.000E+00	-0.523
SR-85	2.039E+01	2.781E+00	5.516E+00	0.000E+00	3.697
Y-88	-1.886E+00	2.469E+00	3.749E+00	0.000E+00	-0.503
NB-94	-5.347E-01	2.146E+00	3.506E+00	0.000E+00	-0.152
NB-95	2.098E+00	2.314E+00	3.971E+00	0.000E+00	0.528
ZR-95	3.988E-01	4.293E+00	7.088E+00	0.000E+00	0.056
MO-99	-2.447E+00	1.823E+02	2.999E+02	0.000E+00	-0.008
RU-103	2.174E+00	2.486E+00	4.239E+00	0.000E+00	0.513
RU-106	7.334E+00	2.132E+01	3.465E+01	0.000E+00	0.212
AG-110m	-9.160E-01	2.112E+00	3.436E+00	0.000E+00	-0.267
SN-113	1.807E+00	2.965E+00	4.926E+00	0.000E+00	0.367
SB-124	5.759E-01	5.114E+00	3.765E+00	0.000E+00	0.153
SB-125	-5.518E-01	6.019E+00	9.987E+00	0.000E+00	-0.055
TE-129M	1.932E+01	2.841E+01	4.830E+01	0.000E+00	0.400
I-131	-6.537E+00	5.021E+00	7.820E+00	0.000E+00	-0.836
BA-133	9.020E+00	3.424E+00	5.354E+00	0.000E+00	1.685
CS-134	2.900E+00	4.689E+00	3.741E+00	0.000E+00	0.775
CS-136	1.676E+00	3.520E+00	5.897E+00	0.000E+00	0.284
CS-137	3.869E-01	2.266E+00	3.791E+00	0.000E+00	0.102
CE-139	5.673E-01	2.056E+00	3.415E+00	0.000E+00	0.166
BA-140	-3.038E+00	1.215E+01	1.971E+01	0.000E+00	-0.154
LA-140	7.048E-01	4.339E+00		0.000E+00	0.097
CE-141	2.663E+00	4.804E+00		0.000E+00	0.383
CE-144	-8.218E+00	1.753E+01	2.464E+01	0.000E+00	-0.334
EU-152	-2.438E+00	7.809E+00		0.000E+00	-0.228
EU-154	2.182E-01	3.984E+00		0.000E+00	0.033
RA-226	3.418E+01	5.415E+01		0.000E+00	0.405
AC-228	1.953E+00	9.615E+00		0.000E+00	0.132
TH-228	6.674E+00	4.561E+00		0.000E+00	0.898
U-235	1.863E+00	1.812E+01		0.000E+00	0.072
U-238	-5.593E+01	2.447E+02		0.000E+00	-0.141
AM-241	-9.829E+00	2.151E+01	3.364E+01	0.000E+00	-0.292

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C, TH-232
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           , NO
                    -8.218E+00,
                                    1.753E+01,
                                                   2.464E+01,,
                                                                   -0.334
C, EU-152
                                                   1.068E+01,,
           , NO
                    -2.438E+00,
                                    7.809E+00,
                                                                   -0.228
C, EU-154
           , NO
                     2.182E-01,
                                    3.984E+00,
                                                   6.676E+00,,
                                                                    0.033
C, RA-226
                     3.418E+01,
                                    5.415E+01,
                                                   8.432E+01,,
           , NO
                                                                    0.405
C, AC-228
                     1.953E+00,
                                    9.615E+00,
                                                   1.476E+01,,
           , NO
                                                                    0.132
C, TH-228
           , NO
                     6.674E+00,
                                    4.561E+00,
                                                   7.431E+00,,
                                                                    0.898
C, U-235
           , NO
                     1.863E+00,
                                    1.812E+01,
                                                   2.584E+01,,
                                                                    0.072
C, U-238
           ,NO
                    -5.593E+01,
                                    2.447E+02,
                                                   3.980E+02,,
                                                                   -0.141
```

2.151E+01,

3.364E+01,,

-0.292

C, AM-241

, NO

-9.829E+00,

Analyst: LIMS: Sec. Review:

-----

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:33:42.61 TBE07 P-10768B HpGe \*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:10:58.73 

LIMS No., Customer Name, Client ID: WG L28834-13 QUAD CITY

Sample ID : 07L28834-13 Smple Date: 31-MAY-2006 09:40:00.

Sample Type : WG Geometry : 073L082504 Quantity : 3.00630E+00 L BKGFILE : 07BG060306MT 

Pk I	t	Energy	Area	Bkgnd	FWHM Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5	1 1 1	66.39* 139.94* 295.81* 596.03 609.43* 1764.49*	250 205 127 144 79 36	643 621 494 188 193	1.34 133.36 1.07 280.57 2.68 592.52 2.69 1193.23 1.54 1220.03 3.27 3529.56	2.36E+00 1.81E+00 1.10E+00 1.09E+00	1.04E-02 8.53E-03 5.30E-03 6.00E-03 3.31E-03 1.50E-03	25.3 39.5 21.4 42.6	1.84E+00 2.12E+00 3.75E+00 9.64E-01

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity
Sample ID: 07L28834-13

Page: 2 Acquisition date : 9-JUN-2006 22:10:58

Total number of lines in spectrum 6 Number of unidentified lines 6
Number of lines tentatively identified by NID 0
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

0.00왕

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID: 07L28834-13

Page: 3 Acquisition date : 9-JUN-2006 22:10:58

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff F	lags
4	66.39	250	643	1.34	133.36	124	14	1.04E-02	39.4	8.08E-01	
1	139.94	205	621	1.07	280.57					2.36E+00	
1	295.81	127	494	2.68	592.52	586	13	5.30E-03	78.9	1.81E+00	
1	596.03	144	188	2.69						1.10E+00	
1	609.43	79	193	1.54				3.31E-03			
1	1764.49	36	45	3.27	3529.56	3523	17	1.50E-03	****	5.12E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 6 Number of unidentified lines 6 Number of lines tentatively identified by NID 0.00% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found
"E" = Manually edited "M" = Manually accepted

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	4.590E+00		1.783E+01	2.930E+01	0.000E+00	0.157
NA-24	-4.453E-02		4.360E-02	Half-Life	too short	
K-40	2.075E+01		2.881E+01	4.893E+01	0.000E+00	0.424
CR-51	-3.236E+01		1.958E+01	3.109E+01	0.000E+00	-1.041
MN-54	1.595E+00		1.979E+00	3.383E+00	0.000E+00	0.472
CO-57	-1.302E+00		1.859E+00	2.991E+00	0.000E+00	-0.435
CO-58	6.172E-01		2.057E+00	3.451E+00	0.000E+00	0.179
FE-59	6.186E+00		4.153E+00	7.378E+00	0.000E+00	0.838
CO-60	1.662E-01		1.882E+00	3.091E+00	0.000E+00	0.054
ZN-65	5.280E+00		4.010E+00	7.077E+00	0.000E+00	0.746
SE-75	3.782E-01		2.624E+00	4.301E+00	0.000E+00	0.088
SR-85	2.143E+01		2.548E+00	5.068E+00	0.000E+00	4.228
Y-88	-1.573E-01		2.206E+00	3.634E+00	0.000E+00	-0.043
NB-94	-1.178E+00		1.856E+00	2.946E+00	0.000E+00	-0.400
NB-95	-2.894E-01		2.106E+00	3.480E+00	0.000E+00	-0.083
ZR-95	-2.477E+00		3.774E+00	5.944E+00	0.000E+00	-0.417
MO-99	-6.492E+01		1.658E+02	2.649E+02	0.000E+00	-0.245
RU-103	3.215E+00		2.316E+00	3.945E+00	0.000E+00	0.815
RU-106	2.484E+00		1.902E+01	3.104E+01	0.000E+00	0.080
AG-110m	-1.002E+00		1.916E+00	3.070E+00	0.000E+00	-0.326
SN-113	1.295E+00		2.540E+00	4.251E+00	0.000E+00	0.305
SB-124	3.016E+00		4.428E+00	3.470E+00	0.000E+00	0.869

SB-125	1.290E+00	5.490E+00	9,068E+00	0.000E+00	0.142
TE-129M	2.243E+00	2.578E+01	4.219E+01	0.000E+00	0.053
I-131	6.514E-01	4.247E+00	7.056E+00	0.000E+00	0.092
BA-133	1.833E+00	2.631E+00	4.442E+00	0.000E+00	0.413
CS-134	6.888E+00	4.093E+00	3.620E+00	0.000E+00	1.903
CS-136	-1.220E+00	2.992E+00	4.856E+00	0.000E+00	-0.251
CS-137	-1.667E-01	2.083E+00	3.402E+00	0.000E+00	-0.049
CE-139	-5.214E-01	1.834E+00	3.041E+00	0.000E+00	-0.171
BA-140	-6.843E-01	1.081E+01	1.789E+01	0.000E+00	-0.038
LA-140	-7.423E-01	3.522E+00	5.704E+00	0.000E+00	-0.130
CE-141	6.270E+00	4.331E+00	6.261E+00	0.000E+00	1.001
CE-144	-4.833E+00	1.694E+01	2.325E+01	0.000E+00	-0.208
EU-152	-1.455E+01	6.154E+00	9.528E+00	0.000E+00	-1.527
EU-154	-1.731E+00	3.837E+00	6.207E+00	0.000E+00	-0.279
RA-226	1.233E+01	4.933E+01	7.942E+01	0.000E+00	0.155
AC-228	-1.469E+00	8.265E+00	1.256E+01	0.000E+00	-0.117
TH-228	-3.434E-01	3.828E+00	6.026E+00	0.000E+00	-0.057
TH-232	-1.464E+00	8.238E+00	1.252E+01	0.000E+00	-0.117
U-235	3.160E+01	1.669E+01	2.443E+01	0.000E+00	1.293
U-238	2.168E+02	2.145E+02	3.678E+02	0.000E+00	0.590
AM-241	2.125E+00	1.996E+01	2.757E+01	0.000E+00	0.077

```
A,07L28834-13
                      ,06/10/2006 11:33,05/31/2006 09:40,
                                                                  3.006E+00,WG L28834-13 Q
B,07L28834-13
                      ,LIBD
                                              ,06/07/2006 09:32,073L082504
C, BE-7
            , NO
                     4.590E+00,
                                    1.783E+01,
                                                    2.930E+01,,
                                                                     0.157
C, K-40
            , NO
                     2.075E+01,
                                    2.881E+01,
                                                    4.893E+01,,
                                                                     0.424
C, CR-51
                    -3.236E+01,
            , NO
                                    1.958E+01,
                                                    3.109E+01,,
                                                                    -1.041
C, MN-54
            , NO
                     1.595E+00,
                                    1.979E+00,
                                                    3.383E+00,,
                                                                     0.472
C, CO-57
            , NO
                    -1.302E+00,
                                    1.859E+00,
                                                    2.991E+00,,
                                                                    -0.435
C, CO-58
            , NO
                                    2.057E+00,
                     6.172E-01,
                                                    3.451E+00,,
                                                                     0.179
C, FE-59
            , NO
                     6.186E+00,
                                    4.153E+00,
                                                    7.378E+00,,
                                                                     0.838
C, CO-60
            , NO
                     1.662E-01,
                                    1.882E+00,
                                                   3.091E+00,,
                                                                     0.054
C, ZN-65
            , NO
                     5.280E+00,
                                    4.010E+00,
                                                    7.077E+00,,
                                                                     0.746
C, SE-75
            , NO
                     3.782E-01,
                                    2.624E+00,
                                                   4.301E+00,,
                                                                     0.088
C, SR-85
            , NO
                     2.143E+01,
                                                   5.068E+00,,
                                    2.548E+00,
                                                                     4.228
C, Y-88
            , NO
                    -1.573E-01,
                                    2.206E+00,
                                                   3.634E+00,,
                                                                    -0.043
C, NB-94
            , NO
                    -1.178E+00,
                                    1.856E+00,
                                                   2.946E+00,,
                                                                    -0.400
C, NB-95
                    -2.894E-01,
            , NO
                                    2.106E+00,
                                                   3.480E+00,,
                                                                    -0.083
C, ZR-95
            , NO
                    -2.477E+00,
                                    3.774E+00,
                                                   5.944E+00,,
                                                                    -0.417
C,MO-99
                    -6.492E+01,
            , NO
                                    1.658E+02,
                                                   2.649E+02,,
                                                                    -0.245
C, RU-103
            , NO
                     3.215E+00,
                                    2.316E+00,
                                                   3.945E+00,,
                                                                     0.815
C, RU-106
            , NO
                     2.484E+00,
                                    1.902E+01,
                                                   3.104E+01,,
                                                                     0.080
C, AG-110m
            , NO
                    -1.002E+00,
                                    1.916E+00,
                                                   3.070E+00,,
                                                                    -0.326
C, SN-113
            , NO
                     1.295E+00,
                                    2.540E+00,
                                                   4.251E+00,,
                                                                     0.305
C,SB-124
            , NO
                     3.016E+00,
                                    4.428E+00,
                                                   3.470E+00,,
                                                                     0.869
C,SB-125
            , NO
                     1.290E+00,
                                    5.490E+00,
                                                   9.068E+00,,
                                                                     0.142
C, TE-129M
           , NO
                     2.243E+00,
                                    2.578E+01,
                                                   4.219E+01,,
                                                                     0.053
C, I-131
            , NO
                     6.514E-01,
                                    4.247E+00,
                                                   7.056E+00,,
                                                                     0.092
C, BA-133
            , NO
                     1.833E+00,
                                    2.631E+00,
                                                   4.442E+00,,
                                                                     0.413
C, CS-134
            , NO
                     6.888E+00,
                                    4.093E+00,
                                                   3.620E+00,,
                                                                     1.903
C, CS-136
            , NO
                    -1.220E+00,
                                    2.992E+00,
                                                   4.856E+00,,
                                                                    -0.251
C, CS-137
            , NO
                    -1.667E-01,
                                    2.083E+00,
                                                   3.402E+00,,
                                                                   -0.049
C, CE-139
            , NO
                    -5.214E-01,
                                    1.834E+00,
                                                   3.041E+00,,
                                                                   -0.171
C, BA-140
            , NO
                    -6.843E-01,
                                    1.081E+01,
                                                   1.789E+01,,
                                                                   -0.038
C, LA-140
            , NO
                    -7.423E-01,
                                    3.522E+00,
                                                   5.704E+00,,
                                                                   -0.130
C, CE-141
            , NO
                     6.270E+00,
                                    4.331E+00,
                                                   6.261E+00,,
                                                                    1.001
C, CE-144
            , NO
                    -4.833E+00,
                                    1.694E+01,
                                                   2.325E+01,,
                                                                   -0.208
C, EU-152
            , NO
                    -1.455E+01,
                                    6.154E+00,
                                                   9.528E+00,,
                                                                   -1.527
C, EU-154
           , NO
                    -1.731E+00,
                                    3.837E+00,
                                                   6.207E+00,,
                                                                   -0.279
C, RA-226
           , NO
                     1.233E+01,
                                    4.933E+01,
                                                   7.942E+01,,
                                                                    0.155
C, AC-228
           , NO
                    -1.469E+00,
                                    8.265E+00,
                                                   1.256E+01,,
                                                                   -0.117
C, TH-228
           , NO
                    -3.434E-01,
                                    3.828E+00,
                                                   6.026E+00,,
                                                                   -0.057
C, TH-232
           , NO
                    -1.464E+00,
                                    8.238E+00,
                                                   1.252E+01,,
                                                                   -0.117
C, U-235
           , NO
                     3.160E+01,
                                    1.669E+01,
                                                   2.443E+01,,
                                                                    1.293
C, U-238
           , NO
                     2.168E+02,
                                    2.145E+02,
                                                   3.678E+02,,
                                                                    0.590
C, AM-241
           , NO
```

1.996E+01,

2.757E+01,,

0.077

2.125E+00,



2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L28837
Exelon Quad Cities
June 13, 2006



2508 Quality Lane Knoxville, TN 37931-3133

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

# Case Narrative - L28837 EX001-3ESPQUAD-06

06/13/2006 15:06

### Sample Receipt

The following samples were received on June 5, 2006 in good condition, unless otherwise noted. CRA supplied revised chain of custodies with corrected client IDs.

Cross Reference Table

	Cross regerence re	<b>3010</b>
Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-108S-053106-JH-012	L28837-1	
WG-QC-MW-QC-107I-053106-JH-011	L28837-2	
WG-QC-MW-QC-103I-060106-JH-020	L28837-3	
WG-QC-MW-QC-106S-053106-JH-015	L28837-4	
RB-QC-MW-QC-108S-053106-JH-013	L28837-5	
WG-QC-MW-QC-106I-053106-JH-014	L28837-6	
WG-QC-MW-QC-101I-060106-JH-027	L28837-7	
WG-QC-MW-QC-104S-060106-JH-025	L28837-8	
WG-QC-MW-QC-105I-060106-JH-024	L28837-9	
WG-QC-MW-QC-FTW-053106-JH-001	L28837-10	

Analytical Method Cross Reference Table

	11/101/11/00/11/00/10/10/10/10/10/10/10/	
Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3	TBE-2010	EPA 906.0
TOTAL SR	TBE-2018	EPA 905.0



### Case Narrative - L28837 EX001-3ESPQUAD-06

06/13/2006 15:06

#### **Gamma Spectroscopy**

#### **Quality Control**

Quality control samples were analyzed as WG4097.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	Laboratory ID	QC Sample #
WG-QC-MW-QC-107I-	L28837-2	WG4097-3
053106-JH-011		

#### H-3

#### **Quality Control**

Quality control samples were analyzed as WG4089.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	<u>Laboratory ID</u>	QC Sample #
WG-QC-MW-QC-103I-	L28837-3	WG4089-3
060106-JH-020		



2508 Quality Lane Knoxville, TN 37931-3133

### Case Narrative - L28837 EX001-3ESPQUAD-06

06/13/2006 15:06

#### **TOTAL SR**

#### **Quality Control**

Quality control samples were analyzed as WG4135.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

 Client ID
 Laboratory ID
 QC Sample #

 WG-TMI-MS-7-053106 L28846-1
 WG4135-3

 JAS-015
 WG4135-3

#### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter

Operations Manager

# Sample Receipt

A Teledyne Technologies Company 2508 Quality Lane Knoxville, TN 37931-3133

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

LIMS #: L28837

Project ID#: EX001-3ESPQUAD-06

Received: 06/05/2006

Delivery Date: 06/12/2006

P.O. #: 00411203

Release #: SDG #:

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-108S-053106-JH-012	L28837-1	
WG-QC-MW-QC-107I-053106-JH-011	L28837-2	
WG-QC-MW-QC-1031-060106-JH-020	L28837-3	
WG-QC-MW-QC-106S-053106-JH-015	L28837-4	
RB-QC-MW-QC-108S-053106-JH-013	L28837-5	
WG-QC-MW-QC-106I-053106-JH-014	L28837-6	
WG-QC-MW-QC-1011-060106-JH-027	L28837-7	
WG-QC-MW-QC-104S-060106-JH-025	L28837-8	
WG-QC-MW-QC-105I-060106-JH-024	L28837-9	
WG-QC-MW-QC-FTW-053106-JH-001	L28837-10	

06/13/06 13:40 SR #: SR08709

### Teledyne Brown Engineering Sample Receipt Verification/Variance Report

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L28837

	ated By: RCHARLES it Date: 06/05/06 Receive Date: 06/05/	'06
	Notificati	on of Variance
N Not	n Notified: otify Date: ify Method: fy Comment:	Contacted By:
	Client Respo	onse
Perso	n Responding:	
R	esponse Date:	
Res	ponse Method:	
Resp	oonse Comment	
C:	riteria	Yes No NA Comment
1	Shipping container custody seals present and intact.	NA
2	Sample container custody seals present and intact.	AN
3	Sample containers received in good condition	Y
4	Chain of custody received with samples	Y
5	All samples listed on chain of custody received	Υ .
6	Sample container labels present and legible.	Y
7	Information on container labels correspond with chain of custody	Y
8	Sample(s) properly preserved and in appropriate container(s)	D H C Z
9	Other (Describe)	NA

L28837

0f

CON	86 CI	615 W. nicago,	OVERS & ASSOCIATE Bryn Mawr Avenue Illinois 60631 -9933 phone	1	(Laboratory Name):   Eledyne Brown												
	(7	73)380-	-6421 fax	REFERENCE NU	REFERENCE NUMBER:				PROJECT NAME:								
		NN-QF	-CUSTODY RECORD	45136	1 45136-28				Exelon Quad cities								
SAMI	PLER'S TURE:	[fg1]	PRINTED NAME:	John Han	John Hargens			PARAMETERS,									
SEQ. No.	DATE	TIME	SAMPLE IDENTIF	CATION No.	SAMPLE NO. OP TAIL									//	REMARKS		
	5/31/ex	0800			HZO		Y	V									
	<b>T</b>		6	53166													
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RELING	UISHED E	3Y·	11/01	DATE: 6/1/	106 -	1/1											
1_			John Harry	TIME: /60	2 RE	CEIVED	BY)	-07	2	lon	lei		go ware			DATE:	1/00
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<u></u>	Ban		and	TIME: 505 p	3			7/1	Jan .		$\mathcal{L}$	_				DATE: 6.	2.00
RELING	UISHED E	BY:	$\mathcal{O}$	DATE:		CEIVED	BY:		<i></i>							DATE:	<del>-/</del> 5
<u> </u>				TIME:	4	)										TIME:	
	ETHOD OF SHIPMENT: N VERSCA)  AIR BILL No.																
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#### Charles, Rebecca

From: Shaw, Kathy [kshaw@craworld.com]

Sent: Wednesday, June 07, 2006 5:26 PM

To: Charles, Rebecca

Cc: Larry.Walton@exeloncorp.com

Subject: 45136-28 Quad Cities

Hi Rebecca,

I have revised the COCs for the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

## **Kathy Shaw - Chemist**

Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, Connecticut 06062 PH 860 747-1800 Fax 860 747-1900 CRAWORLD.COM



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TELEDYNE BROWN ENGINEERING 2508 Quality Lane Knoxville, TN 37931-3133

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# ACKNOWLEDGEMENT This is not an invoice

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, CT 06062 June 06, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 05, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 12, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely, Rebecca Charles Project Manager (865)934-0379

Project ID:

EX001-3ESPQUAD-06

P.O. #:

00411203

Release #:

Contract#:

00411203

Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Start Collect End Collect Laboratory ID Vol/Units Client ID/ Date/Time Date/Time Price Analysis Station 05/31/06:1030 WG-QC-MW-QC-108S-053106-JH-0 L28837-1 108.00 GELT WG 162.00 H-3WG 140.00 SR-90 (FAST) WG 05/31/06:0910 WG-QC-MW-QC-107I-053106-JH-0 L28837-2 108.00 GELI WG 162.00 H-3WG 140.00 SR-90 (FAST) WG 06/01/06:0748 WG-QC-MW-QC-103I-060106-JH-0 L28837-3 108.00 GELI WG 162.00 H-3WG SR-90 (FAST) 140.00 WG 05/31/06:1437 WG-QC-MW-QC-106S-053106-JH-0 L28837-4 108.00 GELI WG 162.00 H-3WG SR-90 (FAST) 140.00 WG 05/31/06:1100 RB-QC-MW-QC-108S-053106-JH-0 L28837-5

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Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect End Collect Date/Time Date/Time
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WG-QC-MW-QC-106I-05310	06-JH-0 L28837-6		05/31/06:1445
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00	
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WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00	
WG-QC-MW-QC-104S-0601	06-JH-0 L28837-8		06/01/06:1258
WG WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00	
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WG WG	GELI H-3 SR-90 (FAST)	108.00 162.00 140.00	
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# Internal Chain of Custody

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06/05/2006 00:00

Teledyne Brown Engineering

Internal Chain of Custody \* Containernum 1 Sample # L28837-1 Analyst Prod н-3 ЕJ SR-90 (FAST) LCB EJ GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 2 Sample # L28837-1 Analyst Prod ΕJ H-3 LCB SR-90 (FAST) ΕJ GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \* Containernum 1 Sample # L28837-2 Analyst Prod ЕJ GELI ΕJ H-3SR-90 (FAST) LCB Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 2 Sample # L28837-2 Analyst Prod ЕJ **GELI** ΕJ H-3 LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 1 Sample # L28837-3 Analyst Prod so H-3ΕJ GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L28837-3 Containernum 2 Analyst Prod SO H-3GELI ЕJ LCB SR-90 (FAST)

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Relinquish Date Relinquish By

06/05/2006 00:00

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Internal Chain of Custody \* Containernum 1 Sample # L28837-4 Analyst Prod GELI ΕJ SO H-3 LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 06/05/2006 00:00 Containernum 2 Sample # L28837-4 Analyst Prod ЕJ GELI SO H-3 LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 1 Sample # L28837-5 Analyst Prod ΕJ GELI SO H-3 LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 2 Sample # L28837-5 Analyst Prod ЕJ GELI SO H-3LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 1 Sample # L28837-6 Analyst Prod ΕJ **GELI** SO H-3SR-90 (FAST) LCB Received By Relinquish Date Relinquish By Sample Custodian 099999 06/05/2006 00:00 \* Containernum 2 Sample # L28837-6 Analyst Prod E.T GELI so H-3LCB SR-90 (FAST) Received By

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Teledyne Brown Engineering

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Teledyne Brown Engineering
Internal Chain of Custody

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Sample # L28837-10

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SR-90 (FAST)

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Relinquish Date Relinquish By

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Sample # L28837-10

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Sample Custodian

06/13/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

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L28837-1	WG	WG-QC-MW-QC-108S-053	3106-JH-012	
Process step	Prod		Analyst	Date
Login			RCHARLES	06/05/06
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Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVM	06/09/06
Count Room	н-3		KOJ	06/06/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	*****	*****	*******
L28837-2	WG	WG-QC-MW-QC-107I-05	3106-ЈН-011	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	н-3		EJ	06/05/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVM	06/09/06
Count Room	н-3		KOJ	06/06/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
******	****	******	*****	*****
L28837-3	WG	WG-QC-MW-QC-103I-06		
Process step	Prod		Analyst	Date
Login			RCHARLES	06/05/06
Aliquot	н-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		KPW	06/09/06
Count Room	H-3		KPW	06/06/06
Count Room	SR-90	(FAST)	КОЈ	06/12/06
*****			*****	*******
L28837-4	WG	WG-QC-MW-QC-106S-05		
Process step	Prod		Analyst	<u>Date</u>
Login	*******		RCHARLES	06/05/06
Aliquot	н-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI	,	MVM	06/09/06
Count Room	H-3		KPW	06/06/06
Count Room		(FAST)	KOJ	06/12/06
********	*****	*****	****	*******
L28837-5	WG	RB-QC-MW-QC-108S-0		
Process step		2	Analyst	Date
Login	1100		RCHARLES	06/05/06
Aliquot	н-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	) (FAST)	LCB	06/09/06
-	GELI	· ( )	MVW	06/09/06
Count Room	٢٠٦٦		== * * *	

06/13/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

L28837-5	WG	RB-QC-MW-QC-108S-053	3106-ЈН-013	
Count Room	H-3	2	KPW	06/06/06
Count Room		(FAST)	KOJ	06/12/06
*****			*****	******
L28837-6	WG	WG-QC-MW-QC-106I-053		
Process step	Prod		<u>Analyst</u>	Date
Login			RCHARLES	06/05/06
Aliquot	Н-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/06/06
Count Room		(FAST)	KOJ	06/12/06
*****	*****	*****	*****	******
L28837-7	WG	WG-QC-MW-QC-101I-060	0106-ЈН-027	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	н-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/10/06
Count Room	H-3		KPW	06/06/06
Count Room	SR-90	(FAST)	KOJ	06/12/06
*****	*****	******	*****	******
L28837-8	WG	WG-QC-MW-QC-104S-06	0106-ЈН-025	
Process step	Prod		Analyst	Date
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/05/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/10/06
Count Room	H-3		KOJ	06/06/06
Count Room		(FAST)	KOJ	06/13/06
*****	****	*******	****	******
L28837-9	WG	WG-QC-MW-QC-105I-06	0106-JH-024	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/10/06
Count Room	Н-3		KPW	06/06/06
Count Room		(FAST)	KOJ	06/12/06
******	*****	*****	******	*******
L28837-10	WG	WG-QC-MW-QC-FTW-053	3106-ЈН-001	
Process step	Prod		Analyst	<u>Date</u>
Login			RCHARLES	06/05/06
-				

Page 3 of 3

06/13/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

L28837-10	WG	WG-QC-MW-QC-FTW-053	106-JH-001	
Aliquot	H-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90	(FAST)	LCB	06/09/06
Count Room	GELI		MVW	06/10/06
Count Room	н-3		KPW	06/06/06
Count Room	SR-90	(FAST)	KOJ	06/12/06

# Analytical Results Summary

06/13/06 15:04



L28837

Conestoga-Rovers & Associates

Kathy Shaw

Sample ID: WG-QC-MW-QC-108S-053106-JH-012

EX001-3ESPQUAD-06

Collect Start: 05/31/2006 10:30

Volume:

Matrix: Ground Water

(WG)

Description:

Station:

Collect Stop:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-1

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
			0.175.00	2.30E+02	pCi/L	<u> </u>	10	ml		06/06/06	42.5	M	+
H-3	2010	1.46E+03				1	450	ml	05/31/06 10:30	06/12/06	200	M	U
TOTAL SR	2018	1.36E+00		1.64E+00	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	+ Yes
K-40	2007	1.63E+02		4.73E+01	pCi/L				05/31/06 10:30	06/09/06	24000	Sec	U No
MN-54	2007	1.20E+00	2.74E+00	4.62E+00	pCi/L		2714.41	ml ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CO-58	2007	-1.17E-01	2.79E+00	4.60E+00	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
FE-59	2007	1.92E+00	5.68E+00	9.62E+00	pCi/L		2714.41	ml		06/09/06	24000	Sec	U No
CO-60	2007	-5.26E-01	2.78E+00	4.49E+00	pCi/L		2714.41	ml	05/31/06 10:30		24000	Sec	U No
ZN-65	2007	7.33E+00	6.68E+00	1.02E+01	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06			U No
	2007	1.52E+00		4.75E+00	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	
NB-95		-2.47E+00		7.93E+00	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
ZR-95	2007		1	5.09E+00	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CS-134	2007	6.61E+00	1		pCi/L	1	2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CS-137	2007	-1.61E+00		4.61E+00	1		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
BA-140	2007	3.36E-02		2.57E+01	pCi/L	-	2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
LA-140	2007	-6.48E-01	5.08E+00	8.32E+00	pCi/L	-	2/14.41	1111	1 03/31/00 10/30	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High MDC exceeds customer technical specification

Spec Low recovery

Н High recovery Page 1 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

### L28837

BROWN ENGINEERING, INC. A Teledyne Technologies Company

(WG)

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-107I-053106-JH-011

Collect Start: 05/31/2006 09:10

Matrix: Ground Water

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

pCi/L

% Moisture:

LIMS Number: 1.28837-2.

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
	2010	1.09E+02	1.22E+02	1.91E+02	pCi/L	1	10	ml		06/06/06	60	M	U
H-3	2010		9.13E-01	1.61E+00	pCi/L	1	450	ml	05/31/06 09:10	06/12/06	200	M	U
TOTAL SR	2018	1.09E+00		3.87E+00	pCi/L	1	3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
MN-54	2007	6.45E-01	2.33E+00		pCi/L	-	3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
CO-58	2007	1.08E+00		4.17E+00	<u> </u>	<del>                                     </del>	3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
FE-59	2007	1.60E+00		8.37E+00	pCi/L	-	3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
CO-60	2007	2.11E+00		4.20E+00	pCi/L	1			05/31/06 09:10	06/09/06	24000	Sec	U No
ZN-65	2007	6.37E+00	5.26E+00	9.29E+00	pCi/L	-	3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
NB-95	2007	1.19E+00	2.47E+00	4.15E+00	pCi/L	-	3004.21	ml	00.01.00	06/09/06	24000	Sec	U No
ZR-95	2007	2.53E-01	4.32E+00	7.13E+00	pCi/L		3004.21	ml	05/31/06 09:10			Sec	U* No
CS-134	2007	7.21E+00	4.21E+00	4.41E+00	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000		
CS-137	2007	1.79E+00	2.50E+00	4.28E+00	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	
BA-140	2007	4.66E+00		2.28E+01	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
BA-140	2007	-1 94E+00		7.77E+00	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No

Flag Values

LA-140

Compound/Analyte not detected or less than 3 sigma

2007

-1.94E+00

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only) =

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

4.82E+00

7.77E+00

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 2 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis 06/13/06 15:04

## BROWN ENGINEERING, INC. A Teledyne Technologies Company

#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-103I-060106-JH-020

Collect Start: 06/01/2006 07:48

Matrix: Ground Water

(WG)

Station:

Collect Stop: Receive Date: 06/05/2006

Volume: % Moisture:

Description:

1 20027 2

LIMS Number: L2	28837-3					\ <b>D</b>	Aliquot	Aliquot	Reference	Count	Count	Count	
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Volume	Units	Date	Date	Time	Units	Flag Values
TTO	2010	5.47E+01	1.06E+02	1.69E+02	pCi/L		10	ml		06/06/06	60	M	U
H-3	2018	1.15E+00		1.23E+00	pCi/L		450	ml	06/01/06 07:48	06/12/06	200	M	U
TOTAL SR	2017	6.20E-01	2.07E+00	3.46E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
MN-54	2007	-1.70E+00		3.48E+00	pCi/L	İ	3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
CO-58	2007	3.79E+00	1	7.78E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
FE-59	2007	-2.32E+00	<del></del>	3.39E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
CO-60	2007	5.90E+00		8.07E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
ZN-65	2007	1.76E+00		3.90E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
NB-95	2007	-1.79E+00		6.45E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
ZR-95		-2.15E+00		3.66E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
CS-134	2007	4.20E-01	2.44E+00	3.78E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
CS-137	2007		1.12E+01	1.87E+01	pCi/L	1	3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
BA-140	2007	6.51E-01		6.91E+00	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U No
LA-140	2007	3.15E+00	3.9/E+00	0.91E+00	PCI/L	<u> </u>	7011.1	1	1				

Flag Values

Spec

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification

Low recovery

High recovery

Page 3 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

06/13/06 15:04

BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-106S-053106-JH-015

Collect Start: 05/31/2006 14:37

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Receive Date: 06/05/2006

% Moisture:

Description:

1 20037-4

LIMS Number: L28  Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Value	:s
LI O	2010	2.60E+01	1.12E+02	1.81E+02	pCi/L		10	ml		06/06/06	60	M	U	
H-3	2018	1.12E+00	1.05E+00	1.86E+00	pCi/L		450	ml	05/31/06 14:37	06/12/06	200	M	U	
TOTAL SR	2007	5.31E-01	2.62E+00	4.32E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	1 0 1	No
MN-54	2007	1.28E+00	2.75E+00	4.59E+00	pCi/L	i -	3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	1 0 1	No
CO-58		1.28E+00	5.26E+00	8.72E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec		No
FE-59	2007	-2.10E+00	2.56E+00	3.99E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec		No
CO-60	2007	5.08E+00	,	9.92E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec		No
ZN-65	2007		2.68E+00	4.42E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec		No
NB-95	2007	3.49E-01	4.88E+00	7.98E+00	pCi/L	1	3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec		No
ZR-95	2007	-3.93E-01	1	4.74E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U	No
CS-134	2007	5.21E+00					3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U   1	No
CS-137	2007	1.55E-01	2.67E+00	4.44E+00	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U   1	No
BA-140	2007	7.05E+00		2.50E+01	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U   1	No
LA-140	2007	4.30E+00	4.36E+00	7.71E+00	pCi/L		3014.23	1111	105/51/00 11:57	1 00.00,001				

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification = Spec

Low recovery = High recovery Page 4 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis

MDC - Minimum Detectable Concentration

unless otherwise noted

L28837 30 0 Ť

# Report of Analysis 06/13/06 15:04

# BROWN ENGINEERING, INC. A Teledyne Technologies Company

#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: RB-QC-MW-QC-108S-053106-JH-013

Collect Start: 05/31/2006 11:00

Matrix: Ground Water

(WG)

Station:

Volume:

Collect Stop:

% Moisture:

Description:

Receive Date: 06/05/2006

LIMS Number: L2  Radionuclide	28837-5 SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units		Values
	2010	1.500.00	1.15E+02	1.74E+02	pCi/L		10	ml		06/06/06	60	M	U	
H-3	2010	1.50E+02	8.64E-01	1.58E+00	pCi/L		450	ml	05/31/06 11:00	06/12/06	200	M	U	
TOTAL SR	2018	4.73E-01		3.04E+00	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
MN-54	2007	5.56E-01	1.82E+00	3.19E+00	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
CO-58	2007	-2.79E-01	1.95E+00	,	pCi/L	1	3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
FE-59	2007	1.28E+00	3.70E+00	6.25E+00			3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
CO-60	2007	-1.08E-01	1.99E+00	3.23E+00	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
ZN-65	2007	6.06E+00		7.02E+00	pCi/L	1	3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
NB-95	2007	1.80E-01	1.90E+00	3.16E+00	pCi/L	-	3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
ZR-95	2007	-2.86E+00		5.56E+00	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
CS-134	2007	2.81E+00		3.17E+00	pCi/L				05/31/06 11:00	06/09/06	24000	Sec	U	No
CS-137	2007	-6.10E-01	1.99E+00	3.19E+00	pCi/L	<u> </u>	3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
3A-140	2007	1.56E+00	1.03E+01	1.71E+01	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec	U	No
A-140	2007	-1.23E+00	3.50E+00	5.56E+00	pCi/L	1	3014.24	ml	103/31/06 11:00	00/03/00	27000	1 500	, 0 1	

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High MDC exceeds customer technical specification

Spec = Low recovery

High recovery

Page 5 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis

unless otherwise noted

## L28837

Receive Date: 06/05/2006

### BROWN ENGINEERING, INC. A Teledyne Technologies Company

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-106I-053106-JH-014

Collect Start: 05/31/2006 14:45

Matrix: Ground Water

(WG)

Station:

Volume:

% Moisture:

Collect Stop:

Description:

100027 (

LIMS Number: L2  Radionuclide	8837-6 SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag V	alues
H-3	2010	-5.14E+01	1.05E+02	1.79E+02	pCi/L		10	ml		06/06/06	60	M	U	
TOTAL SR	2018	1.02E+00	7.89E-01	1.38E+00	pCi/L		450	ml	05/31/06 14:45	06/12/06	200	M	U	
MN-54	2007	-1.42E+00	2.04E+00	3.36E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
CO-58	2007	4.32E-01	2.16E+00	3.73E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
FE-59	2007	2.40E+00	4.19E+00	7.50E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
CO-60	2007	1.65E+00	2.20E+00	3.96E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
ZN-65	2007	4.83E+00	4.32E+00	7.91E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
NB-95	2007	1.60E+00	·	3.92E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
ZR-95	2007	5.07E-01	3.82E+00	6.58E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
	2007	5.50E+00	,	4.03E+00	pCi/L	1	3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
CS-134		2.58E+00		3.99E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No
CS-137	2007			2.06E+01	pCi/L	1	3000.84	m1	05/31/06 14:45	06/09/06	24000	Sec	U	No
BA-140 LA-140	2007	6.69E+00 2.20E+00		6.95E+00	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U	No

Flag	Va	lu
------	----	----

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 6 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted



#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-101I-060106-JH-027 Sample ID:

Collect Start: 06/01/2006 14:10

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-7

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	3.30E+01	9.52E+01	1.53E+02	pCi/L		10	ml		06/06/06	60	M	U
TOTAL SR	2018	1.13E+00	6.79E-01	1.16E+00	pCi/L	-	450	ml	06/01/06 14:10	06/12/06	200	M	U
MN-54	2007	1.91E+00	3.29E+00	5.61E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
CO-58	2007	8.96E-01	3.63E+00	6.04E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
FE-59	2007	3.21E+00	6.88E+00	1.17E+01	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
CO-60	2007	2.91E+00	3.64E+00	6.37E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
ZN-65	2007	7.00E+00	7.41E+00	1.30E+01	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
NB-95	2007	2.86E+00	3.38E+00	5.88E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
ZR-95	2007	-3.11E+00	6.07E+00	9.60E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
CS-134	2007	7.47E+00	6.52E+00	6.01E+00	pCi/L	1	3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
CS-137	2007	3.61E+00	3.38E+00	6.00E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
BA-140	2007	-1.09E+01	1.88E+01	2.98E+01	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No
LA-140	2007	1.01E+00	5.85E+00	9.87E+00	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec	U No

#### Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

---MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 7 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted



(WG)

#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-104S-060106-JH-025 Sample ID:

Collect Start: 06/01/2006 12:58

Matrix: Ground Water

Collect Stop:

Volume:

Station: Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-8

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	2.62E+02	1.30E+02	1.88E+02	pCi/L		10	ml		06/06/06	60	M	+
TOTAL SR	2018	1.19E+00		1.04E+00	pCi/L		450	ml	06/01/06 12:58	06/13/06	150	M	+
MN-54	2007	2.00E-01	2.77E+00	4.60E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
CO-58	2007	-2.09E+00	3.00E+00	4.74E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
FE-59	2007	1.10E+00	5.89E+00	9.89E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
CO-60	2007	1.82E+00	3.09E+00	5.29E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
ZN-65	2007	7.13E+00	7.67E+00	1.17E+01	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
NB-95	2007	4.41E+00	2.92E+00	5.29E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
ZR-95	2007	-3.62E+00	5.54E+00	8.61E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
CS-134	2007	7.92E+00	6.57E+00	5.74E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
CS-137	2007	1.74E+00		4.92E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
BA-140	2007	1.34E+01	1.53E+01	2.66E+01	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No
LA-140	2007	-1.44E+00		7.93E+00	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U No

FI	ag	Va	lue
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Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 8 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

## Report of Analysis 06/13/06 15:04



#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

Sample ID: WG-QC-MW-QC-105I-060106-JH-024

Collect Start: 06/01/2006 11:18

Matrix: Ground Water

Volume:

(WG)

Station:

Collect Stop:

% Moisture:

Description:

Receive Date: 06/05/2006

LIMS Number: L2  Radionuclide	8837-9 SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag V	'alues
	2010	6.46E+00	1.10E+02	1.80E+02	pCi/L		10	ml		06/06/06	60	M	U	
H-3	2010	7.38E-01	9.30E-01	1.69E+00	pCi/L		450	ml	06/01/06 11:18	06/12/06	200	M	U	
TOTAL SR	2018		2.93E+00	4.53E+00	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
MN-54	2007	1.40E-01	3.02E+00	4.94E+00	pCi/L	1	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
CO-58	2007	-6.00E-01		1.09E+01	pCi/L	1	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
FE-59	2007	3.79E+00		5.02E+00	pCi/L	<u> </u>	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
CO-60	2007	1.70E+00			pCi/L	1	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
ZN-65	2007	8.72E+00		1.15E+01			3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
NB-95	2007	2.88E+00		5.22E+00	pCi/L	1	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
ZR-95	2007	-2.01E+00		8.84E+00	pCi/L	-	3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
CS-134	2007	5.12E+00		5.52E+00	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
CS-137	2007	-1.42E+00		4.91E+00	pCi/L	1		-	06/01/06 11:18	06/10/06	19000	Sec	U	No
BA-140	2007	-2.75E+00		2.62E+01	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec	U	No
LA-140	2007	-3.08E+00	4.99E+00	7.79E+00	pCi/L		3000.54	ml	100/01/00 11.10	7 00/10/00/	.,,,,,,			

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only) =

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High MDC exceeds customer technical specification

Spec Low recovery

High recovery

Page 9 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

4

## Report of Analysis

06/13/06 15:04



#### L28837

Conestoga-Rovers & Associates

Kathy Shaw

EX001-3ESPQUAD-06

WG-QC-MW-QC-FTW-053106-JH-001 Sample ID:

Collect Start: 05/31/2006 08:00

Ground Water Matrix:

(WG)

Station: Description: Collect Stop:

Volume:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-10

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Value	es
H-3	2010	2.36E+01	1.10E+02	1.79E+02	pCi/L		10	ml		06/06/06	60	M	U	
TOTAL SR	2018	1.27E-02	7.88E-01	1.50E+00	pCi/L	İ	450	ml	05/31/06 08:00	06/12/06	200	M	U	
MN-54	2007	9.83E-01	2.72E+00	4.54E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
CO-58	2007	-2.70E-01	2.91E+00	4.75E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
FE-59	2007	7.83E+00	5.87E+00	1.05E+01	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
CO-60	2007	1.26E+00	2.83E+00	4.80E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
ZN-65	2007	4.66E+00	6.75E+00	1.00E+01	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
NB-95	2007	2.29E+00	2.82E+00	4.84E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
ZR-95	2007	-5.90E+00	5.13E+00	7.89E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
CS-134	2007	6.44E+00	6.08E+00	5.14E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
CS-137	2007	5.03E-01	2.93E+00	4.89E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
BA-140	2007	2.74E+00	1.64E+01	2.69E+01	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec		No
LA-140	2007	-7.23E-01	5.18E+00	8.50E+00	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec	U   1	No

Flag Values

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value High

MDC exceeds customer technical specification Spec

Low recovery

High recovery

Page 10 of 10

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

### **OC Summary Report**

L28837 for

6/13/2006

3:10:49PM



H-3

**Method Blank Summary** 

TBE Sample ID

WG4089-1

Radionuclide H-3

Matrix WO

Count Date/Time 06/06/2006 4:08

Blank Result < 1.900E+00

Units pCi/Total Qualifier P/F U

**LCS Sample Summary** 

TBE Sample ID

WG4089-2

Radionuclide H-3

Matrix WO

Count Date/Time 06/06/2006 5:12

Spike Value 5.05E+002

LCS Result 5.010E+02

**Units** pCi/Total

Spike Recovery 99.3

Range Qualifier P/F

70-130

Spike ID: 3H-041706-1

Spike conc: 5.05E+002 Spike Vol: 1.00E+000

**Duplicate Summary** 

TBE Sample ID

Radionuclide

Matrix

Count Date/Time

**Original Result** 

**DUP Result** 

Units pCi/L **RPD** 

Range Qualifier P/F

NE

WG4089-3 L28837-3

H-3

06/06/2006 14:20 WG

< 1.690E+02

< 1.780E+02

<30

Positive Result

Compound/analyte was analyzed, peak not identified and/or not detected above MDC U < 5 times the MDC are not evaluated

\*\* Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass P Fail F

Not evaluated NE

Page: 1

9 4

## **QC** Summary Report

for L28837

6/13/2006

3:10:49PM

L28837

H-3

Associated Samples for	WG4089
<b>SAMPLENUM</b>	<u>CLIENTID</u>
L28837-1	WG-QC-MW-QC-108S-053106-JH-012
L28837-2	WG-QC-MW-QC-107I-053106-JH-011
L28837-3	WG-QC-MW-QC-103I-060106-JH-020
L28837-4	WG-QC-MW-QC-106S-053106-JH-015
L28837-5	RB-QC-MW-QC-108S-053106-JH-013
L28837-6	WG-QC-MW-QC-106I-053106-JH-014
L28837-7	WG-QC-MW-QC-101I-060106-JH-027
L28837-8	WG-QC-MW-QC-104S-060106-JH-025
L28837-9	WG-QC-MW-QC-105I-060106-JH-024
L28837-10	WG-QC-MW-QC-FTW-053106-JH-001

Positive Result

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass Fail F

NE Not evaluated A Teledyne Technologies Company

## **QC Summary Report**

L28837 for

6/13/2006

3:10:49PM



#### TOTAL SR

TOTAL DA									
				Method Blank Summ	ary				
TBE Sample ID WG4135-1	Radionuclide TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/12/2006 17:54		Blank Result < 6.410E-01	<u>Units</u> pCi/Total	<u>Qualifier</u> <u>P/F</u> U P		
LCS Sample Summary									
TBE Sample ID WG4135-2	Radionuclide TOTAL SR	<u>Matrix</u> WO	Count Date/Time 06/12/2006 17:54	<u>Spike Value</u> 5.84E+001	LCS Result 6.350E+01	Units Spike Recov pCi/Total 108.8	Range Qualifier P/F 70-130 + P		
Spike ID: 90SR-6 Spike conc: 2.34E Spike Vol: 2.50E-	+002								
				<b>Duplicate Summar</b>	$\mathbf{y}$				
TBE Sample ID WG4135-3 L28846-1	Radionuclide TOTAL SR	Matrix WG	Count Date/Time 06/12/2006 17:54	Original Result < 1.510E+00	<u><b>DUP Result</b></u> < 1.820E+00	Units RPD pCi/L	Range Qualifier P/F <30 ** NE		

Positive Result Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity \*\*\*

Pass F Fail

NE Not evaluated

## **QC Summary Report**

L28837 for

6/13/2006

3:10:49PM

L28837

SR-90 (FAST)

Associated Samples for	<u>WG4135</u>
<u>SAMPLENUM</u>	CLIENTID
L28837-1	WG-QC-MW-QC-108S-053106-JH-012
L28837-2	WG-QC-MW-QC-107I-053106-JH-011
L28837-3	WG-QC-MW-QC-103I-060106-JH-020
L28837-4	WG-QC-MW-QC-106S-053106-JH-015
L28837-5	RB-QC-MW-QC-108S-053106-JH-013
L28837-6	WG-QC-MW-QC-106I-053106-JH-014
L28837-7	WG-QC-MW-QC-101I-060106-JH-027
L28837-8	WG-QC-MW-QC-104S-060106-JH-025
L28837-9	WG-QC-MW-QC-105I-060106-JH-024
L28837-10	WG-QC-MW-QC-FTW-053106-JH-001

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated U

Nuclide not detected

Spiking level < 5 times activity

Pass Fail F

Not evaluated NE



## Raw Data

## Raw Data Sheet (rawdata) Jun 13 2006, 03:19 pm

Customer: Exelon Work Order: <u>L28837</u>

Nuclide: H-3 Proje	ect : <u>EX001-3E</u>	SPQUAD-06										Decay 8	
		_	261 2 2-1	Mount	Count	Coun	ter To	otal	Sample	Bkg	Bkg	Eff. Ingrowt	h Analyst
Sample ID Kun Analysis Recommend	Ozamo,	Scavenge	Milking Date/time		Recovery Date/ti		C	ounts	dt(min)		dt (min)	Factor	
Citencin #	Aliquot	Date/time	Date/time	0	06-jur	-06 L	S7	373	42.5	2.13	60	.205	EJ
L28837-1 H-3				U	05:30								
MG-OC-WM-OC-TOOP-033T0	10 ml				••••								
Activity: 1.46E+05 E1101. 2:1:2:01	DC: 2.3E+02			0	06-jur	-06 L	S7	158	60	2.13	60	.208	EJ
L28837-2 H-3				Ü	06:16								
MG-OC-WM-OC-TO/T-033T0	10 ml												
ACCIVICY: 1:05H+02 D22O2:	C: 1.91E+02 *		100 100 100	0	06-jur	-06 L	<b>S</b> 7	132	60	1.93	60	.223	so
L28837-3 H-3				Ü	15:24								
MG-0C-WM-0C-1031-00010	10 ml												
Activity: 5.47E+01 Hizor: 1.00E.01	C: 1.69E+02 *			0	06-ju	-06 L	.S7	123	60	1.93	60	.208	so
L28837-4 H-3				Ū	16:21								
MG-0C-WM-0C-1002-02210	10 ml												so
Activity: 2.0E+01 Hilo1. 1.11	C: 1.81E+02 *			0	06-ju	-06 I	.S7	159	60	1.93	60	.216	50
L28837-5 H-3				Ü	17:3								
KB-QC-MM-QC-100B-05510	10 ml												so
ACCIVICY: IIII	C: 1.74E+02 *			0	06-ju	1-06 I	.S7	101	60	1.93	60	.211	50
L28837-6 H-3	1			ŭ	18:3								
MG-OC-WM-OC-TOOT-033T0	10 ml												so
ACCIVICY: -3.14B.01 MILES. IVI	C: 1.79E+02 *			0	06-ju	1-06 I	.s7	127	60	1.93	60	.246	50
L28837-7 H-3				Ū	19:3	3							
MG-QC-WM-QC-IOII-000IO	10 ml C: 1.53E+02 *												EJ
Activity: 3.32+01 BIIST. 9.322.02	C: 1.53E+02 ^			0	06-ju	1-06 I	<b>5</b> 57	201	60	2.13	60	.21	EU
L28837-8 H-3	10 1			-	07:2	ס							
WG-QC-MW-QC-104S-06010	10 ml DC: 1.88E+02												so
ACCIVITY: 2.025+02 BILOI: 2.025-02	DC: 1.88E+02			0	06-ju	1-06	LS7	118	60	1.93	60	.21	50
L28837-9 H-3	10 ml			•	20:4	1							
WG-QC-MW-QC-105I-06010	10 ml C: 1.8E+02 *											0.1	so
ACCIVICY: 0.40M400 MILES	DC: 1.0E+U2 -			0	06-ju	n-06	LS7	122	60	1.93	60	.21	50
L28837-10 H-3	10 ml			-	21:4	5							
WG-QC-MW-QC-FTW-053106	10 mi C: 1.79E+02 *												.,
Activity: 2.36E+01 Error: 1.1E+02 MI	JC: 1./3ETUZ "												

#### Raw Data Sheet (rawdata) Jun 13 2006, 03:19 pm

11:00

11:00

11:00

12-jun-06

12-jun-06

Customer: Exelon Work Order: L28837

450 ml

450 ml

450 ml

MDC: 1.04E+00

MDC: 1.69E+00 \*

MDC: 1.5E+00 \*

Project : EX001-3ESPQUAD-06 Nuclide: SR-90 (FAST)

12:58

11:18

08:00

TOTAL SR 01-jun-06

TOTAL SR 31-may-06

WG-QC-MW-QC-104S-06010

WG-QC-MW-QC-105I-06010

WG-QC-MW-QC-FTW-053106

L28837-9

L28837-10

Activity: 1.19E+00 \* Error: 6.09E-01

Activity: 7.38E-01 Error: 9.3E-01

Activity: 1.27E-02 Error: 7.88E-01

Eff. Ingrowth Analyst Bkg Counter Total Sample Bkq Count Scavenge Milking Mount Volume/ Factor Reference Sample ID Run Analysis dt (min) counts dt(min) counts Weight Recovery Date/time ID Date/time Date/time LCB .999 Date/time Aliquot 400 .346 Client ID 200 308 202 12-jun-06 X1A 0 12-jun-06 TOTAL SR 31-may-06 L28837-1 17:54 51.08 450 ml 11:00 WG-QC-MW-QC-108S-05310 10:30 MDC: 1.64E+00 \* LCB .999 Activity: 1.36E+00 Error: 9.47E-01 342 400 .343 212 200 X1B 12-jun-06 0 12-jun-06 TOTAL SR 31-may-06 L28837-2 55.11 17:54 11:00 09:10 450 ml WG-QC-MW-QC-107I-05310 MDC: 1.61E+00 \* .999 LCB Activity: 1.09E+00 Error: 9.13E-01 . 354 289 400 200 X1C 197 12-jun-06 0 12-jun-06 TOTAL SR 01-jun-06 L28837-3 17:54 64.52 11:00 450 ml WG-QC-MW-QC-103I-06010 07:48 LCB Activity: 1.15E+00 Error: 7.2E-01 MDC: 1.23E+00 \* .344 .999 312 400 200 12-jun-06 X1D 191 0 12-jun-06 TOTAL SR 31-may-06 L28837-4 17:54 45.43 11:00 450 ml WG-QC-MW-QC-106S-05310 14:37 LCB MDC: 1.86E+00 \* Activity: 1.12E+00 Error: 1.05E+00 264 400 .354 .999 200 148 12-jun-06 X2A 0 12-jun-06 TOTAL SR 31-may-06 L28837-5 17:54 47.85 11:00 450 ml 11:00 RB-QC-MW-QC-108S-05310 MDC: 1.58E+00 \* LCB Activity: 4.73E-01 Error: 8.64E-01 .345 .999 400 200 289 186 12-jun-06 X2B 0 12-jun-06 TOTAL SR 31-may-06 L28837-6 59.14 17:54 11:00 450 ml WG-QC-MW-QC-106I-05310 14:45 MDC: 1.38E+00 \* LCB Activity: 1.02E+00 Error: 7.89E-01 400 .35 .999 299 205 200 X4C 12-jun-06 12-jun-06 0 TOTAL SR 01-jun-06 L28837-7 21:46 70.43 11:00 14:10 450 ml WG-QC-MW-QC-101I-06010 Activity: 1.13E+00 Error: 6.79E-01 MDC: 1.16E+00 \* .356 .999 LCB 315 400 150 13-jun-06 Y2B 176 0 12-jun-06 01-jun-06 TOTAL SR L28837-8

91.40

55.65

57.53

0

0

01:17

17:54

17:54

12-jun-06

12-jun-06

хза

хзв

209

161

Page: 2

200

200

363

321

Decay &

400

400

.335

.343

.999

.999

LCB

LCB

Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:40:15.90

TBE10 12892256 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:07.83 

LIMS No., Customer Name, Client ID: WG L28837-1 QUAD CITY

Smple Date: 31-MAY-2006 10:30:00. : 10L28837-1 Sample ID

Geometry : 103L083004 BKGFILE : 10BG060306MT Sample Type : WG Quantity : 2.71440E+00 L 

Pk I	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11 12	1 1 1 1 1 1 1 1	66.47* 92.66* 139.72 185.76* 198.21* 238.50* 294.99 351.73* 596.03 609.53* 1120.61* 1461.75	133 0 202 55 180 8 56 45 103 60 18 163	742 650 714 641 586 426 274 316 152 154 77 86	1.14 1.35 1.44 2.58 2.32 1.69 1.54 1.75 2.07 1.73 1.65 2.84	132.05 184.46 278.61 370.74 395.65 476.27 589.30 702.84 1191.73 1218.76 2241.71 2924.65	1.52E+00 1.91E+00	3.33E-04 2.32E-03 1.89E-03 4.28E-03 2.49E-03 7.53E-04	***** 24.6 101.3 29.7 539.4 49.4 92.4 28.4 51.4 119.6	1.57E+00 1.45E+00 3.28E+00 4.10E+00 1.29E+00 6.84E+00 3.44E+00 1.48E+00 1.91E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Type: natura	3.T			Uncorrected	Decay Corr	2-Sigma
Nuclide K-40 RA-226 TH-228 U-235	Energy 1460.81 186.21 238.63 240.98 143.76 163.35 185.71 205.31	Area 163 55 8  55	%Abn 10.67* 3.28* 44.60* 3.95 10.50* 4.70 54.00 4.70	%Eff 3.884E-01 1.771E+00 1.539E+00 1.529E+00 1.905E+00 1.860E+00 1.771E+00 1.684E+00	pCi/L 1.629E+02 3.901E+01 4.834E-01 Li Li 2.369E+00	pCi/L 1.629E+02 3.901E+01 4.880E-01 ne Not Found ne Not Found ne Not Found 2.369E+00 ne Not Found	%Error 34.16 202.51 1078.72  202.51

Flag: "\*" = Keyline

Summary of Nuclide Activity

Page: 2 Acquisition date: 9-JUN-2006 22:11:07 Sample ID : 10L28837-1

12 Total number of lines in spectrum Number of unidentified lines

Number of lines tentatively identified by NID 3 25.00%

Nuclide Type : natural

				Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma Error	Flags
Nuclide K-40	Hlife 1.28E+09Y	Decay	pCi/L 1.629E+02	1.629E+02	0.557E+02	34.16	
RA-226	1600.00Y		3.901E+01 4.834E-01	3.901E+01 4.880E-01	7.899E+01 52.64E-01	202.51 1078.72	
TH-228 U-235	1.91Y 7.04E+08Y	1.01	2.369E+00	2.369E+00	4.798E+00	202.51	K
0 233			2 048E+02	2.048E+02			

Total Activity: 2.048E+02 2.048E+02

2.048E+02 Grand Total Activity: 2.048E+02

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 10L28837-1

Page: 3 Acquisition date: 9-JUN-2006 22:11:07

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1 1	66.47 92.66 139.72 198.21 294.99 351.73 596.03 609.53 1120.61	133 0 202 180 56 45 103 60	742 650 714 586 274 316 152 154 77	1.14 1.35 1.44 2.32 1.54 1.75 2.07 1.73		586 696 1186 1214	8 9 11 7 13 15	9.99E-06 8.43E-03 7.51E-03 2.32E-03	**** 49.3 59.5 98.8 *** 56.7 ***	7.32E-03 1.52E+00 1.91E+00 1.72E+00 1.33E+00 7.85E-00 7.72E-00 4.79E-0	0 0 0 0 0 1 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

12 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 3 25.00%

Nuclide Type : natural

Nuclide	Type . Haca		Wtd Mean Uncorrected	Wtd Mean Decay Corr	Decay Corr	2-Sigma	חוממ
Nuclide		Decay	pCi/L 1.629E+02	pCi/L 1.629E+02	2-Sigma Error 0.557E+02	%Error 34.16	Flags
K-40 RA-226	1.28E+09Y 1600.00Y	1.00	3.901E+01	3.901E+01	7.899E+01	202.51	
TH-228	1.91Y	1.01	4.834E-01	4.880E-01	52.64E-01	1078.72	
	Total Acti	Lvity :	2.024E+02	2.024E+02			

Grand Total Activity: 2.024E+02 2.024E+02

Flags: "K" = Keyline not found

"M" = Manually accepted "A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40 RA-226 TH-228	1.629E+02 3.901E+01 4.880E-01	5.566E+01 7.899E+01 5.264E+00	4.725E+01 1.132E+02 8.262E+00	0.000E+00 0.000E+00 0.000E+00	3.448 0.344 0.059
NT T	Joseffied Muglide	25			

---- Non-Identified Nuclides ----

Key-Line Activity K.L. Act error MDA	MDA error	Act/MDA
--------------------------------------	-----------	---------

Nuclide	(pCi/L) Id	ed	(pCi/L)		
ים דו	2.382E+01	2.562E+01	4.393E+01	0.000E+00	0.542
BE-7	-1.263E-01	6.109E-02	Half-Life t	oo short	
NA-24	-3.289E+01	3.020E+01	4.814E+01	0.000E+00	-0.683
CR-51	1.203E+01	2.742E+00	4.623E+00	0.000E+00	0.260
MN-54 CO-57	-1.679E+00	2.719E+00	4.444E+00	0.000E+00	-0.378
	-1.166E-01	2.790E+00	4.602E+00	0.000E+00	-0.025
CO-58	1.918E+00	5.682E+00	9.616E+00	0.000E+00	0.199
FE-59	-5.260E-01	2.778E+00	4.492E+00	0.000E+00	-0.117
CO-60	7.328E+00	6.680E+00	1.022E+01	0.000E+00	0.717
ZN-65	8.052E-03	3.875E+00	6.426E+00	0.000E+00	0.001
SE-75	2.192E+01	3.563E+00	6.860E+00	0.000E+00	3.196
SR-85 Y-88	2.601E+00	3.044E+00	5.354E+00	0.000E+00	0.486
1-88 NB-94	-7.048E-01	2.674E+00	4.295E+00	0.000E+00	-0.164
NB-94 NB-95	1.520E+00	2.793E+00	4.754E+00	0.000E+00	0.320
NB-95 ZR-95	-2.469E+00	4.905E+00	7.930E+00	0.000E+00	-0.311
MO-99	6.729E+01	2.247E+02	3.785E+02	0.000E+00	0.178
	1.215E+00	3.315E+00	5.561E+00	0.000E+00	0.218
RU-103	1.139E+01	2.666E+01	4.274E+01	0.000E+00	0.267
RU-106 AG-110m	-8.946E-01	2.692E+00	4.325E+00	0.000E+00	-0.207
SN-113	-7.891E-01	3.754E+00	6.077E+00	0.000E+00	-0.130
SN-113 SB-124	3.597E-01	6.697E+00	4.719E+00	0.000E+00	0.076
	-5.069E+00	7.882E+00	1.249E+01	0.000E+00	-0.406
SB-125 TE-129M	-1.534E+01	3.675E+01	6.016E+01	0.000E+00	-0.255
TE-129M I-131	-4.200E+00	6.428E+00	1.029E+01	0.000E+00	-0.408
BA-133	6.701E+00	4.640E+00	6.839E+00	0.000E+00	0.980
CS-134	6.612E+00	6.197E+00	5.086E+00	0.000E+00	1.300
CS-134 CS-136	-1.570E+00	4.190E+00	6.784E+00	0.000E+00	-0.231
CS-136 CS-137	-1.606E+00	2.902E+00	4.608E+00	0.000E+00	-0.349
CE-139	2.020E+00	2.869E+00	4.767E+00	0.000E+00	0.424
BA-140	3.355E-02	1.558E+01	2.570E+01	0.000E+00	0.001
LA-140	-6.484E-01	5.080E+00	8.315E+00	0.000E+00	-0.078
CE-141	-4.827E+00	6.485E+00	8.848E+00	0.000E+00	-0.546
CE-141 CE-144	9.203E+00	2.455E+01	3.478E+01	0.000E+00	0.265
EU-152	3.718E-02	1.031E+01	1.428E+01	0.000E+00	0.003
EU-152	-3.478E+00	5.617E+00	9.178E+00	0.000E+00	-0.379
AC-228	-3.028E+00	1.139E+01	1.729E+01	0.000E+00	-0.175
TH-232	-3.020E+00	1.136E+01	1.724E+01	0.000E+00	-0.175
U-235	2.566E+01	2.453E+01	3.532E+01	0.000E+00	0.726
U-238	1.479E+02	2.984E+02	5.013E+02	0.000E+00	0.295
0-238 AM-241	-3.524E+01	2.591E+01	3.709E+01	0.000E+00	-0.950
W11-74T					

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2.714E+00,WG L28837-1 QU
                     ,06/10/2006 11:40,05/31/2006 10:30,
A,10L28837-1
                                             ,06/07/2006 09:32,103L083004
                     ,LIBD
B,10L28837-1
                                                                    3.448
                                                   4.725E+01,,
                                   5.566E+01,
                     1.629E+02,
           ,YES,
C, K-40
                                                                    0.344
                                                   1.132E+02,,
                                   7.899E+01,
                     3.901E+01,
C, RA-226
           , YES,
                                                                    0.059
                                                   8.262E+00,,
                                   5.264E+00,
           , YES,
                     4.880E-01,
C, TH-228
                                                                    0.542
                                                   4.393E+01,,
                                    2.562E+01,
                     2.382E+01,
           , NO
C, BE-7
                                                                   -0.683
                                                   4.814E+01,,
                                    3.020E+01,
                    -3.289E+01,
C, CR-51
           , NO
                                                   4.623E+00,,
                                                                    0.260
                                    2.742E+00,
                     1.203E+00,
            , NO
C, MN-54
                                                                   -0.378
                                                   4.44E+00,,
                                    2.719E+00,
            , NO
                    -1.679E+00,
C, CO-57
                                                                   -0.025
                                                   4.602E+00,,
                                    2.790E+00,
                    -1.166E-01,
            , NO
C, CO-58
                                                                    0.199
                                                   9.616E+00,,
                                    5.682E+00,
                     1.918E+00,
            , NO
C, FE-59
                                                                   -0.117
                                                   4.492E+00,,
                                    2.778E+00,
            , NO
                    -5.260E-01,
C,CO-60
                                                   1.022E+01,,
                                                                    0.717
                                    6.680E+00,
                     7.328E+00,
            , NO
C, ZN-65
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                                                                    0.001
                                    3.875E+00,
                     8.052E-03,
C,SE-75
            , NO
                                                                    3.196
                                                   6.860E+00,,
                                    3.563E+00,
                     2.192E+01,
            , NO
C,SR-85
                                                                    0.486
                                                   5.354E+00,,
                                    3.044E+00,
                     2.601E+00,
C, Y-88
            , NO
                                                                    -0.164
                                                   4.295E+00,,
                                    2.674E+00,
                    -7.048E-01,
            , NO
C, NB-94
                                                   4.754E+00,,
                                                                     0.320
                                    2.793E+00,
                     1.520E+00,
C, NB-95
            ,NO
                                                                    -0.311
                                                   7.930E+00,,
                    -2.469E+00,
                                    4.905E+00,
            ,NO
C, ZR-95
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                     6.729E+01,
                                    2.247E+02,
C, MO-99
            , NO
                                                                     0.218
                                                   5.561E+00,,
                     1.215E+00,
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C, RU-103
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                                                                     0.267
                                                   4.274E+01,,
                                    2.666E+01,
                     1.139E+01,
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C,RU-106
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                                                   4.325E+00,,
                                    2.692E+00,
                    -8.946E-01,
            , NO
C, AG-110m
                                                                    -0.130
                                                    6.077E+00,,
                                    3.754E+00,
            , NO
                    -7.891E-01,
C, SN-113
                                                    4.719E+00,,
                                                                     0.076
                                    6.697E+00,
            , NO
                     3.597E-01,
C,SB-124
                                                                    -0.406
                                                    1.249E+01,,
                                    7.882E+00,
                    -5.069E+00,
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C,SB-125
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                                                    6.016E+01,,
                                     3.675E+01,
                    -1.534E+01,
            , NO
 C, TE-129M
                                                                    -0.408
                                                    1.029E+01,,
                                     6.428E+00,
                     -4.200E+00,
            , NO
 C, I-131
                                                                     0.980
                                                    6.839E+00,,
                      6.701E+00,
                                     4.640E+00,
            ,NO
 C,BA-133
                                                                     1.300
                                                    5.086E+00,,
                                     6.197E+00,
                      6.612E+00,
 C, CS-134
             , NO
                                                    6.784E+00,,
                                                                    -0.231
                     -1.570E+00,
                                     4.190E+00,
             , NO
 C, CS-136
                                                                    -0.349
                                                    4.608E+00,,
                                     2.902E+00,
                     -1.606E+00,
             , NO
 C, CS-137
                                                                     0.424
                                                    4.767E+00,,
                                     2.869E+00,
             , NO
                      2.020E+00,
 C, CE-139
                                                                     0.001
                                                    2.570E+01,,
                                     1.558E+01,
                      3.355E-02,
             , NO
 C, BA-140
                                                                    -0.078
                                                    8.315E+00,,
                                     5.080E+00,
                     -6.484E-01,
 C, LA-140
             , NO
                                                                    -0.546
                                                    8.848E+00,,
                                     6.485E+00,
                     -4.827E+00,
 C, CE-141
             , NO
                                                                     0.265
                                                    3.478E+01,,
                                     2.455E+01,
                      9.203E+00,
             , NO
 C, CE-144
                                                    1.428E+01,,
                                                                     0.003
                                     1.031E+01,
                      3.718E-02,
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 C, EU-152
                                                                    -0.379
                                                    9.178E+00,,
                                     5.617E+00,
                     -3.478E+00,
             , NO
 C, EU-154
                                                                    -0.175
                                                    1.729E+01,,
                                     1.139E+01,
                     -3.028E+00,
 C, AC-228
             , NO
                                                                    -0.175
                                                    1.724E+01,,
                     -3.018E+00,
                                     1.136E+01,
             , NO
 C, TH-232
                                                                      0.726
                                                    3.532E+01,,
                                     2.453E+01,
                      2.566E+01,
 C, U-235
             , NO
                                                                      0.295
                                                    5.013E+02,,
                                     2.984E+02,
                      1.479E+02,
 C, U-238
             , NO
                                                                     -0.950
                                                    3.709E+01,,
                                     2.591E+01,
```

-3.524E+01,

C,AM-241

, NO

LIMS: Ana/lyst: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:42:34.86

TBE11 P-20610B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:16.87 

LIMS No., Customer Name, Client ID: WG L28837-2 QUAD CITY

Smple Date: 31-MAY-2006 09:10:00. : 11L28837-2

Geometry : 113L082304 Sample ID Sample Type : WG BKGFILE : 11BG060306MT Quantity : 3.00420E+00 L

Pk It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0	66.39 139.97* 198.74 351.96* 595.96 608.67* 911.27* 1762.44*	203 109 205 122 122 106 1 27	1271 665 493 284 126 149 74 49	1.74 1.88	131.78 279.37 397.23 704.37 1193.15 1218.59 1824.12 3523.86	7.90E-01 5.74E-01	4.56E-03 8.53E-03	49.0 21.5 33.3 20.0 29.2 ****	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

2-Sigma Uncorrected Decay Corr Oncorrected Decay Corr 2-Sigma
Area %Abn %Eff pCi/L pCi/L %Error
---- 1.75 6.158E-01 ----- Line Not Found -----%Error Energy Nuclide 1 27.70\* 5.744E-01 2.171E-01 2.178E-01 5104.48 835.50 AC-228 911.07

Flag: "\*" = Keyline

Summary of Nuclide Activity Sample ID: 11L28837-2

Page: 2 Acquisition date : 9-JUN-2006 22:11:16

7

Total number of lines in spectrum

Number of unidentified lines Number of lines tentatively identified by NID 12.50% 1

\_\_\_\_\_

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma pCi/L pCi/L 2-Sigma Error %Error 2-Sigma Error %Error Flags Decay pCi/L Nuclide Hlife

\_\_\_\_\_

2.178E-01 111.2E-01 5104.48 1.00 2.171E-01 5.75Y AC-228

> Total Activity : 2.171E-01 2.178E-01

Grand Total Activity : 2.171E-01 2.178E-01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID: 11L28837-2

Page: 3 Acquisition date: 9-JUN-2006 22:11:16

1											
It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0	66.39 139.97 198.74 351.96 595.96 608.67 1762.44	203 109 205 122 122 106 27	1271 665 493 284 126 149 49	1.71 1.11 1.09 1.69 1.82 1.74 2.24	1218.59	393 699 1188 1212	10 10 12 11 13	8.47E-03 4.56E-03 8.53E-03 5.10E-03 5.08E-03 4.42E-03 1.12E-03	98.0 43.0 66.5 40.0 58.4	6.89E-03 1.90E+00 1.75E+00 1.20E+00 8.03E-03 7.90E-03 3.39E-00	0 0 0 1 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

8 Total number of lines in spectrum 7 Number of unidentified lines Number of lines tentatively identified by NID 12.50% 1

Nuclide Type : natural

Wtd Mean Wtd Mean Decay Corr 2-Sigma Uncorrected Decay Corr 2-Sigma Error %Error Flags pCi/L pCi/L Decay Hlife Nuclide 111.2E-01 5104.48 2.178E-01 2.171E-01 1.00 5.75Y AC-228 \_\_\_\_\_\_ 2.178E-01

Grand Total Activity: 2.171E-01 2.178E-01

"M" = Manually accepted Flags: "K" = Keyline not found

2.171E-01

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Total Activity:

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
AC-228	2.178E-01	1.112E+01	1.376E+01	0.000E+00	0.016
Non-Ide	ntified Nuclides				
Nuclide	Key-Line Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7 NA-24 K-40 CR-51	-8.198E+00 -8.104E-02 1.694E+01 1.271E+01	2.199E+01 6.401E-02 3.605E+01 2.521E+01	3.534E+01 Half-Life too 6.114E+01 4.231E+01	0.000E+00 short 0.000E+00 0.000E+00	-0.232 0.277 0.300

		2.327E+00	3.867E+00	0.000E+00	0.167
MN-54	6.447E-01	2.356E+00	3.861E+00	0.000E+00	-0.173
CO-57	-6.691E-01	2.487E+00	4.171E+00	0.000E+00	0.260
CO-58	1.084E+00	4.959E+00	8.371E+00	0.000E+00	0.192
FE-59	1.604E+00	2.406E+00	4.197E+00	0.000E+00	0.504
CO-60	2.114E+00	5.261E+00	9.292E+00	0.000E+00	0.686
ZN-65	6.372E+00	3.254E+00	5.380E+00	0.000E+00	-0.146
SE-75	-7.869E-01	3.254E+00 3.108E+00	5.881E+00	0.000E+00	2.988
SR-85	1.757E+01	3.108E+00 2.674E+00	4.496E+00	0.000E+00	0.138
Y-88	6.209E-01	2.674E+00 2.290E+00	3.745E+00	0.000E+00	-0.115
NB-94	-4.312E-01		4.154E+00	0.000E+00	0.286
NB-95	1.187E+00	2.467E+00	7.125E+00	0.000E+00	0.035
ZR-95	2.526E-01	4.319E+00	3.265E+02	0.000E+00	0.036
MO-99	1.187E+01	1.977E+02	4.814E+00	0.000E+00	0.271
RU-103	1.306E+00	2.905E+00	3.640E+01	0.000E+00	-0.218
RU-106	-7.919E+00	2.230E+01	3.872E+00	0.000E+00	-0.048
AG-110m	-1.839E-01	2.349E+00	5.564E+00	0.000E+00	0.770
SN-113	4.282E+00	3.243E+00	4.102E+00	0.000E+00	1.136
SB-124	4.661E+00	4.837E+00	1.172E+01	0.000E+00	-0.052
SB-125	-6.122E-01	7.173E+00	5.478E+01	0.000E+00	0.597
TE-129M	3.271E+01	3.229E+01	8.871E+00	0.000E+00	-0.404
I-131	-3.586E+00	5.503E+00	5.856E+00	0.000E+00	0.964
BA-133	5.644E+00	3.940E+00	4.413E+00	0.000E+00	1.633
CS-134	7.206E+00	4.205E+00	4.413E+00 6.078E+00	0.000E+00	-0.121
CS-136	-7.333E-01	3.748E+00	4.277E+00	0.000E+00	0.418
CS-137	1.790E+00	2.504E+00	4.277E+00 4.054E+00	0.000E+00	-0.278
CE-139	-1.126E+00	2.501E+00	2.278E+01	0.000E+00	0.205
BA-140	4.664E+00	1.382E+01	7.765E+00	0.000E+00	-0.249
LA-140	-1.937E+00	4.821E+00	7.765E+00 7.656E+00	0.000E+00	0.231
CE-141	1.765E+00	5.440E+00	3.019E+01	0.000E+00	-0.015
CE-144	-4.420E-01	2.164E+01		0.000E+00	-0.444
EU-152	-5.343E+00	8.873E+00	1.204E+01 8.013E+00	0.000E+00	-0.007
EU-154	-5.569E-02	4.863E+00		0.000E+00	-0.341
RA-226	-3.339E+01	6.503E+01	9.805E+01	0.000E+00	0.159
TH-228	1.232E+00	5.172E+00	7.742E+00	0.000E+00	0.014
TH-232		+ 1.108E+01	1.527E+01	0.000E+00	0.503
U-235	1.507E+01	2.102E+01	2.994E+01	0.000E+00	-0.039
U-238	-1.669E+01	2.602E+02	4.311E+02	0.000E+00	-0.166
AM-241	-8.285E+00	3.656E+01	4.988E+01	U.UUUE+UU	0.100

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B,11L28837-2
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C, AC-228
                                                                   -0.232
                                    2.199E+01,
                                                   3.534E+01,,
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C, BE-7
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                                    3.605E+01,
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C, K-40
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                     1.271E+01,
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C, CR-51
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C, MN-54
            , NO
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                                    2.356E+00,
C, CO-57
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                                    2.467E+00,
                     1.187E+00,
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                     1.306E+00,
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                                                   3.640E+01,,
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                                                    4.277E+00,,
                                     2.504E+00,
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                                                                     0.014
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                                     1.108E+01,
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                                     2.602E+02,
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             , NO
 C, U-238
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-8.285E+00,

C, AM-241

, NO

4.988E+01,,

-0.166

Analyst: LIMS: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 12-JUN-2006 00:29:34.86

TBE13 P-10727B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:27.46 

LIMS No., Customer Name, Client ID: WG L28837-3 QUAD CITY

Smple Date: 1-JUN-2006 07:48:00.0 Sample ID : 13L28837-3

Geometry : 133L082404 Sample Type : WG Quantity : 3.01140E+00 L BKGFILE : 13BG060306MT 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	1 5 5 1 1 1 1 1 1 1 1 1 1 1	46.06* 63.36* 65.95 87.43* 92.57* 139.69* 185.67* 198.33* 241.70 295.33* 351.96* 582.87* 609.19* 707.67 969.13* 1121.12* 1237.74* 1461.48*	95 120 178 28 32 119 7 242 88 72 134 2 181 56 18 27 52 24 73	666 685 845 436 770 751 730 599 559 387 368 209 192 116 131 102 122 93	1.66 1.18 1.33 0.86 1.11 0.96 0.97 1.37 1.67 1.28 1.08 2.34 1.32 1.50 1.94 2.36 5.36 2.34 2.36	1218.04 1415.00 1938.03 2242.13 2475.51 2923.36	1.49E-01 7.09E-01 8.13E-01 1.59E+00 1.73E+00 2.27E+00 2.18E+00 1.92E+00 1.70E+00 1.51E+00 1.04E+00 1.01E+00 8.96E-01 7.01E-01 6.26E-01 5.81E-01 5.14E-01 4.55E-01	7.46E-04 1.10E-03 2.16E-03 9.99E-04	44.5 29.5 130.0 187.8 44.4 816.9 21.1 51.4 55.4 32.4 **** 20.0 37.1 154.3 100.4 55.9 133.3	2.00E+00 1.86E+00 1.10E+00 3.85E-01 1.13E+00 1.48E+00 1.66E+00 3.44E+00 7.55E-01 8.62E-01 2.09E+00 1.17E+00 1.97E+00 5.93E-01
19	7	1765.38*	13	J±	2.50					

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Type: natura	aT.			Uncorrected Decay Corr 2-Sigma
Nuclide K-40 RA-226 TH-232	Energy 1460.81 186.21 583.14 911.07 969.11 143.76	Area 24 7 2  18	%Abn 10.67* 3.28* 30.25 27.70* 16.60 10.50*	%Eff 5.142E-01 2.179E+00 1.040E+00 7.361E-01 7.013E-01 2.278E+00	pCi/L pCi/L %Error  1.634E+01 1.634E+01 266.62  3.612E+00 3.612E+00 1633.89  2.323E-01 2.323E-01 3632.74  Line Not Found  5.749E+00 5.749E+00 308.52  Line Not Found
0 233	163.35 185.71 205.31	 7 	4.70 54.00 4.70	2.256E+00 2.179E+00 2.093E+00	2.194E-01 2.194E-01 1633.89

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity Sample ID : 13L28837-3

Acquisition date : 9-JUN-2006 22:11:27

Total number of lines in spectrum Number of unidentified lines

19 13

Number of lines tentatively identified by NID 6

31.58%

Nuclide Type : natural

RA-226	1.28E+09Y 1600.00Y	Decay 1.00 1.00	Uncorrected pCi/L 1.634E+01 3.612E+00 2.323E-01	Decay Corr pCi/L 1.634E+01 3.612E+00 2.323E-01	Decay Corr 2-Sigma Error 4.356E+01 59.02E+00 84.37E-01	%Error 266.62 1633.89	Flags
	1.41E+10Y 7.04E+08Y		2.323E-01 2.194E-01	2.323E-01 2.194E-01	84.37E-01 35.85E-01		

Total Activity : 2.040E+01 2.040E+01

2.040E+01 Grand Total Activity : 2.040E+01

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 13L28837-3

Page: 3 Acquisition date: 9-JUN-2006 22:11:27

1       46.06       95       666       1.66       92.24       88       9 3.96E-03       ****       1.49E-01         5       63.36       120       685       1.18       126.82       123       15 5.01E-03       89.1       7.09E-01         5       65.95       178       845       1.33       131.99       123       15 7.42E-03       59.0       8.13E-01         1       87.43       28       436       0.86       174.93       173       5 1.17E-03       ****       1.59E+00         1       92.57       32       770       1.11       185.19       181       8 1.33E-03       ****       1.73E+00         1       139.69       119       751       0.96       279.39       276       8 4.97E-03       88.8       2.27E+00         1       198.33       242       599       1.37       396.60       392       9 1.01E-02       42.2       2.12E+00         1       198.33       242       599       1.37       396.60       392       9 1.01E-02       42.2       2.12E+00	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff F	lags	,
1       241.70       88       559       1.67       463.29       461       16       3.01E-03       ****       1.70E+00         1       295.33       72       387       1.28       590.50       587       8       3.01E-03       ****       1.70E+00         1       351.96       134       368       1.08       703.71       699       10       5.58E-03       64.7       1.51E+00         1       609.19       181       192       1.32       1218.04       1213       12       7.56E-03       39.9       1.01E+00         1       707.67       56       116       1.50       1415.00       1411       9       2.32E-03       74.3       8.96E-01         1       1121.12       27       102       2.36       2242.13       2236       15       1.10E-03       ****       5.81E-01         1       1237.74       52       122       5.36       2475.51       2471       20       2.16E-03       ****       5.81E-01         1       1765.38       73       54       2.36       3531.83       3523       18       3.05E-03       60.7       4.55E-01	5 1 1 1 1 1 1 1	63.36 65.95 87.43 92.57 139.69 198.33 241.70 295.33 351.96 609.19 707.67 1121.12 1237.74	120 178 28 32 119 242 88 72 134 181 56 27 52	685 845 436 770 751 599 559 387 368 192 116 102 122	1.18 1.33 0.86 1.11 0.96 1.37 1.67 1.28 1.08 1.32 1.50 2.36 5.36	126.82 131.99 174.93 185.19 279.39 396.60 483.29 590.50 703.71 1218.04 1415.00 2242.13 2475.51	123 123 173 181 276 392 481 587 699 1213 1411 2236 2471	15 5 8 9 10 8 10 12 9 15 20	5.01E-03 7.42E-03 1.17E-03 1.33E-03 4.97E-03 1.01E-02 3.68E-03 3.01E-03 5.58E-03 7.56E-03 2.32E-03 1.10E-03 2.16E-03	89.1 59.0 **** 88.8 42.2 **** 64.7 39.9 74.3 ****	7.09E-01 8.13E-01 1.59E+00 1.73E+00 2.27E+00 2.12E+00 1.92E+00 1.70E+00 1.51E+00 1.01E+00 8.96E-01 6.26E-01 5.81E-01	Т	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 19 Number of unidentified lines 13 Number of lines tentatively identified by NID 6 31.58%

Nuclide Type : natural

Nuclide	Type : natural	Wtd Mean Uncorrected	Wtd Mean Decay Corr	Decay Corr 2-Sigma
Nuclide K-40 RA-226 TH-232	Hlife Decay 1.28E+09Y 1.00 1600.00Y 1.00 1.41E+10Y 1.00 Total Activity	pCi/L 1.634E+01 3.612E+00 1.250E+00	pCi/L 1.634E+01 3.612E+00 1.250E+00  2.120E+01	2-Sigma Error %Error Flags 4.356E+01 266.62 59.02E+00 1633.89 7.619E+00 609.41

Grand Total Activity: 2.120E+01 2.120E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Identified Nuclides ----

100110-					
Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40 RA-226	1.634E+01 3.612E+00	4.356E+01 5.902E+01	3.096E+01 7.522E+01	0.000E+00 0.000E+00	0.528 0.048

TH-232 1.250E+00 7.619E+00 1.407E+01 0.000E+00 0.089

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/L) Ided		MDA (pCi/L)	MDA error	Act/MDA
BE-7	5.730E+00	1.872E+01	3.089E+01	0.000E+00	0.186
NA-24	-3.270E-02	1.797E-02	Half-Life to		0 075
CR-51	-2.542E+00	2.097E+01	3.400E+01	0.000E+00	-0.075
MN-54	6.199E-01	2.072E+00	3.458E+00	0.000E+00	0.179
CO-57	-2.652E-01	1.876E+00	3.121E+00	0.000E+00	-0.085
CO-58	-1.701E+00	2.189E+00	3.483E+00	0.000E+00	-0.488
FE-59	3.791E+00	4.535E+00	7.784E+00	0.000E+00	0.487
CO-60	-2.315E+00	2.197E+00	3.390E+00	0.000E+00	-0.683
ZN-65	5.895E+00	5.384E+00	8.073E+00	0.000E+00	0.730
SE-75	-1.654E+00	2.780E+00	4.516E+00	0.000E+00	-0.366
SR-85	1.733E+01	2.692E+00	5.101E+00	0.000E+00	3.397
Y-88	2.153E-01	2.346E+00	3.863E+00	0.000E+00	0.056
NB-94	1.108E+00	2.395E+00	3.383E+00	0.000E+00	0.328
NB-95	1.758E+00	2.281E+00	3.904E+00	0.000E+00	0.450
ZR-95	-1.786E+00	3.961E+00	6.451E+00	0.000E+00	-0.277
MO-99	-2.019E+01	1.405E+02	2.324E+02	0.000E+00	-0.087 0.478
RU-103	1.947E+00	2.438E+00	4.077E+00	0.000E+00	-0.173
RU-106	-5.576E+00	1.979E+01	3.219E+01	0.000E+00	
AG-110m	-2.039E+00	2.068E+00	3.242E+00	0.000E+00	-0.629 -0.322
SN-113	-1.422E+00	2.709E+00	4.414E+00	0.000E+00	
SB-124	-6.074E+00	2.837E+00	3.486E+00	0.000E+00	-1.742
SB-125	-2.204E-01	5.594E+00	9.194E+00	0.000E+00	-0.024 -0.195
TE-129M	-8.811E+00	2.791E+01	4.518E+01	0.000E+00	0.368
I-131	2.612E+00	4.181E+00	7.095E+00	0.000E+00	-0.265
BA-133	-1.213E+00	3.272E+00	4.579E+00	0.000E+00	-0.587
CS-134	-2.147E+00	2.733E+00	3.659E+00	0.000E+00	
CS-136	-9.217E-01	3.171E+00	5.160E+00	0.000E+00	-0.179
CS-137	4.200E-01	2.444E+00	3.779E+00	0.000E+00	0.111 0.140
CE-139	4.570E-01	1.980E+00	3.259E+00	0.000E+00	0.140
BA-140	6.508E-01	1.122E+01	1.872E+01	0.000E+00	0.457
LA-140	3.153E+00	3.972E+00	6.905E+00	0.000E+00	0.086
CE-141	5.358E-01	4.379E+00	6.238E+00	0.000E+00	-0.187
CE-144	-4.458E+00	1.613E+01	2.380E+01	0.000E+00	-1.184
EU-152	-1.198E+01	7.590E+00	1.012E+01	0.000E+00	-0.131
EU-154	-8.441E-01	3.876E+00	6.434E+00	0.000E+00	0.074
AC-228	1.041E+00	9.459E+00	1.411E+01	0.000E+00	0.481
TH-228	3.171E+00	4.631E+00	6.595E+00	0.000E+00	-0.014
U-235	-3.330E-01	1.771E+01	2.413E+01	0.000E+00	-0.358
U-238	-1.344E+02	2.529E+02	3.749E+02	0.000E+00	0.672
AM-241	1.718E+01	1.721E+01	2.557E+01	0.000E+00	0.672

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Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:47:04.01

TBE14 P-10933A HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:37.55

LIMS No., Customer Name, Client ID: WG L28837-4 QUAD CITY

LIMS:

Smple Date: 31-MAY-2006 14:37:00. : 14L28837-4 Sample ID

Geometry : 143L082304 Sample Type : WG BKGFILE : 14BG060306MT : 3.01420E+00 L Quantity Start Channel: 90 Energy Tol: 1.00000 Real Time: 0 06:40:03.84 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 06:40:00.00 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.27	248	875	1.47	133.52		1.03E-02		
2	1	92.57*	19	798	1.64	186.27		8.07E-042		
3	1	139.76	181	750	1.11	280.89		7.56E-03		
4	1	198.52*	106	576	1.55	398.65		4.42E-03		
5	1	242.25	120	349	1.64	486.26		5.01E-03		
6	1	295.79	118	319	1.75	593.47		4.93E-03		
7	1	351.84*	114	338	2.97	705.66	1.28E+00	4.74E-03	39.6	9.87E-01
8	1	596.15	109	189	2.10	1194.08	8.48E-01	4.56E-03	27.7	1.30E+00
9	1	609.58*	77	214	2.00	1220.89	8.33E-01	3.22E-03	48.1	1.66E+00
10	1	1767.32	109	86	1.35	3522.29	3.79E-01	4.55E-03	22.6	3.33E+01

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flaq: "\*" = Keyline

Page: 2 Summary of Nuclide Activity Acquisition date: 9-JUN-2006 22:11:37 Sample ID : 14L28837-4

Total number of lines in spectrum 10 Number of unidentified lines 10

Number of lines tentatively identified by NID 0
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\* 0.00%

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit Unidentified Energy Lines Sample ID : 14L28837-4

Page: 3 Acquisition date: 9-JUN-2006 22:11:37

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1	66.27 92.57 139.76 198.52 242.25 295.79 351.84 596.15	248 19 181 106 120 118 114 109	875 798 750 576 349 319 338 189	1.47 1.64 1.11 1.55 1.64 1.75 2.97 2.10	133.52 186.27 280.89 398.65 486.26 593.47 705.66 1194.08	129 182 276 395 483 590 700 1187	9 10 9 8 8	1.03E-02 8.07E-04 7.56E-03 4.42E-03 5.01E-03 4.93E-03 4.74E-03 4.56E-03	**** 58.4 91.3 57.2 55.6 79.1	5.10E-01 1.28E+00 1.89E+00 1.83E+00 1.66E+00 1.45E+00 1.28E+00 8.48E-01	) ) ) )
1 1	609.58 1767.32	77 109	214 86	2.00 1.35	1220.89 3522.29		14 22	3.22E-03 4.55E-03		8.33E-01 3.79E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

10 Total number of lines in spectrum Number of unidentified lines 10 Number of lines tentatively identified by NID 0 0.00% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.: (pCi/L) Id		MDA (pCi/L)	MDA error	Act/MDA
	· ·		<b>.</b>		
BE-7	1.089E+01	2.306E+01	3.861E+01	0.000E+00	0.282
NA-24	-4.619E-02	4.571E-02	Half-Life	too short	
K-40	3.919E-01	3.738E+01	6.554E+01	0.000E+00	0.006
CR-51	-1.420E+01	2.608E+01	4.212E+01	0.000E+00	-0.337
MN-54	5.305E-01	2.623E+00	4.317E+00	0.000E+00	0.123
CO-57	2.397E+00	2.509E+00	4.240E+00	0.000E+00	0.565
CO-58	1.276E+00	2.750E+00	4.588E+00	0.000E+00	0.278
FE-59	1.265E+00	5.258E+00	8.717E+00	0.000E+00	0.145
CO-60	-2.096E+00	2.556E+00	3.988E+00	0.000E+00	-0.526
ZN-65	5.077E+00	5.822E+00	9.923E+00	0.000E+00	0.512
SE-75	1.823E+00	3.407E+00	5.710E+00	0.000E+00	0.319
SR-85	2.364E+01	3.186E+00	6.210E+00	0.000E+00	3.807
Y-88	4.631E-01	3.061E+00	5.068E+00	0.000E+00	0.091
NB-94	-1.711E+00	2.452E+00	3.928E+00	0.000E+00	-0.436
NB-95	3.489E-01	2.680E+00	4.421E+00	0.000E+00	0.079
ZR-95	-3.925E-01	4.879E+00	7.980E+00	0.000E+00	-0.049
MO-99	-1.054E+02	2.005E+02	3.218E+02	0.000E+00	-0.327
RU-103	4.792E-02	2.937E+00	4.831E+00	0.000E+00	0.010

RU-106 AG-110m SN-113 SB-124 SB-125	-2.134E+01 8.247E-02 -5.559E-01 9.687E-02 -8.802E-01	2.422E+01 2.461E+00 3.341E+00 6.660E+00 7.141E+00	3.725E+01 4.079E+00 5.389E+00 4.583E+00 1.179E+01	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	-0.573 0.020 -0.103 0.021 -0.075
TE-129M	1.298E+01	3.457E+01	5.776E+01	0.000E+00	0.225
I-131	2.064E-01	5.619E+00	9.161E+00	0.000E+00	0.023
BA-133	4.665E+00	4.125E+00	5.948E+00	0.000E+00	0.784
CS-134	5.206E+00	6.139E+00	4.742E+00	0.000E+00	1.098
CS-136	-9.256E-02	4.076E+00	6.649E+00	0.000E+00	-0.014
CS-137	1.549E-01	2.674E+00	4.436E+00	0.000E+00	0.035
CE-139	1.084E+00	2.512E+00	4.156E+00	0.000E+00	0.261
BA-140	7.053E+00	1.500E+01	2.496E+01	0.000E+00	0.283
LA-140	4.299E+00	4.364E+00	7.713E+00	0.000E+00	0.557
CE-141	2.146E+00	5.900E+00	8.349E+00	0.000E+00	0.257
CE-144	1.031E+01	2.184E+01	3.114E+01	0.000E+00	0.331
EU-152	-7.691E+00	9.287E+00	1.233E+01	0.000E+00	-0.624
EU-154	3.393E+00	5.173E+00	8.691E+00	0.000E+00	0.390
RA-226	-8.555E+00	6.562E+01	1.007E+02	0.000E+00	-0.085
AC-228	4.907E+00	1.016E+01	1.650E+01	0.000E+00	0.297
TH-228	4.642E+00	5.506E+00	7.752E+00	0.000E+00	0.599
TH-232	4.891E+00	1.013E+01	1.645E+01	0.000E+00	0.297
U-235	1.735E+01	2.264E+01	3.242E+01	0.000E+00	0.535
U-238	8.653E+01	2.711E+02	4.537E+02	0.000E+00	0.191
AM-241	-1.187E+01	3.857E+01	5.355E+01	0.000E+00	-0.222

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                                                    4.537E+02,,
                      8.653E+01,
                                     2.711E+02,
 C, U-238
             , NO
                                                                     -0.222
```

3.857E+01,

-1.187E+01,

C,AM-241

, NO

5.355E+01,,

Analyst: LIMS: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:48:06.58 TBE15 P-10635B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:48.67 

LIMS No., Customer Name, Client ID: WG L28837-5 QUAD CITY

Smple Date: 31-MAY-2006 11:00:00. : 15L28837-5 Sample ID

Geometry : 153L082604 Sample Type : WG BKGFILE: 15BG060306MT Quantity : 3.01420E+00 L 

Pk It	Energy	Area	Bkgnd	FWHM Channel	%Eff	Cts/Sec	%Err	Fit
2 1 3 1	198.13 595.26 608.55 1459.93*	107 58 132 48	144 137	1.53 385.18 1.74 1183.58 2.62 1210.28 2.82 2920.46	1.01E+00 9.91E-01	2.41E-03 5.49E-03	40.9 20.9	1.92E+00 1.04E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Uncorrected Decay Corr 2-Sigma %Error %Abn %Eff pCi/L pCi/L Area Nuclide Energy 3.608E+01 90.65 10.67\* 4.696E-01 3.608E+01 48 1460.81 K-40

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date : 9-JUN-2006 22:11:48 Sample ID : 15L28837-5

Total number of lines in spectrum

3 Number of unidentified lines

Number of lines tentatively identified by NID 1 25.00%

\_\_\_\_\_

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

2-Sigma Error %Error Flags pCi/L pCi/L Nuclide Hlife Decay

3.271E+01 90.65 1.00 3.608E+01 3.608E+01 K-40 1.28E+09Y

> 3.608E+01 Total Activity: 3.608E+01

3.608E+01 Grand Total Activity: 3.608E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

0.071

0.183

-0.300

-0.087

0.204

-0.033

0.000E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

Unidentified Energy Lines Sample ID : 15L28837-5

Page : Acquisition date: 9-JUN-2006 22:11:48

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	198.13 595.26 608.55	107 58 132	144	1.74	1183.58	1179	10	4.44E-03 2.41E-03 5.49E-03	81.8	1.01E+00	

Flags: "T" = Tentatively associated

Total Activity:

Summary of Nuclide Activity

4 Total number of lines in spectrum 3 Number of unidentified lines 25.00% Number of lines tentatively identified by NID 1

Nuclide Type : natural

Wtd Mean Wtd Mean 2-Sigma Decay Corr Uncorrected Decay Corr 2-Sigma Error %Error Flags pCi/L pCi/L Hlife Decay Nuclide 90.65 3.271E+01 3.608E+01 1.00 3.608E+01 1.28E+09Y K-40

3.608E+01

3.608E+01 Grand Total Activity: 3.608E+01

"M" = Manually accepted Flags: "K" = Keyline not found

3.608E+01

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

NA-24

CR-51

MN-54

CO-57

CO-58

FE-59

CO-60

No interference correction performed

-2.225E-02

2.076E+00

5.557E-01

-7.526E-01

-2.786E-01

1.276E+00

-1.077E-01

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.608E+01	3.271E+01	3.087E+01	0.000E+00	1.169
Non-Ide	ntified Nuclides				
Nuclide	Key-Line Activity K.L. (pCi/L) Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7 NA-24	-1.711E+00 -2.225E-02	1.582E+01 4.282E-02	2.620E+01 Half-Life toc	0.000E+00 short	-0.065

2.909E+01

3.041E+00

2.511E+00

3.191E+00

6.252E+00

3,227E+00

1.753E+01

1.816E+00

1.634E+00

1.949E+00

3.696E+00

1.989E+00

ZN-65 SE-75 SR-85 Y-88 NB-94 NB-95 ZR-95 MO-99 RU-103 RU-106 AG-110m SN-113 SB-124 SB-125 TE-129M	6.060E+00 -1.096E-01 8.500E+00 4.997E-01 1.542E+00 1.804E-01 -2.863E+00 4.087E+01 -4.872E-01 -9.095E+00 -2.949E-01 -5.376E-01 1.639E+00 5.755E+00	3.872E+00 2.337E+00 2.162E+00 2.087E+00 1.760E+00 1.900E+00 3.502E+00 1.405E+02 2.074E+00 1.666E+01 1.848E+00 2.311E+00 3.872E+00 4.974E+00 2.418E+01	7.018E+00 3.770E+00 4.015E+00 3.533E+00 2.981E+00 3.163E+00 5.562E+00 2.369E+02 3.410E+00 2.653E+01 2.988E+00 3.746E+00 3.064E+00 8.456E+00 3.910E+01	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	0.864 -0.029 2.117 0.141 0.517 0.057 -0.515 0.173 -0.143 -0.343 -0.099 -0.144 0.535 0.681 -0.019 -0.098
			2.981E+00		
			3.163E+00		
			5.562E+00		
			2.369E+02		
			2.653E+01		
	- ·		2.988E+00		
		2.311E+00			
		3.872E+00		<del>-</del>	
		4.974E+00			
	_ :	2.418E+01			
I-131	-6.406E-01	4.011E+00	6.549E+00		
BA-133	-5.813E-01	2.436E+00	3.974E+00	0.000E+00	-0.146 0.886
CS-134	2.807E+00	2.652E+00	3.168E+00	0.000E+00	-0.024
CS-136	-1.114E-01	2.865E+00	4.715E+00	0.000E+00	-0.191
CS-137	-6.097E-01	1.985E+00	3.185E+00	0.000E+00	-0.191
CE-139	-1.040E-01	1.566E+00	2.585E+00	0.000E+00	0.091
BA-140	1.562E+00	1.030E+01	1.712E+01	0.000E+00	-0.221
LA-140	-1.228E+00	3.496E+00	5.562E+00	0.000E+00	-0.538
CE-141	-2.716E+00	3.097E+00	5.051E+00	0.000E+00	-0.527
CE-144	-1.020E+01	1.182E+01	1.937E+01	0.000E+00 0.000E+00	-1.044
EU-152	-8.735E+00	5.367E+00	8.363E+00	0.000E+00	0.033
EU-154	1.707E-01	3.356E+00	5.216E+00	0.000E+00	-0.299
RA-226	-1.918E+01	4.211E+01	6.406E+01	0.000E+00	0.376
AC-228	4.394E+00	6.884E+00	1.167E+01	0.000E+00	0.347
TH-228	1.817E+00	3.398E+00	5.231E+00	0.000E+00	0.376
TH-232	4.380E+00	6.862E+00	1.163E+01	0.000E+00	0.033
U-235	6.508E-01	1.176E+01	1.959E+01	0.000E+00	0.096
U-238	3.391E+01	2.145E+02	3.521E+02	0.000E+00	-0.622
AM-241	-1.648E+01	1.639E+01	2.650E+01	0.0005400	0.022

```
3.014E+00,WG L28837-5 QU
                     ,06/10/2006 11:48,05/31/2006 11:00,
A,15L28837-5
                                             ,06/06/2006 10:43,153L082604
                     ,LIBD
B,15L28837-5
                                                                    1.169
                                                   3.087E+01,,
                                    3.271E+01,
                     3.608E+01,
            ,YES,
C, K-40
                                                                   -0.065
                                                   2.620E+01,,
                                    1.582E+01,
                    -1.711E+00,
            , NO
C, BE-7
                                                                    0.071
                                                   2.909E+01,,
                                    1.753E+01,
                     2.076E+00,
            , NO
C, CR-51
                                                                    0.183
                                                   3.041E+00,,
                                    1.816E+00,
                     5.557E-01,
            ,NO
C, MN-54
                                                                   -0.300
                                                   2.511E+00,,
                                    1.634E+00,
                    -7.526E-01,
C, CO-57
            , NO
                                                                   -0.087
                                    1.949E+00,
                                                   3.191E+00,,
                    -2.786E-01,
            , NO
C, CO-58
                                                                    0.204
                                                   6.252E+00,,
                                    3.696E+00,
            , NO
                     1.276E+00,
C,FE-59
                                                                   -0.033
                                                   3.227E+00,,
                                    1.989E+00,
                    -1.077E-01,
            , NO
C, CO-60
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                                                   7.018E+00,,
                                    3.872E+00,
                     6.060E+00,
            ,NO
C, ZN-65
                                                                    -0.029
                                                   3.770E+00,,
                                    2.337E+00,
                    -1.096E-01,
            , NO
C, SE-75
                                                                     2.117
                                                   4.015E+00,,
                                    2.162E+00,
                     8.500E+00,
            , NO
C, SR-85
                                                                     0.141
                                                   3.533E+00,,
                                    2.087E+00,
                     4.997E-01,
            , NO
C, Y-88
                                                                     0.517
                                                   2.981E+00,,
                     1.542E+00,
                                    1.760E+00,
            , NO
C, NB-94
                                                                     0.057
                                                   3.163E+00,,
                                    1.900E+00,
                     1.804E-01,
            , NO
C, NB-95
                                                                    -0.515
                                                   5.562E+00,,
                                    3.502E+00,
                    -2.863E+00,
            , NO
C, ZR-95
                                                                     0.173
                                                    2.369E+02,,
                                    1.405E+02,
                     4.087E+01,
C, MO-99
            , NO
                                                                    -0.143
                                                    3.410E+00,,
                                     2.074E+00,
                    -4.872E-01,
            , NO
C, RU-103
                                                                    -0.343
                                                    2.653E+01,,
                                     1.666E+01,
                     -9.095E+00,
            , NO
 C, RU-106
                                                    2.988E+00,,
                                                                    -0.099
                                     1.848E+00,
                     -2.949E-01,
            , NO
 C, AG-110m
                                                                    -0.144
                                                    3.746E+00,,
                                     2.311E+00,
                     -5.376E-01,
            , NO
 C,SN-113
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                                                    3.064E+00,,
                                     3.872E+00,
                     1.639E+00,
 C,SB-124
             , NO
                                                                     0.681
                                                    8.456E+00,,
                                     4.974E+00,
                      5.755E+00,
             , NO
 C,SB-125
                                                                    -0.019
                                                    3.910E+01,,
                                     2.418E+01,
                     -7.355E-01,
 C, TE-129M , NO
                                                    6.549E+00,,
                                                                    -0.098
                                     4.011E+00,
                     -6.406E-01,
             , NO
 C, I-131
                                                                    -0.146
                                                    3.974E+00,,
                                     2.436E+00,
                     -5.813E-01,
             , NO
 C, BA-133
                                                                     0.886
                                                    3.168E+00,,
                                     2.652E+00,
                      2.807E+00,
             , NO
 C, CS-134
                                                                    -0.024
                                                    4.715E+00,,
                                     2.865E+00,
                     -1.114E-01,
             , NO
 C, CS-136
                                                                    -0.191
                                                    3.185E+00,,
                                     1.985E+00,
                     -6.097E-01,
 C, CS-137
             , NO
                                                                    -0.040
                                                    2.585E+00,,
                                     1.566E+00,
                     -1.040E-01,
             ,NO
 C, CE-139
                                                    1.712E+01,,
                                                                      0.091
                                     1.030E+01,
                      1.562E+00,
             , NO
 C, BA-140
                                                                     -0.221
                                                    5.562E+00,,
                                     3.496E+00,
                     -1.228E+00,
             , NO
 C, LA-140
                                                                     -0.538
                                                    5.051E+00,,
                                     3.097E+00,
                     -2.716E+00,
             , NO
 C, CE-141
                                                                     -0.527
                                                    1.937E+01,,
                                     1.182E+01,
                     -1.020E+01,
 C, CE-144
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                                                                     -1.044
                                                     8.363E+00,,
                                     5.367E+00,
                     -8.735E+00,
             , NO
 C, EU-152
                                                                      0.033
                                                     5.216E+00,,
                                     3.356E+00,
                      1.707E-01,
             , NO
 C, EU-154
                                                                     -0.299
                                                     6.406E+01,,
                                     4.211E+01,
                     -1.918E+01,
             , NO
  C, RA-226
                                                                      0.376
                                                     1.167E+01,,
                                      6.884E+00,
                      4.394E+00,
             , NO
  C, AC-228
                                                                      0.347
                                                     5.231E+00,,
                                      3.398E+00,
                      1.817E+00,
  C, TH-228
             , NO
                                                                      0.376
                                                     1.163E+01,,
                                      6.862E+00,
                       4.380E+00,
              , NO
  C,TH-232
                                                                      0.033
                                                     1.959E+01,,
                                      1.176E+01,
              , NO
                       6.508E-01,
  C, U-235
                                                     3.521E+02,,
                                                                      0.096
                                      2.145E+02,
                       3.391E+01,
              , NO
  C, U-238
                                                                     -0.622
                                                     2.650E+01,,
                                      1.639E+01,
                      -1.648E+01,
```

,NO ,

C, AM-241

LIMS: Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:49:04.59 TBE23 03017322 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:59.79

LIMS No., Customer Name, Client ID: WG L28937-6 QUAD CITY

Smple Date: 31-MAY-2006 14:45:00. : 23L28837-6 Sample ID

: WG Sample Type Geometry : 233L082404 Quantity : 3.00080E+00 L BKGFILE : 23BG060306MT Start Channel: 50 Energy Tol: 1.50000 Real Time: 0 06:40:16.41 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 06:40:00.00 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	5	33.80*	45	143	1.13	67.92	8.26E-02	1.88E-03	69.2	3.01E+00
2	0	64.28*	250	1494	1.72	128.84	1.08E+00	1.04E-02	36.7	
3	0	92.47*	90	1104	1.39	185.18	1.93E+00	3.75E-03	78.8	
4	0	139.76*	85	837	1.02	279.69	2.32E+00	3.53E-03	65.8	
5	0	185.58*	22	783	1.03	371.26	2.17E+00	9.20E-042	277.6	
6	0	197.95*	103	807	1.14	395.99	2.11E+00	4.30E-03	56.1	
7	0	238.52*	17	547	1.34	477.08	1.90E+00	6.93E-042	297.2	
8	0	351.26*	109	463	1.63	702.43	1.44E+00	4.56E-03	48.4	
9	0	583.14*	9	122	0.99	1165.98	9.71E-01	3.90E-042	267.0	
10	0	595.67	102	149	1.51	1191.02	9.56E-01	4.24E-03	25.3	
11	0	608.76*	38	165	1.41	1217.20	9.41E-01	1.57E-03	82.9	
12	0	727.11*	27	65	1.01	1453.82	8.28E-01	1.11E-03	67.7	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
RA-226	186.21	22	3.28*	2.175E+00	1.162E+01	1.162E+01	555.30
TH-228	238.63	17	44.60*	1.901E+00	7.364E-01	7.433E-01	594.48
	240.98		3.95	1.888E+00	Li:	ne Not Found	

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date: 9-JUN-2006 22:11:59 Sample ID : 23L28837-6

12

Total number of lines in spectrum

Number of unidentified lines 9

3 Number of lines tentatively identified by NID 25.00%

Nuclide Type : natural

2-Sigma Uncorrected Decay Corr Decay Corr pCi/L 2-Sigma Error %Error Flags pCi/L Decay Nuclide Hlife 1.162E+01 RA-226

\_\_\_\_\_

1.162E+01 6.451E+01 555.30 7.433E-01 44.19E-01 594.48 1600.00Y 1.00 1.91Y 1.01 1.01 7.364E-01 TH-228

\_\_\_\_\_\_ 1.236E+01 Total Activity: 1.235E+01

1.236E+01 Grand Total Activity: 1.235E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID: 23L28837-6 Page: 3
Acquisition date: 9-JUN-2006 22:11:59

25.00%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5 0 0 0 0 0 0 0 0 0	33.80 64.28 92.47 139.76 197.95 351.26 583.14 595.67 608.76 727.11	45 250 90 85 103 109 9 102 38 27	143 1494 1104 837 807 463 122 149 165 65	1.13 1.72 1.39 1.02 1.14 1.63 0.99 1.51 1.41	67.92 128.84 185.18 279.69 395.99 702.43 1165.98 1191.02 1217.20 1453.82	181 276 391 695 1162 1187 1213	16 10 8 10 16 9	1.88E-03 1.04E-02 3.75E-03 3.53E-03 4.30E-03 4.56E-03 3.90E-04 4.24E-03 1.57E-03 1.11E-03	**** **** 96.9 ***	8.26E-02 1.08E+00 1.93E+00 2.32E+00 2.11E+00 1.44E+00 9.71E-01 9.56E-01 9.41E-01 8.28E-01	Т

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 12
Number of unidentified lines 9
Number of lines tentatively identified by NID 3

Nuclide Type : natural

			Wtd Mean	Wtd Mean	D	2 G-1 mm 5	
		-		Decay Corr	Decay Corr 2-Sigma Error		
Nuclide	Hlife	Decay	pCi/L	pCi/L			riags
RA-226	1600.00Y		1.162E+01	1.162E+01	6.451E+01	555.30	
TH-228	1.91Y	1.01	7.364E-01	7.433E-01	44.19E-01	594.48	
	Total Acti	vity:	1.235E+01	1.236E+01			

Grand Total Activity: 1.235E+01 1.236E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	1.162E+01	6.451E+01	9.415E+01	0.000E+00	0.123
TH-228	7.433E-01	4.419E+00	6.763E+00	0.000E+00	0.110

#### ---- Non-Identified Nuclides ----

Nuglido		K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
Nuclide	(DC1/L)	raea		(bcr/n)		

חם ס	2.098E+00	1.986E+01	3.354E+01	0.000E+00	0.063
BE-7 NA-24	-2.110E-03	3.509E-02	Half-Life to	o short	
NA-24 K-40	-4.696E+01	3.192E+01	5.807E+01	0.000E+00	-0.809
	-1.568E+01	2.251E+01	3.743E+01	0.000E+00	-0.419
CR-51 MN-54	-1.421E+00	2.039E+00	3.359E+00	0.000E+00	-0.423
CO-57	-6.001E-01	2.322E+00	3.871E+00	0.000E+00	-0.155
	4.317E-01	2.159E+00	3.725E+00	0.000E+00	0.116
CO-58	2.398E+00	4.191E+00	7.499E+00	0.000E+00	0.320
FE-59	1.652E+00	2.195E+00	3.956E+00	0.000E+00	0.418
CO-60	4.828E+00	4.316E+00	7.908E+00	0.000E+00	0.611
ZN-65	4.828E+00 1.991E+00	3.157E+00	5.435E+00	0.000E+00	0.366
SE-75	1.333E+01	2.657E+00	5.054E+00	0.000E+00	2.637
SR-85	-1.891E+00	2.057E+00 2.263E+00	3.717E+00	0.000E+00	-0.509
Y-88		2.044E+00	3.353E+00	0.000E+00	-0.591
NB-94	-1.980E+00 1.600E+00	2.044E+00 2.220E+00	3.915E+00	0.000E+00	0.409
NB-95	_	3.820E+00	6.581E+00	0.000E+00	0.077
ZR-95	5.069E-01	1.596E+02	2.716E+02	0.000E+00	-0.088
MO-99	-2.385E+01	2.408E+00	4.266E+00	0.000E+00	0.820
RU-103	3.496E+00	1.960E+01	3.318E+01	0.000E+00	-0.212
RU-106	-7.036E+00	2.039E+00	3.537E+00	0.000E+00	0.144
AG-110m	5.094E-01	2.039E+00 2.956E+00	4.925E+00	0.000E+00	-0.247
SN-113	-1.217E+00	4.981E+00	3.753E+00	0.000E+00	0.151
SB-124	5.667E-01		1.050E+01	0.000E+00	-0.130
SB-125	-1.361E+00	6.275E+00	4.961E+01	0.000E+00	0.280
TE-129M	1.389E+01	2.899E+01	8.560E+00	0.000E+00	0.754
I-131	6.457E+00	4.876E+00	5.142E+00	0.000E+00	0.217
BA-133	1.114E+00	3.548E+00	4.027E+00	0.000E+00	1.366
CS-134	5.501E+00	4.622E+00	5.347E+00	0.000E+00	-0.143
CS-136	-7.633E-01	3.165E+00	3.986E+00	0.000E+00	0.647
CS-137	2.578E+00	2.216E+00	3.990E+00	0.000E+00	0.187
CE-139	7.466E-01	2.385E+00	2.057E+01	0.000E+00	0.325
BA-140	6.687E+00	1.197E+01	6.950E+00	0.000E+00	0.316
LA-140	2.196E+00	3.811E+00	7.686E+00	0.000E+00	-0.165
CE-141	-1.270E+00	5.463E+00		0.000E+00	-0.108
CE-144	-3.258E+00	2.142E+01	3.026E+01	0.000E+00	-0.629
EU-152	-6.865E+00	7.916E+00	1.091E+01	0.000E+00	0.063
EU-154	5.058E-01	4.813E+00	8.069E+00	0.000E+00	0.145
AC-228	1.914E+00	8.805E+00	1.325E+01	0.000E+00	0.145
TH-232	1.908E+00	8.777E+00	1.321E+01	0.000E+00	-0.087
U-235	-2.590E+00	2.194E+01	2.973E+01	0.000E+00	0.527
U-238	2.193E+02	2.457E+02	4.159E+02	0.000E+00	0.714
AM-241	1.508E+01	1.469E+01	2.111E+01	0.0005+00	0.714

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2.111E+01,,

Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 15:21:15.54 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:13:10.51

LIMS No., Customer Name, Client ID: WG L28837-7 EXELON QUAD

LIMS: (

Smple Date: 1-JUN-2006 14:10:00.0 : 04L28837-7 Sample ID

Geometry : 043L082004 Sample Type : WG : 3.02260E+00 L BKGFILE: 04BG060306MT Quantity End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:07:53.21 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.24*	100	260	1.30	132.94	6.61E-01	8.85E-03	29.7	6.75E-01
2	1	77.31	98	208	1.24	155.08	1.07E+00	8.72E-03	25.6	2.22E-01
3	1	85.62*	24	385	2.20	171.68	1.34E+00	2.12E-031	L69.3	6.31E-01
4	1	140.08	147	320	1.73	280.60	2.04E+00	1.30E-02	26.5	2.90E+00
5	1	198.82*	20	209	1.68	398.06	1.86E+00	1.74E-031	L44.0	1.88E+00
6	1	238.51*	94	255	1.16	477.42	1.68E+00	8.36E-03	35.6	5.80E+00
7	1	295.52	71	132	1.84	591.43	1.45E+00	6.29E-03	32.6	3.77E-01
8	1	351.89*	107	128	1.58	704.14	1.28E+00	9.51E-03	24.4	9.41E-01
9	1	583.48*	31	55	1.84	1167.19	8.77E-01	2.71E-03	53.5	3.02E+00
10	1	596.88	79	45	2.60	1194.00	8.62E-01	6.97E-03	20.2	1.72E+00
11	1	609.51*	115	51	1.31	1219.24	8.48E-01	1.02E-02	17.1	1.02E+00
12	1	1155.59	18	14	1.81	2310.91	5.15E-01	1.62E-03	45.5	1.45E+00
13	1	1461.45*	14	24	4.20	2922.27	4.29E-01	1.28E-03	105.9	1.59E+00
14	1	1764.90*	33	8	3.14	3528.72	3.77E-01	2.92E-03	29.9	1.37E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĊi/L	%Error
K-40	1460.81	14	10.67*	4.294E-01	2.507E+01	2.507E+01	211.89
TH-228	238.63	94	44.60*	1.680E+00	9.979E+00	1.007E+01	71.23
	240.98		3.95	1.669E+00	Li	ne Not Found	

Flaq: "\*" = Keyline

Page: 2 Summary of Nuclide Activity

Acquisition date : 10-JUN-2006 12:13:10 Sample ID : 04L28837-7

Total number of lines in spectrum 14 Number of unidentified lines 11

Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 2.507E+01 2.507E+01 5.311E+01 211.89 TH-228 1.91Y 1.01 9.979E+00 1.007E+01 0.717E+01 71.23

Total Activity: 3.505E+01 3.514E+01

Grand Total Activity: 3.505E+01 3.514E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted "A" = Nuclide specific abn. limit

Page: 3

Unidentified Energy Lines Sample ID: 04L28837-7

Acquisition date : 10-JUN-2006 12:13:10

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff ]	Flags
	66.24 77.31 85.62 140.08 198.82 295.52 351.89 583.48 596.88 609.51 1155.59	100 98 24 147 20 71 107 31 79 115 18	260 208 385 320 209 132 128 55 45 51 14	1.30 1.24 2.20 1.73 1.68 1.84 1.58 1.84 2.60 1.31 1.81 3.14	132.94 155.08 171.68 280.60 398.06 591.43 704.14 1167.19 1194.00 1219.24 2310.91	275 395 587 699 1163 1189 1215 2304	6 11 12 8 10 11 9 11 10	8.85E-03 8.72E-03 2.12E-03 1.30E-02 1.74E-03 6.29E-03 9.51E-03 2.71E-03 6.97E-03 1.02E-02 1.62E-03 2.92E-03	51.2 *** 53.1 *** 65.2 48.8 *** 40.4	6.61E-01 1.07E+00 1.34E+00 2.04E+00 1.86E+00 1.45E+00 8.77E-01 8.62E-01 8.48E-01 5.15E-01 3.77E-01	Т

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 14
Number of unidentified lines 11
Number of lines tentatively identified by NID 3

21.43%

Nuclide Type : natural

			Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	2.507E+01	2.507E+01	5.311E+01	211.89	
TH-228	1.91Y	1.01	9.979E+00	1.007E+01	0.717E+01	71.23	
	Total Acti	vity:	3.505E+01	3.514E+01			

Grand Total Activity: 3.505E+01 3.514E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.507E+01	5.311E+01	5.702E+01	0.000E+00	0.440
TH-228	1.007E+01	7.172E+00	9.415E+00	0.000E+00	1.069

---- Non-Identified Nuclides ----

Nuclide		K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
DH 7	1.290E+00		2.986E+01	4.947E+01	0.000E+00	0.026
BE-7	-2.256E-02		3.427E-02	Half-Life too	short	
NA-24 CR-51	2.945E+00		3.344E+01	5.525E+01	0.000E+00	0.053
MN-54	1.913E+00		3.292E+00	5.605E+00	0.000E+00	0.341
MN-54 CO-57	-1.764E+00		2.901E+00	4.766E+00	0.000E+00	-0.370
CO-57	8.961E-01		3.631E+00	6.042E+00	0.000E+00	0.148
FE-59	3.213E+00		6.878E+00	1.171E+01	0.000E+00	0.274
CO-60	2.906E+00		3.641E+00	6.372E+00	0.000E+00	0.456
ZN-65	7.000E+00		7.412E+00	1.303E+01	0.000E+00	0.537
SE-75	2.578E+00		4.418E+00	7.516E+00	0.000E+00	0.343
SR-85	2.376E+01		4.258E+00	8.511E+00	0.000E+00	2.792
Y-88	-1.593E+00		4.267E+00	6.684E+00	0.000E+00	-0.238
NB-94	7.578E-01		3.165E+00	5.310E+00	0.000E+00	0.143
NB-94 NB-95	2.858E+00		3.378E+00	5.881E+00	0.000E+00	0.486
ZR-95	-3.112E+00		6.070E+00	9.598E+00	0.000E+00	-0.324
MO-99	1.005E+01		2.137E+02	3.531E+02	0.000E+00	0.028
RU-103	-8.068E-02		3.582E+00	5.898E+00	0.000E+00	-0.014
RU-105	7.535E+00		3.294E+01	5.424E+01	0.000E+00	0.139
AG-110m	-8.669E-01		3.201E+00	5.220E+00	0.000E+00	-0.166
SN-113	2.407E+00		4.469E+00	7.461E+00	0.000E+00	0.323
SB-124	-1.540E+00		7.715E+00	5.276E+00	0.000E+00	-0.292
SB-124 SB-125	-4.749E+00		8.940E+00	1.446E+01	0.000E+00	-0.328
TE-129M	-1.076E+01		4.292E+01	7.017E+01	0.000E+00	-0.153
I-131	-1.287E+00		6.987E+00	1.130E+01	0.000E+00	-0.114
BA-133	5.931E+00		5.580E+00	8.270E+00	0.000E+00	0.717
CS-134	7.471E+00		6.515E+00	6.008E+00	0.000E+00	1.243
CS-136	-4.196E+00		5.230E+00	8.022E+00	0.000E+00	-0.523
CS-137	3.608E+00		3.380E+00	5.995E+00	0.000E+00	0.602
CE-139	-2.099E+00		3.084E+00	4.974E+00	0.000E+00	-0.422
BA-140	-1.092E+01		1.880E+01	2.975E+01	0.000E+00	-0.367
LA-140	1.005E+00		5.852E+00	9.867E+00	0.000E+00	0.102
CE-141	-2.806E+00		6.775E+00	9.430E+00	0.000E+00	-0.298
CE-144	-6.027E+00		2.658E+01	3.754E+01	0.000E+00	-0.161
EU-152	-6.217E+00		1.204E+01	1.612E+01	0.000E+00	-0.386
EU-154	-3.066E+00		5.978E+00	9.845E+00	0.000E+00	-0.311
RA-226	1.726E+01		7.851E+01	1.278E+02	0.000E+00	0.135
AC-228	-8.576E+00	)	1.297E+01	2.046E+01	0.000E+00	-0.419
TH-232	-8.551E+00		1.293E+01	2.040E+01	0.000E+00	-0.419
U-235	-3.468E+00		2.565E+01	3.623E+01	0.000E+00	-0.096
U-238	2.262E+01		3.482E+02	5.769E+02	0.000E+00	0.039
AM-241	-2.271E+01		3.145E+01	4.838E+01	0.000E+00	-0.469

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                    -8.669E-01,
C, AG-110m
            , NO
                                                                     0.323
                                                   7.461E+00,,
                                    4.469E+00,
C, SN-113
            , NO
                     2.407E+00,
                                                   5.276E+00,,
                                                                    -0.292
            , NO
                    -1.540E+00,
                                    7.715E+00,
C,SB-124
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                    -4.749E+00,
                                    8.940E+00,
                                                   1.446E+01,,
C,SB-125
            , NO
                                    4.292E+01,
                                                   7.017E+01,,
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                    -1.076E+01,
C, TE-129M
            , NO
                                                                    -0.114
                                                   1.130E+01,,
            ,NO
                    -1.287E+00,
                                    6.987E+00,
C, I-131
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                                    5.580E+00,
C,BA-133
            , NO
                     5.931E+00,
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                     7.471E+00,
                                    6.515E+00,
                                                   6.008E+00,,
C, CS-134
            , NO
                                                                    -0.523
            , NO
                                    5.230E+00,
                                                   8.022E+00,,
C, CS-136
                    -4.196E+00,
                                    3.380E+00,
                                                   5.995E+00,,
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C, CS-137
            , NO
                                                   4.974E+00,,
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                                    3.084E+00,
                    -2.099E+00,
C, CE-139
            , NO
                                                                    -0.367
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                                    1.880E+01,
            , NO
                    -1.092E+01,
C,BA-140
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                     1.005E+00,
                                    5.852E+00,
C, LA-140
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                                    6.775E+00,
                                                    9.430E+00,,
                                                                    -0.298
            ,NO
                    -2.806E+00,
C, CE-141
                                    2.658E+01,
                                                    3.754E+01,,
                                                                    -0.161
                    -6.027E+00,
C, CE-144
            , NO
                                                    1.612E+01,,
                                                                    -0.386
                                    1.204E+01,
                    -6.217E+00,
C, EU-152
            , NO
                                                                    -0.311
                                                    9.845E+00,,
                                    5.978E+00,
C, EU-154
            , NO
                    -3.066E+00,
                                                    1.278E+02,,
                                                                     0.135
                                    7.851E+01,
C, RA-226
            , NO
                     1.726E+01,
                                                    2.046E+01,,
                                                                    -0.419
                    -8.576E+00,
                                    1.297E+01,
C, AC-228
            , NO
                                                                    -0.419
                                                    2.040E+01,,
                    -8.551E+00,
                                    1.293E+01,
C, TH-232
            , NO
                                                    3.623E+01,,
                                                                    -0.096
                                    2.565E+01,
                    -3.468E+00,
C, U-235
            , NO
                                                                     0.039
                                                    5.769E+02,,
C, U-238
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                     2.262E+01,
                                     3.482E+02,
                                                    4.838E+01,,
                                                                    -0.469
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3.145E+01,

-2.271E+01,

C, AM-241

,NO,

Analyst: LIMS: \_\_\_ Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 15:22:51.09

TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:13:12.28 

LIMS No., Customer Name, Client ID: WG L28837-8 EXELON QUAD

Smple Date: 1-JUN-2006 12:58:00.0 : 07L28837-8 Sample ID

Geometry : 073L082504 Sample Type : WG BKGFILE : 07BG060306MT Quantity : 3.02060E+00 L 

Pk It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 1 2 1 3 1 4 2 5 1 6 1 7 1 8 1 9 1	66.19* 139.75* 198.38* 242.09 352.04* 596.08 609.28* 1120.40* 1764.49*	105 82 66 56 82 53 87 34 40	283 265 233 194 143 71 150 25	1.56	132.94 280.18 397.53 485.00 705.03 1193.33 1219.74 2242.03 3529.57	2.36E+00 2.25E+00 2.04E+00 1.61E+00 1.10E+00 1.09E+00 7.03E-01	9.25E-03 7.21E-03 5.83E-03 4.89E-03 7.21E-03 4.66E-03 7.64E-03 2.99E-03 3.49E-03	38.7 45.4 46.2 32.9 36.0 33.7 38.9	2.05E+00 1.96E+00 6.74E-01 1.03E+00 1.64E+00 7.17E-01 9.50E-01

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity

Page: 2 Acquisition date: 10-JUN-2006 12:13:12

Sample ID : 07L28837-8

0.00%

9 Total number of lines in spectrum 9 Number of unidentified lines Number of lines tentatively identified by NID 0

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found

"M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 07L28837-8

Page : Acquisition date : 10-JUN-2006 12:13:12

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 2 1 1 1	66.19 139.75 198.38 242.09 352.04 596.08 609.28 1120.40	105 82 66 56 82 53 87 34	283 265 233 194 143 71 150 25	1.29 1.43 1.06 1.31 1.25 1.81 1.56 2.44	2242.03	700 1163 1213 2236	8 16 10 41 14	9.25E-03 7.21E-03 5.83E-03 4.89E-03 7.21E-03 4.66E-03 7.64E-03 2.99E-03	77.4 90.8 92.3 65.9 71.9 67.4 77.8	8.00E-01 2.36E+00 2.25E+00 2.04E+00 1.61E+00 1.10E+00 7.03E-01	) ) ) ) )
1	1764.49	40	11	3.39	3529.57	3525	12	3.49E-03	51.9	5.12E-01	-

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

9 Total number of lines in spectrum Number of unidentified lines 9 Number of lines tentatively identified by NID 0 0.00% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Non-Identified Nuclides ----

Nuclide	. 2	L. Act error led	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-4.576E+00	2.620E+01	4.226E+01	0.000E+00	-0.108
NA-24	-7.167E-02	3.396E-02	Half-Life	too short	
K-40	2.532E+01	3.983E+01	7.336E+01	0.000E+00	0.345
CR-51	-3.264E+01	2.791E+01	4.426E+01	0.000E+00	-0.738
MN-54	2.001E-01	2.770E+00	4.599E+00	0.000E+00	0.044
CO-57	-1.168E+00	2.715E+00	4.377E+00	0.000E+00	-0.267
CO-58	-2.089E+00	3.001E+00	4.744E+00	0.000E+00	-0.440
FE-59	1.103E+00	5.888E+00	9.887E+00	0.000E+00	0.112
CO-60	1.819E+00	3.086E+00	5.285E+00	0.000E+00	0.344
ZN-65	7.125E+00	7.665E+00	1.165E+01	0.000E+00	0.611
SE-75	-5.086E-02	3.939E+00	6.428E+00	0.000E+00	-0.008
SR-85	2.296E+01	3.736E+00	7.476E+00	0.000E+00	3.071
Y-88	-2.816E+00	3.068E+00	4.555E+00	0.000E+00	-0.618
NB-94	1.415E+00	2.894E+00	4.854E+00	0.000E+00	0.291
NB-95	4.409E+00	2.922E+00	5.289E+00	0.000E+00	0.834
ZR-95	-3.617E+00	5.540E+00	8.612E+00	0.000E+00	-0.420
MO-99	1.751E+00	2.128E+02	3.463E+02	0.000E+00	0.005
RU-103	3.380E+00	3.220E+00	5.517E+00	0.000E+00	0.613
RU-106	1.150E+01	2.728E+01	4.480E+01	0.000E+00	0.257

	-2.182E+00	2.703E+00	4.202E+00	0.000E+00	-0.519
AG-110m	-2.182E+00 -1.881E+00	3.705E+00	5.957E+00	0.000E+00	-0.316
SN-113		6.981E+00	4.874E+00	0.000E+00	-0.053
SB-124	-2.592E-01	8.379E+00	1.383E+01	0.000E+00	0.092
SB-125	1.269E+00	3.695E+01	6.130E+01	0.000E+00	0.196
TE-129M	1.204E+01	6.138E+00	1.020E+01	0.000E+00	0.069
I-131	7.064E-01	4.671E+00	7.168E+00	0.000E+00	1.044
BA-133	7.482E+00	6.569E+00	5.742E+00	0.000E+00	1.379
CS-134	7.917E+00	4.316E+00	7.399E+00	0.000E+00	0.330
CS-136	2.440E+00	2.893E+00	4.917E+00	0.000E+00	0.353
CS-137	1.735E+00	2.716E+00	4.473E+00	0.000E+00	-0.263
CE-139	-1.174E+00	1.533E+01	2.663E+01	0.000E+00	0.505
BA-140	1.344E+01	4.968E+00	7.926E+00	0.000E+00	-0.182
LA-140	-1.440E+00	6.417E+00	9.059E+00	0.000E+00	0.355
CE-141	3.215E+00	2.426E+01	3.398E+01	0.000E+00	0.171
CE-144	5.806E+00	1.090E+01	1.452E+01	0.000E+00	-0.654
EU-152	-9.501E+00	5.519E+00	9.066E+00	0.000E+00	0.104
EU-154	9.406E-01		1.122E+02	0.000E+00	-0.312
RA-226	-3.496E+01	6.839E+01	1.768E+01	0.000E+00	0.045
AC-228	7.942E-01	1.079E+01	9.459E+00	0.000E+00	-0.219
TH-228	-2.070E+00	6.685E+00	1.762E+01	0.000E+00	0.045
TH-232	7.919E-01	1.076E+01	3.563E+01	0.000E+00	0.323
U-235	1.152E+01	2.529E+01	5.331E+02	0.000E+00	0.370
U-238	1.972E+02	3.124E+02	5.331E+02 4.116E+01	0.000E+00	-0.804
AM-241	-3.310E+01	2.902E+01	4.1100+01	0.000100	

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                                             ,06/07/2006 09:32,073L082504
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B,07L28837-8
                                                                   -0.108
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                                    2.620E+01,
                    -4.576E+00,
C, BE-7
           , NO
                                                                    0.345
                                                   7.336E+01,,
                                    3.983E+01,
                     2.532E+01,
           , NO
C, K-40
                                                                   -0.738
                                                   4.426E+01,,
                                    2.791E+01,
                    -3.264E+01,
            , NO
C, CR-51
                                                                    0.044
                                                   4.599E+00,,
                                    2.770E+00,
                     2.001E-01,
C, MN-54
            , NO
                                                   4.377E+00,,
                                                                    -0.267
                                    2.715E+00,
                    -1.168E+00,
            , NO
C, CO-57
                                                                    -0.440
                                                   4.744E+00,,
                                    3.001E+00,
            , NO
                    -2.089E+00,
C, CO-58
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                                                   9.887E+00,,
                                    5.888E+00,
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C, FE-59
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                                    3.086E+00,
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C, CO-60
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C, ZR-95
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C, MO-99
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C, RU-103
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                                                    4.480E+01,,
                                     2.728E+01,
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C, RU-106
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                                     2.703E+00,
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C, AG-110m
                                                                    -0.316
                                                    5.957E+00,,
                                     3.705E+00,
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                                                    6.130E+01,,
                                     3.695E+01,
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 C, TE-129M , NO
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                                                                     1.044
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                                     4.671E+00,
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                                                    5.742E+00,,
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 C, CS-134
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                                                    7.399E+00,,
                                     4.316E+00,
                      2.440E+00,
 C, CS-136
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                                                    4.917E+00,,
                                     2.893E+00,
                      1.735E+00,
 C, CS-137
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                                                                    -0.263
                                                    4.473E+00,,
                                     2.716E+00,
             , NO
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                                     4.968E+00,
                     -1.440E+00,
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                                     2.426E+01,
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 C, CE-144
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                                     6.839E+01,
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                                     1.079E+01,
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                                                                     -0.219
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                                     6.685E+00,
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                                                                      0.045
                                                    1.762E+01,,
                                     1.076E+01,
                      7.919E-01,
 C, TH-232
             , NO
                                                                      0.323
                                                     3.563E+01,,
                                     2.529E+01,
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  C,U-235
                                                                      0.370
                                                     5.331E+02,,
                      1.972E+02,
                                     3.124E+02,
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  C, U-238
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                                                     4.116E+01,,
                                     2.902E+01,
                     -3.310E+01,
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, NO

C,AM-241

LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 18:07:34.41

TBE10 12892256 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:39:34.67 

LIMS No., Customer Name, Client ID: WG L28837-9 EXELON QUAD

Smple Date: 1-JUN-2006 11:18:00.0 : 10L28837-9

Sample ID Geometry : 103L083004 Sample Type : WG BKGFILE : 10BG060306MT Quantity : 3.00050E+00 L Energy Tol : 1.00000 Real Time : 0 05:16:43.21

Start Channel : 80 End Channel: 4090 Pk Srch Sens: 5.00000 Live time: 0 05:16:40.00 MDA Constant: 0.00 Library Used: LIBD

Pk It	t	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1 1	66.24* 139.91 185.97* 198.40* 352.11* 583.67* 596.29 609.59* 847.35* 1120.80* 1461.53* 1764.99*	146 148 26 102 71 9 79 152 25 16 34 10	614 593 391 499 249 129 170 133 81 62 26 35	2.95 1.69 2.54	131.59 278.99 371.17 396.02 703.61 1167.00 1192.25 1218.88 1694.73 2242.10 2924.21 3531.83	1.77E+00	7.78E-03 1.34E-03 5.37E-03 3.74E-03 4.73E-04 4.14E-03 8.02E-03 1.32E-03 8.31E-04 1.79E-03	30.8 155.8 45.9 48.2 302.9 36.8 19.4 89.5 115.2 58.7	1.26E+00 1.11E+00 1.73E+00 1.01E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Type: natura	al		Uncorrected	Decay Corr	2-Sigma
Nuclide K-40 RA-226 U-235	Energy 1460.81 186.21 143.76 163.35 185.71 205.31	Area 34 26  26	%Eff 3.885E-01 1.770E+00 1.905E+00 1.860E+00 1.770E+00 1.684E+00	2.084E+01 Li: 1.266E+00	pCi/L 3.895E+01 2.084E+01 ne Not Found ne Not Found 1.266E+00 ne Not Found	%Error 117.33 311.53  311.53

Flag: "\*" = Keyline

Summary of Nuclide Activity

Sample ID : 10L28837-9

Page: 2 Acquisition date : 10-JUN-2006 12:39:34

12

3

Total number of lines in spectrum

Number of unidentified lines

Number of lines tentatively identified by NID

25.00%

Nuclide Type : natural

			Olicoraco	Decay Corr	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
Nuclide	Hlife D 1.28E+09Y	ecay	pCi/L 3.895E+01	3.895E+01	4.570E+01	117.33	
RA-226	1600.00Y	1.00	2.084E+01	2.084E+01 1.266E+00	6.492E+01 3.943E+00	311.53 311.53	K
U-235	7.04E+08Y			6.106E+01			
	Total Activi	itv :	6.106E+UI	6.T00E+0T			

Total Activity: 6.106E+01

Grand Total Activity : 6.106E+01 6.106E+01

Flags: "K" = Keyline not found

"M" = Manually accepted
"A" = Nuclide specific abn. limit "E" = Manually edited

Page: 3

Unidentified Energy Lines Sample ID : 10L28837-9

Acquisition date: 10-JUN-2006 12:39:34

Sample ID : 10L28837-9				11094420-1-1							
Ιt	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1 1	66.24 139.91 198.40 352.11 583.67 596.29 609.59 847.35 1120.80 1764.99	146 148 102 71 9 79 152 25 16	614 593 499 249 129 170 133 81 62 35	1.54 1.78 1.75 1.18 1.63 1.71 1.42 2.95 1.69 2.07	1218.88 1694.73 2242.10	699 1157 1186 1212 1688 2235	9 10 10 14 14 13 14 12		61.6 91.9 96.4 **** 73.6 38.7 ****	7.24E-01 1.91E+00 1.71E+00 7.98E-01 7.85E-01 7.72E-01 5.98E-01 4.79E-01	) ) ) L T L L 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

12 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 3 25.00%

Nuclide Type : natural

Nuclide	Type : natural	Wtd Mean Uncorrected	Wtd Mean Decay Corr	DCCal co	2-Sigma	
Nuclide K-40 RA-226	Hlife Dec 1.28E+09Y 1. 1600.00Y 1.	pCi/L 00 3.895E+01	pCi/L 3.895E+01 2.084E+01	2-Sigma Error 4.570E+01 6.492E+01	%Error 117.33 311.53	Flags
	Total Activity	: 5.979E+01	5.979E+01			

Grand Total Activity: 5.979E+01 5.979E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

# ---- Identified Nuclides ----

Nuclide		Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.895E+01	4.570E+01	4.119E+01	0.000E+00	0.946
RA-226	2.084E+01	6.492E+01	1.175E+02	0.000E+00	0.177

# ---- Non-Identified Nuclides ----

	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
Nuclide	(pc1/L)	Taea		\L		

		2.584E+01	4.201E+01	0.000E+00	-0.297
BE-7	-1.248E+01	3.846E-02	Half-Life too	short	
NA-24	-8.298E-02		4.930E+01	0.000E+00	0.114
CR-51	5.630E+00	2.978E+01	4.529E+00	0.000E+00	0.031
MN-54	1.396E-01	2.929E+00	4.785E+00	0.000E+00	0.028
CO-57	1.324E-01	2.891E+00	4.765E+00 4.944E+00	0.000E+00	-0.121
CO-58	-5.997E-01	3.024E+00		0.000E+00	0.348
FE-59	3.787E+00	6.336E+00	1.089E+01	0.000E+00	0.339
CO-60	1.704E+00	2.931E+00	5.021E+00	0.000E+00	0.756
ZN-65	8.718E+00	7.485E+00	1.153E+01	0.000E+00	0.111
SE-75	7.455E-01	4.012E+00	6.687E+00		3.050
SR-85	2.103E+01	3.529E+00	6.893E+00	0.000E+00	-0.217
	-1.081E+00	3.151E+00	4.983E+00	0.000E+00	0.397
Y-88	1.827E+00	2.738E+00	4.606E+00	0.000E+00	
NB-94	2.881E+00	3.002E+00	5.222E+00	0.000E+00	0.552
NB-95		5.431E+00	8.839E+00	0.000E+00	-0.227
ZR-95	-2.008E+00	2.012E+02	3.252E+02	0.000E+00	-0.310
MO-99	-1.007E+02	3.315E+00	5.662E+00	0.000E+00	0.459
RU-103	2.599E+00	2.716E+01	4.192E+01	0.000E+00	-0.371
RU-106	-1.554E+01	2.716E+01 2.791E+00	4.473E+00	0.000E+00	-0.217
AG-110m	-9.713E-01		6.498E+00	0.000E+00	0.290
SN-113	1.887E+00	3.914E+00	4.770E+00	0.000E+00	-0.759
SB-124	-3.622E+00	7.538E+00	1.364E+01	0.000E+00	-0.073
SB-125	-9.930E-01	8.440E+00	6.251E+01	0.000E+00	-0.199
TE-129M	-1.242E+01	3.810E+01	1.026E+01	0.000E+00	-0.540
I-131	-5.538E+00	6.470E+00		0.000E+00	1.704
BA-133	1.291E+01	4.855E+00	7.576E+00	0.000E+00	0.928
CS-134	5.123E+00	7.034E+00	5.517E+00	0.000E+00	0.247
CS-134	1.816E+00	4.344E+00	7.344E+00		-0.290
CS-137	-1.421E+00	3.081E+00	4.907E+00	0.000E+00	-0.487
CE-139	-2.383E+00	3.043E+00	4.897E+00	0.000E+00	-0.105
	-2.750E+00	1.601E+01	2.620E+01	0.000E+00	-0.105
BA-140	-3.076E+00	4.989E+00	7.787E+00	0.000E+00	
LA-140	1.250E+00	6.695E+00	9.405E+00	0.000E+00	0.133
CE-141	-1.890E+01	2.607E+01	3.567E+01	0.000E+00	-0.530
CE-144		1.101E+01	1.502E+01	0.000E+00	-0.227
EU-152	-3.405E+00	5.926E+00	9.901E+00	0.000E+00	0.303
EU-154	3.002E+00	1.163E+01	1.836E+01	0.000E+00	0.021
AC-228	3.779E-01		9.249E+00	0.000E+00	0.366
TH-228	3.382E+00	5.679E+00	1.831E+01	0.000E+00	0.021
TH-232	3.767E-01	1.160E+01	3.739E+01	0.000E+00	0.732
U-235	2.737E+01	2.590E+01	5.075E+02	0.000E+00	-0.062
U-238	-3.158E+01	3.129E+02		0.000E+00	-0.149
AM-241	-5.927E+00	2.777E+01	3.970E+01	0.000100	

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3.000E+00,WG L28837-9 EX
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B,10L28837-9
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                                                   4.119E+01,,
                                    4.570E+01,
                     3.895E+01,
           , YES,
C, K-40
                                                                    0.177
                                                   1.175E+02,,
                                    6.492E+01,
                     2.084E+01,
           , YES,
C, RA-226
                                                                   -0.297
                                                   4.201E+01,,
                                    2.584E+01,
                    -1.248E+01,
C, BE-7
            , NO
                                                                     0.114
                                                   4.930E+01,,
                                    2.978E+01,
                     5.630E+00,
            , NO
C, CR-51
                                                                     0.031
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                                    2.929E+00,
                     1.396E-01,
            , NO
C, MN-54
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                                    2.891E+00,
                     1.324E-01,
            ,NO
C, CO-57
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                    -5.997E-01,
            , NO
C, CO-58
                                                   1.089E+01,,
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                                    6.336E+00,
                     3.787E+00,
            , NO
C, FE-59
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                                                                     0.339
                                    2.931E+00,
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            , NO
C, CO-60
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                     8.718E+00,
C, ZN-65
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                     7.455E-01,
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C, SE-75
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                                    3.529E+00,
                     2.103E+01,
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C, SR-85
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                                     3.151E+00,
                    -1.081E+00,
            ,NO
C, Y-88
                                                                     0.397
                                                    4.606E+00,,
                                     2.738E+00,
                     1.827E+00,
            , NO
 C, NB-94
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                                                    5.222E+00,,
                                     3.002E+00,
                     2.881E+00,
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 C, NB-95
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                                                    8.839E+00,,
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                    -2.008E+00,
            , NO
 C, ZR-95
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                                                    3.252E+02,,
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                    -1.007E+02,
             , NO
 C, MO-99
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                                                    5.662E+00,,
                                     3.315E+00,
                      2.599E+00,
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 C, RU-103
                                                    4.192E+01,,
                                                                    -0.371
                                     2.716E+01,
                     -1.554E+01,
             , NO
 C, RU-106
                                                                    -0.217
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                                     2.791E+00,
                     -9.713E-01,
 C, AG-110m
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                                     3.914E+00,
                      1.887E+00,
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                     -5.538E+00,
 C, I-131
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                                     4.855E+00,
                      1.291E+01,
             ,NO
 C, BA-133
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                      5.123E+00,
             , NO
 C, CS-134
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                                                    7.344E+00,,
                                     4.344E+00,
                      1.816E+00,
             , NO
 C, CS-136
                                                                     -0.290
                                                    4.907E+00,,
                                     3.081E+00,
                     -1.421E+00,
             , NO
 C, CS-137
                                                                     -0.487
                                                    4.897E+00,,
                                     3.043E+00,
                     -2.383E+00,
             , NO
 C, CE-139
                                                                     -0.105
                                                     2.620E+01,,
                                     1.601E+01,
                     -2.750E+00,
             , NO
  C, BA-140
                                                                     -0.395
                                                     7.787E+00,,
                                      4.989E+00,
                     -3.076E+00,
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  C, LA-140
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                                                     9.405E+00,,
                                      6.695E+00,
                      1.250E+00,
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  C, CE-141
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                     -1.890E+01,
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  C, CE-144
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                      -3.405E+00,
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                       3.002E+00,
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  C, EU-154
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                       3.779E-01,
              , NO
  C, AC-228
                                                                      0.366
                                                     9.249E+00,,
                                      5.679E+00,
                       3.382E+00,
  C, TH-228
              , NO
                                                                       0.021
                                                     1.831E+01,,
                                      1.160E+01,
                       3.767E-01,
              , NO
  C, TH-232
                                                                       0.732
                                                     3.739E+01,,
                                      2.590E+01,
                       2.737E+01,
              , NO
  C, U-235
                                                     5.075E+02,,
                                                                      -0.062
                                      3.129E+02,
                      -3.158E+01,
              , NO
  C, U-238
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                                                     3.970E+01,,
                                      2.77TE+01,
                      -5.927E+00,
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C, AM-241

,NO ,

Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 18:13:48.42 TBE11 P-20610B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:39:37.57 

LIMS No., Customer Name, Client ID: WG L28837-10 EXELON QUAD

Smple Date: 31-MAY-2006 08:00:00.

: 11L28837-10 Geometry : 113L082304 Sample ID : WG Sample Type BKGFILE : 11BG060306MT Quantity : 3.00070E+00 L

Start Channel: 40 Energy Tol: 1.00000 Real Time: 0 05:25:06.95 Pk Srch Sens: 5.00000 Live time : 0 05:25:00.00 End Channel : 4090

Library Used: LIBD MDA Constant : 0.00

Pk It	Energy	Area	Bkgnd	FWHM C	hannel	%Eff	Cts/Sec	%Err	Fit
1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0	139.71* 198.48 295.14* 351.75* 596.30 608.91* 1120.28* 1460.16*	71 159 108 71 85 91 39	484 347 328 293 134 140 24 36	1.75 1.77 1.82 1.50 1 1.40 1	396.71 590.50 703.97 193.84 219.09	8.03E-01 7.90E-01 4.86E-01	8.16E-03	21.1 37.9 55.8 29.9 31.8 34.7	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Uncorrected Decay Corr 2-Sigma pCi/L %Error %Abn pCi/L %Eff Area 3.219E-01 11953.61 Energy Nuclide 10.67\* 3.920E-01 3.219E-01 0 1460.81 K - 40

Flag: "\*" = Keyline

Summary of Nuclide Activity

Page: 2 Acquisition date: 10-JUN-2006 12:39:37 Sample ID : 11L28837-10

8

Total number of lines in spectrum Number of unidentified lines

7 Number of lines tentatively identified by NID 1 12.50%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 3.219E-01 3.219E-01 384.8E-01 11953.61

Total Activity: 3.219E-01 3.219E-01

Grand Total Activity: 3.219E-01 3.219E-01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

0.278

-0.234

0.216

0.000E+00

0.000E+00

0.000E+00

Unidentified Energy Lines Sample ID : 11L28837-10

Page : Acquisition date: 10-JUN-2006 12:39:37

Dam											=
Ιt	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0	139.71 198.48 295.14 351.75 596.30 608.91 1120.28	71 159 108 71 85 91	484 347 328 293 134 140 24	1.11 1.75 1.77 1.82 1.50 1.40	1219.09	393 585 696 1188 1212	7 13 13 13	3.63E-03 8.16E-03 5.55E-03 3.65E-03 4.38E-03 4.67E-03 2.00E-03	42.1 75.8 **** 59.7 63.6	1.90E+0 1.75E+0 1.37E+0 1.20E+0 8.03E-0 7.90E-0 4.86E-0	00 00 00 01 01

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

8 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 12.50%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma 2-Sigma Error %Error Flags pCi/L Decay pCi/L Hlife Nuclide 384.8E-01 11953.61 3.219E-01 3.219E-01 1.28E+09Y 1.00 K - 40\_\_\_\_\_ \_\_\_\_\_ 3.219E-01 3.219E-01 Total Activity :

Grand Total Activity: 3.219E-01 3.219E-01

"M" = Manually accepted Flags: "K" = Keyline not found "A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

BE-7

NA-24

CR-51

MN-54

No interference correction performed

1.125E+01

-2.990E-01

-1.119E+01

9.831E-01

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Identifi	led Nuclides				
Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.219E-01	3.848E+01	4.330E+01	0.000E+00	0.007
Non-Ide:	ntified Nucli	des			
Nuclide		.L. Act error ded	MDA (pCi/L)	MDA error	Act/MDA

2.426E+01

1.386E-01

2.925E+01

2.718E+00

4.040E+01

4.542E+00

4.780E+01

Half-Life too short

CO-57 CO-58 FE-59 CO-60 ZN-65 SE-75 SR-85 Y-88 NB-94 NB-95 ZR-95 MO-99 RU-103 RU-106 AG-110 SN-113 SB-124 SB-125 TE-129M I-131 BA-133 CS-134 CS-136 CS-137 CE-139 BA-140 CE-141 CE-144 EU-152 EU-154 RA-228 TH-228 TH-235 U-235 U-238 AM-241	-4.533E-01 -2.704E-01 7.831E+00 1.257E+00 4.659E+00 -1.567E+01 7.941E-01 -6.886E-01 2.285E+00 -5.899E+00 9.113E+00 1.093E+00 -5.233E+00 7.568E-02 -1.817E+00 1.33E+00 4.897E-01 6.214E+00 1.133E+00 4.068E+00 6.437E+00 4.136E-01 5.034E-01 -1.655E+00 2.742E+00 -7.233E-01 -1.655E+00 2.742E+00 -7.233E-01 -1.655E+00 -7.233E-01 -1.655E+00 -1.150E+01 -1.204E+01 1.715E+00 -1.150E+01 7.117E+00 -1.150E+01 7.117E+00 -1.150E+01 3.228E+01 2.622E+02 -8.765E+01	2.664E+00 2.914E+00 5.873E+00 2.830E+00 6.748E+00 3.454E+00 3.454E+00 2.668E+00 2.668E+00 2.619E+02 3.247E+00 2.455E+01 2.720E+00 3.680E+00 6.478E+00 3.680E+00 4.637E+00 4.637E+00 4.637E+00 6.082E+00 4.637E+00 2.934E+00 2.934E+00 2.934E+00 1.644E+01 5.181E+00 6.507E+00 1.644E+01 5.181E+00 6.507E+00 1.645E+01 5.454E+01 5.454E+01 5.454E+01 1.187E+01 5.773E+00 1.183E+01 2.891E+02 3.655E+01	4.375E+00 4.753E+00 1.053E+01 4.799E+00 1.004E+01 6.114E+00 6.464E+00 5.206E+00 4.346E+00 4.320E+02 5.366E+00 4.320E+01 4.506E+00 5.937E+00 4.728E+00 1.287E+01 6.076E+01 1.097E+01 6.742E+00 7.399E+00 4.893E+00 4.526E+00 5.140E+00 7.399E+01 8.495E+00 9.166E+01 8.495E+00 9.166E+01 8.495E+01 1.344E+01 9.052E+01 1.344E+01 9.052E+01 5.071E+02 5.670E+01	0.00E+00 0.00E+00	-0.104 -0.057 0.744 0.262 0.464 -0.256 2.482 0.153 -0.158 0.472 -0.747 0.021 0.204 -0.130 0.017 -0.306 0.158 0.038 0.102 0.103 0.603 1.252 0.056 0.103 -0.366 0.102 -0.085 0.239 -0.604 -0.896 0.189 -0.704 0.782 -0.704 0.908 0.517 -1.546
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3.001E+00,WG L28837-10 E
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                                             ,06/07/2006 09:40,113L082304
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B,11L28837-10
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                    3.219E-01,
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C, K-40
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                                   2.426E+01,
                                                   4.040E+01,,
           , NO
                    1.125E+01,
C, BE-7
                                                                   -0.234
                                                   4.780E+01,,
                   -1.119E+01,
                                   2.925E+01,
           ,NO
C, CR-51
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                     9.831E-01,
C, MN-54
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                                    2.664E+00,
                   -4.533E-01,
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C, CO-57
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                                                   4.753E+00,,
                                    2.914E+00,
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C, CO-58
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                                    5.873E+00,
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C, FE-59
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            , NO
C,CO-60
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                                    6.748E+00,
            , NO
                     4.659E+00,
C, ZN-65
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                                                   6.114E+00,,
                                    3.719E+00,
                    -1.567E+00,
            ,NO
C, SE-75
                                                                    2.482
                                                   6.464E+00,,
                                    3.454E+00,
                     1.604E+01,
C, SR-85
            , NO
                                                                    0.153
                                                   5.206E+00,,
                                    3.085E+00,
                     7.941E-01,
            , NO
C, Y-88
                                                   4.346E+00,,
                                                                    -0.158
                                    2.668E+00,
            , NO
                    -6.886E-01,
C, NB-94
                                                                    0.472
                                                   4.839E+00,,
                                    2.819E+00,
                     2.285E+00,
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C, NB-95
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                                                   7.891E+00,,
                                    5.130E+00,
                    -5.899E+00,
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C, ZR-95
                                                                     0.021
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C, MO-99
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C, RU-103
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                                                   4.028E+01,,
                                    2.455E+01,
                    -5.233E+00,
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C, RU-106
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                                    2.720E+00,
                     7.568E-02,
            , NO
C, AG-110m
                                                   5.937E+00,,
                                                                    -0.306
                                    3.680E+00,
            , NO
                    -1.817E+00,
C, SN-113
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                                                   4.728E+00,,
                                    6.478E+00,
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C,SB-124
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                     4.897E-01,
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                     6.214E+00,
                                    3.693E+01,
C, TE-129M , NO
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                                                   1.097E+01,,
                                    6.620E+00,
                     1.133E+00,
C, I-131
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                                                                     0.603
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                                    4.637E+00,
                     4.068E+00,
C,BA-133
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                                    6.082E+00,
                     6.437E+00,
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                                     4.490E+00,
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C, CS-136
            , NO
                                                    4.893E+00,,
                                                                     0.103
                                     2.934E+00,
            , NO
                     5.034E-01,
C, CS-137
                                                                    -0.366
                                                    4.526E+00,,
                    -1.655E+00,
                                     2.805E+00,
            ,NO
 C, CE-139
                                                                     0.102
                                                    2.691E+01,,
                                     1.644E+01,
                     2.742E+00,
            , NO
 C, BA-140
                                                    8.495E+00,,
                                                                    -0.085
                                     5.181E+00,
            , NO
                    -7.233E-01,
 C, LA-140
                                                                     0.239
                                                    9.166E+00,,
                                     6.507E+00,
            ,NO
                      2.190E+00,
 C, CE-141
                                                    3.329E+01,,
                                                                    -0.604
                                     2.452E+01,
                     -2.011E+01,
 C, CE-144
            , NO
                                                                    -0.896
                                                    1.344E+01,,
                     -1.204E+01,
                                     1.024E+01,
 C, EU-152
             , NO
                                                                     0.189
                                                    9.052E+00,,
                                     5.454E+00,
             ,NO
                      1.715E+00,
 C, EU-154
                                                    1.125E+02,,
                                                                    -0.010
                                     7.241E+01,
                     -1.096E+00,
 C, RA-226
             ,NO
                                                                    -0.704
                                                    1.634E+01,,
                                     1.187E+01,
                     -1.150E+01,
 C, AC-228
             , NO
                                                                     0.782
                                                    9.100E+00,,
                                     5.773E+00,
                      7.117E+00,
 C, TH-228
             , NO
                                                                    -0.704
                                                    1.628E+01,,
                                     1.183E+01,
                     -1.146E+01,
 C, TH-232
             , NO
                                                                     0.908
                                                    3.557E+01,,
                                     2.446E+01,
                      3.228E+01,
             , NO
 C, U-235
                                                                      0.517
                                     2.891E+02,
                                                    5.071E+02,,
                      2.622E+02,
             , NO
 C, U-238
                                                    5.670E+01,,
                                                                    -1.546
                                     3.655E+01,
```

-8.765E+01,

C, AM-241

, NO



A Teledyne Technologies Company 2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L29107
Exelon
July 6, 2006



Knoxville, TN 37931-3133

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

# Case Narrative - L29107 EX001-3ESPQUAD-06

07/06/2006 15:26

## Sample Receipt

The following samples were received on June 30, 2006 in good condition, unless otherwise noted.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-102D-062806KR-001	L29107-1	
WG-QC-MW-QC-108I-062806KR-002	L29107-2	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
H-3 (DIST)	TBE-2010	



2508 Quality Lane
Knoxville, TN 37931-3133

## Case Narrative - L29107 EX001-3ESPQUAD-06

07/06/2006 15:26

#### H-3

#### **Quality Control**

Quality control samples were analyzed as WG4198.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### **Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### H-3 (DIST)

#### **Quality Control**

Quality control samples were analyzed as WG4198.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

 Client ID
 Laboratory ID
 QC Sample #

 GW-062806-PG-01
 L29109-1
 WG4198-3

#### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter

**Operations Manager** 

# Sample Receipt Summary

06/30/06 10:39 SR #: SR09162

### Teledyne Brown Engineering Sample Receipt Verification/Variance Report

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #:L29107

Initiated By: PMARSHALL Init Date: 06/30/06 Receive Date: 06/30	/06	
Notificati		
Person Notified: Notify Date:	Contact	ed By:
Notify Method:		
Notify Comment:		
Client Resp	oonse	
Person Responding: Response Date:		
Response Method:		
Response Comment		
Criteria	Yes No NA	Comment
		Commerce
1 Shipping container custody seals present and intact.	C NA	
2 Sample container custody seals present and intact.	NA	
3 Sample containers received in good condition	Y	
4 Chain of custody received with samples	Y	
5 All samples listed on chain of custody received	Y	
6 Sample container labels present and legible.	Y	
7 Information on container labels correspond with chain of custody	N	
WG-QC-MW-QC-102D-062806KR-001		Container:WG-QC-MW-QC-102D- 062806KR-002
WG-QC-MW-QC-108I-062806KR-002		Container:WG-QC-MW-QC-108I- 062806KR-001
<pre>8 Sample(s) properly preserved and in appropriate container(s)</pre>	NA	
9 Other (Describe)	NA	

#### Charles, Rebecca

From: Charles, Rebecca

Sent: Monday, July 03, 2006 2:51 PM

To: Ziggy Karpa (zigmund.karpa@exeloncorp.com); Joyce Tomlinson (joyce.tomlinson@exeloncorp.com); Julie

Czech (jczech@craworld.com); Larry.Walton@exeloncorp.com; Rick Maldanado

(Rick.maldonado@exeloncorp.com); Scott Sklenar (Scott.sklenar@exeloncorp.com); Shaw, Kathy

Subject: Acknowldegements

Acknowledgements for Limerick L29133, Zion L29109 and Quad Cities L29107. The Quad cities acknowledgement has a variance report attached.

The sample IDs on the bottle did not match the sample IDs on the paperwork.

Rebecca Charles Teledyne Brown Engineering Project Manager (865) 934-0379 (865) 934-0396 (fax)

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1001-00(SOURCE)GN-CO004

# Internal Chain of Custody

07/06/06 15:26

Teledyne Brown Engineering
Internal Chain of Custody

Page: L29107 9 of 17

Prod Analyst

H-3 (DIST) EJ

Relinquish Date Relinquish By Received By

06/30/2006 00:00 099999 Sample Custodian

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Sample # L29107-2 Containernum 1

Prod Analyst

H-3 (DIST) EJ

Relinquish Date Relinquish By Received By

06/30/2006 00:00 099999 Sample Custodian

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

L29107

*****	*****	*****	*****	******
L29107-1	WG	WG-QC-MW-QC-102D-062	2806KR-001	
Process step	Prod		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/30/06
Aliquot	н-3 (п	DIST)	EJ	07/05/06
Count Room	н-3 (І	DIST)	KOJ	07/05/06
*****	*****	******	*****	*******
L29107-2	WG	WG-QC-MW-QC-108I-06	2806KR-002	
Process step	Prod		<u>Analyst</u>	Date
Login			RCHARLES	06/30/06
Aliquot	н-3 (І	DIST)	EJ	07/05/06
Count Room	H-3 (I	OIST)	KOJ	07/05/06

# Analytical Results Summary

# Report of Analysis 07/06/06 15:25

TELEDYNE BROWN ENGINEERING, INC. A Teledyne Technologies Company

L29107

Conestoga-Rovers & Associates

Matrix: Ground Water Volume: % Moisture: Collect Start: 06/28/2006 13:20 EX001-3ESPQUAD-06 Receive Date: 06/30/2006 Collect Stop: Sample ID: WG-QC-IMW-QC-102D-062806KR-001 Station: Description: athy Shaw

L29107-1

LIMS Number:

(MG)

Radionuclide	SOP#	Activity Conc	Activity Uncertainty Conc 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Aliquot Volume Units	Reference Date	Count Date	Count Count Time Units	Count Units	Flag Values
-3 (DIST)	2010	3.66E+03	2010 <b>3.66E+03</b> 4.22E+02 3.14E+02	3.14E+02	pCi/L		10	ш		90/20//0	20.62	M	07/05/06 20.62 M + High
Sample ID:	Sample ID: WG-QC-MW-QC-1081-062806KR-002	C-1081-06280	6KR-002		Collect	Start: 0	Collect Start: 06/28/2006 12:25	25		Matrix: Ground Water	round Wate	er	(MG)
Station:					Collect Stop:	t Stop:			_	Volume:			
Description:					Receive	Date: 0	Receive Date: 06/30/2006		% W	% Moisture:			
LIMS Number: L29107-2	L29107-2												
Radionuclide	SOP#	Activity Conc	Activity Uncertainty Conc 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Count Time Units	Count Units	Flag Values

Σ

34.85

90/50//0 Date

Ξ

pCi/L

2.43E+02

2.56E+02

1.94E+03 Conc

2010

-3 (DIST)

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

of

Page 1

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification High recovery Low recovery ligh bec

Compound/Analyte not detected or less than 3 sigma

lag Values

solded text indicates reportable value.

### QC Results Summary

Page:

BROWN ENGINEERING A Teledyne Technologies Company

H-3

for L29107

3:31:06PM

QC Summary Report

				Method Blank Summary	ary			
BE   Sample   ID   Rac   G4198-1   H-3	<u>Radionuclide</u> H-3	Matrix WO	Count Date/Time 07/05/2006 12:32		<b>Blank Result</b> < 1.730E+00	<u>Units</u> pCi/Total		Qualifier P/F U P
			and the second s	LCS Sample Summary	ıry			
BE Sample ID         Rac           'G4198-2         H-3	Radionuclide H-3	Matrix WO	Count Date/Time 07/05/2006 13:36	Spike Value 5.05E+002	LCS Result 5.000E+02	Units Spike pCi/Total	Spike Recovery 99.1	Range Ovalifier         P/F           70-130         +         P
oike ID: 3H-041706-1 oike conc: 5.05E+002 oike Vol: 1.00E+000	_							
L29107	H-3							
Associated Samples for SAMPLENUM L29107-1 L29107-2	nples for <u>M</u>	WG4198  CLIENTID WG-QC-M\	G4198 CLIENTID WG-QC-MW-QC-102D-062806KR-001 WG-QC-MW-QC-1081-062806KR-002	06KR-001 6KR-002				

Positive Result

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated

Nuclide not detected

~ \*

Spiking level < 5 times activity

Pass Fail Not evaluated

Щ

7 Page:

Range Qualifier P/F <30 \* NE

BROWN ENGINEERING
A Teledyne Tethnologies Company

H-3 (DIST)

L29107

for

QC Summary Report

3:31:06PM

**Duplicate Summary** 

Original Result 2.200E+02

**DUP Result** 

< 1.890E+02

pCi/L Units

<u>Matrix</u> WG

Radionuclide

BE Sample ID

/**G4198-3** 29109-1

H-3 (DIST)

Count Date/Time 07/05/2006 17:04

RPD

Pass

Fail Not evaluated

ப

Spiking level < 5 times activity

Nuclide not detected

т <u>\*</u>

Positive Result

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated

### Raw Data

Raw Data Sheet (rawdata) Jul 06 2006, 03:40 pm

ork Order: <b>L29107</b>	Cur	Customer: Exelon							Page: 1				
uclide: H-3 (DIST)	Pro	Project : EX001-3ESPQUAD-06	ESPOUAD-06	1								Decay &	
Run Analysis	Reference	Volume/	Scavenge Milking	Milking	Mount	Count	Counter Total	Total	Sample Bkg Bkg	Bkg I	Bkg		Analyst
lient ID # Date	Date/time	Aliquot	Date/time	Date/time Date/time	Weight	Recovery Date/time	ID	counts	counts at (min) counts at (min)	unts at	(mim)	FACTOR	***************************************
L29107-1 H-3 DIST					0	0 05-jul-06 LS7	LS7	389	20.62 1.99	1.99	09	.208	БÜ
		10 ml				18:07							
WG-QC-MW-QC-102D-062806KR-001													
ctivity: 3.66E+03 * Error: 4.22E+02	2E+02	MDC: 3.14E+02										***************************************	
L29107-2 H-3 DIST					0	05-jul-06 LS7	LS7	380	34.85 1.99	1.99	9	60 .207	題づ
		10 ml				18:31							
WG-QC-MW-QC-1081-062806KR-002													
ctivity: 1.94E+03 * Error: 2.56E+02	5E+02	MDC: 2.43E+02				A PROPERTY AND A PROP							



2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L29389
Exelon
August 1, 2006



Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

#### Case Narrative - L29389 EX001-3ESPQUAD-06

08/01/2006 09:14

#### Sample Receipt

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

Cross Reference Table

		Cross Rejerence ruoi	
	Client ID	Laboratory ID	Station ID(if applicable)
I	WG-QC-MW-QC-108I-072706-NZ-001	L29389-1	
-	WG-QC-MW-QC-110I-072706-NZ-002	L29389-2	
	WG-QC-MW-QC-114I-072706-NZ-003	L29389-3	
	WG-QC-MW-QC-113I-072706-NZ-004	L29389-4	
-	WG-QC-MW-QC-112I-072706-NZ-005	L29389-5	
	WG-QC-MW-QC-111I-072706-NZ-006	L29389-6	
	RB-QC-MW-QC-115S-072706-NZ-007	L29389-7	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3 (DIST)	TBE-2010	
TOTAL SR	TBE-2018	EPA 905.0



#### Case Narrative - L29389 EX001-3ESPQUAD-06

08/01/2006 09:14

#### Gamma Spectroscopy

#### **Quality Control**

Quality control samples were analyzed as WG4270.

**Duplicate Sample** 

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID

Laboratory ID L29389-1

QC Sample # WG4270-1

WG-QC-MW-QC108I-072706-NZ-001

#### H-3 (DIST)

#### **Quality Control**

Quality control samples were analyzed as WG4269.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID WG-QC-MW-QC-111I-072706-NZ-006 Laboratory ID L29389-6

QC Sample # WG4269-3



2508 Quality Lane Knoxville, TN 37931-3133

#### Case Narrative - L29389 EX001-3ESPQUAD-06

08/01/2006 09:14

#### TOTAL SR

#### **Quality Control**

Quality control samples were analyzed as WG4278.

#### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

#### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

#### Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID

Laboratory ID

OC Sample # WG4278-3

WG-QC-MW-QC-111I-072706-NZ-006

L29389-6

### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter

Operations Manager

## Sample Receipt Summary

07/28/06 10:02

#### Teledyne Brown Engineering Sample Receipt Verification/Variance Report

SR #: SR09606

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L29389

Initiated By: PMARSHALL

Init Date: 07/28/06 Receive Date: 07/28/06

Notification of Variance

Person Notified: 56tot(5

Contacted By: R. Charles

Notify Date: 7/28/06

Notify Method: Phone

Notify Comment: Thould be what IP

Client Response

Person Responding: 340 115 Response Date: 7/28/06
Response Method: Phone

Response Comment

108 I is correct 1D

Criteria	Yes No NA	Comment
1 Shipping container custody seals presen and intact.	nt NA	
2 Sample container custody seals present and intact.	NA	
3 Sample containers received in good condition	Y	
4 Chain of custody received with samples	Y	
5 All samples listed on chain of custody received	Y	
6 Sample container labels present and legible.	Y	
7 Information on container labels correspond with chain of custody	Y	
8 Sample(s) properly preserved and in appropriate container(s)	N	Approx 4mL of nitric added to each Gamma container to bring pH to =<br 2
9 Other (Describe)	N	Was not sure if the id should read
WG-QC-MW-QC-102I-072706-MZ-001		1021 or 1081.

ERS & ASSOCIATES Way Ohio 45069	TO ry Name):		FREDYNE Brun	729389
513-942-4750 phone 513-942-8585 fax CHAIN-OF-CUSTODY RECORD	REFERENCE NUMBER:		PROJECT NAME: BUCHO CITIES	252
SAMPLER'S THE FLOGICY PRINTED NAME: NAME:	Zeg Cr	90. АІИЕRS	PARAMETERS S	REMARKS
SEQ. DATE TIME SAMPLE IDENTIFICATION N	N NO. NATRIX	οM	King School A	
5 2 halfeligir who-ac-my-ac-112I-0727-65	N2-005 HO	2	XXX	And the second s
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3/6/	+ t-00-21	2	× × × × ×	
		4		
TOTAL NUMBER OF CONTAINERS		0	The second secon	
RELINQUISHERBY (2)	DATE: 4/24/06 RI	RECEIVED BY	Br. Mule	DATE: 2/3 7/00 TIME: 1450
RELINQUISHED BY:	DATE: 7-77-06 RI	RECEIVED BY:	3BY: 1, 196	DATE: 7-27-06 TIME: 4/32
RELINQUISHED BY:		RECEIVED BY:	) BY:	DATE: TIME:
METHOD OF SHIPMENT: HAND IN INCH & EVE	6	AIR	AIR BILL NO. NA	
White -Fully Executed Copy SAMPLE T Yellow -Receiving Laboratory Copy	E TEAM:		RECEIVED FOR LABORATORY BY:	T & O \ O O
Pink -Shipper Copy Goldenrod -Sampler Copy	Lowis		DATE: $1/28/06$ TIME: 1/00	000
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1001-00(SOURCE)GN-CO004

CONESTOGA-ROVERS & ASSOCIATES 9033 Meridian Way West Chester, Ohio 45069	& ASSOCIATES  y io 45069	SHIPPED TO (Laboratory Name):		OYNE - BRO	WN Engine	TELEDYNE - BROWN ENGINEERING L29389
513-942-4750 phone 513-942-8585 fax	one School	REFERENCE NUMBER:	8ER:	PROJECT NAME:	Quan Cities	
SAMPLER'S SIGNATURE:	RINTED NAME:	NANE Zegler	OF SABNIA	PAR		REMARKS
SEQ. DATE TIME SA	SAMPLE IDENTIFICATION	ATION No.	SAMPLE 22 MATRIX CO			
3/23/04 0835	W6-0C-MW-0C-1405-072	100-24-07270-001	40 2	× × × × × × × × × × × × × × × × × × ×		
37.000/	1011	88	N	ノフ・		
ð	- 131	7007	1	× > >		
TOTAL	TOTAL NUMBER OF CONTAINERS		55			100
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RELINOUISHED BY		127	7-06 RECEIVED BY	26 BY A. 18C		DATE: ファンらん TIME: 4/??
RELINQUISHED BY:		DATE: 7	RECEIVED BY:	ED BY:	46	DATE:TIME:
METHOD OF SHIPMENT: HAND	TAND DELIVER TO	3	AIR	AIR BILL No. N/		
		SAMPLE TEAM:		RECEIVED FOR	RECEIVED FOR LABORATORY BY:	
Yellow - Receiving Laboratory Copy Pink - Shipper Copy Coldourd - Sampler Copy	oratory copy	G. (25/15)		DATE: 7/28/04 TIME: 1100	TIME: 11 0 C	004284
Goldelilod -Salipie Ochy						

1001-00(SOURCE)GN-CO004

TELEDYNE BROWN ENGINEERING 2508 Quality Lane Knoxville, TN 37931-3133

#### JUL 2 8 2006

#### ACKNOWLEDGEMENT

This is not an invoice

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, CT 06062

July 28, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 28, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 31, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely, Rebecca Charles Project Manager (865) 934 - 0379

Project ID: EX001-3ESPQUAD-06

P.O. #:

00411203

Release #:

Contract#: 00411203

Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/	Laboratory ID	Vol/Units	Start Collect Bnd Collect Date/Time Date/Time
Station	Analysis	Price	
WG-QC-MW-QC-108I-072706	-NZ-0 L29389-1		07/27/06:0835
WG	GELI	135.00	
WG	H-3 (DIST)	135.00	
WG	SR-90 (FAST)	175.00	
WG-QC-MW-QC-110I-072706	-NZ-0 L29389-2		07/27/06:0920
WG	GELI	135.00	
WG	H-3 (DIST)	135.00	
WG	SR-90 (FAST)	175.00	
WG-QC-MW-QC-114I-072706	-NZ-0 L29389-3		07/27/06:1010
WG	GELI	135.00	
WG	H-3 (DIST)	135.00	
WG	SR-90 (FAST)	175.00	
WG-QC-MW-QC-1131-072706	-NZ-0 L29389-4		07/27/06:1100
WG	GELI	135.00	
WG	H-3 (DIST)	135.00	
WG	SR-90 (FAST)	175.00	
WG-QC-MW-QC-112I-072706	-NZ-0 L29389-5		07/27/06:1315

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-1111-(	072706-NZ-0 L29389-6		07/27/06:1405	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
RB-QC-MW-QC-115S-(	072706-NZ-0 L29389-7		07/27/06:1415	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
	SR-90 (FAST)	175.00		

End of document

#### Charles, Rebecca

From: Charles, Rebecca

Sent: Monday, July 31, 2006 12:39 PM

To: 'Wayne.Stotts@exeloncorp.com'; 'Larry.Walton@exeloncorp.com'

Subject: preliminary data

All,

Attached are the tritium results (and some gamma) from the Quad Cities samples received on Friday. Three of the tritiums were above 200 pCi/L and one is fairly high. Thought you might want to see the results sooner than Tuesday.

Rebecca Charles Teledyne Brown Engineering Project Manager (865) 934-0379 (865) 934-0396 (fax)

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### Internal Chain of Custody

Teledyne Brown Engineering
Internal Chain of Custody

Internal Chain of Custody \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29389-1 Analyst Prod H-3 (DIST) ЕJ LCB SR-90 (FAST) DWGELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 099999 07/28/2006 11:57 099999 Sample Custodian Donna Webb 030854 07/28/2006 11:58 \* Containernum 2 Sample # L29389-1 Analyst Prod ΕJ H-3 (DIST) LCB SR-90 (FAST) DW **GELI** Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 030854 Donna Webb Sample Custodian 07/28/2006 11:59 099999 Lauren Larsen 029728 Donna Webb 030854 07/28/2006 12:00 Donna Webb Lauren Larsen 030854 029728 07/29/2006 10:06 Sample Custodian 099999 Donna Webb 07/29/2006 10:07 030854 \* Containernum 1 Sample # L29389-2 Analyst Prod H-3 (DIST) ΕJ SR-90 (FAST) LCB DW GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 030854 Donna Webb Sample Custodian 099999 07/28/2006 11:57 099999 Sample Custodian Donna Webb 07/28/2006 11:58 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29389-2 Analyst Prod H-3 (DIST) ΕJ LCB SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 07/28/2006 11:59 099999 029728 Lauren Larsen Donna Webb 030854 07/28/2006 12:00 Donna Webb 030854 Lauren Larsen 07/29/2006 10:06 029728 Sample Custodian 099999 Donna Webb 030854 07/29/2006 10:07 \*

Sample # L29389-3 Containernum 1

Prod

Analyst

Teledyne Brown Engineering

Internal Chain of Custody \* Containernum 1 Sample # L29389-3 ЕJ H-3 (DIST) LCB SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 Donna Webb Sample Custodian 030854 07/28/2006 11:57 099999 099999 Sample Custodian Donna Webb 07/28/2006 11:58 030854 \* Containernum 2 Sample # L29389-3 Analyst Prod ΕJ H-3 (DIST) LCB SR-90 (FAST) DWGELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 030854 Donna Webb Sample Custodian 07/28/2006 11:59 099999 029728 Lauren Larsen Donna Webb 07/28/2006 12:00 030854 Donna Webb Lauren Larsen 030854 029728 07/29/2006 10:06 Sample Custodian 099999 Donna Webb 07/29/2006 10:07 030854 \* Containernum 1 Sample # L29389-4 Analyst Prod H-3 (DIST) ΕJ SR-90 (FAST) LCB DW GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 030854 Donna Webb Sample Custodian 099999 07/28/2006 11:57 Sample Custodian 099999 Donna Webb 07/28/2006 11:58 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29389-4 Analyst Prod H-3 (DIST) ΕJ LCB SR-90 (FAST) DΜ GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 07/28/2006 11:59 099999 029728 Lauren Larsen Donna Webb 030854 07/28/2006 12:00 Donna Webb 030854 Lauren Larsen 07/29/2006 10:06 029728 Sample Custodian 099999 Donna Webb 030854 07/29/2006 10:07

\*

Sample # L29389-5

Containernum 1

Prod

Analyst

Prod

Teledyne Brown Engineering Internal Chain of Custody

\* Containernum 1 Sample # L29389-5 ΕJ H-3 (DIST) **LCB** SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 07/28/2006 11:57 099999 Sample Custodian 099999 Donna Webb 030854 07/28/2006 11:58 \* Containernum 2 Sample # L29389-5 Analyst Prod ΕJ H-3 (DIST) LCB SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 099999 07/28/2006 11:59 029728 Lauren Larsen Donna Webb 07/28/2006 12:00 030854 Donna Webb 030854 Lauren Larsen 029728 07/29/2006 10:06 099999 Sample Custodian Donna Webb 030854 07/29/2006 10:07 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29389-6 Analyst Prod H-3 (DIST) ΕJ SR-90 (FAST) LCB DW GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 030854 Donna Webb Sample Custodian 099999 07/28/2006 11:57 Sample Custodian 099999 Donna Webb 030854 07/28/2006 11:58 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29389-6 Analyst Prod H-3 (DIST) ΕJ LCB SR-90 (FAST) nw GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 099999 07/28/2006 11:59 Lauren Larsen 029728 Donna Webb 030854 07/28/2006 12:00 Donna Webb 030854 Lauren Larsen 07/29/2006 10:06 029728 Sample Custodian 099999 Donna Webb 030854 07/29/2006 10:07 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29389-7

Analyst

07/28/2006 12:00

07/29/2006 10:06

07/29/2006 10:07

030854

029728

030854

Teledyne Brown Engineering
Internal Chain of Custody

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Containernum 1 Sample # L29389-7 ΕJ H-3 (DIST) LCB SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 099999 07/28/2006 11:57 Sample Custodian 099999 Donna Webb 07/28/2006 11:58 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29389-7 Analyst Prod ΕJ H-3 (DIST) LCB SR-90 (FAST) DW GELI Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 030854 Sample Custodian 07/28/2006 11:57 099999 099999 Sample Custodian Donna Webb 07/28/2006 11:58 030854 Donna Webb Sample Custodian 030854 07/28/2006 11:59 099999

Donna Webb

Donna Webb

Lauren Larsen

029728

030854

099999

Lauren Larsen

Sample Custodian

Donna Webb

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

#### L29389

		.29389	
*****			*******
L29389-1	WG WG-QC-MW-QC-10	08I-072706-NZ-001	
Process step	Prod	Analyst	Date
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	${\tt ILL}$	07/28/06
Count Room	H-3 (DIST)	кој	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
******			*******
L29389-2	WG WG-QC-MW-QC-1	10I-072706-NZ-002	
Process step	Prod	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	${\tt ILL}$	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
*****	******	******	******
L29389-3	WG WG-QC-MW-QC-1	14I-072706-NZ-003	
Process step	Prod	<u> Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	кој	07/30/06
Count Room	H-3 (DIST)	кој	07/31/06
Count Room	SR-90 (FAST)	кој	07/31/06
*****	*****	*****	*******
L29389-4	WG WG-QC-MW-QC-1	L13I-072706-NZ-004	
Process step	Prod	Analyst	Date
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
**********		*****	******
L29389-5		112I-072706-NZ-005	
	Prod	Analyst	Date
Process step	1100	KTHURMAN	07/28/06
Login	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot		ILL	07/28/06
Count Room	GELI	* ****	- , ,

08/01/06

#### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

#### L29389

L29389-5	WG	WG-QC-MW-QC-112I-072	2706-NZ-005	
Count Room	н-3 (D	DIST)	KOJ	07/31/06
Count Room	SR-90	(FAST)	KOJ	07/31/06
*****	*****	*****	*****	******
L29389-6	WG	WG-QC-MW-QC-111I-072	2706-NZ-006	
Process step	Prod		Analyst	Date
Login			KTHURMAN	07/28/06
Aliquot	GELI		DW	07/28/06
Aliquot	н-3 (Г	DIST)	EJ	07/28/06
Aliquot	SR-90	(FAST)	LCB	07/29/06
Count Room	GELI		ILL	07/28/06
Count Room	н-3 (Г	DIST)	KOJ	07/31/06
Count Room	SR-90	(FAST)	KOJ	07/31/06
*****	*****	*****	*****	******
L29389-7	WG	RB-QC-MW-QC-115S-07	2706-NZ-007	
Process step	Prod		Analyst	Date
Login			KTHURMAN	07/28/06
Aliquot	GELI		DW	07/28/06
Aliquot	н-3 (І	DIST)	EJ	07/28/06
Aliquot	SR-90	(FAST)	LCB	07/29/06
Count Room	GELI		ILL	07/28/06
Count Room	н-3 (І	DIST)	KOJ	07/31/06
Count Room	SR-90	(FAST)	KOJ	07/31/06

### Analytical Results Summary

TELEDYNE BROWN ENGINEERING, INC.

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L29389

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(MG) S No å % 2 å S Z 2 Flag Values \* า  $\supset$  $\supset$  $\supset$  $\Box$  $\supset$  $\Box$  $\Box$ +  $\supset$ Units Count Sec Sec Sec Sec Sec Sec Sec Sec Sec Sec Σ Σ Ground Water 10531 10531 10531 10531 10531 10531 34.56 Count Time 10531 10531 10531 10531 07/28/06 01/28/06 02/28/06 01/28/06 07/28/06 02/28/06 02/28/06 07/28/06 07/31/06 07/31/06 07/28/06 07/28/06 Count Date Matrix: Volume: % Moisture: 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 07/27/06 08:35 Reference Aliquot Units 핕 핕 E E E 핕 ш Ξ ш 핍 Ξ Collect Start: 07/27/2006 08:35 Volume Aliquot 3122.7 3122.7 3122.7 3122.7 3122.7 3122.7 3122.7 3122.7 3122.7 Receive Date: 07/28/2006 3122.7 10 Collect Stop: Run # Units pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L 7.16E+00 5.94E+00 1.38E+01 6.64E+00 9.48E+00 2.40E+02 1.45E+00 5.37E+00 5.29E+00 1.07E+01 4.94E+00 2.10E+01 MDC 8.60E+00 4.40E+00 3.43E+00 3.40E+00 6.32E+00 3.41E+00 4.11E+00 5.72E+00 1.30E+01 2.52E+02 3.30E+00 Uncertainty 6.94E-01 2 Sigma Sample ID: WG-QC-MW-QC-108I-072706-NZ-001 2.10E+00 3.79E-01 -2.33E+00 1.20E+00 -3.42E+00 9.24E+00 2.55E+00 8.56E+00 1.89E+03 -3.96E-01 6.35E+00 1.02E-01 Activity Conc 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 L29389-1 LIMS Number: Station Description: Radionuclide Kathy Shaw H-3 (DIST) **FOTAL SR BA-140** MN-54 CS-137 CS-134 ZN-65 NB-95 CO-58 FE-59 CO-60 ZR-95

Sec

10531

07/28/06

07/27/06 08:35

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3122.7

pCi/L

7.64E+00

4.55E+00

1.13E+00

LA-140

\*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum Yes = Peak identified in gamma spectrum unless otherwise noted

MDC - Minimum Detectable Concentration

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of

Page 1

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification Low recovery High recovery l | | | High Spec

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

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TELEDYNE BROWN ENGINEERING, INC.

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L29389

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(MG) Ground Water Matrix: Volume: % Moisture: Collect Start: 07/27/2006 09:20 Receive Date: 07/28/2006 Collect Stop: Sample ID: WG-QC-MW-QC-1101-072706-NZ-002 Station: Description: Kathy Shaw

LIMS Number: L29389-2	39-2													
Radionuclide	SOP#	Activity Conc	Activity Uncertainty Conc 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count	Count Units	Flag Values	nes
100000000000000000000000000000000000000	0,00	2337.01	3	1 70E±02	1/i.Ju		10	m		07/31/06	09	Σ	n	
H-3 (DIST)	7010	7.31E+01	1.10E+02	1./7ETU4	יי ויטן			****	00.00 70/20/20	20/10/20	00	M	11	
TOTAL SR	2018	1.01E+00	8.38E-01	1.53E+00	pCi/L		450	III	07//2//06 09:20	01/21/00	120021	IM	0 1	Nic
MN-54	2007	3.56E+00	3.44E+00	6.01E+00	pCi/L		3260.4	ш	07/27/06 09:20	01/28/06	13872	Sec	-   -	ON
100 58	2007	-1 94E+00		5.67E+00	pCi/L		3260.4	m	02/22//06 09:20	02/28/06	13825	Sec	n	No :
EE 50	2007	-4 93E+00		1.00E+01	pCi/L		3260.4	m	07/27/06 09:20	02/28/06	13825	Sec	D	No
CD 50	2002	-9.01E-01		5.51E+00	pCi/L		3260.4	III	07/27/06 09:20	02/28/06	13825	Sec	ח	No
00-00	7007	1 50E+01		1 61E+01	nCi/I.		3260.4	lm.	07/27/06 09:20	02/28/06	13825	Sec	ם	No
C0-NZ	7007	2.70E±00		70 - TIOY	nCi/I.		3260.4	п	07/27/06 09:20	07/28/06	13825	Sec	n	No
NB-95	7000	3./UE+00	ļ	9 57E+00	nCi/L		3260.4	Im.	07/27/06 09:20		13825	Sec	Ω	No
ZK-93	2007	2.02E+05		9 06F±00	nCi/I.		3260.4	lm.	07/27/06 09:20	02/28/06	13825	Sec	n*	No
CS-134	2007	5.47E±00		6 73E+00	nCi/L		3260.4	Im	07/27/06 09:20	02/28/06	13825	Sec	n	No
C3-13/	2007	2 60F±00	i	2.11E+01	pCi/L		3260.4	Im.	07/27/06 09:20	01/28/06	13825	Sec	n	No
LA-140	2007	-5.02E-01		6.07E+00	pCi/L		3260.4	ш	07/27/06 09:20	01/28/06	13825	Sec	Ω	No
		The second secon	The second secon											

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum unless otherwise noted

MDC - Minimum Detectable Concentration

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Page

Bolded text indicates reportable value. High recovery

Low recovery

High Spec

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

TELEDYNE BROWN ENGINEERING, INC.

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Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(MG)

Ground Water

Matrix:

Sample ID: WG-QC-MW-QC-114I-072706-NZ-003

Kathy Shaw

8 N % N<sub>o</sub> S ô γ å 2 Flag Values  $\supset$  $\supset$  $\supset$  $\Box$  $\supset$  $\Box$  $\Box$ Units Count Sec Sec Sec Sec Sec Sec Sec Sec Sec Sec Sec Σ 9712 9712 Time 9712 Count 9712 9712 9712 9712 90/08//20 90/08//0 07/31/06 90/08//20 90/08//0 90/08//0 01/30/06 90/08//0 90/08//20 90/08//0 90/08//20 07/31/06 90/08//0 Count Date Volume: % Moisture: 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 07/27/06 10:10 Reference Aliquot Units Ξ 田 표 핕 E Ξ Ē E 핕 ᄪ 피 ᄪ E Collect Start: 07/27/2006 10:10 Volume Aliquot Receive Date: 07/28/2006 3273 3273 3273 3273 3273 3273 3273 3273 Collect Stop: Run # Units pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L pCi/L 9.15E+00 5.73E+00 4.46E+00 4.54E+00 4.97E+00 8.63E+00 4.74E+00 4.78E+00 1.86E+01 6.55E+00 1.78E+02 1.65E+00 1.02E+01 MDC 2.82E+00 3.66E+00 5.10E+00 7.54E+00 4.85E+00 2.93E+00 1.05E+02 2.55E+00 2.86E+00 2.92E+00 2.88E+00 1.14E+01 Uncertainty 8.40E-01 2 Sigma -1.10E+00 -1.09E+01 -5.61E+00 5.46E+00 1.17E+00 -2.53E+00 -1.08E+00 2.02E+00 -9.26E-01 3.95E-02 -7.20E-01 5.67E-01 Activity 2007 2007 2007 2007 2007 2007 2007 2007 2007 2007 SOP# L29389-3 LIMS Number: Description: Radionuclide TOTAL SR H-3 (DIST) LA-140 **BA-140** MN-54 CS-137 09-00 CS-134 CO-58 2N-65 NB-95 ZR-95 FE-59

\*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum Yes = Peak identified in gamma spectrum unless otherwise noted

MDC - Minimum Detectable Concentration

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3 Page

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification Low recovery High recovery Spec

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High

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

TELEDYNE
BROWN ENGINEERING, INC. A Teledyne Technologies Company

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Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Collect Start: 07/27/2006 11:00 Collect Stop: Sample ID: WG-QC-MW-QC-113I-072706-NZ-004 Station:

Kathy Shaw

Description:

Receive Date: 07/28/2006

Volume: % Moisture:

(WG)

Ground Water

Matrix:

LIMS Number: L29389-4	9-4													
Radionuclide	SOP#	Activity Conc	Activity Uncertainty Conc 2 Sigma	MDC	Units	Rum #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag	Flag Values
H-3 (DIST)	2010	3.69E+01	1.14E+02	1.84E+02	pCi/L		10	lm		07/31/06	09	M	n	
TOTAL SR	2018	6.53E-01	8.06E-01	1.55E+00	pCi/L		450	m	07/27/06 11:00	01/31/06	80	Σ	Ω	
MN-54	2007	2.08E+00	3.21E+00	5.47E+00	pCi/L		3041.7	Ē	07/27/06 11:00	07/28/06	9121	Sec	n	No
CO-58	2007	-3.16E+00		5.32E+00	pCi/L		3041.7	lm	07/27/06 11:00	01/28/06	9121	Sec	n	No
FE-59	2007	3.62E+00	5.88E+00	1.01E+01	pCi/L		3041.7	m	07/27/06 11:00	07/28/06	9121	Sec	n	No
09-00	2007	2.74E+00	3.53E+00	6.18E+00	pCi/L		3041.7	III	07/27/06 11:00	90/87/20	9121	Sec	ח	No
NZ-65	2007	2.71E+01	9.24E+00	1.63E+01	pCi/L		3041.7	ш	07/27/06 11:00	01/28/06	9121	Sec	*	No
NB-95	2007	3.80E+00		5.82E+00	pCi/L		3041.7	E E	07/27/06 11:00	01/28/06	9121	Sec	ם	No
ZR-95	2007	3.90E+00	6.01E+00	9.11E+00	pCi/L		3041.7	m	07/27/06 11:00	01/28/06	9121	Sec	n	No
CS-134	2007	2.64E+01	7.24E+00	8.62E+00	pCi/L		3041.7	ш	07/27/06 11:00	02/28/06	9121	Sec	*	No
CS-137	2007	1.71E+00	3.42E+00	5.85E+00	pCi/L		3041.7	ш	07/27/06 11:00	02/28/06	9121	Sec	Ω	No
BA-140	2007	6.12E+00	1.16E+01	1.95E+01	pCi/L		3041.7	m	07/27/06 11:00 07/28/06	02/28/06	9121	Sec	n	No
LA-140	2007	-1.51E+00	4.09E+00	6.50E+00	pCi/L		3041.7	ml	07/27/06 11:00	02//28/06	9121	Sec	n	No

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

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Page 4

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma Activity concentration exceeds customer reporting value MDC exceeds customer technical specification Low recovery High recovery High Spec

Compound/Analyte not detected or less than 3 sigma

Flag Values U =

TELEDYNE BROWN ENGINEERING, INC.

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L29389

EX001-3ESPQUAD-06

Conestoga-Rovers & Associates

Kathy Shaw

			100		1100	C. C. C. C. C. C. C. C. C. C. C. C. C. C	FL 9000/40/4	<u>د</u>		Marrix: Cr	Ground water	ī	_	5
Sample ID:	Sample ID: WG-QC-MW-QC-1121-072706-NZ-005	C-1121-0727U	90-ZN-90		Collect Star.	Ston.	Collect Ston: 0/12/1/2000 15:13	3		Volume:				
Station:						r otrop.	7000,00,1		W %	% Moisture:				
Description:					Keceive	e Date: 0	Receive Date: 0//28/2000							
LIMS Number: L29389-5	L29389-5													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count	Count	Flag Values	<b>5</b> 0
	0100	1 4700.01	-	1 02E±02			10	lm		02//31/06	09	Σ	n	
H-3 (DIST)	0107	4./3E+UI	_	1.035-04	מייטל ד		450	- E	07/27/06 13:15	07/31/06	80	Σ	ר	
TOTAL SR	2018	4.09E-01	8.63E-01	1.74E+00	pCI/L	_	004	1	51.00 10.15	90/80/20	9921	Sp	1	No
MN-54	2007	-3.44E+00	3.92E+00	5.91E+00	pCi/L		2993	IMI	01/7//00 13:13	0//20/00	0021	3	0 5	
65 00	2002	-5 43E+00	3.69E+00	5.21E+00	pCi/L		2993	Ħ	07/27/06 13:15	02//28/06	8871	Sec	0	001
-00-00 10-00	2002	8 66E+00		1.26E+01	pCi/L		2993	m	07/27/06 13:15	01/28/06	8821	Sec	n	No No
FE-39	1007	1 101 00	_	0074507	1/1,04		2993	Īш	07/27/06 13:15	02//28/06	8821	Sec	<u>_</u>	e S
CO-60	/007	1.105+00	_	0.73E+00	pci/r		2000		07/27/06 13:15	90/86/20	8821	Sec	*1	No No
29-NZ	2007	2.10E+01	1.03E+01	1.78E+01	pCi/L		6667		07/2//00 13:15	- -	0001	S S	2	No.
NB-95	2007	5.60E+00	4.41E+00	7.00E+00	pCi/L		2993	百	07/27/06 13:15		1700	350		ON ON
7B-05	2007	-2.45E+00	5.89E+00	9.31E+00	pCi/L		2993	ш	07/27/06 13:15	_	1799	200		- -
CE 124	2007	1.21E+01	L	7.21E+00	pCi/L		2993	m	07/27/06 13:15	02/28/06	8821	Sec	*	S N
104	7007	2 OGE-01	-	6 54E+00	nCi/L		2993	E	07/27/06 13:15	07/28/06	8821	Sec	ח	No
CS-13/	2007	-7 99F-01	-	2.14E+01	pCi/L		2993	III	07/27/06 13:15	01/28/06	8821	Sec	N N	% %
DA-140	1000	1 145-00		8 05E+00	nCi/I.		2993	E	07/27/06 13:15	07/28/06	8821	Sec	Z	No No

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

of

Page

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
Activity concentration exceeds customer reporting value

MDC exceeds customer technical specification Low recovery High recovery 11 11 11 11 11 U\* High Spec

Compound/Analyte not detected or less than 3 sigma

Flag Values

TELEDYNE BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29389

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(WG) Ground Water Matrix: Volume: % Moisture: Collect Start: 07/27/2006 14:05 Receive Date: 07/28/2006 Collect Stop: Sample ID: WG-QC-MW-QC-1111-072706-NZ-006 LIMS Number: L29389-6 Station: Description: Kathy Shaw

LIMS Number: L22367-0	0-6									7		3		
Radionuclide	#dos	Activity Conc	Activity Uncertainty Cone 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Keference Date	Count	Count	Units	Flag	Flag Values
	2010	4 20E±02	1 33E+02	1 79E+02	nCi/L		10	lm		07/31/06	09	Σ	+	
H-3 (DIST)	2010	4.40ET04		20.000	1/:04		450	l m	07/27/06 14:05	07/31/06	80	Σ	n	
OTAL SR	2018	-1.72E-01	8.72E-01	1.89E+00	pci/L		004	THE PERSON NAMED IN COLUMN 1	01/01/07/06	20/00/20	10071	Con	11	No
	2007	-1.81E-01	3.11E+00	5.43E+00	pCi/L		2929.5	E E	01/2//00 14:03	01/20/00	100/1	3	) )	274
	2007	-2 54F+00	3.21E+00	5.33E+00	pCi/L		2929.5	ᄪ	07/27/06 14:05	07/28/06	108/1	Sec	) )	ONI
CORP. The second second of the second	2007	-1 29E-01		1.05E+01	pCi/L		2929.5	m	07/27/06 14:05	02/28/06	10871	Sec	n	oN
	2007	-2 38F+00		5.31E+00	pCi/L		2929.5	Гш	07/27/06 14:05	07/28/06	10871	Sec	ם	No
A Company of the Comp	2007	2.30E 00		1 68F±01	nCi/I.		2929.5	lm	07/27/06 14:05	07/28/06	10871	Sec	*	No No
The state of the s	7007	2.17.E+01		7.00E-01	pCi/I	-	7979 5	Ē	07/27/06 14:05	02/28/06	10871	Sec	n	No
(V) (A)	7007	3.83E+00		0.735.00	PCi/L	-	2929 5	ı E	07/27/06 14:05	1	10871	Sec	n	No
	7007	-2.18E+00	Į		7/201		2000	=	07/27/06 14:05		10871	Sec	*1	No
	2007	1.91E+01	5.23E+00		PCI/L		2,6767	ıııı	01/2/100 14:05		10071	Con		Ŋ
And the same of th	2007	-1.43E-01	3.56E+00	6.11E+00	pCi/L		2929.5	E E	C0:41 00//7//0	ļ	1/001	325	2 2	NIC
	2007	-1.25E+00	1.24E+01	2.14E+01	pCi/L		2929.5	E E	07/27/06 14:05	- 1	1/801	Sec	0 5	NO
	2007	3.22E-01	3.65E+00	6.62E+00	pCi/L	********	2929.5	ᄪ	07/27/06 14:05	01/28/06	108/1	Sec	)	020
						The same of the last of the la								

Yes = Peak identified in gamma spectrum
\*\*\*\* Results are reported on an as received basis
unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

of 9 Page

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec

Low recovery

Bolded text indicates reportable value. High recovery

TELEDYNE BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29389

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(MG) Matrix: Ground Water Collect Start: 07/27/2006 14:15 Sample ID: RB-QC-MW-QC-115S-072706-NZ-007 Kathy Shaw

		-	maggarcadan Li	engas	y		summers.	ownerson I	and the same	- Secretaria	- Poolanie	ung-no-	naconiprin	e company		MANGEOR.		i
		Flag Values				No	ONI	No	No	No	No							
		E	+	-  -		ם	ם	ם	n	n	1	5 =	) )	<u> </u>	n	Ω	n	
	1	Units	Σ	IVI	Σ	Sec	Sec	Sec	Sec	Sec	Sec	300	Sec	Sec	Sec	Sec	Sec	
	,	Count	09	20	80	11431	11431	11431	11431	11431	11431	1771	11431	11431	11431	11431	11431	
Volume: % Moisture:		Count Date	07/21/06	01/21/00	07/31/06	07/28/06	02/28/06	07/28/06	01/28/06	02//28/06	90/86/20	00/07/10	ı	02//28/06	02/28/06	02/28/06	07/28/06	
		Reference Date			07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/77/06 14:15	01/2//00 14:13	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	07/27/06 14:15	
		Aliquot Units		III	m	Im	ml	Im	E	ш		Ш	Ē	ш	ml	m	lm.	
Collect Stop: Receive Date: 07/28/2006		Aliquot Volume	•	0	450	3087.9	3087.9	3087.9	30879	3087.9	0.1000	308/.9	3087.9	3087.9	3087.9	3087.9	3087.9	
Stop: Date: 0		Run #																2007 5.29E+00 4.04E+00 7.49E+00 pCi/L 3087.9 mi 0//2//06 14:13 0//26/09 114:31
Collect Stop: Receive Date:		Units		pCi/L	pCi/L	pCi/L	pCi/L	nCi/I.	/i.)u	pCi/I	יייסן	pCi/L	pCi/L	pCi/L	nCi/I.	nCi/I.	nCi/I	۲. ز
		MDC		1.76E+02	1.51E+00	5.51E+00	\$ 57E+00	1.09E+01	E AND TOO	1 255 101	107466.1	5.81E+00	9.90E+00	7.11E+00	6.27E+00	2 17F+01	7.495+00	22.47
		Incertainty 2 Sioma	D	1.24E+02	6.70E-01	3 57E+00	3 62E+00	6.65E+00	2 605.00	3,000,00	/./0E+00	3.37E+00	6.29E+00	4 93F+00	3 88E+00	1 37E+01	A 04E+00	*************************************
		Activity Uncertainty		2.82E+02	-3 31E-01	-3 11E+00	2 85E+00	2.02E.03	2 0617 100	-2.03E+00	/./1E+00	3.01E+00	-3.26E+00	3 12E+00	061E-01	1 165±00	-1.10£100 5.20E±00	0.472.00
•	2-6	#dOS		2010	2018	2002	2007	2007	7007	7007	7007	2007	2007	2007	2007	2007	2007	7007
Station: Description:	LIMS Number: L29389-7	Radionuclide		H-3 (DIST)	TOTAL SP	MAI SA	40-VIN	CC-30	FE-39	CO-60	ZN-65	NB-95	7R-95	CC 134	134	CS-13/	BA-140	LA-140

\*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum Yes = Peak identified in gamma spectrum unless otherwise noted

MDC - Minimum Detectable Concentration

1 JО Page 7

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec Bolded text indicates reportable value.

Low recovery

## QC Results Summary

Page:

Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated

Spiking level < 5 times activity

Pass Fail Not evaluated

\* 4 H

Nuclide not detected

Positive Result

+ > \* \*

QC Summary Report

L29389

for

9:33:28AM

8/1/2006

H-3 (DIST)

TELEDYNE BROWN ENGINEERING A Teledyne Technologies Company

								and the same of th
				Method Blank Summary	ary			
TBE Sample ID WG4269-1	Radionuclide H-3 (DIST)	Matrix WO	Count Date/Time 07/31/2006 0:08		Blank Result        	<u>Units</u> pCi/Total		Qualifier P/F U P
				LCS Sample Summary	ıry			
TBE Sample ID WG4269-2	Radionuclide H-3 (DIST)	Matrix WO	Count Date/Time 07/31/2006 1:12	Spike Value 5.05E+002	LCS Result 4.960E+02	Units Spik pCi/Total	Spike Recovery 98.3	Range         Qualifier         P/F           70-130         +         P
Spike ID: 3H-041706-1 Spike conc: 5.05E+002 Spike Vol: 1.00E+000	1706-1 +002 +000							
- Constitution				Duplicate Summary	y			
TBE Sample ID WG4269-3 L29389-6	Radionuclide H-3 (DIST)	<u>Matrix</u> WG	Count Date/Time 07/31/2006 1:30	Original Result 4.200E+02	<b>DUP Result</b> 5.110E+02	Units pCi/L	RPD	Range Qualifier P/F < 30 * NE

# QC Summary Report

L29389

for.

9:33:28AM

ROWN ENGINEERING A Teledyne Technologies Company

		Qualifier P/F U P		Range Qualifier P/F 70-130 + P			Range Qualifier P/F <30 ** NE	
		<u>Units</u> pCi/Total		<u>Units</u> Spike Recovery pCi/Total 109.6			Units RPD pCi/L	
TOTAL SR	Method Blank Summary	Blank Result < 8.500E-01	LCS Sample Summary	Spike Value         LCS Result           5.84E+001         6.400E+01		Duplicate Summary	Original Result         DUP Result           < 1.890E+00	
		Matrix         Count Date/Time           WO         07/31/2006 17:05		Matrix         Count Date/Time         Signal           WO         07/31/2006         17:05         5.			Matrix Count Date/Time WG 07/31/2006 17:05	
		TBE Sample ID Radionuclide WG4278-1 TOTAL SR		TBE Sample ID Radionuclide WG4278-2 TOTAL SR	Spike ID: 90SR-011905 Spike conc: 2.34E+002	Spine voi: 2:302 301	TBE Sample ID Radionuclide WG4278-3 TOTAL SR L29389-6	

~ Page:

Positive Result Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated Nuclide not detected

Spiking level < 5 times activity Pass Fail Not evaluated

\* \* P F NE + > \* \*

### Raw Data

Raw Data Sheet (rawdata) Aug 01 2006, 09:46 am

	1075	2017	ы Б	思		图订	l	þ	3	F 5	ą	+	2		q	
	Decay &	Factor	.21	.214		215	) <del> </del>		. 208		17.		.215		8177.	
			09	09		5	9	1	09	ļ	0 9		09		09	
		Bkg s dt (min)	67	2			N		7		73		64		64	
<del></del>		Bkg					<b>-</b>		0		09		09		09	
Page: 1		Sample Bkg dt(min) counts	34.56	09			0.9		09		φ		w		<b>o</b>	
		Total	375	127	ì		109		130		133		240		202	
		Counter	7.5	101	Ž		LS7		LS7		LS7		1.87		LS7	
		Count C	31-jul-06 02:33	00 500	31-Jur-08 03:11		31-ju1-06 04:14		31-jul-06 05:18		31-jul-06 06:21		31-jul-06 07:25		31-jul-06 08:28	
			1										at a second			
		Mount	Weight 0	1	0		0		0		0		0		0	
	1	Milking	Date/time													
	3ESPQUAD-06	Scavenge	Date/time			*		4	<b>K</b>	4	*		k		7	2
Customer: <u>Exelon</u>	Project : EX001-3ESPQUAD-06	Volume/	Aliquot 10 ml	MDC: 2.4E+02	10 ml	704402	10 ml		MDC: 1.78E+02 * 10 ml		MDC: 1.84E+02 10 ml		MDC: 1.83E+02 10 ml		MDC: 1./9E+0Z 10 ml	MDC: 1.76E+02
Đ	Ài 	Reference	Date/time	1-001 2.52E+02	TS	5-002	T. 15+02	2-003	1.05E+02	2-004	1.14E+02 ST	Z-005	Error: 1.14E+02 H-3 DIST	Z-006	* Error: 1,33E+02 H-3 DIST	Z-007
-		Analvsis	H-3 DIST	)72706-NZ * Error:	H-3 DIST	372706-NZ	H-3 DIST	072706-NZ	H-3 DIST	072706-N	Error: 1 H-3 DIST	072706-N		072706-N	* Error: H-3 DIST	072706-N * Error
1.29389	(DIST)	Run An	#	3-108I-0		2-110I-C	31E+01	C-114I-	3.988+0	C-113I-	.69E+01	C-112I-	.73E+01	C-1111-	.2E+02	)c-1158-
Work Order: <u>L29389</u>	Nuclide: H-3 (DIST)	CT almas	Client ID L29389-1	WG-QC-MW-QC-108I-072706-NZ-001	129389-2	WG-QC-MW-QC-110I-072706-NZ-002	Activity: 2.31E+01 Error: 1.1E+02 L29389-3 H-3 DIST	WG-QC-MW-QC-114I-072706-NZ-003	Activity: -3.98E+01 Error: 1.05E+02 L29389-4 H-3 DIST	WG-QC-MW-QC-113I-072706-NZ-004	Activity: 3.69E+01 Error: 1.14E+02 L29389-5 H-3 DIST	WG-QC-MW-QC-112I-072706-NZ-005	Activity: 4.73E+01 L29389-6	WG-QC-MW-QC-1111-072706-NZ-006	Activity: 4.2E+02 L29389-7	RB-QC-MM-QC-115S-072706-NZ-007 Activity: 2.82E+02 * Error: 1.24E+02

Raw Data Sheet (rawdata) Aug 01 2006, 09:46 am Page: 2

LCB LCB LCB LCB LCB LCB LCB Analyst Decay & Eff. Ingrowth Factor Н .344 I .335 .343 .343 .345 .344 .354 400 400 400 400 400 Bkg dt (min) 400 321 363 289 277 307 264 counts Bkg 80 80 80 80 80 80 80 dt (min) Sample counts 65 Total 26 70 70 70 69 75 Counter X2C X2D X3A хзв X2A X2B XID A 31-jul-06 17:05 31-jul-06 17:05 31-jul-06 17:05 31-jul-06 17:05 31-jul-06 17:05 31-jul-06 17:05 31-ju1-06 Mount Count Weight Recovery Date/time Count 17:05 90.38 92.31 78.02 78.02 81.32 78.30 76.65 0 0 0 0 0 0 0 Scavenge Milking
Date/time Date/time
31-jul-06 31-jul-06 12:30 31-jul-06 12:30 31-ju1-06 12:30 31-jul-06 12:30 31-jul-06 12:30 31-jul-06 12:30 12:30 Project : EX001-3ESPQUAD-06 MDC: 1.51E+00 \* Customer: Exelon MDC: 1.89E+00 MDC: 1.55E+00 MDC: 1.53E+00 MDC: 1.65E+00 MDC: 1.74E+00 MDC: 1.45E+00 Volume/ Aliquot 450 ml 450 ml 450 ml 450 ml 450 ml 450 ml 450 ml WG-QC-MW-QC-1111-072706-NZ-006
Activity: -1.72E-01 ELICI: 8.72E-01 M
TOTAL SR 27-jul-06 27-jul-06 11:00 27-jul-06 09:20 27-jul-06 10:10 27-jul-06 27-jul-06 27-jul-06 Reference Date/time 14:15 WG-QC-MW-QC-112I-072706-NZ-005 Activity: 4.09E-01 Error: 8.63E-01 L29389-6 TOTAL SR 27-ju Activity: 6.53E-01 Error: 8.06E-01 13:15 14:05 Activity: 1.02E-01 Error: 6.94E-01 L29389-2 TOTAL SR 27-ju WG-QC-MW-QC-1101-072706-NZ-002 Activity: 1.01E+00 Exror: 8.38E-01 129389-3 TOTAL SR 27-jv 08:35 Activity: -3.31E-01 Error: 6.7E-01 WG-QC-MW-QC-1141-072706-NZ-003 Activity: 5.67E-01 Error: 8.4E-01 RB-QC-MW-QC-115S-072706-NZ-007 WG-QC-MW-QC-113I-072706-NZ-004 WG-QC-MW-QC-1081-072706-NZ-001 TOTAL SR TOTAL SR TOTAL SR TOTAL SR Run Analysis # Nuclide: SR-90 (FAST) Work Order: <u>129389</u> L29389-4 L29389-5 L29389-7 Sample ID L29389-1

Sec. Review:

LIMS: Analyst:

\_\_\_\_\_\_ 

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 1-AUG-2006 00:07:12.97 TBE11 P-20610B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:22.09

\_\_\_\_\_\_\_

LIMS No., Customer Name, Client ID: L29389-1 WG EX/QUAD

Smple Date: 27-JUL-2006 08:35:00. Sample ID : 11L29389-1

Geometry : 113L082304 Sample Type : WG BKGFILE : 11BG070106MT : 3.12270E+00 L Quantity End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:55:31.28 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	197.81	132	320	1.42	395.75	1.75E+00	1.26E-02	26.7	
2	1	238.42*	54	231	1.45	477.20	1.58E+00	5.13E-03	57.1	1.90E+00
3	1	241.90	175	181	1.18	484.18	1.56E+00	1.66E-02	14.6	
4	0	295.37*	353	230	1.31	591.40	1.37E+00	3.36E-02	10.5	
5	Ō	351.65*	510	241	1.40	704.23	1.20E+00	4.85E-02	8.2	
6	0	609.15*	410	72	1.68	1220.14	7.90E-01	3.90E-02	6.9	
7	0	767.82	77	59	4.32	1537.79	6.59E-01	7.31E-03	26.0	
8	0	1120.16*	109	20	1.87	2242.46	4.86E-01	1.04E-02	13.9	
9	0	1237.49	58	13	1.67	2476.89	4.48E-01	5.52E-03	18.3	
10	0	1407.13	20	12	0.99	2815.69	4.04E-01	1.91E-03	39.5	
11	0	1460.70*	21	13	2.82	2922.63	3.92E-01	1.96E-03	62.2	
12	0	1728.59	23	14	1.41	3457.05	3.44E-01	2.15E-03	40.0	
13	0	1762.59*	77	12	2.05	3524.85	3.39E-01	7.30E-03	17.3	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	21	10.67*	3.919E-01	4.057E+01	4.057E+01	124.45
TH-228	238.63	54	44.60*	1.578E+00	6.311E+00	6.319E+00	114.17
	240 98	175	3.95	1.563E+00	2.327E+02	2.330E+02	29.15

Flag: "\*" = Keyline

Summary of Nuclide Activity

Acquisition date: 28-JUL-2006 13:20:22 Sample ID : 11L29389-1

13

Total number of lines in spectrum

Number of unidentified lines

Number of lines tentatively identified by NID 4 30.77%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 4.057E+01 4.057E+01 5.049E+01 124.45 TH-228 1.91Y 1.00 6.311E+00 6.319E+00 7.214E+00 114.17 \_\_\_\_\_ \_\_\_\_\_

> Total Activity: 4.688E+01 4.689E+01

Grand Total Activity: 4.688E+01 4.689E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

3

Unidentified Energy Lines Sample ID : 11L29389-1

Page: Acquisition date : 28-JUL-2006 13:20:22

30.77%

	-										
It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0 0	197.81 295.37 351.65 609.15 767.82 1120.16 1237.49 1407.13 1728.59 1762.59	132 353 510 410 77 109 58 20 23 77	320 230 241 72 59 20 13 12 14	1.42 1.31 1.40 1.68 4.32 1.87 1.67 0.99 1.41 2.05	2242.46 2476.89 2815.69 3457.05	586 697 1215 1530 2234 2470 2810 3450	12 15 14 18 16 13 10 12	1.26E-02 3.36E-02 4.85E-02 3.90E-02 7.31E-03 1.04E-02 5.52E-03 1.91E-03 2.15E-03 7.30E-03	21.0 16.4 13.9 51.9 27.7 36.6 79.1 80.0	1.75E+00 1.37E+00 1.20E+00 7.90E-01 6.59E-01 4.86E-01 4.48E-01 4.04E-01 3.44E-01 3.39E-01	T

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

13 Total number of lines in spectrum Number of unidentified lines Number of lines tentatively identified by NID 4

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma 2-Sigma Error %Error Flags p̄Ci/L pCi/L Hlife Decay Nuclide 124.45 5.049E+01 4.057E+01 1.00 4.057E+01 1.28E+09Y K-40 7.214E+00 114.17 6.319E+00 1.00 6.311E+00 1.91Y TH-228 \_\_\_\_\_ 4.689E+01 Total Activity: 4.688E+01

Grand Total Activity: 4.688E+01 4.689E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA			
K-40 TH-228	4.057E+01 6.319E+00	5.049E+01 7.214E+00	6.012E+01 1.061E+01	0.000E+00 0.000E+00	0.675 0.595			
Non-Identified Nuclides								
	Trans Time							

Key-Line Act/MDA MDA error MDAK.L. Act error Activity (pCi/L) Ided (pCi/L) Nuclide

	1 4000.03	2.844E+01	4.477E+01	0.000E+00	-0.332
BE-7	-1.488E+01 -2.492E+01	1.537E+01	2.062E+01	0.000E+00	-1.209
NA-24		3.115E+01	5.053E+01	0.000E+00	-0.268
CR-51	-1.353E+01	3.303E+00	5.369E+00	0.000E+00	-0.074
MN-54	-3.961E-01	3.525E+00	5.875E+00	0.000E+00	0.373
CO-57	2.191E+00	3.404E+00	5.288E+00	0.000E+00	-0.441
CO-58	-2.333E+00	6.324E+00	1.072E+01	0.000E+00	0.112
FE-59	1.199E+00	3.406E+00	4.942E+00	0.000E+00	-0.692
CO-60	-3.421E+00	8.598E+00	1.377E+01	0.000E+00	0.671
ZN-65	9.243E+00		6.938E+00	0.000E+00	-1.116
SE-75	-7.743E+00	4.492E+00	7.443E+00	0.000E+00	1.271
SR-85	9.461E+00	4.163E+00	5.668E+00	0.000E+00	-0.548
Y-88	-3.105E+00	3.825E+00	5.373E+00	0.000E+00	-0.120
NB-94	-6.428E-01	3.291E+00	6.643E+00	0.000E+00	0.956
NB-95	6.350E+00	4.108E+00	9.478E+00	0.000E+00	0.270
ZR-95	2.554E+00	5.723E+00		0.000E+00	-0.308
MO-99	-1.614E+01	3.299E+01	5.236E+01	0.000E+00	0.123
RU-103	7.196E-01	3.568E+00	5.867E+00	0.000E+00	0.108
RU-106	5.265E+00	2.899E+01	4.886E+01	0.000E+00	-0.214
AG-110m	-1.081E+00	3.124E+00	5.054E+00		0.126
SN-113	9.591E-01	4.574E+00	7.583E+00	0.000E+00	-0.927
SB-124	-5.129E+00	4.348E+00	5.535E+00	0.000E+00	-0.038
SB-125	-6.242E-01	1.008E+01	1.642E+01	0.000E+00	0.075
TE-129M	4.807E+00	3.911E+01	6.421E+01	0.000E+00	-0.240
I-131	-1.489E+00	3.850E+00	6.208E+00	0.000E+00	1.231
BA-133	1.117E+01	5.732E+00	9.080E+00	0.000E+00	1.196
CS-134	8.560E+00	4.396E+00	7.158E+00	0.000E+00	0.393
CS-136	2.326E+00	3.411E+00	5.913E+00	0.000E+00	
CS-137	2.101E+00	3.430E+00	5.942E+00	0.000E+00	0.354
CE-139	-8.446E-01	3.569E+00	5.748E+00	0.000E+00	-0.147
BA-140	3.794E-01	1.296E+01	2.103E+01	0.000E+00	0.018
LA-140	1.127E+00	4.553E+00	7.642E+00	0.000E+00	0.147
CE-141	-2.799E+00	6.241E+00	1.003E+01	0.000E+00	-0.279
CE-144	-2.429E+01	2.687E+01	4.261E+01	0.000E+00	-0.570
EU-152	-1.183E+01	1.293E+01	1.702E+01	0.000E+00	-0.695
EU-154	2.344E+00	7.394E+00	1.221E+01	0.000E+00	0.192
RA-226	-7.558E+01	9.219E+01	1.450E+02	0.000E+00	-0.521
AC-228	-6.366E+00	1.413E+01	2.251E+01	0.000E+00	-0.283
TH-232	-6.363E+00	1.413E+01	2.250E+01	0.000E+00	-0.283
U-235	-2.560E+01	2.828E+01	4.480E+01	0.000E+00	-0.571
U-238	-1.491E+02	3.883E+02	6.093E+02	0.000E+00	-0.245
AM-241	-2.608E+01	4.104E+01	6.715E+01	0.000E+00	-0.388

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C, K-40
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C, TH-228
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C, AM-241

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-0.388

LIMS: Sec. Review: Analyst:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 17:11:00.52 TBE10 12892256 HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:21.07

LIMS No., Customer Name, Client ID: L29389-2 WG EX/QUAD

Smple Date: 27-JUL-2006 09:20:00. Sample ID : 10L29389-2

Geometry : 1035L091004 : WG Sample Type BKGFILE : 10BG070106MT Quantity : 3.26040E+00 L End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:50:24.98 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11 12 13	1 1 1 1 1 1 1 1 1 1 1	66.14 74.75* 77.17 198.14* 238.49* 242.21 295.23* 351.80* 609.24* 768.10 1120.29* 1238.54* 1377.75 1460.88*	121 8 187 78 94 172 193 391 409 36 83 37 46 15	633 509 487 449 277 264 280 248 98 66 59 48 22 37	1.44 1.39 1.33 1.66 1.54 1.55 1.62 1.28 1.60 1.03 1.82 2.99 2.66 2.40	131.72 148.94 153.79 395.94 476.72 484.17 590.31 703.55 1218.91 1536.93 2241.99 2478.72 2757.41 2923.83	6.29E-01 8.79E-01 9.45E-01 1.55E+00 1.40E+00 1.39E+00 1.21E+00 1.07E+00	8.72E-03 5.53E-045 1.36E-02 5.63E-03 6.77E-03 1.25E-02 1.40E-02 2.83E-02 2.95E-02 2.57E-03 5.97E-03 2.68E-03 3.32E-03 1.10E-03	38.7 574.2 22.2 54.5 35.4 18.9 20.1 10.0 7.5 49.9 25.3 47.1 24.4 111.0	9.06E-01 1.75E+00 5.97E-01 2.55E+00 4.85E+00 7.35E-01 7.02E-01 9.06E-01 7.21E-01
15 16 17	1 1 1	1730.26 1764.73* 1847.53	32 65 15	20 29 16	4.50 2.15 1.24	3463.14 3532.15 3697.92	3.13E-01		23.6	1.25E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĈi/L	%Error
K-40	1460.81	15	10.67*	3.559E-01	2.408E+01	2.408E+01	222.00
TH-228	238.63	94	44.60*	1.401E+00	8.977E+00	8.988E+00	70.84
	240.98		3.95	1.392E+00	Li:	ne Not Found	

Flaq: "\*" = Keyline

Summary of Nuclide Activity

Sample ID : 10L29389-2

Page: 2 Acquisition date: 28-JUL-2006 13:20:21

Total number of lines in spectrum

17 15

Number of unidentified lines

Number of lines tentatively identified by NID 2 11.76%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 2.408E+01 2.408E+01 5.347E+01 222.00 TH-228 1.91Y 1.00 8.977E+00 8.988E+00 6.367E+00 70.84

\_\_\_\_\_

\_\_\_\_\_ Total Activity: 3.306E+01 3.307E+01

Grand Total Activity: 3.306E+01 3.307E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 10L29389-2

Page: 3 Acquisition date: 28-JUL-2006 13:20:21

т.											
It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1 1 1 1 1	66.14 74.75 77.17 198.14 242.21 295.23 351.80 609.24 768.10 1120.29 1238.54 1377.75 1730.26 1764.73 1847.53	121 8 187 78 172 193 391 409 36 83 37 46 32 65 15	633 509 487 449 264 280 248 98 66 59 48 22 20 29 16	1.44 1.39 1.33 1.66 1.55 1.62 1.28 1.60 1.03 1.82 2.99 2.66 4.50 2.15 1.24	131.72 148.94 153.79 395.94 484.17 590.31 703.55 1218.91 1536.93 2241.99 2478.72 2757.41 3463.14 3532.15 3697.92	141 391 472 586 698 1212 1531 2234 2474 2751 3454 3526	18 10 18 12 12 13 12 17 15 11 16 16	8.72E-03 5.53E-04 1.36E-02 5.63E-03 1.25E-02 1.40E-02 2.83E-02 2.95E-02 2.57E-03 5.97E-03 2.68E-03 3.32E-03 4.71E-03 1.10E-03	**** 37.8 40.1 20.1 15.1 99.9 50.7 94.2 48.8 70.3 47.3	6.29E-03 8.79E-03 9.45E-01 1.55E+0 1.39E+0 1.07E+0 6.94E-0 5.79E-0 4.33E-0 4.01E-0 3.71E-0 3.17E-0 3.13E-0	1 0 0 0 0 1 1 1 1 2 1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 17 Number of unidentified lines 15 Number of lines tentatively identified by NID 2 11.76%

Nuclide	Type : nati	ural	Wtd Mean	Wtd Mean	_		
Nuclide K-40 TH-228	Hlife 1.28E+09Y 1.91Y	Decay 1.00 1.00	Uncorrected pCi/L 2.408E+01 8.977E+00	Decay Corr pCi/L 2.408E+01 8.988E+00	Decay Corr 2-Sigma Error 5.347E+01 6.367E+00	2-Sigma %Error 222.00 70.84	Flags
	Total Act	ivity :	3.306E+01	3.307E+01			

Grand Total Activity: 3.306E+01 3.307E+01

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit

"E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.408E+01	5.347E+01	5.600E+01	0.000E+00	0.430
TH-228	8.988E+00	6.367E+00	1.073E+01	0.000E+00	0.838

## ---- Non-Identified Nuclides ----

BE-7	Nuclide	Key-Line Activity K.L (pCi/L) Ide		MDA (pCi/L)	MDA error	Act/MDA
NR-24	BE-7	2.346E+00	3.009E+01	4.936E+01		
CR-51			1.750E+01			
NN-54			3.086E+01	4.953E+01		
CO-57			3.439E+00			
CO-58			3.808E+00			
FE-59			3.572E+00			
CO-60		-4.927E+00	6.415E+00			
N=05			3.436E+00			
SE-75 SR-85 SR-85 SR-85 SR-86 SR-86 SR-86 SR-86 SR-86 SR-87 SR-87 SR-87 SR-87 SR-87 SR-86 SR-86 SR-87 SR-86 SR-86 SR-87 SR-86 SR-87 SR-87 SR-86 SR-87 SR-87 SR-86 SR-87 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-87 SR-86 SR-86 SR-86 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-86 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-86 SR-87 SR-86 SR-86 SR-87 SR-86 SR-86 SR-87 SR-86 SR-86 SR-87 SR-86 SR-87 SR-86 SR-86 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-94 SR-95 SR-95 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-96 SR-110			1.012E+01			
SR-85         1.587E+01         4.035E+00         7.531E+00         0.000E+00         2.107           Y-88         3.440E+00         3.514E+00         5.915E+00         0.000E+00         0.581           NB-94         5.523E-01         3.432E+00         5.723E+00         0.000E+00         0.580           NB-95         3.702E+00         3.674E+00         6.387E+00         0.000E+00         0.580           ZR-95         -2.086E+00         6.312E+00         9.566E+00         0.000E+00         -0.218           MO-99         -4.146E+01         3.356E+01         5.491E+01         0.000E+00         0.076           RU-106         1.482E+00         3.074E+01         5.120E+01         0.000E+00         0.136           RU-107         2.854E-02         3.418E+00         5.66E+00         0.000E+00         0.029           AG-110m         -2.854E-02         3.418E+00         5.724E+01         0.000E+00         0.029           N-113         3.308E+00         4.558E+00         7.724E+00         0.000E+00         0.428           SB-124         -2.630E+00         4.252E+00         5.703E+00         0.000E+00         0.408           SB-125         3.599E+00         1.027E+01         1.710E+01         0.000E+		2.152E+00	4.882E+00			
Y-88         3.440E+00         3.514E+00         5.915E+00         0.000E+00         0.381           NB-94         5.523E-01         3.432E+00         5.723E+00         0.000E+00         0.980           JR-95         3.702E+00         3.674E+00         9.566E+00         0.000E+00         -0.218           MO-99         -4.146E+00         3.356E+01         5.491E+01         0.000E+00         -0.076           RU-103         8.061E-01         3.582E+00         5.908E+00         0.000E+00         0.136           RU-106         1.482E+00         3.074E+01         5.120E+01         0.000E+00         0.136           RU-1108         -2.854E-02         3.418E+00         5.662E+00         0.000E+00         0.029           AG-110m         -2.854E-02         3.418E+00         5.662E+00         0.000E+00         -0.055           SN-113         3.308E+00         4.558E+00         7.724E+00         0.000E+00         0.428           SB-124         -2.630E+00         4.252E+00         5.703E+00         0.000E+00         0.210           TE-129M         2.692E+01         3.906E+01         1.710E+01         0.000E+00         0.210           TE-129M         2.692E+01         3.906E+01         6.62E+01 <th< td=""><td></td><td>1.587E+01</td><td>4.035E+00</td><td></td><td></td><td></td></th<>		1.587E+01	4.035E+00			
NB-94 5.523E-01 3.432E+00 5.723E+00 0.000E+00 0.580 NB-95 3.702E+00 3.674E+00 6.387E+00 0.000E+00 -0.218 MO-99 -4.146E+00 3.356E+01 5.491E+01 0.000E+00 -0.218 MO-99 -4.146E+00 3.356E+01 5.491E+01 0.000E+00 -0.076 RU-103 8.061E-01 3.582E+00 5.908E+00 0.000E+00 0.136 RU-106 1.482E+00 3.074E+01 5.120E+01 0.000E+00 0.229 AG-110m -2.854E-02 3.418E+00 5.662E+00 0.000E+00 -0.005 SN-113 3.308E+00 4.558E+00 7.724E+00 0.000E+00 -0.428 SB-124 -2.630E+00 4.252E+00 5.703E+00 0.000E+00 0.428 SB-125 3.599E+00 1.027E+01 1.710E+01 0.000E+00 0.210 TE-129M 2.692E+01 3.906E+01 6.602E+01 0.000E+00 0.210 SB-131 1.433E+00 3.901E+00 6.530E+00 0.000E+00 0.219 BA-133 3.139E+01 6.433E+00 1.104E+01 0.000E+00 0.219 SB-134 2.247E+01 5.276E+00 9.064E+00 0.000E+00 2.480 CS-136 -5.181E-01 3.419E+00 5.556E+00 0.000E+00 -0.093 CS-137 5.466E+00 3.766E+00 6.726E+00 0.000E+00 -0.093 CS-139 -2.9559E-01 3.803E+00 6.219E+00 0.000E+00 0.813 CE-139 -2.9559E-01 3.803E+00 6.219E+00 0.000E+00 0.233 LA-140 -5.023E-01 3.782E+00 6.066E+01 0.000E+00 -0.093 CE-141 -1.352E+01 3.033E+01 4.811E+01 0.000E+00 -0.038 CE-141 -1.352E+01 1.362E+01 1.306E+01 0.000E+00 -0.0307 RA-226 1.206E+01 9.696E+01 1.580E+02 0.000E+00 -0.756 EU-152 -3.997E+00 7.989E+001 5.009E+01 0.000E+00 -0.756 EU-153 -8.678E-01 1.306E+01 2.143E+01 0.000E+00 -0.076 AC-228 -8.681E-01 1.306E+01 5.009E+01 0.000E+00 -0.0757 AC-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 -0.040 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 -0.0757		3.440E+00	3.514E+00			
NB-95		5.523E-01	3.432E+00			
ZR-95		3.702E+00	3.674E+00			
MO-99		-2.086E+00	6.312E+00			
RU-103		-4.146E+00	3.356E+01			
RU-106		8.061E-01	3.582E+00			
AG-110m		1.482E+00	3.074E+01			
SN-113		-2.854E-02	3.418E+00			
SB-124       -2.630E+00       4.252E+00       5.703E+00       0.000E+00       -0.461         SB-125       3.599E+00       1.027E+01       1.710E+01       0.000E+00       0.210         TE-129M       2.692E+01       3.906E+01       6.602E+01       0.000E+00       0.219         I-131       1.433E+00       3.901E+00       6.530E+00       0.000E+00       0.219         BA-133       3.139E+01       6.433E+00       1.104E+01       0.000E+00       2.844         CS-134       2.247E+01       5.276E+00       9.064E+00       0.000E+00       2.480         CS-136       -5.181E-01       3.419E+00       5.556E+00       0.000E+00       -0.093         CS-137       5.466E+00       3.766E+00       6.726E+00       0.000E+00       0.813         CE-139       -2.959E-01       3.803E+00       6.219E+00       0.000E+00       -0.48         BA-140       2.596E+00       1.280E+01       2.106E+01       0.000E+00       -0.083         LA-140       -5.023E-01       3.782E+00       6.066E+00       0.000E+00       -0.083         LE-141       -1.352E+01       6.894E+00       1.083E+01       0.000E+00       -0.756         EU-152       -1.362E+01       1.362E+01 <td></td> <td>3.308E+00</td> <td>4.558E+00</td> <td></td> <td></td> <td></td>		3.308E+00	4.558E+00			
SB-125       3.599E+00       1.027E+01       1.710E+01       0.000E+00       0.408         TE-129M       2.692E+01       3.906E+01       6.602E+01       0.000E+00       0.408         I-131       1.433E+00       3.901E+00       6.530E+00       0.000E+00       0.219         BA-133       3.139E+01       6.433E+00       1.104E+01       0.000E+00       2.844         CS-134       2.247E+01       5.276E+00       9.064E+00       0.000E+00       2.480         CS-136       -5.181E-01       3.419E+00       5.556E+00       0.000E+00       -0.093         CS-137       5.466E+00       3.766E+00       6.726E+00       0.000E+00       0.813         CE-139       -2.959E-01       3.803E+00       6.219E+00       0.000E+00       -0.048         BA-140       2.596E+00       1.280E+01       2.106E+01       0.000E+00       -0.083         CE-141       -1.352E+01       6.894E+00       1.083E+01       0.000E+00       -1.248         CE-144       -5.042E+01       3.033E+01       4.811E+01       0.000E+00       -0.756         EU-154       -3.997E+00       7.989E+00       1.303E+01       0.000E+00       -0.307         RA-226       1.206E+01       1.306E+01 <td></td> <td>-2.630E+00</td> <td>4.252E+00</td> <td></td> <td></td> <td></td>		-2.630E+00	4.252E+00			
TE-129M		3.599E+00	1.027E+01			
BA-133		2.692E+01	3.906E+01			
CS-134	I-131	1.433E+00	3.901E+00			
CS-134 CS-136 CS-136 CS-137 S.466E+00 S.466E+00 S.766E+00 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-139 CE-140 CE-140 CE-140 CE-141 CE-144 CE-150 CE-141 CE-144 CE-00 CE-00 COODE+00 CO-00	BA-133	3.139E+01	6.433E+00			
CS-136 CS-137 S.466E+00 3.766E+00 6.726E+00 0.000E+00 0.048 BA-140 2.596E+00 1.280E+01 2.106E+01 0.000E+00 0.123 LA-140 CE-141 -1.352E+01 6.894E+00 1.083E+01 0.000E+00 -1.248 CE-144 -5.042E+01 3.033E+01 4.811E+01 0.000E+00 -1.048 EU-152 -1.362E+01 1.362E+01 1.362E+01 1.362E+01 1.362E+01 1.362E+01 1.362E+01 1.303E+01 0.000E+00 -0.756 EU-154 -3.997E+00 7.989E+00 1.303E+01 0.000E+00 -0.307 RA-226 1.206E+01 9.696E+01 1.580E+02 0.000E+00 0.766 AC-228 -8.681E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 TH-232 -8.678E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 U-235 -9.877E+00 3.819E+02 6.690E+02 0.000E+00 0.602 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 0.602	CS-134	2.247E+01	5.276E+00			
CS-137       5.466E+00       3.766E+00       6.726E+00       0.000E+00       0.048         CE-139       -2.959E-01       3.803E+00       6.219E+00       0.000E+00       -0.048         BA-140       2.596E+00       1.280E+01       2.106E+01       0.000E+00       0.123         LA-140       -5.023E-01       3.782E+00       6.066E+00       0.000E+00       -0.083         CE-141       -1.352E+01       6.894E+00       1.083E+01       0.000E+00       -1.248         CE-144       -5.042E+01       3.033E+01       4.811E+01       0.000E+00       -1.048         EU-152       -1.362E+01       1.362E+01       1.800E+01       0.000E+00       -0.756         EU-154       -3.997E+00       7.989E+00       1.303E+01       0.000E+00       -0.307         RA-226       1.206E+01       9.696E+01       1.580E+02       0.000E+00       -0.040         AC-228       -8.681E-01       1.306E+01       2.143E+01       0.000E+00       -0.040         TH-232       -8.678E-01       1.306E+01       5.009E+01       0.000E+00       -0.197         U-235       -9.877E+00       3.069E+01       5.009E+01       0.000E+00       -0.602         U-238       4.030E+02       3.819E+	CS-136	-5.181E-01	3.419E+00			
BA-140       2.596E+00       1.280E+01       2.106E+01       0.000E+00       0.123         LA-140       -5.023E-01       3.782E+00       6.066E+00       0.000E+00       -0.083         CE-141       -1.352E+01       6.894E+00       1.083E+01       0.000E+00       -1.248         CE-144       -5.042E+01       3.033E+01       4.811E+01       0.000E+00       -1.048         EU-152       -1.362E+01       1.362E+01       1.800E+01       0.000E+00       -0.756         EU-154       -3.997E+00       7.989E+00       1.303E+01       0.000E+00       -0.307         RA-226       1.206E+01       9.696E+01       1.580E+02       0.000E+00       0.076         AC-228       -8.681E-01       1.306E+01       2.143E+01       0.000E+00       -0.040         TH-232       -8.678E-01       1.306E+01       2.143E+01       0.000E+00       -0.040         U-235       -9.877E+00       3.069E+01       5.009E+01       0.000E+00       -0.579         U-238       4.030E+02       3.819E+02       6.690E+02       0.000E+00       -0.579	CS-137	5.466E+00				
LA-140	CE-139	-2.959E-01				
LA-140	BA-140	2.596E+00				
CE-141		-5.023E-01	3.782E+00			
EU-152 -1.362E+01 1.362E+01 1.800E+01 0.000E+00 -0.307 EU-154 -3.997E+00 7.989E+00 1.303E+01 0.000E+00 -0.307 RA-226 1.206E+01 9.696E+01 1.580E+02 0.000E+00 0.076 AC-228 -8.681E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 TH-232 -8.678E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 U-235 -9.877E+00 3.069E+01 5.009E+01 0.000E+00 -0.197 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 -0.579	CE-141	-1.352E+01				
EU-152	CE-144	-5.042E+01				
RA-226	EU-152	-1.362E+01	1.362E+01			
AC-228 -8.681E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 TH-232 -8.678E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 U-235 -9.877E+00 3.069E+01 5.009E+01 0.000E+00 -0.197 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 0.602	EU-154	-3.997E+00				
TH-232 -8.678E-01 1.306E+01 2.143E+01 0.000E+00 -0.040 U-235 -9.877E+00 3.069E+01 5.009E+01 0.000E+00 -0.197 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 0.602	RA-226	1.206E+01				
U-235	AC-228	-8.681E-01				
U-235 -9.877E+00 3.069E+01 5.009E+01 0.000E+00 -0.197 U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 0.602		-8.678E-01				
U-238 4.030E+02 3.819E+02 6.690E+02 0.000E+00 0.602		-9.877E+00				
AM-241 -3.103E+01 4.018E+01 5.362E+01 0.000E+00 -0.579	U-238	4.030E+02				
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-3.103E+01,

C, AM-241

,NO,

LIMS: Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 30-JUL-2006 23:46:18.99 TBE23 03017322 HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:04:06.80

LIMS No., Customer Name, Client ID: WG L29389-3 EX QUAD

\_\_\_\_\_

Smple Date: 27-JUL-2006 10:10:00. : 23L29389-3 Sample ID

Geometry : 2335L090704 Sample Type : WG BKGFILE : 23BG072806MT Quantity : 3.27300E+00 L Start Channel: 50 Energy Tol: 1.00000 Real Time: 0 02:41:57.99 End Channel: 4090 Pk Srch Sens: 5.00000 Live time: 0 02:41:51.52 MDA Constant: 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1.	0	33.57*	0	100	1.00	67.47	9.06E-02	6.69E-06*	****	
2	0	41.51*	46	277	3.26	83.32	2.50E-01	4.69E-03	68.3	
3	0	77.28*	100	375	1.05	154.77	1.36E+00	1.03E-02	34.1	
4	0	92.67*	52	449	1.37	185.53	1.69E+00	5.33E-03	80.1	
5	0	139.46*	23	438	0.56	279.02	2.05E+00	2.41E-03	157.8	
6	4	238.61*	59	225	1.78	477.13	1.72E+00	6.04E-03	49.9	1.33E+00
7	4	241.90	123	275	1.79	483.71	1.71E+00	1.27E-02	28.1	
8	0	295.15*	153	197	1.30	590.12	1.50E+00	1.58E-02	18.7	
9	0	351.73*	255	208	1.35	703.22	1.32E+00	2.63E-02	13.5	
10	0	609.19*	283	70	1.33	1217.96	8.59E-01	2.91E-02	9.0	
11	Ô	1120.92*	60	47	1.64	2241.90	5.52E-01	6.18E-03	31.0	
12	0	1460.39*	1	19	1.97	2921.72	4.60E-01	1.22E-04	****	
13	0	1728.94	28	7	0.89	3459.85	4.07E-01	2.89E-03	27.4	
14	Ō	1764.28*	61	3	2.61	3530.69	4.00E-01	6.26E-03	16.0	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

NUCLIUC	Type: macaran				Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	1	10.67*	4.595E-01	2.056E+00	2.056E+00	2352.21
TH-228	238.63	59	44.60*	1.724E+00	6.487E+00	6.509E+00	99.70
	240.98	123	3.95	1.710E+00	1.549E+02	1.555E+02	56.23

Flaq: "\*" = Keyline

Summary of Nuclide Activity Sample ID : 23L29389-3

Acquisition date : 30-JUL-2006 21:04:06

14

11

Total number of lines in spectrum Number of unidentified lines

Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma Decay pCi/L pCi/L 2-Sigma Error %Error Flags 1.00 2.056E+00 2.056E+00 48.36E+00 2352.21 1.00 6.487E+00 6.509E+00 6.490E+00 99.70 Hlife Nuclide K-40 1.28E+09Y 1.00 TH-228 1.91Y \_\_\_\_\_ \_\_\_\_\_

> Total Activity: 8.542E+00 8.565E+00

Grand Total Activity: 8.542E+00 8.565E+00

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID : 23L29389-3

Acquisition date : 30-JUL-2006 21:04:06

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0 0	33.57 41.51 77.28 92.67 139.46 295.15 351.73 609.19 1120.92	0 46 100 52 23 153 255 283 60 28	100 277 375 449 438 197 208 70 47	1.00 3.26 1.05 1.37 0.56 1.30 1.35 1.33	67.47 83.32 154.77 185.53 279.02 590.12 703.22 1217.96 2241.90	2234	9 7 9 8 9 13 14 17	6.69E-06 4.69E-03 1.03E-02 5.33E-03 2.41E-03 1.58E-02 2.63E-02 2.91E-02 6.18E-03 2.89E-03	**** **** 37.4 27.1	9.06E-02 2.50E-01 1.36E+00 1.69E+00 2.05E+00 1.50E+00 1.32E+00 8.59E-01 5.52E-01	) ) ) ) ) ) L
0	1764.28	61	3	2.61	3530.69	3525	14	6.26E-03	32.0	4.00E-01	1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 14 Number of unidentified lines 11 Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

			Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr		
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	2.056E+00	2.056E+00	48.36E+00	2352.21	
TH-228	1.91Y	1.00	6.487E+00	6.509E+00	6.490E+00	99.70	
	Total Acti	Lvity :	8.542E+00	8.565E+00			

Grand Total Activity: 8.542E+00 8.565E+00

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.056E+00	4.836E+01	3.720E+01	0.000E+00	0.055
TH-228	6.509E+00	6.490E+00	8.809E+00	0.000E+00	0.739

---- Non-Identified Nuclides ----

Key-Line					,
Activity	K.L.	Act error	MDA	MDA error	Act/MDA

Nuclide	(pCi/L)	Ided		(pCi/L)		
BE-7	2.148E+01		2.365E+01	4.398E+01	0.000E+00	0.488
NA-24	1.009E+02		1.271E+02	2.514E+02	0.000E+00	0.401
CR-51	1.485E+01		2.575E+01	4.508E+01	0.000E+00	0.330
MN-54	-9.260E-01		2.548E+00	4.462E+00	0.000E+00	-0.208
CO-57	-1.425E-01		3.172E+00	5.241E+00	0.000E+00	-0.027
CO-58	-2.534E+00		2.855E+00	4.542E+00	0.000E+00	-0.558
FE-59	3.948E-02		5.098E+00	9.147E+00	0.000E+00	0.004
CO-60	-1.082E+00		2.917E+00	4.965E+00	0.000E+00	-0.218
ZN-65	-5.608E+00		7.538E+00	1.018E+01	0.000E+00	-0.551
SE-75	-2.260E+00		4.070E+00	6.783E+00	0.000E+00	-0.333
SR-85	-1.346E+00		3.617E+00	6.148E+00	0.000E+00	-0.219
Y-88	1.787E-01		2.631E+00	4.956E+00	0.000E+00	0.036
NB-94	2.879E+00		2.589E+00	4.913E+00	0.000E+00	0.586
NB-95	5.461E+00		2.878E+00	5.732E+00	0.000E+00	0.953
ZR-95	1.172E+00		4.846E+00	8.628E+00	0.000E+00	0.136
MO-99	-2.652E+01		4.937E+01	8.197E+01	0.000E+00	-0.324
RU-103	-2.859E+00		2.892E+00	4.761E+00	0.000E+00	-0.600
RU-106	-8.852E+00		2.743E+01	4.674E+01	0.000E+00	-0.189
AG-110m	-1.328E+00		2.492E+00	4.177E+00	0.000E+00	-0.318
SN-113	2.347E+00		3.623E+00	6.385E+00	0.000E+00	0.368
SB-124	-1.548E-01		3.132E+00	4.684E+00	0.000E+00	-0.033
SB-125	-9.821E+00		8.271E+00	1.284E+01	0.000E+00	-0.765
TE-129M	-1.040E+01		3.272E+01	5.661E+01	0.000E+00	-0.184
I-131	1.833E+00		3.845E+00	6.705E+00	0.000E+00	0.273
BA-133	4.189E+00		4.434E+00	6.985E+00	0.000E+00	0.600
CS-134	2.024E+00		2.930E+00	4.737E+00	0.000E+00	0.427
CS-136	1.349E+00		3.704E+00	6.561E+00	0.000E+00	0.206
CS-137	-1.095E+00		2.815E+00	4.776E+00	0.000E+00	-0.229
CE-139	3.101E-01		3.011E+00	5.228E+00	0.000E+00	0.059
BA-140	-1.091E+01		1.136E+01	1.862E+01	0.000E+00	-0.586
LA-140	-7.200E-01		3.657E+00	6.553E+00	0.000E+00	-0.110
CE-141	3.568E+00		6.116E+00	9.898E+00	0.000E+00	0.360
CE-144	-6.547E-01		2.413E+01	3.839E+01	0.000E+00	-0.017
EU-152	-9.194E-01		9.154E+00	1.456E+01	0.000E+00	-0.063
EU-154	-3.513E+00		6.629E+00	1.077E+01	0.000E+00	-0.326
RA-226	1.603E+01		7.937E+01	1.406E+02	0.000E+00	0.114
AC-228	-4.872E+00		1.032E+01	1.833E+01	0.000E+00	-0.266
TH-232	-4.866E+00		1.030E+01	1.830E+01	0.000E+00	-0.266
U-235	-1.068E+01		2.971E+01	4.189E+01	0.000E+00	-0.255
U-238	6.224E+01		3.181E+02	5.877E+02	0.000E+00	0.106
AM-241	-9.464E+00	)	1.625E+01	2.710E+01	0.000E+00	-0.349

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3.273E+00, WG L29389-3 EX
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                                             ,07/28/2006 10:10,2335L090704
B,23L29389-3
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                                    4.836E+01,
                                                   3.720E+01,,
                                                                    0.055
C, K-40
                                                                    0.739
C, TH-228
                    6.509E+00,
                                    6.490E+00,
                                                   8.809E+00,,
           ,YES,
           , NO
C, BE-7
                     2.148E+01,
                                    2.365E+01,
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                                                   2.514E+02,,
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C, NA-24
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C, CR-51
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C, MN-54
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C, CO-60
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C, SE-75
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C, SR-85
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C, RU-103
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C,BA-140
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C, TH-232
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                                                   4.189E+01,,
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C, U-238
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                                    3.181E+02,
                                                   5.877E+02,,
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1.625E+01,

2.710E+01,,

-0.349

-9.464E+00,

C, AM-241

, NO

Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 15:52:30.79 TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:19.12

LIMS No., Customer Name, Client ID: L29389-4 WG EX/QUAD

Sample ID : 07L29389-4 Smple Date: 27-JUL-2006 11:00:00.

Sample Type : WG Geometry : 073L082504
Quantity : 3.04170E+00 L BKGFILE : 07BG070106MT
Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 02:32:02.94
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:32:00.95

MDA Constant : 0.00 Library Used: LIBD

Pk	Ιt	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
٦	٦	CE 00+	98	316	1.59	132.83	7 92E-01	1.07E-02	33.9	1.57E+00
1	1	65.98*						8.55E-03		
2	1	77.22*	78	283	1.02	155.33	1.23E+00			
3	1	140.05*	97	334	1.43	281.17	2.36E+00	1.06E-02	37.6	1.34E+00
4	1	198.34*	70	285	1.24	397.89	2.25E+00	7.67E-03	48.5	1.40E+00
5	1	241.93*	163	141	1.20	485.17	2.04E+00	1.79E-02	15.4	9.32E-01
6	1	295.27*	273	166	1.65	591.97	1.81E+00	2.99E-02	12.2	3.03E+00
7	1	351.70*	413	171	1.18	704.95	1.61E+00	4.52E-02	8.4	2.81E+00
8	1	595.82	49	76	1.49	1193.63	1.10E+00	5.37E-03	37.4	1.76E+00
9	1	609.13*	396	76	1.59	1220.28	1.09E+00	4.34E-02	7.3	1.19E+00
1.0	1	767.84	44	68	1.87	1537.89	9.20E-01	4.78E-03	46.6	7.96E-01
11	1	1120.11*	86	50	2.26	2242.72	7.03E-01	9.40E-03	23.0	1.05E+00
12	1	1155.17	22	34	1.64	2312.85	6.88E-01	2.39E-03	62.8	6.12E-01
13	1	1239.76	32	57	2.42	2482.06	6.54E-01	3.54E-03	65.6	5.40E+00
1.4	1	1378.57	16	23	1.19	2759.67	6.07E-01	1.73E-03	76.6	2.54E+00
15	1	1730.33	54	15	5.58	3463.01	5.19E-01	5.93E-03	20.6	2.97E+00
16	1	1764.36*	57	12	2.43	3531.04	5.12E-01	6.23E-03	21.2	1.13E+00

Flaq: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity Sample ID : 07L29389-4

Acquisition date: 28-JUL-2006 13:20:19

16 Total number of lines in spectrum Number of unidentified lines 15

Number of lines tentatively identified by NID 1
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\* 6.25%

Flags: "K" = Keyline not found

"M" = Manually accepted "A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 07L29389-4

Page: 3 Acquisition date: 28-JUL-2006 13:20:19

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
It  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Energy  65.98 77.22 140.05 198.34 241.93 295.27 351.70 595.82 609.13 767.84 1120.11 1155.17 1239.76 1378.57	98 78 97 70 163 273 413 49 396 44 86 22 32 16	316 283 334 285 141 166 171 76 76 68 50 34 57 23	1.59 1.02 1.43 1.24 1.20 1.65 1.18 1.49 1.59 1.87 2.26 1.64 2.42 1.19	132.83 155.33 281.17 397.89 485.17 591.97 704.95 1193.63 1220.28 1537.89 2242.72 2312.85 2482.06 2759.67	129 153 276 393 482 586 699 1190 1212 1529 2235 2306 2469 2754	8 7 10 10 8 13 12 11 14 17 18 15 25 15	1.07E-02 8.55E-03 1.06E-02 7.67E-03 1.79E-02 2.99E-02 4.52E-02 5.37E-03 4.34E-02 4.78E-03 9.40E-03 2.39E-03 3.54E-03 1.73E-03	67.9 79.1 75.2 97.0 30.9 24.4 16.8 74.8 14.7 93.1 46.0 **** ****	7.92E-01 1.23E+00 2.36E+00 2.25E+00 2.04E+00 1.81E+00 1.61E+00 1.10E+00 1.09E+01 7.03E-01 6.88E-01 6.54E-01 6.07E-01	T
1 1	1730.33 1764.36	54 57	15 12	5.58 2.43	3463.01 3531.04					5.12E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

16 Total number of lines in spectrum 15 Number of unidentified lines Number of lines tentatively identified by NID 1 6.25% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

"M" = Manually accepted Flags: "K" = Keyline not found
"E" = Manually edited

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

No interference correction performed

Combined Activity-MDA Report

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
CR-51 MN-54 CO-57 CO-58 FE-59 CO-60 ZN-65	2.044E+01 9.198E+00 -3.441E+01 -1.554E+01 2.080E+00 2.231E+00 -3.164E+00 3.616E+00 2.736E+00 2.710E+01 -4.395E+00		2.594E+01 1.299E+01 4.298E+01 2.891E+01 3.207E+00 3.167E+00 3.476E+00 5.875E+00 3.526E+00 9.240E+00	4.471E+01 1.979E+01 7.782E+01 4.659E+01 5.465E+00 5.244E+00 5.321E+00 1.008E+01 6.177E+00 1.625E+01 6.635E+00	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	0.457 0.465 -0.442 -0.334 0.381 0.425 -0.595 0.359 0.443 1.668 -0.662

Y-88 NB-94 NB-95 ZR-95 MO-99 RU-103 RU-106 AG-110m SN-113 SB-124 SB-125 TE-129M I-131 BA-133 CS-134 CS-136 CS-137 CE-139 BA-140 IA-140	-3.457E+00 2.469E-01 3.797E+00 3.895E+00 8.266E+00 2.279E+00 -8.654E+00 -1.958E+00 -3.304E-01 7.508E-01 6.237E-01 -3.477E+00 2.452E+00 1.698E+01 2.635E+01 1.007E+00 1.709E+00 5.860E-01 6.116E+00 -1.509E+00	3.809E+00 3.159E+00 3.848E+00 6.006E+00 3.146E+01 3.290E+00 2.937E+01 3.130E+00 4.234E+00 6.599E+00 9.218E+00 3.601E+01 3.558E+00 5.932E+00 7.238E+00 3.403E+00 3.422E+00 3.181E+00 1.155E+01 4.086E+00	5.564E+00 5.238E+00 5.824E+00 9.107E+00 5.264E+01 5.621E+00 4.668E+01 4.985E+00 6.860E+00 4.896E+00 1.540E+01 5.937E+01 6.006E+00 9.582E+00 8.622E+00 5.668E+00 5.849E+00 5.297E+00 1.954E+01 6.495E+00	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	-0.621 0.047 0.652 0.428 0.157 0.406 -0.185 -0.393 -0.048 0.153 0.040 -0.059 0.408 1.773 3.057 0.178 0.292 0.111 0.313 -0.232
	6.237E-01	9.218E+00	1.540E+01		
·= ·		3.601E+01	5.937E+01	• • • • • • • • • • • • • • • • • • • •	
		3.558E+00	6.006E+00		
		7.238E+00	8.622E+00		
		3.403E+00	5.668E+00		
		3.422E+00	5.849E+00		
		3.181E+00		• • • • • • • • • • • • • • • • • • • •	
_	6.116E+00	1.155E+01			
LA-140	-1.509E+00	4.086E+00		- · · · ·	
CE-141	1.842E+00	6.420E+00	9.277E+00	0.000E+00	0.199
CE-144	1.592E+00	2.764E+01	3.975E+01	0.000E+00	0.040
EU-152	-6.061E+00	1.209E+01	1.624E+01	0.000E+00	-0.373 -0.141
EU-154	-1.523E+00	6.723E+00	1.079E+01	0.000E+00	0.199
RA-226	2.752E+01	8.261E+01	1.384E+02	0.000E+00	-0.090
AC-228	-1.920E+00	1.288E+01	2.126E+01	0.000E+00	1.058
TH-228	1.230E+01	7.509E+00	1.162E+01	0.000E+00 0.000E+00	-0.090
TH-232	-1.919E+00	1.288E+01	2.125E+01	0.000E+00	0.393
U-235	1.665E+01	2.894E+01	4.241E+01	0.000E+00	0.289
U-238	1.668E+02	3.381E+02	5.780E+02	0.000E+00	-0.718
AM-241	-3.413E+01	3.323E+01	4.752E+01	0.0006+00	0.710

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C, BE-7
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                                    1.299E+01,
                     9.198E+00,
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C, NA-24
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                                    4.298E+01,
                   -3.441E+01,
C, K-40
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                                    2.891E+01,
                   -1.554E+01,
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C, CO-60
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                                                                   -0.621
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C, Y-88
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C, NB-94
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                                                                    0.652
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C, NB-95
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C, ZR-95
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                     8.266E+00,
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C, RU-106
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C, AG-110m , NO
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            , NO
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 C, CS-136
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                                     3.422E+00,
            ,NO
 C, CS-137
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                                     1.155E+01,
                      6.116E+00,
            , NO
 C, BA-140
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                                                                    -0.232
                                     4.086E+00,
                     -1.509E+00,
             , NO
 C, LA-140
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                                                                     0.199
                                     6.420E+00,
             , NO
                      1.842E+00,
 C, CE-141
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                                     2.764E+01,
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                                                    4.752E+01,,
                                     3.323E+01,
                     -3.413E+01,
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C, AM-241

,NO,

Analyst: Sec. Reyiew:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 15:47:25.22 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:17.59 

LIMS No., Customer Name, Client ID: L29389-5 WG EX/QUAD

Smple Date: 27-JUL-2006 13:15:00. : 04L29389-5 Sample ID

Geometry : 043L082004 : WG Sample Type BKGFILE : 04BG070106MT : 2.99300E+00 L Quantity Start Channel: 90 Energy Tol: 1.50000 Real Time: 0 02:27:02.59 End Channel: 4090 Pk Srch Sens: 5.00000 Live time: 0 02:27:00.81 MDA Constant: 0.00 Library Used: LIBD

Pk :	Ιt	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11 12	1 1 1 1 1 1 1 1 1	66.68* 77.25 198.16* 240.67* 295.13* 351.92* 597.60 609.01* 767.96 1119.94* 1237.61 1460.71* 1764.13*	39 143 73 38 288 435 97 395 47 101 44 5	375 292 210 249 166 166 87 42 23 23 20 18	2.53		1.87E+00 1.67E+00 1.46E+00 1.28E+00	1.62E-02 8.27E-03 4.32E-03 3.26E-02 4.93E-02 1.10E-02 4.48E-02 5.31E-03 1.15E-02 4.98E-03 6.05E-04	21.7 37.5 91.5 11.4 8.3 27.1 6.4 25.5 15.8 27.8 227.5	4.19E+00 1.77E+00 1.45E+01 1.74E+00 3.62E+00 2.17E+00 1.54E+00 1.65E+00 1.04E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

2-Sigma Uncorrected Decay Corr pCi/L %Error %Abn %Eff pCi/L Area Energy Nuclide 1.192E+01 455.05 10.67\* 4.296E-01 1.192E+01 5 1460.81 K - 40

Flag: "\*" = Keyline

Summary of Nuclide Activity

Acquisition date: 28-JUL-2006 13:20:17 Sample ID : 04L29389-5

13

Total number of lines in spectrum

11 Number of unidentified lines

Number of lines tentatively identified by NID 2 15.38%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags

K-40 1.28E+09Y 1.00 1.192E+01 1.192E+01 5.425E+01 455.05

Total Activity: 1.192E+01 1.192E+01

Grand Total Activity: 1.192E+01 1.192E+01

"M" = Manually accepted "A" = Nuclide specific abn. limit Flags: "K" = Keyline not found
"E" = Manually edited

Unidentified Energy Lines
Sample ID: 04L29389-5
Acquisition date: 28-JUL-2006 13:20:17

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 1 1 1 1 1	66.68 77.25 198.16 240.67 295.13 351.92 597.60 609.01	39 143 73 38 288 435 97 395	375 292 210 249 166 166 87 42	1.20 1.22 1.60 1.04 1.27 1.18 6.91 1.44	134.25 155.42 397.37 482.42 591.39 705.01 1196.49 1219.33	130 153 394 476 586 698 1185 1213	8 7 8 12 13 14 22	4.43E-03 1.62E-02 8.27E-03 4.32E-03 3.26E-02 4.93E-02 1.10E-02 4.48E-02	**** 43.4 75.1 **** 22.7 16.6 54.1 12.7	6.77E-01 1.07E+00 1.87E+00 1.67E+00 1.46E+00 1.28E+00 8.61E-01 8.49E-01	
1	767.96 1119.94	47 101	23 23	2.42	2241.07			1.15E-02		5.27E-01	
1			9,							• · • · · ·	
1	767.96	47	23	2.42							
1	1237.61 1764.13	44 70	20 17	2.12	2476.32 3528.61	2468	16		55.6	4.88E-01 3.77E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 13
Number of unidentified lines 11
Number of lines tentatively identified by NID 2 15.38%

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma %Error Flags pCi/L 2-Sigma Error pCi/L Nuclide Hlife Decay 5.425E+01 455.05 1.192E+01 1.192E+01 K - 401.28E+09Y 1.00 \_\_\_\_\_

1,192E+01

Grand Total Activity : 1.192E+01 1.192E+01

Flags: "K" = Keyline not found "M" = Manually accepted

1.192E+01

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Total Activity :

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.192E+01	5.425E+01	6.205E+01	0.000E+00	0.192
Non-Iden	tified Nuclides				

Key-Line
Activity K.L. Act error MDA MDA error Act/MDA
Nuclide (pCi/L) Ided (pCi/L)

		0.0078.01	4.954E+01	0.000E+00	0.340
BE-7	1.682E+01	2.907E+01 1.460E+01	1.868E+01	0.000E+00	-1.625
NA-24	-3.035E+01	3.190E+01	5.108E+01	0.000E+00	-0.136
CR-51	-6.929E+00	3.190E+01 3.916E+00	5.907E+00	0.000E+00	-0.582
MN-54	-3.438E+00	3.420E+00	5.600E+00	0.000E+00	0.071
CO-57	3.985E-01	3.420E+00 3.687E+00	5.212E+00	0.000E+00	-1.042
CO-58	-5.431E+00	6.865E+00	1.263E+01	0.000E+00	0.686
FE-59	8.661E+00	3.991E+00	6.951E+00	0.000E+00	0.158
CO-60	1.099E+00	1.034E+01	1.781E+01	0.000E+00	1.181
ZN-65	2.104E+01	4.731E+00	7.360E+00	0.000E+00	-0.675
SE-75	-4.970E+00	4.470E+00	7.946E+00	0.000E+00	1.052
SR-85	8.356E+00		6.275E+00	0.000E+00	0.153
Y-88	9.610E-01	3.651E+00	5.802E+00	0.000E+00	-0.310
NB-94	-1.800E+00	3.647E+00	6.998E+00	0.000E+00	0.800
NB-95	5.599E+00	4.410E+00	9.307E+00	0.000E+00	-0.264
ZR-95	-2.453E+00	5.891E+00	5.742E+01	0.000E+00	0.248
MO-99	1.425E+01	3.373E+01	5.606E+00	0.000E+00	-0.134
RU-103	-7.511E-01	3.479E+00	5.414E+01	0.000E+00	-0.132
RU-106	-7.163E+00	3.303E+01	5.358E+00	0.000E+00	-0.078
AG-110m	-4.154E-01	3.264E+00	7.491E+00	0.000E+00	-0.450
SN-113	-3.370E+00	4.694E+00	7.491E+00 5.314E+00	0.000E+00	0.583
SB-124	3.100E+00	5.743E+00		0.000E+00	-0.041
SB-125	-6.995E-01	1.038E+01	1.709E+01 6.840E+01	0.000E+00	-0.161
TE-129M	-1.100E+01	4.226E+01		0.000E+00	0.239
I-131	1.542E+00	3.784E+00	6.458E+00	0.000E+00	0.477
BA-133	3.859E+00	5.337E+00	8.088E+00	0.000E+00	1.681
CS-134	1.212E+01	6.091E+00	7.208E+00	0.000E+00	0.533
CS-136	3.503E+00	3.728E+00	6.571E+00	0.000E+00	0.045
CS-137	2.957E-01	3.928E+00	6.544E+00	0.000E+00	0.188
CE-139	1.105E+00	3.624E+00	5.886E+00	0.000E+00	-0.037
BA-140	-7.990E-01	1.321E+01	2.141E+01	0.000E+00	0.142
LA-140	1.144E+00	4.788E+00	8.051E+00	0.000E+00	0.150
CE-141	1.489E+00	6.093E+00	9.938E+00	0.000E+00	0.207
CE-144	9.228E+00	2.711E+01	4.454E+01	0.000E+00	-0.096
EU-152	-1.765E+00	1.349E+01	1.838E+01	0.000E+00	-0.096
EU-154	-8.953E-01	7.249E+00	1.176E+01	0.000E+00	0.605
RA-226	9.282E+01	8.788E+01	1.535E+02		0.014
AC-228	3.325E-01	1.355E+01	2.314E+01	0.000E+00	0.014
TH-228	1.376E+00	8.213E+00	1.225E+01	0.000E+00	0.014
TH-232	3.324E-01	1.355E+01	2.314E+01	0.000E+00	-0.466
U-235	-2.054E+01	2.799E+01	4.405E+01	0.000E+00	0.431
U-238	2.834E+02	3.694E+02	6.573E+02	0.000E+00	-0.271
AM-241	-1.627E+01	3.727E+01	5.999E+01	0.000E+00	-U.Z/I

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,07/28/2006 15:47,07/27/2006 13:15,
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C, K-40
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                                                   4.954E+01,,
           , NO
                    1.682E+01,
C, BE-7
                                                   1.868E+01,,
                                                                   -1.625
                                    1.460E+01,
           , NO
                    -3.035E+01,
C, NA-24
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                                    3.190E+01,
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C, MN-54
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C, CO-57
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                     8.661E+00,
C, FE-59
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                                                   7.946E+00,,
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C, SR-85
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                                                   6.275E+00,,
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-1.627E+01,

C, AM-241

, NO

5.999E+01,,

LIMS: Analyst: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 16:21:53.60

TBE23 03017322 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:26.10 

LIMS No., Customer Name, Client ID: L29389-6 WG EX/QUAD

Smple Date: 27-JUL-2006 14:05:00. : 23L29389-6 Sample ID

Geometry : 233L082404 Sample Type : WG BKGFILE : 23BG070106MT : 2.92950E+00 L Quantity 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec <sup>5</sup>	&Err	Fit
1 2	0	77.01* 139.44	100 109	518 406	1.27	154.25 278.97	2.32E+00	9.24E-03 4 9.99E-03 3 2.11E-031	32.2	0.00E+00
3 4 5	0 0 1	185.25* 198.31 238.63*	23 82 21	475 344 284	1.32 0.99 1.34	370.50 396.61 477.17		7.58E-03 (	40.6 46.1	1.30E+00
6 7	1	241.99 295.11*	166 409	256 264 214	1.34 1.28 1.34	483.88 590.04 703.28	1.88E+00 1.64E+00 1.43E+00	3.77E-02	18.5 9.8 7.3	
8 9 10	0 0 0	351.76* 609.04* 768.31	559 476 94	74 60	1.64 1.46	1217.66 1536.24	9.41E-01 7.96E-01	4.38E-02 8.67E-03		
11 12 13	0 0 0	1120.40* 1239.97 1379.86	111 49 46	40 51 40	1.69 1.05 8.89	2240.86 2480.26 2760.41	6.16E-01 5.74E-01 5.32E-01		38.4	
14 15 16	0	1460.66* 1729.69 1763.90*	28 30 82	25 7 11	1.56 1.30 0.91	3461.37	5.10E-01 4.45E-01 4.38E-01	2.012		

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide	Type: natura	1			Uncorrected	Decay Corr	2-Sigma
Nuclide K-40 RA-226 TH-228	Energy 1460.81 186.21 238.63 240.98	Area 28 23 21	%Abn 10.67* 3.28* 44.60* 3.95	%Eff 5.096E-01 2.177E+00 1.900E+00 1.888E+00	pCi/L 4.317E+01 2.727E+01 2.094E+00	pCi/L 4.317E+01 2.727E+01 2.096E+00 ne Not Found	%Error 120.35 375.68 292.20

Flag: "\*" = Keyline

Summary of Nuclide Activity Sample ID : 23L29389-6 Acquisition date : 28-JUL-2006 13:20:26

Total number of lines in spectrum 16

Number of unidentified lines 13
Number of lines tentatively identified by NID 3 18.75%

Nuclide Type : natural

				Uncorrected	Decay Corr	Decay Corr		
ř	Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error Flags	3
		1.28E+09Y		4.317E+01	4.317E+01	5.195E+01	120.35	
		1600.00Y		2.727E+01	2.727E+01	10.24E+01	375.68	
ALL NORTH A	RA-226			2.094E+00	2.096E+00	6.124E+00	292.20	
	TH-228	1.91Y	1.00	2.0946+00	2.000100	0.1211.00		
		Total Acti	vity :	7.253E+01	7.253E+01			

Grand Total Activity: 7.253E+01 7.253E+01

Flags: "K" = Keyline not found

"M" = Manually accepted "A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 23L29389-6

Acquisition date : 28-JUL-2006 13:20:26

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
	77.01 139.44 198.31 241.99 295.11 351.76 609.04 768.31 1120.40 1239.97 1379.86 1729.69	100 109 82 166 409 559 476 94 111 49 46 30	518 406 344 256 264 214 74 60 40 51 40	1.27 1.20 0.99 1.34 1.28 1.34 1.64 1.69 1.05 8.89 1.30	154.25 278.97 396.61 483.88 590.04 703.28 1217.66 1536.24 2240.86 2480.26 2760.41 3461.37	151 276 393 473 584 696 1211 1528 2232 2471 2750 3454	7 8 17 13 15 12 16 18 19 25	9.24E-03 9.99E-03 7.58E-03 1.53E-02 3.77E-02 5.14E-02 4.38E-02 8.67E-03 1.02E-02 4.47E-03 4.26E-03 2.80E-03	80.5 64.4 81.1 37.0 19.6 14.7 12.3 43.0 34.5 76.9 77.3 51.6	1.53E+00 2.32E+00 2.11E+00 1.88E+00 1.64E+00 9.41E-01 7.96E-01 6.16E-01 5.74E-01 5.32E-01 4.45E-01	
0	1763.90	82	11	0.91	3529.94	3522	Т6	7.53E-03	34.4	4.38E-01	•

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 16 Number of unidentified lines 13
Number of lines tentatively identified by NID 3 18.75%

Nuclide Type : natural

			Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	_
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error		Flags
	1.28E+09Y	1.00	4.317E+01	4.317E+01	5.195E+01	120.35	
RA-226	1600.00Y	1.00	2.727E+01	2.727E+01	10.24E+01	375.68	
TH-228	1.91Y	1.00	2.094E+00	2.096E+00	6.124E+00	292.20	
	Total Act:	ivity :	7.253E+01	7.253E+01			

Grand Total Activity: 7.253E+01 7.253E+01

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Tdentified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	4.317E+01	5.195E+01	5.393E+01	0.000E+00	0.800
RA-226	2.727E+01	1.024E+02	1.454E+02	0.000E+00	0.188
TH-228	2.096E+00	6.124E+00	1.087E+01	0.000E+00	0.193

# ---- Non-Identified Nuclides ----

Nuclide	-	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	7.746E-01		2.895E+01	4.896E+01	0.000E+00	0.016
NA-24	5.132E+00		1.130E+01	1.797E+01	0.000E+00	0.286
CR-51	-3.361E+01		2.938E+01	4.811E+01	0.000E+00	-0.699
MN-54	-1.814E-01		3.113E+00	5.434E+00	0.000E+00	-0.033
CO-57	1.466E-01		3.521E+00	5.800E+00	0.000E+00	0.025
CO-58	-2.542E+00		3.211E+00	5.333E+00	0.000E+00	-0.477
FE-59	-1.286E-01		5.948E+00	1.053E+01	0.000E+00	-0.012
CO-60	-2.381E+00		3.225E+00	5.307E+00	0.000E+00	-0.449
ZN-65	2.165E+01		9.548E+00	1.684E+01	0.000E+00	1.286
SE-75	-1.073E+00		4.553E+00	7.524E+00	0.000E+00	-0.143
SR-85	9.687E+00		3.639E+00	6.916E+00	0.000E+00	1.401
Y-88	-1.456E+00		3.024E+00	5.149E+00	0.000E+00	-0.283
NB-94	-1.962E+00		3.270E+00	5.393E+00	0.000E+00	-0.364
NB-95	5.849E+00		4.232E+00	6.929E+00	0.000E+00	0.844
ZR-95	-2.183E+00		6.339E+00	9.844E+00	0.000E+00	-0.222
MO-99	-1.727E+00		3.163E+01	5.402E+01	0.000E+00	-0.032
RU-103	-4.362E-01		3.395E+00	5.856E+00	0.000E+00	-0.074
RU-106	-4.016E+00		3.061E+01	5.241E+01	0.000E+00	-0.077
AG-110m	1.572E-01		3.252E+00	5.612E+00	0.000E+00	0.028
SN-113	1.423E+00		4.522E+00	7.788E+00	0.000E+00	0.183
SB-124	-6.782E+00		4.370E+00	5.566E+00	0.000E+00	-1.219
SB-125	6.247E+00		9.880E+00	1.725E+01	0.000E+00	0.362
TE-129M	7.046E+00		3.981E+01	6.787E+01	0.000E+00	0.104
I-131	-2.443E+00		3.724E+00	6.173E+00	0.000E+00	-0.396
BA-133	2.345E+01		5.956E+00	1.035E+01	0.000E+00	2.265
CS-134	1.908E+01		5.234E+00	9.046E+00	0.000E+00	2.109
CS-136	1.937E+00		3.205E+00	5.852E+00	0.000E+00	0.331
CS-137	-1.433E-01		3.560E+00	6.114E+00	0.000E+00	-0.023
CE-139	1.004E+00		3.558E+00	6.059E+00	0.000E+00	0.166
BA-140	-1.249E+00		1.240E+01	2.138E+01	0.000E+00	-0.058
LA-140	3.224E-01		3.651E+00	6.620E+00	0.000E+00	0.049
CE-141	2.135E+00		7.124E+00	1.046E+01	0.000E+00	0.204
CE-144	1.791E+00		3.130E+01	4.578E+01	0.000E+00	0.039
EU-152	-5.546E-01		1.233E+01	1.784E+01	0.000E+00	-0.031
EU-154	-1.871E+00		7.469E+00	1.221E+01	0.000E+00	-0.153
AC-228	6.579E+00		1.223E+01	2.218E+01	0.000E+00	0.297
TH-232	6.576E+00		1.223E+01	2.218E+01	0.000E+00	0.297
U-235	1.702E+01		3.218E+01	4.745E+01	0.000E+00	0.359
U-238	-3.873E+02		3.881E+02	6.294E+02	0.000E+00	-0.615
AM-241	-9.501E+00		1.952E+01	3.256E+01	0.000E+00	-0.292

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Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 16:31:09.23
TBE14 P-10933A HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:25.47

LIMS No., Customer Name, Client ID: L29389-7 WG EX/QUAD

Sample ID : 14L29389-7 Smple Date: 27-JUL-2006 14:15:00.

MDA Constant : 0.00 Library Used: LIBD

Pk It	Energy	Area	Bkgnd	FWHM Channe	el %Eff	Cts/Sec %Err	Fit
2 1 3 1 4 1	92.13* 185.47* 295.65* 352.06* 609.39*	22 57 33 87 70	310 260 128	2.24 373. 2.26 594. 2.42 707.	1.88E+00 1.46E+00 1.28E+00	1.94E-03164.7 4.96E-03 62.3 2.92E-03106.1 7.59E-03 31.0 6.15E-03 32.8	8.82E-01 2.06E+00 1.07E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nucliae	Type: Hadar	O			Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĊi/L	%Error
RA-226	186.21	57	3.28*	1.878E+00			124.60
U-235	143.76		10.50*			ne Not Found	
	163.35		4.70	1.923E+00	Li:	ne Not Found	
	185.71	57	54.00		4.282E+00	1.2022.00	124.60
	205.31		4.70	1.809E+00	Li	ne Not Found	

Flag: "\*" = Keyline

Summary of Nuclide Activity

Acquisition date: 28-JUL-2006 13:20:25 Sample ID : 14L29389-7

5

4

Total number of lines in spectrum

Number of unidentified lines

Number of lines tentatively identified by NID 1 20.00%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

 Nuclide
 Hlife
 Decay
 pCi/L
 pCi/L
 2-Sigma Error
 %Error Flags

 RA-226
 1600.00Y
 1.00
 7.049E+01
 7.049E+01
 8.784E+01
 124.60

 U-235
 7.04E+08Y
 1.00
 4.282E+00
 4.282E+00
 5.335E+00
 124.60

\_\_\_\_\_ \_\_\_\_\_\_ Total Activity: 7.478E+01 7.478E+01

Grand Total Activity: 7.478E+01 7.478E+01

Flags: "K" = Keyline not found

"M" = Manually accepted
"A" = Nuclide specific abn. limit "E" = Manually edited

Page : Unidentified Energy Lines Acquisition date : 28-JUL-2006 13:20:25 Sample ID : 14L29389-7

Ιt	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff :	Flags
1	92.13	22	355	1.47						1.26E+00	
1	295.65	33	260	2.26	594.42	587	13	2.92E-03	****	1.46E+00	
1	352.06	87	128	2.42	707.56	702	12	7.59E-03	62.0	1.28E+00	
1	609.39	70	90	1.99	1223.05	1215	13	6.15E-03	65.5	8.33E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

5 Total number of lines in spectrum Number of unidentified lines 4 Number of lines tentatively identified by NID 20.00% 1

Nuclide Type : natural

Wtd Mean Wtd Mean 2-Sigma Uncorrected Decay Corr Decay Corr pCi/L 2-Sigma Error %Error Flags pCi/L Nuclide Hlife Decay 8.784E+01 124.60 7.049E+01 RA-226 1600.00Y 1.00 7.049E+01 7.049E+01 7.049E+01

7.049E+01 Grand Total Activity: 7.049E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

Interference Report

BE-7

NA-24

K-40

CR-51

MN-54

CO-57

CO-58

No interference correction performed

-8.615E+00

-1.140E+01

1.908E+02

-2.176E+01

-3.111E+00

-9.682E-01

-2.853E+00

Total Activity:

Combined Activity-MDA Report

### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA			
RA-226	7.049E+01	8.784E+01	1.496E+02	0.000E+00	0.471			
Non-Identified Nuclides								
Nuclide		K.L. Act error Ided	MDA (pCi/L)	MDA error	Act/MDA			

3.144E+01

1.233E+01

4.502E+01

3.205E+01

3.523E+00

3.964E+00

3.617E+00

5.144E+01

1.885E+01

9.433E+01

5.114E+01

5.511E+00

6.416E+00

5.565E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

0.000E+00

-0.167

-0.605

2.023

-0.425

-0.565

-0.151

-0.513

FE-59	2.438E-01	6.645E+00	1.094E+01	0.000E+00	0.022
CO-60	-2.850E+00	3.600E+00	5.404E+00	0.000E+00	-0.527
ZN-65	7.714E+00	7.695E+00	1.354E+01	0.000E+00	0.570
SE-75	2.310E+00	5.082E+00	8.482E+00	0.000E+00	0.272
SR-85	1.806E+01	4.237E+00	8.056E+00	0.000E+00	2.242
Y-88	1.981E+00	3.502E+00	6.114E+00	0.000E+00	0.324
NB-94	1.572E-01	3.428E+00	5.621E+00	0.000E+00	0.028
NB-95	3.010E+00	3.366E+00	5.811E+00	0.000E+00	0.518
ZR-95	-3.256E+00	6.286E+00	9.901E+00	0.000E+00	-0.329
MO-99	-2.185E+01	3.580E+01	5.618E+01	0.000E+00	-0.389
RU-103	-2.172E+00	3.844E+00	6,195E+00	0.000E+00	-0.351
RU-106	-1.494E+01	3.541E+01	5.681E+01	0.000E+00	-0.263
AG-110m	1.578E+00	3.602E+00	6.053E+00	0.000E+00	0.261
SN-113	3.925E+00	4.931E+00	8.294E+00	0.000E+00	0.473
SB-124	-3.819E+00	4.566E+00	5.895E+00	0.000E+00	-0.648
SB-125	4.122E+00	1.095E+01	1.849E+01	0.000E+00	0.223
TE-129M	3.021E+01	4.159E+01	7.122E+01	0.000E+00	0.424
I-131	-3.663E+00	4.173E+00	6.352E+00	0.000E+00	-0.577
BA-133	1.231E+01	6.101E+00	9.357E+00	0.000E+00	1.315
CS-134	3.120E+00	4.931E+00	7.105E+00	0.000E+00	0.439
CS-136	-2.468E+00	3.700E+00	5.734E+00	0.000E+00	-0.431
CS-137	-9.605E-01	3.881E+00	6.266E+00	0.000E+00	-0.153
CE-139	-3.271E+00	3.699E+00	6.008E+00	0.000E+00	-0.544
BA-140	-1.157E+00	1.323E+01	2.174E+01	0.000E+00	-0.053
LA-140	5.288E+00	4.037E+00	7.486E+00	0.000E+00	0.706
CE-141	-6.823E+00	6.705E+00	1.059E+01	0.000E+00	-0.644
CE-144	-2.241E+01	3.053E+01	4.870E+01	0.000E+00	-0.460
EU-152	1.970E+00	1.403E+01	1.944E+01	0.000E+00	0.101
EU-154	-2.454E+00	8.294E+00	1.341E+01	0.000E+00	-0.183
AC-228	-6.859E-01	1.372E+01	2.287E+01	0.000E+00	-0.030
TH-228	2.843E+00	6.950E+00	1.159E+01	0.000E+00	0.245
TH-232	-6.856E-01	1.372E+01	2.286E+01	0.000E+00	-0.030
U-235	1.725E+01	3.046E+01	5.021E+01	0.000E+00	0.344
U-238	1.552E+02	4.087E+02	6.914E+02	0.000E+00	0.225
AM-241	-3.380E+01	5.340E+01	8.662E+01	0.000E+00	-0.390

-0.390

8.662E+01,,

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3.088E+00,L29389-7 WG EX
                    ,07/28/2006 16:31,07/27/2006 14:15,
A,14L29389-7
                                             ,07/27/2006 14:28,143L082304
                    , LIBD
B,14L29389-7
                                                   1.496E+02,,
                                                                    0.471
           , YES,
                                    8.784E+01,
                    7.049E+01,
C, RA-226
                                                   5.144E+01,,
                                    3.144E+01,
                                                                   -0.167
                   -8.615E+00,
           , NO
C, BE-7
                                                                   -0.605
                                                   1.885E+01,,
                                   1.233E+01,
C, NA-24
           ,NO
                   -1.140E+01,
                                                   9.433E+01,,
                                                                    2.023
           , NO
                    1.908E+02,
                                    4.502E+01,
C, K-40
                                                                   -0.425
                                    3.205E+01,
                                                   5.114E+01,,
                   -2.176E+01,
C, CR-51
           , NO
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                                                                   -0.565
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C, MN-54
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C, CO-57
                   -9.682E-01,
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                                                   5.565E+00,,
           , NO
                                    3.617E+00,
C, CO-58
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                                    6.645E+00,
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                                                                    0.022
C, FE-59
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C, CO-60
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                                    7.695E+00,
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C, ZN-65
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                                    5.082E+00,
C, SE-75
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C, SR-85
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                                                   6.114E+00,,
C, Y-88
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                                                   5.621E+00,,
                                                                    0.028
C, NB-94
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C, NB-95
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                                    6.286E+00,
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C, ZR-95
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                                                                   -0.389
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C, MO-99
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                                                   6.195E+00,,
C, RU-103
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C, RU-106
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C, AG-110m , NO
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C, SN-113
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                                    4.159E+01,
C, TE-129M , NO
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C, I-131
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C, BA-133
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                                    4.931E+00,
C, CS-134
            , NO
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                                                   5.734E+00,,
C, CS-136
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                                    3.700E+00,
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                                                                   -0.153
            , NO
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                                                   6.266E+00,,
C, CS-137
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                                                   6.008E+00,,
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                    -3.271E+00,
C, CE-139
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                                    1.323E+01,
                    -1.157E+00,
C, BA-140
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C, LA-140
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C, CE-141
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                                    6.705E+00,
                                    3.053E+01,
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C, CE-144
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C, EU-152
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                                                   1.341E+01,,
                    -2.454E+00,
C, EU-154
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                                                                    -0.030
                                                   2.287E+01,,
                    -6.859E-01,
                                    1.372E+01,
C, AC-228
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                                                   1.159E+01,,
                                                                     0.245
                     2.843E+00,
                                    6.950E+00,
C, TH-228
            , NO
                                    1.372E+01,
                                                   2.286E+01,,
                                                                    -0.030
                    -6.856E-01,
C, TH-232
            , NO
                                                   5.021E+01,,
                                                                     0.344
C, U-235
            , NO
                     1.725E+01,
                                    3.046E+01,
                                    4.087E+02,
                                                   6.914E+02,,
                                                                     0.225
                     1.552E+02,
C, U-238
            , NO
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5.340E+01,

C, AM-241

,NO ,

-3.380E+01,

Analyst: Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 30-JUL-2006 23:24:16.65 TBE07 P-10768B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:04:00.36 

LIMS No., Customer Name, Client ID: WG WG4270-1 EX QUAD

Smple Date: 27-JUL-2006 08:35:00. Sample ID : 07WG4270-1

Geometry : 073L082504 : WG Sample Type BKGFILE : 07BG072806MT : 3.12270E+00 L Quantity 

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9	5 1 1 1 1 1	66.33* 139.63* 241.97* 295.32* 351.88* 583.21* 609.39* 1120.41* 1238.31*	83 54 100 154 263 31 263 53	217 187 141 174 141 46 59 38 26	1.23 1.34 1.35 1.48 1.06 2.91 1.56 2.25	133.52 280.33 485.25 592.06 705.30 1168.38	1.81E+00 1.61E+00	6.49E-03 1.19E-02 1.83E-02 3.13E-02 3.72E-03 3.13E-02 6.31E-03	46.2 24.0 19.1 11.0 49.4 9.4 27.5	1.63E+00 5.23E+00 2.38E+00
1.0	1	1707.72	12	5	2.16	3417.80	5.23E-01	1.47E-03		
	1			5 18	2.16		5.23E-01 5.12E-01			1.62E+00
11 12	3 3	1765.08* 1769.97	47 18	8	2.50	3542.26	<b>—</b> • • • • • • • • • • • • • • • • • • •	2.13E-03		

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "\*" = Keyline

Page: 2

Summary of Nuclide Activity Sample ID: 07WG4270-1

Acquisition date: 30-JUL-2006 21:04:00

Total number of lines in spectrum

Number of unidentified lines 10
Number of lines tentatively identified by NID 2
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\* 16.67%

Flags: "K" = Keyline not found
"E" = Manually edited

12

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID : 07WG4270-1

Page: 3 Acquisition date : 30-JUL-2006 21:04:00

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	66.33	83	217	1.23	133.52	123	14	9.85E-03	65.1	8.06E-01	
1	139.63	54	187	1.34	280.33	277	7	6.49E-03	92.3	2.36E+00	
1	241.97	100	141	1.35	485.25	474	16	1.19E-02	47.9	2.04E+00	${f T}$
1	295.32	154	174	1.48	592.06	587	11	1.83E-02	38.1	1.81E+00	
1	351.88	263	141	1.06	705.30	700	11	3.13E-02	21.9	1.61E+00	
1	583.21	31	46	2.91	1168.38	1164	11	3.72E-03	98.7	1.12E+00	T
1	609.39	263	59	1.56	1220.79	1214	14	3.13E-02	18.8	1.09E+00	
1	1120.41	53	38	2.25	2243.32	2237	12	6.31E-03	54.9	7.03E-01	
1	1238.31	36	26	2.68	2479.15	2470	15	4.23E-03	71.8	6.55E-01	
1	1707.72	12	5	2.16	3417.80	3410	12	1.47E-03	91.7	5.23E-01	
3	1765.08	47	18	2.95	3532.47	3522	24	5.62E-03	55.6	5.12E-01	
3	1769.97	18	8	2.31	3542.26	3522	24	2.13E-03	62.2	5.11E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 12 Number of unidentified lines 10 Number of lines tentatively identified by NID 2 16.67% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

"M" = Manually accepted Flags: "K" = Keyline not found
"E" = Manually edited

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-3.214E+01		2.750E+01	4.231E+01	0.000E+00	-0.760
NA-24	-3.360E+02		2.076E+02	2.885E+02	0.000E+00	-1.165
K-40	2.799E+01		4.040E+01	8.112E+01	0.000E+00	0.345
CR-51	-1.217E+01		2.936E+01	4.747E+01	0.000E+00	-0.256
MN-54	2.546E-01		3.251E+00	5.327E+00	0.000E+00	0.048
CO-57	-1.395E+00		3.216E+00	5.121E+00	0.000E+00	-0.272
CO-58	-1.682E+00		3.385E+00	5.320E+00	0.000E+00	-0.316
FE-59	2.544E+00		6.614E+00	1.114E+01	0.000E+00	0.228
CO-60	5.320E-01		3.354E+00	5.592E+00	0.000E+00	0.095
ZN-65	1.430E+01		9.443E+00	1.501E+01	0.000E+00	0.953
SE-75	-3.848E-01		4.316E+00	7.170E+00	0.000E+00	-0.054
SR-85	1.803E+01		3.925E+00	7.667E+00	0.000E+00	2.351
Y-88	-2.216E+00		3.505E+00	5.234E+00	0.000E+00	-0.423
NB-94	1.559E+00		3.048E+00	5.202E+00	0.000E+00	0.300
NB-95	6.265E+00		3.376E+00	6.210E+00	0.000E+00	1.009
ZR-95	-1.610E+00		5.497E+00	8.819E+00	0.000E+00	-0.183

MO-99	-1.817E+01	5.910E+01	9.503E+01	0.000E+00	-0.191
RU-103	6.061E-01	3.505E+00	5.833E+00	0.000E+00	0.104
RU-106	3.488E+00	3.110E+01	5.010E+01	0.000E+00	0.070
AG-110m	-2.413E+00	3.108E+00	4.881E+00	0.000E+00	-0.494
SN-113	-2.004E+00	4.292E+00	6.806E+00	0.000E+00	-0.294
SB-124	-6.782E+00	4.491E+00	5.314E+00	0.000E+00	-1.276
SB-125	3.859E+00	9.371E+00	1.593E+01	0.000E+00	0.242
TE-129M	5.317E+01	4.065E+01	7.178E+01	0.000E+00	0.741
I-131	-2.695E+00	4.277E+00	6.754E+00	0.000E+00	-0.399
BA-133	1.702E+01	5.521E+00	9.177E+00	0.000E+00	1.855
CS-134	9.057E+00	4.958E+00	7.648E+00	0.000E+00	1.184
CS-136	1.995E+00	3.758E+00	6.379E+00	0.000E+00	0.313
CS-137	4.646E+00	3.354E+00	6.063E+00	0.000E+00	0.766
CE-139	-1.125E+00	3.160E+00	5.168E+00	0.000E+00	-0.218
BA-140	-4.515E+00	1.319E+01	2.114E+01	0.000E+00	-0.214
LA-140	1.698E+00	4.523E+00	7.745E+00	0.000E+00	0.219
CE-141	1.758E+00	6.602E+00	9.540E+00	0.000E+00	0.184
CE-144	-4.330E-01	2.840E+01	4.070E+01	0.000E+00	-0.011
EU-152	-1.035E+01	1.269E+01	1.665E+01	0.000E+00	-0.621
EU-154	2.312E-01	6.695E+00	1.084E+01	0.000E+00	0.021
RA-226	-1.281E+01	7.800E+01	1.310E+02	0.000E+00	-0.098
AC-228	-1.814E+00	1.261E+01	2.168E+01	0.000E+00	-0.084
TH-228	1.229E+01	7.364E+00	1.146E+01	0.000E+00	1.073
TH-232	-1.812E+00	1.260E+01	2.166E+01	0.000E+00	-0.084
U-235	-2.256E+01	2.867E+01	3.950E+01	0.000E+00	-0.571
U-238	3.034E+00	3.569E+02	5.840E+02	0.000E+00	0.005
AM-241	1.039E+01	3.179E+01	4.650E+01	0.000E+00	0.223

```
A,07WG4270-1
                     ,07/30/2006 23:24,07/27/2006 08:35,
                                                                 3.123E+00, WG WG4270-1 EX
B,07WG4270-1
                     ,LIBD
                                             ,07/28/2006 09:50,073L082504
           , NO
C, BE-7
                    -3.214E+01,
                                    2.750E+01,
                                                   4.231E+01,,
                                                                   -0.760
C, NA-24
           , NO
                                    2.076E+02,
                                                   2.885E+02,,
                    -3.360E+02,
                                                                   -1.165
C, K-40
           , NO
                     2.799E+01,
                                    4.040E+01,
                                                   8.112E+01,,
                                                                    0.345
C, CR-51
           , NO
                    -1.217E+01,
                                    2.936E+01,
                                                   4.747E+01,,
                                                                   -0.256
C, MN-54
            , NO
                     2.546E-01,
                                    3.251E+00,
                                                   5.327E+00,,
                                                                    0.048
C, CO-57
           , NO
                    -1.395E+00,
                                    3.216E+00,
                                                   5.121E+00,,
                                                                   -0.272
C, CO-58
           , NO
                    -1.682E+00,
                                    3.385E+00,
                                                   5.320E+00,,
                                                                   -0.316
C,FE-59
                                                   1.114E+01,,
           , NO
                     2.544E+00,
                                    6.614E+00,
                                                                    0.228
           , NO
C, CO-60
                     5.320E-01,
                                    3.354E+00,
                                                   5.592E+00,,
                                                                    0.095
C, ZN-65
                                                   1.501E+01,,
           , NO
                     1.430E+01,
                                    9.443E+00,
                                                                     0.953
C,SE-75
           , NO
                    -3.848E-01,
                                    4.316E+00,
                                                   7.170E+00,,
                                                                   -0.054
C, SR-85
            , NO
                     1.803E+01,
                                    3.925E+00,
                                                   7.667E+00,,
                                                                    2.351
C, Y-88
           , NO
                    -2.216E+00,
                                    3.505E+00,
                                                   5.234E+00,,
                                                                   -0.423
C, NB-94
           , NO
                     1.559E+00,
                                    3.048E+00,
                                                   5.202E+00,,
                                                                    0.300
C,NB-95
           , NO
                     6.265E+00,
                                    3.376E+00,
                                                   6.210E+00,,
                                                                    1.009
           , NO
C, ZR-95
                    -1.610E+00,
                                    5.497E+00,
                                                   8.819E+00,,
                                                                   -0.183
C, MO-99
           , NO
                    -1.817E+01,
                                    5.910E+01,
                                                   9.503E+01,
                                                                   -0.191
C, RU-103
                                    3.505E+00,
           , NO
                     6.061E-01,
                                                   5.833E+00,,
                                                                     0.104
C, RU-106
           , NO
                                                   5.010E+01,,
                     3.488E+00,
                                    3.110E+01,
                                                                    0.070
C, AG-110m
           , NO
                    -2.413E+00,
                                    3.108E+00,
                                                   4.881E+00,,
                                                                   -0.494
C, SN-113
           , NO
                    -2.004E+00,
                                                   6.806E+00,,
                                    4.292E+00,
                                                                   -0.294
C,SB-124
            , NO
                    -6.782E+00,
                                    4.491E+00,
                                                   5.314E+00,,
                                                                   -1.276
C,SB-125
           , NO
                                                   1.593E+01,,
                     3.859E+00,
                                    9.371E+00,
                                                                    0.242
           ,NO
                     5.317E+01,
C, TE-129M
                                    4.065E+01,
                                                   7.178E+01,,
                                                                     0.741
C, I-131
           , NO
                    -2.695E+00,
                                    4.277E+00,
                                                   6.754E+00,,
                                                                   -0.399
C, BA-133
           , NO
                     1.702E+01,
                                    5.521E+00,
                                                   9.177E+00,,
                                                                    1.855
C, CS-134
            , NO
                     9.057E+00,
                                    4.958E+00,
                                                   7.648E+00,,
                                                                    1.184
C, CS-136
            , NO
                     1.995E+00,
                                    3.758E+00,
                                                   6.379E+00,,
                                                                    0.313
C, CS-137
            , NO
                     4.646E+00,
                                    3.354E+00,
                                                   6.063E+00,,
                                                                    0.766
C, CE-139
            , NO
                    -1.125E+00,
                                    3.160E+00,
                                                   5.168E+00,,
                                                                   -0.218
                    -4.515E+00,
C, BA-140
            , NO
                                    1.319E+01,
                                                   2.114E+01,,
                                                                   -0.214
C, LA-140
            , NO
                     1.698E+00,
                                    4.523E+00,
                                                   7.745E+00,,
                                                                     0.219
C, CE-141
            , NO
                     1.758E+00,
                                    6.602E+00,
                                                   9.540E+00,,
                                                                     0.184
C, CE-144
                    -4.330E-01,
                                                   4.070E+01,,
            , NO
                                    2.840E+01,
                                                                   -0.011
C, EU-152
                    -1.035E+01,
            , NO
                                    1.269E+01,
                                                   1.665E+01,,
                                                                   -0.621
C, EU-154
            , NO
                     2.312E-01,
                                    6.695E+00,
                                                   1.084E+01,,
                                                                    0.021
C, RA-226
            , NO
                    -1.281E+01,
                                    7.800E+01,
                                                   1.310E+02,,
                                                                   -0.098
            , NO
C, AC-228
                    -1.814E+00,
                                    1.261E+01,
                                                   2.168E+01,,
                                                                   -0.084
C, TH-228
            , NO
                     1.229E+01,
                                    7.364E+00,
                                                   1.146E+01,,
                                                                    1.073
C, TH-232
                    -1.812E+00,
            , NO
                                    1.260E+01,
                                                   2.166E+01,,
                                                                   -0.084
C, U-235
                                                   3.950E+01,,
            , NO
                    -2.256E+01,
                                    2.867E+01,
                                                                   -0.571
C, U-238
            , NO
                     3.034E+00,
                                    3.569E+02,
                                                   5.840E+02,,
                                                                    0.005
C,AM-241
```

3.179E+01,

4.650E+01,,

0.223

, NO

1.039E+01,



2508 Quality Lane Knoxville, TN 37931 865-690-6819 (Phone)

Work Order #: L29403
Exelon
August 1, 2006



Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville CT 06062

### Case Narrative - L29403 EX001-3ESPQUAD-06

08/01/2006 09:57

### Sample Receipt

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

Cross Reference Table

	0.000 1000 1000	
Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-116S-072806-NZ-008	L29403-1	
WG-QC-MW-QC-115S-072806-NZ-009	L29403-2	
WG-QC-MW-QC-109S-072806-NZ-010	L29403-3	
WG-QC-MW-QC-109S-072806-NZ-011	L29403-4	
WG-QC-MW-QC-109I-072806-NZ-012	L29403-5	
WG-QC-MW-QC-109I-072806-NZ-013	L29403-6	
RB-QC-MW-QC-102D-072806-NZ-014	L29403-7	
WG-QC-MW-QC-102D-072806-NZ-015	L29403-8	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3 (DIST)	TBE-2010	
TOTAL SR	TBE-2018	EPA 905.0



Knoxville, TN 37931-3133

### Case Narrative - L29403 EX001-3ESPQUAD-06

08/01/2006 09:57

### Gamma Spectroscopy

### **Quality Control**

Quality control samples were analyzed as WG4276.

### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	Laboratory ID	QC Sample #
WG-ZION-MW-ZN-10U-072806-MS-003	L29402-1	WG4276-1

### **H-3 (DIST)**

### **Quality Control**

Quality control samples were analyzed as WG4273.

### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

### **Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

Client ID	Laboratory ID	QC Sample #
WG-ZION-MW-ZN-10U-072806-MS-003	L29402-1	WG4273-3



A Teledyne Technologies Company 2508 Quality Lane Knoxville, TN 37931-3133

### Case Narrative - L29403 EX001-3ESPQUAD-06

08/01/2006 09:57

### TOTAL SR

### **Quality Control**

Quality control samples were analyzed as WG4278.

### Method Blank

All blanks were within acceptance limits, unless otherwise noted.

### Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

### **Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u> WG-QC-MW-QC-111I-072706-NZ-006 Laboratory ID L29389-6 QC Sample # WG4278-3

### Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter

Operations Manager

### Sample Receipt Summary

L29403 6 of 73

Teledyne Brown Engineering
Sample Receipt Verification/Variance Report

07/31/06 08:37

Client: Exelon

SR #: SR09618

9 Other (Describe)

Project #: EX001-3ESPQUAD-06 LIMS #:L29403

	,	
Initiated By: PMARSH Init Date: 07/28/		V06
IIIC Date. 07/28/		
	Notificati	on of Variance
Person Notified:		Contacted By:
Notify Date:		
Notify Method:		
Notify Comment:		
	Client Resp	onse
Person Responding:		
Response Date:		
Response Method:		
Response Comment		
Criteria		Yes No NA Comment
1 Shipping conta and intact.	ainer custody seals present	NA
2 Sample contain and intact.	ner custody seals present	NA
3 Sample contain condition	ners received in good	Y
4 Chain of custo	ody received with samples	Y
5 All samples 1: received	isted on chain of custody	Y
6 Sample contain legible.	ner labels present and	Y
	n container labels th chain of custody	Y
8 Sample(s) prop appropriate co	perly preserved and in ontainer(s)	AN

NA

ESTOGA-ROVERS & ASSOCIATES 9033 Meridian Way	SHIPPED TO (Laboratory Name):	IELENYNE	YNE BROWN	
513-942-4750 phone 513-942-8585 fax	REFERENCE NUMBER:		\	
CHAIN-OF-CUSTODY RECORD	45736-28		EXECUT WHAP CITIES	
SAMPLER'S TO A SIGNATURE: NAME: N	16 Inglesc	OF INERS	PARAMETERS	
SEQ. DATE TIME SAMPLE IDENTIFICATION	ATION NO. MATRIX	RE No.		REMARKS
The 1110 WG-GC-MW-GC-109I	4	70	Yav X	Turney ?
7 115 Mg-cc-11W- cc- 1047 - 070	10/1-01/200-10/-019	N		
WG-GC-MW-CC-	7 510 ZN -9173270	2)	KK K	CATE OF
		1		-
				mental control
		(		
TOTAL NUMBER OF CONTAINERS	VERS			
RELINQUISHED BY: (1)	DATE: 7/22/06 TIME: 1945	RECEIVED BY:	DBY: Huter	DATE: 7-28-6 TIME: 13:47
RELINQUISHED BY:	DATE: 7. 28.06 TIME: 16:39	RECEIVED BY:	() - 1. J. J. J. J. J. J. J. J. J. J. J. J. J.	DATE: 7-28 - TIME: 16:59
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY:	Jeri Thum	DATE: 7-40-06-
METHOD OF SHIPMENT: HOWD DELIVER TO	Exern	AIR	AIR BILL No.	
-Fully Executed Copy	SAMPLE TEAM:		RECEIVED FOR LABORATORY BY:	
	SC Lewis		(24/02 TIME: 12:15	004287
12	1			

Sol Con	ESTO We SO	GA-R 33 Mer est Ch	ERS & ASSOCIATES Way Ohio 45069	SHIPPED TO (Laboratory Name):		TROUND BROWN	
		513-942-8585 513-942-8585 HAIN-OF-CUS	phone fax TODY RECORD	REFERENCE NUMBER:	35 R.:	PROJECT NAME: CLAM CITIES	âa
SAME	SAMPLER'S SIGNATURE:	No.	HAGO PRINTED N NAME: N	ME Zuglow	OF SHERS	PAR	
S S .	DATE	TIME	SAMPLE IDENTIFICATION	No.	SAMPLE 221	The state of the s	
- 1	Melio	600	WG-00-1MW-00C-	900-2N	40 2	メメ	CRA CONTACT
10 =				300	70	× × ×	KATTIY SHAW
Ţ		7625	, 5/0/			<u> </u>	
			TOTAL NUMBER OF CONTAINERS	NERS	$(\varepsilon)$		
RELIN	RELINQUISHER BY	BY	hal	DATE: 7/28	RECEIVED BY:	Bersi Huter	DATE: 7-28-6 TIME: 13:48
RELIN (2)	RELINQUISHED BY:	BY:	Drugg	22	1	ED-BY: C	DATE: 7-2% TIME: /6>\$
RELIN	RELINQUISHED BY:	BY:		4	RECEIVED BY:	ED BY:	DATE: /
E E	HOD OF	SHIP!	METHOD OF SHIPMENT: 1- AND OCCUMENTS	IN CINNIS CX	EKZLN AIR	AIR BILL NO. $N\!\!\!/\!\!\!/_{\!$	
White		-Fully I	-Fully Executed Copy -Receiving Laboratory Copy	SAMPLE TEAM:		RECEIVED FOR LABORATORY BY:	
Pin A	enrod	-Shipp	-Shipper Copy -Sampler Copy	G. Lewis		DATE: 729 OF TIME: 12:45	004286
1001	12	(CE)GN-	C0004				

1001-00(SOURCE)GN-CO004

TELEDYNE BROWN ENGINEERING 2508 Quality Lane Knoxville, TN 37931-3133

### ACKNOWLEDGEMENT This is not an invoice

Kathy Shaw Conestoga-Rovers & Associates 45 Farmington Valley Drive Plainville, CT 06062

July 31, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 28, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 31, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely, Rebecca Charles Project Manager (865)934 - 0379

Project ID: EX001-3ESPQUAD-06

P.O. #:

00411203

Release #:

Contract#:

00411203

Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect End Collect Date/Time Date/Time
WG-QC-MW-QC-116S-0728	306-NZ-0 L29403-1		07/28/06:0650
WG	GELI	162.00	
WG WG	H-3 (DIST) SR-90 (FAST)	162.00 210.00	
WG-QC-MW-QC-115s-0728	306-NZ-0 L29403-2		07/28/06:0750
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
WG-QC-MW-QC-1095-0728	306-NZ-0 L29403-3		07/28/06:1000
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
WG-QC-MW-QC-109S-0728	806-NZ-0 L29403-4		07/28/06:1005
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
WG-QC-MW-QC-109I-0728	806-NZ-0 L29403-5		07/28/06:1110

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect End Collect Date/Time Date/Time
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
WG-QC-MW-QC-1091-0	72806-NZ-0 L29403-6		07/28/06:1115
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
RB-QC-MW-QC-102D-0	72806-NZ-0 L29403-7		07/28/06:1120
WG	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG	SR-90 (FAST)	210.00	
WG-QC-MW-QC-102D-0	72806-NZ-0 L29403-8		07/28/06:1225
WO	GELI	162.00	
WG	H-3 (DIST)	162.00	
WG WG	H-3 (DISI) SR-90 (FAST)	210.00	
WG	(16A1) 06-36	210.00	

End of document

### Internal Chain of Custody

08/01/06 09:57 Teledyne Brown Engineering Internal Chain of Custody \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Sample # L29403-1 Containernum 1 Analyst Prod H-3 (DIST) ΕJ DW **GELI** LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29403-1 Analyst Prod EJ H-3 (DIST) DW GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Donna Webb 029728 Lauren Larsen 030854 07/31/2006 10:08 Sample Custodian 030854 Donna Webb 099999 07/31/2006 10:08 030854 Donna Webb Lauren Larsen 07/31/2006 10:47 029728 Donna Webb 099999 Sample Custodian 07/31/2006 11:01 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29403-2 Analyst Prod H-3 (DIST) ΕJ DW GELI LCB SR-90 (FAST) Relinquish Date Relinquish By Received By 099999 Sample Custodian 07/28/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29403-2 Analyst Prod ΕJ H-3 (DIST) GELI DW SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 029728 Lauren Larsen Donna Webb 07/31/2006 10:08 030854 Sample Custodian 030854 Donna Webb 07/31/2006 10:08 099999 030854 Donna Webb Lauren Larsen 07/31/2006 10:47 029728 099999 Sample Custodian Donna Webb 030854 07/31/2006 11:01

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Containernum 1 Sample # L29403-3

Analyst Prod

H-3 (DIST) ΕJ GELI DW SR-90 (FAST) LCB

Relinquish Date Relinquish By

Received By

Teledyne Brown Engineering

Internal Chain of Custody \* Containernum 1 Sample # L29403-3 Received By Relinquish Date 099999 Sample Custodian 07/28/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29403-3 Analyst Prod ΕJ H-3 (DIST) DW **GELI** LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 029728 Lauren Larsen Donna Webb 07/31/2006 10:08 030854 030854 Donna Webb Sample Custodian 099999 07/31/2006 10:08 Donna Webb 030854 Lauren Larsen 07/31/2006 10:47 029728 Sample Custodian Donna Webb 099999 030854 07/31/2006 11:01 \* Sample # L29403-4 Containernum 1 Analyst Prod ЕJ H-3 (DIST) GELI DW SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 \* Containernum 2 Sample # L29403-4 Analyst ΕJ H-3 (DIST) GELI DW LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 Lauren Larsen 029728 Donna Webb 07/31/2006 10:08 030854 030854 Donna Webb Sample Custodian 07/31/2006 10:08 099999 Donna Webb 030854 Lauren Larsen 029728 07/31/2006 10:47 099999 Sample Custodian Donna Webb 07/31/2006 11:01 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29403-5 Analyst Prod H-3 (DIST) ЕJ DW GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By Sample Custodian 099999 07/28/2006 00:00 \*

Containernum 2

Sample # L29403-5

Analyst Prod ΕJ H-3 (DIST)

Relinquish Date Relinquish By

07/28/2006 00:00

Teledyne Brown Engineering Internal Chain of Custody

Containernum 2 Sample # L29403-5 DW GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Lauren Larsen Donna Webb 029728 030854 07/31/2006 10:08 030854 Donna Webb Sample Custodian 07/31/2006 10:08 099999 Donna Webb 030854 Lauren Larsen 07/31/2006 10:47 029728 099999 Sample Custodian Donna Webb 07/31/2006 11:01 030854 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 1 Sample # L29403-6 Analyst Prod ΕJ H-3 (DIST) DW GELI SR-90 (FAST) LCB Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Containernum 2 Sample # L29403-6 Analyst Prod ΕJ H-3 (DIST) DW GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 Lauren Larsen 029728 Donna Webb 07/31/2006 10:08 030854 Donna Webb Sample Custodian 030854 07/31/2006 10:08 099999 Donna Webb 030854 Lauren Larsen 07/31/2006 10:47 029728 Donna Webb 099999 Sample Custodian 030854 07/31/2006 11:01 \* Containernum 1 Sample # L29403-7 Analyst Prod H-3 (DIST) EJ DW GELI LCB SR-90 (FAST) Received By Relinquish Date Relinquish By 099999 Sample Custodian 07/28/2006 00:00 \* Containernum 2 Sample # L29403-7 Analyst Prod H-3 (DIST) ΕJ DW GELI LCB SR-90 (FAST)

Received By

Sample Custodian

099999

07/31/2006 10:08

07/31/2006 10:47

07/31/2006 11:01

099999

029728

030854

Teledyne Brown Engineering
Internal Chain of Custody

		Incommendation of the	cody	
*****	*****	******	*****	****
Sample # L29403-7		Containernum 2		
Relinquish Date			Received By	
07/31/2006 10:08	030854	Donna Webb	029728	Lauren Larsen
07/31/2006 10:08	099999	Sample Custodian	030854	Donna Webb
07/31/2006 10:47	029728	Lauren Larsen	030854	Donna Webb
07/31/2006 11:01	030854	Donna Webb	099999	Sample Custodian
*****	*****	*******	*****	****
Sample # L29403-8		Containernum 1		
Prod	Ana	alyst		
H-3 (DIST)	EJ			
GELI	DW	*		
SR-90 (FAST)	LC	3		
Relinquish Date Reli	inquish By		Received By	
07/28/2006 00:00			099999	Sample Custodian
**************************************	*****	**************************************	******	****
Prod	Ana	alyst		
H-3 (DIST)	EJ			
GELI	DW			
SR-90 (FAST)	LC	В		
Relinquish Date Reli	inquish By		Received By	
07/28/2006 00:00	_		099999	Sample Custodian
07/31/2006 10:08	030854	Donna Webb	029728	Lauren Larsen

Sample Custodian

Lauren Larsen

Donna Webb

030854

030854

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Donna Webb

Donna Webb

Sample Custodian

### Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

### L29403

*****	*****	**************	*****	******				
L29403-1	WG	WG-QC-MW-QC-116S-072						
Process step	Prod		Analyst	Date				
Login			RCHARLES	07/28/06				
Aliquot	GELI		DW	07/29/06				
Aliquot	SR-90	(FAST)	LCB	07/29/06				
	H-3 (D	DIST)	EJ	07/31/06				
Aliquot H-3 (DIST) EJ 07/31/0  Count Room GELI KOJ 07/30/0  Count Room H-3 (DIST) KOJ 08/01/0  Count Room SR-90 (FAST) KOJ 07/31/0  ***********************************	07/30/06							
	08/01/06							
Count Room	SR-90	(FAST)	KOJ	07/31/06				
******	*****	*****	******	*****				
L29403-2	WG	WG-QC-MW-QC-115S-072	806-NZ-009					
Process step	Prod		KOJ 07/30/06  KOJ 08/01/06  AST) KOJ 07/31/06  ***********************************					
Login			RCHARLES	07/28/06				
Aliquot	GELI		DW	07/29/06				
Aliquot	SR-90	(FAST)	LCB	07/29/06				
Aliquot	н-3 (Г	DIST)	EJ	07/31/06				
Count Room	GELI		KOJ	07/30/06				
Count Room	н-3 (Г	DIST)	KOJ	08/01/06				
Count Room	SR-90	(FAST)	KOJ	07/31/06				
******	*****	******	*****	********				
L29403-3	WG	WG-QC-MW-QC-109S-072	2806-NZ-010					
Process step	<u>Prod</u>		Analyst	<u>Date</u>				
Login			RCHARLES	07/28/06				
Aliquot	GELI		DW	07/29/06				
Aliquot	SR-90	(FAST)	LCB	07/29/06				
Aliquot	н-3 (І	DIST)	EJ	07/31/06				
Count Room	GELI		ILL	07/31/06				
Count Room	н-3 (1	DIST)	KOJ	08/01/06				
Count Room		(FAST)	KOJ	07/31/06				
*****	*****	******	*****	***********				
L29403-4	WG	WG-QC-MW-QC-109S-07						
Process step	Prod		<u>Analyst</u>	<u>Date</u> 07/28/06 07/29/06				
Login			RCHARLES	07/28/06				
Aliquot	GELI		DW	07/29/06				
Aliquot	SR-90	(FAST)	LCB	07/29/06				
Aliquot	н-3 (	DIST)	EJ	07/31/06				
Count Room	GELI		ILL	07/31/06				
Count Room	H-3 (	DIST)	KOJ	08/01/06				
Count Room		(FAST)	KOJ	07/31/06				
*****	*****			******				
L29403-5	WG	WG-QC-MW-QC-109I-07	2806-NZ-012					
Process step	Prod		<u>Analyst</u>	Date				
Login			RCHARLES	07/28/06				
Aliquot	GELI		DW	07/29/06				
Aliquot	SR-90	(FAST)	LCB	07/29/06				
Aliquot	н-3 (	DIST)	EJ	07/31/06				
Count Room	GELI		ILL	07/31/06				

Teledyne Brown Engineering Internal Chain of Custody Supplemental Sheet

### L29403

L29403-5	WG WG-QC-MW-QC-109	I-072806-NZ-012	
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
******	******	*****	*******
L29403-6	WG WG-QC-MW-QC-109	I-072806-NZ-013	
Process step	Prod	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	${\tt ILL}$	07/31/06
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
*****	*******	******	*******
L29403-7	WG RB-QC-MW-QC-102	D-072806-NZ-014	
Process step	Prod	Analyst	Date
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	ILL	07/31/06
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06
*****	********	****	*******
L29403-8	WG WG-QC-MW-QC-102	D-072806-NZ-015	
Process step	Prod	Analyst	Date
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	ILL	07/31/06
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

### Analytical Results Summary

TELEDYNE BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: W	Sample ID: WG-QC-MW-QC-116S-072806-NZ-008	C-116S-07280	800-ZN-90		Collect	t Start: 0	Collect Start: 07/28/2006 06:50	:50		Matrix: Ground Water	ound Wat	er		(MG)
Station:	ı				Collec	Collect Stop:				Volume:				
Description:					Receive	Date: 0	Receive Date: 07/28/2006		W %	% Moisture:				
LIMS Number: L29403-1	29403-1													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count	Count	Flag Values	nes
H-3 (DIST)	2010	1.71E+02	1.22E+02	1.83E+02	pCi/L		10	m		08/01/06	09	M	I N	
TOTAL SR	2018	-6.21E-01		1.88E+00	pCi/L		450	III	07/28/06 06:50	02/31/06	120	M	Ω	
MN-54	2007	-9.27E-01	2.39E+00	3.78E+00	pCi/L		3139.72	ml	07/28/06 06:50	90/08//	14400	Sec	Ŋ	No No
CO-58	2007	1.46E+00	2.65E+00	4.50E+00	pCi/L		3139.72	Ш	07/28/06 06:50	90/08//20	14400	Sec	Ŋ	%
FE-59	2007	1.05E+00	5.02E+00	8.38E+00	pCi/L		3139.72	ш	07/28/06 06:50	90/08//0	14400	Sec	Ŋ	No
09-00	2007	8.13E-01	2.73E+00	4.89E+00	pCi/L		3139.72	m	07/28/06 06:50	90/08//	14400	Sec	Ω	%
29-NZ	2007	1.26E+01	5.83E+00	1.02E+01	pCi/L		3139.72	m	07/28/06 06:50	90/08//	14400	Sec	<b>*</b> 1	% %
NB-95	2007	2.04E+00		4.57E+00	pCi/L		3139.72	TI I	07/28/06 06:50	02/30/06	14400	Sec	n	% %
ZR-95	2007	1.97E+00	4.43E+00	7.50E+00	pCi/L		3139.72	m]	07/28/06 06:50	02/30/06	14400	Sec	D	No
CS-134	2007	9.00E+00		4.87E+00	pCi/L		3139.72	m	07/28/06 06:50	04/30/06	14400	Sec	*5	No
CS-137	2007	1.23E+00	2.74E+00	4.67E+00	pCi/L		3139.72	m	02/28/06 06:50	02/30/06	14400	Sec	n n	No
BA-140	2007	-1.38E+00	1.03E+01	1.67E+01	pCi/L		3139.72	m	07/28/06 06:50	02/30/06	14400	Sec	n	No
I A-140	2007	2.70E+00	3.34E+00	5.92E+00	pCi/L		3139.72	m	07/28/06 06:50	90/08//0	14400	Sec	n	No No
LA-140	1001	7.1.7		22.					Property of the control of the contr					

Yes = Peak identified in gamma spectrum
\*\*\*\* Results are reported on an as received basis
unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

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Page

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification High recovery Low recovery High Spec

Activity concentration exceeds MDC and 3 sigma, peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Bolded text indicates reportable value.

TELEDYNE BROWN ENGINEERING, INC. A Teledyne Technologies Company

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw		EX001-3ESPQUAD-06		TO A CONTRACT OF THE PROPERTY	
			7 774	(DIN)	
Sample ID: WG-OC-MW-OC-115S-072806-NZ-009		Collect Start: 07/28/2006 07:50	Matrix: Ground Water	(DM)	
Station:		Collect Stop:	Volume:		
Description:		Receive Date: 07/28/2006	% Moisture:		
LIMS Number: L29403-2					$\neg$
A ofivity Uncertainty		Run Aliquot Aliquot	Run Alianot Alianot Reference Count Count Count		eza de Kenis
CODE COLLEGIES	MDC	Unite # Volume Unite	Date Time Units	nits Flag Values	- Company

									-	-		4		E) And
		Activity	Activity Uncertainty			Run	Aliquot	Aliquot	Keterence	Count	Count	Commit	;	**************************************
Radionuclide	#dos	Conc	2 Sigma	MDC	Units	#	Volume	Units	Date	Date	Time	Units	Flag Values	
חזוח ז	2010	-1 51E±01	1.11E+02	1.85E+02	pCi/L		10	ml		08/01/06	09	Σ	n	(30 (Joseph C)
TOTAL SP	2018	-9 81E-01		1.72E+00	pCi/L		450	Im	07/28/06 07:50	07/31/06	120	M	Ŋ	
NNI-54	2002	-1 13E+00		3.71E+00	pCi/L		3427.13	lm	07/28/06 07:50	90/08//0	14400	Sec	U No	
CO_58	2007	-1.32E-02		3.76E+00	pCi/L	-	3427.13	lm	07/28/06 07:50	90/08//0	14400	Sec		
EE_50	2007	2.07E-01		7.88E+00	pCi/L		3427.13	m	07/28/06 07:50	02/30/06	14400	Sec	No	
(F-7)	2007	1 02E-01		3.56E+00	pCi/L		3427.13	m	07/28/06 07:50	90/08//0	14400	Sec	U	
ZN-65	2007	3 63E+00		7.85E+00	pCi/L		3427.13	m	07/28/06 07:50	90/08//	14400	Sec	U	
ZU-72	2007	2.3E:30		4.47E+00	pCi/L		3427.13	lm	07/28/06 07:50	90/08//0	14400	Sec	No	
78-05	2007	-1 34E+00		6.08E+00	pCi/L		3427.13	TIII	07/28/06 07:50	90/08//0	14400	Sec	No No	
CC-134	2007	1.78E+00		3.65E+00	pCi/L		3427.13	ım	07/28/06 07:50	90/08//0	14400	Sec	U	
CS-137	2007	-9.73E-02	1	4.10E+00	pCi/L		3427.13	Ш	07/28/06 07:50	90/08//	14400	Sec	U No	
BA-140	2007	-8.13E-02		1.47E+01	pCi/L		3427.13	ш	07/28/06 07:50	01/30/06	14400	Sec		
LA-140	2007	1.77E+00		5.12E+00	pCi/L		3427.13	m	07/28/06 07:50	90/08//0	14400	Sec	No	

Yes = Peak identified in gamma spectrum
\*\*\*\* Results are reported on an as received basis
unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

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Page 2

Low recovery High recovery

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec

Bolded text indicates reportable value.

TELEDYNE BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

(MG) Ground Water Matrix: Volume: % Moisture: Collect Start: 07/28/2006 10:00 Receive Date: 07/28/2006 Collect Stop: Sample ID: WG-QC-MW-QC-109S-072806-NZ-010 Station: Description: Kathy Shaw

uclide S ST)	1 IMS Number: 1.29403-3	3-3													
SOP#   Activity   Uncertainty   MDC   Units   #   Volume   Units   Date   Date	City is a second								7	D. Conomic	Count	Count	Count		
SR   2010   1.54E+02   1.19E+02   1.81E+02   pCi/L   450   ml   07/28/06 10:00   1.54E+02   2.33E-01   4.71E-01   9.21E-01   pCi/L   450   ml   07/28/06 10:00   1.54E+00   2.007   2.79E+00   2.27E+00   pCi/L   3191.67   ml   07/28/06 10:00   0.2007   7.02E+00   5.20E+00   pCi/L   3191.67   ml   07/28/06 10:00   0.2007   2.007   2.00E+00   2.20E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.70E+01   8.37E+00   1.41E+01   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.32E+01   6.42E+00   7.32E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.32E+01   6.42E+00   7.32E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.50E+00   2.05E+01   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.32E+01   2.05E+01   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.32E+01   2.05E+01   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   1.32E+00   1.29E+01   2.05E+01   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   7.44E+00   p.Ci/L   3191.67   ml   07/28/06 10:00   0.2007   3.13E+00   4.19E+00   7.44E+00   7.44E+00   7.44E+00   7.44E+00   7.44E+00   7.44E+00   7.44E+00   0.000		SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Kun #	Anquot	Anquot	Date	Date		Units	Flag Values	ılues
LOST         2018         2.33E-01         4.71E-01         9.21E-01         PCi/L         450         ml         07/28/06 10:00           LOST         2.097         2.79E+00         3.24E+00         5.27E+00         PCi/L         3191.67         ml         07/28/06 10:00           2007         -4.18E-01         3.26E+00         5.27E+00         PCi/L         3191.67         ml         07/28/06 10:00           2007         7.02E+00         6.53E+00         1.15E+01         PCi/L         3191.67         ml         07/28/06 10:00           2007         1.70E+01         8.37E+00         1.41E+01         PCi/L         3191.67         ml         07/28/06 10:00           2007         1.68E+00         3.31E+00         5.61E+00         PCi/L         3191.67         ml         07/28/06 10:00           1         2007         1.32E+01         6.42E+00         PCi/L         3191.67         ml         07/28/06 10:00           1         2007         1.32E+01         6.42E+00         PCi/L         3191.67         ml         07/28/06 10:00           2         2007         1.51E+00         3.45E+00         PCi/L         3191.67         ml         07/28/06 10:00           2         2007	11 2 (PICT)	2010	1 \$4E±02		1 81 E±02	nCi/L		10	Im		08/01/06	09	M	n	
2007         2.79E+00         3.24E+00         5.60E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -4.18E-01         3.26E+00         5.27E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -4.18E-01         3.26E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         7.02E+01         3.26E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.70E+01         8.37E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.68E+00         3.31E+00         5.61E+00         pCi/L         3191.67         ml         07/28/06 10:00           1         2007         1.32E+01         6.42E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.32E+01         6.42E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.51E+00         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         1.51E+00         2.05E+01         pCi/	H-3 (DIS1)	2010	2 33E-01		9.21E-01	pCi/L		450	lm	07/28/06 10:00	07/31/06	120	Z	Ŋ	
2007         4.18E-01         3.26E+00         5.27E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -4.18E-01         3.26E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         8.32E-01         3.08E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.70E+01         8.37E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.78E+00         3.31E+00         5.61E+00         pCi/L         3191.67         ml         07/28/06 10:00           1         2007         1.32E+01         6.42E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.32E+01         6.42E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -1.61E+00         3.45E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -1.61E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         3.35E+00         4.19E+00 </td <td>TOTAL SIX</td> <td>2002</td> <td>2.335-01 2.79E+00</td> <td></td> <td>5.60E+00</td> <td>pCi/L</td> <td></td> <td>3191.67</td> <td>lm</td> <td>07/28/06 10:00</td> <td>07/31/06</td> <td>8581</td> <td>Sec</td> <td>U</td> <td>No</td>	TOTAL SIX	2002	2.335-01 2.79E+00		5.60E+00	pCi/L		3191.67	lm	07/28/06 10:00	07/31/06	8581	Sec	U	No
2007         7.02E+00         6.53E+00         1.15E+01         pCi/L         3191.67         ml         07/28/06 10:00           2007         8.32E-01         3.08E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.70E+01         8.37E+00         1.41E+01         pCi/L         3191.67         ml         07/28/06 10:00           4         2007         1.68E+00         3.31E+00         5.61E+00         pCi/L         3191.67         ml         07/28/06 10:00           5         2007         -3.38E+00         5.69E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.32E+01         6.42E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         -1.61E+00         3.45E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	PIN-54	2007	-4 18E-01		5.27E+00	pCi/L		3191.67	m	07/28/06 10:00	07/31/06	8581	Sec	n	No
2007         8.32E-01         3.08E+00         5.20E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.70E+01         8.37E+00         1.41E+01         pCi/L         3191.67         ml         07/28/06 10:00           4         2007         -3.38E+00         5.69E+00         8.50E+00         pCi/L         3191.67         ml         07/28/06 10:00           5         2007         -3.38E+00         5.69E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         -1.61E+00         3.45E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -1.61E+00         3.45E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	FF-59	2007	7.02E+00		1.15E+01	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	n	No
2007         1.70E+01         8.37E+00         1.41E+01         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.68E+00         3.31E+00         5.61E+00         pCi/L         3191.67         ml         07/28/06 10:00           1         2007         -3.38E+00         5.69E+00         8.50E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.32E+01         6.42E+00         7.32E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -1.61E+00         3.45E+00         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	CO-60	2007	8 32E-01		5.20E+00	pCi/L		3191.67	m	07/28/06 10:00	07/31/06	8581	Sec	n	o Z
2007         1.68E+00         3.31E+00         5.61E+00         pCi/L         3191.67         ml         07/28/06 10:00           1         2007         -3.38E+00         5.69E+00         8.50E+00         pCi/L         3191.67         ml         07/28/06 10:00           7         2007         1.32E+01         6.42E+00         7.32E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -1.61E+00         3.45E+00         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           0         2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	00-00 NZ-65	2007	1 70F+01	8.37E+00	1.41E+01	pCi/L		3191.67	TIE I	07/28/06 10:00	07/31/06	8581	Sec	n*	%
2007         -3.38E+00         5.69E+00         8.50E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         1.32E+01         6.42E+00         7.32E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -1.61E+00         3.45E+00         5.54E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	NR-95	2007	1.68E+00		5.61E+00	pCi/L		3191.67	m_	02/28/06 10:00	07/31/06	8581	Sec	n	oN.
2007         1.32E+01         6.42E+00         7.32E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -1.61E+00         3.45E+00         5.54E+00         pCi/L         3191.67         ml         07/28/06 10:00           2007         -6.29E+00         1.29E+01         2.05E+01         pCi/L         3191.67         ml         07/28/06 10:00           2007         3.13E+00         4.19E+00         7.44E+00         pCi/L         3191.67         ml         07/28/06 10:00	ZR-95	2007	-3.38E+00		8.50E+00	pCi/L		3191.67	m	07/28/06 10:00	. 1	8581	Sec	Ω	So :
2007       -1.61E+00       3.45E+00       5.54E+00       pCi/L       3191.67       ml       07/28/06 10:00         2007       -6.29E+00       1.29E+01       2.05E+01       pCi/L       3191.67       ml       07/28/06 10:00         2007       3.13E+00       4.19E+00       7.44E+00       pCi/L       3191.67       ml       07/28/06 10:00	CS-134	2007	1.32E+01		7.32E+00	pCi/L		3191.67	ш	07/28/06 10:00	07/31/06	8581	Sec	*n	oN ;
2007 -6.29E+00 1.29E+01 2.05E+01 pCi/L 3191.67 ml 07/28/06 10:00 pCi/L 3191.67 ml 07/28/06 10:00	CS-137	2007	-1.61E+00		5.54E+00	pCi/L		3191.67	m	07/28/06 10:00	07/31/06	8581	Sec	n i	S S
2007 3.13E+00 4.19E+00 7.44E+00 pCi/L 3191.67 ml 07/28/06 10:00	BA-140	2007	-6.29E+00		2.05E+01	pCi/L		3191.67	ш	07/28/06 10:00	02/31/06	8581	Sec	<b>)</b>	0N ;
	LA-140	2007	3.13E+00	1	7.44E+00	pCi/L		3191.67	m	07/28/06 10:00		8581	Sec	<b>D</b>	No

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

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Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec

Bolded text indicates reportable value.

Low recovery High recovery

TELEDYNE BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Collect Start: 07/28/2006 10:05

Kathy Shaw

Station: Description:

Sample ID: WG-QC-MW-QC-109S-072806-NZ-011

Receive Date: 07/28/2006 Collect Stop:

Matrix: Ground Water

(MG)

% Moisture:

					N IOOONI	) Tark	Notes Date: 01140/1000							
LIMS Number: L29403-4	.03-4										***************************************			
Radionuclide	SOP#	Activity Conc	Activity Uncertainty Conc 2 Sigma	MDC	Units	<b>R</b> #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count	Count Units	Flag	Flag Values
H-3 (DIST)	2010	6.42E+01	1.08E+02	1.72E+02	pCi/L		10	lm		08/01/06	09	M	U	
TOTAL SR	2018	4.03E-01	7.34E-01	1.49E+00	pCi/L		450	m	07/28/06 10:05	07/31/06	50	M	n	
MN-54	2007	-8.01E-01	2.91E+00	5.07E+00	pCi/L		3333.82	m	07/28/06 10:05	02/31/06	10861	Sec	n	No
CO-58	2007	-1.33E+00	2.79E+00	4.61E+00	pCi/L		3333.82	m	07/28/06 10:05	02/31/06	10861	Sec	n	No
FE-59	2007	-3.72E+00	5.29E+00	8.76E+00	pCi/L		3333.82	m	07/28/06 10:05	07/31/06	10861	Sec	ם	No
09-02	2007	1.38E+00	2.79E+00	5.18E+00	pCi/L		3333.82	ш	07/28/06 10:05	07/31/06	10861	Sec	ם	No
ZN-65	2007	-5.72E-01	7.45E+00	1.10E+01	pCi/L		3333.82	m	07/28/06 10:05	07/31/06	10861	Sec	Ŋ	No
NB-95	2007	6.91E+00	3.49E+00	6.08E+00	pCi/L		3333.82	m	07/28/06 10:05 07/31/06	02/31/06	10861	Sec	*n	No
ZR-95	2007	2.95E+00	4.97E+00	8.94E+00	pCi/L		3333.82	lm	07/28/06 10:05	07/31/06	10861	Sec	n	No
CS-134	2007	2.31E+00	3.11E+00	4.93E+00	pCi/L		3333.82	lm	07/28/06 10:05	07/31/06	10861	Sec	n	No
CS-137	2007	-2.60E+00	3.14E+00	5.12E+00	pCi/L		3333.82	m	07/28/06 10:05	07/31/06	10861	Sec	n	No
BA-140	2007	-1.16E+00	1.16E+01	2.00E+01	pCi/L		3333.82	ш	07/28/06 10:05	07/31/06	10861	Sec	n	No
LA-140	2007	6.07E-01	3.61E+00	6.65E+00	pCi/L		3333.82	m	07/28/06 10:05	02/31/06	10861	Sec	n	No

No = Peak not identified in gamma spectrum

\*\*\*\* Results are reported on an as received basis Yes = Peak identified in gamma spectrum unless otherwise noted

Activity concentration exceeds MDC and 3 sigma, peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Activity concentration exceeds customer reporting value

U\* High Spec

MDC exceeds customer technical specification

Low recovery

Compound/Analyte not detected or less than 3 sigma

Flag Values U =

MDC - Minimum Detectable Concentration

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Bolded text indicates reportable value. High recovery

TELEDYNE BROWN ENGINEERING, INC.

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Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Collect Start: 07/28/2006 11:10 Sample ID: WG-QC-MW-QC-109I-072806-NZ-012 Station:

Kathy Shaw

Collect Stop: Receive Date: 07/28/2006

% Moisture:

(WG)

Ground Water

Matrix:

Description:					Receive	e Date: 0	Receive Date: 07/28/2006		% W6	% Moisture:				
LIMS Number: L29403-5	103-5													
Radionuclide	SOP#	Activity Conc	Activity Uncertainty Cone 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values	lues
H-3 (DIST)	2010	7.68E+02	1.56E+02	1.88E+02	pCi/L		10	ml		90/10/80	09	M	+	
TOTAL SR	2018	9.97E-01		1.10E+00	pCi/L		450	冒	07/28/06 11:10	07/31/06	120	Σ	n	
MN-54	2007	6.82E-01		4.99E+00	pCi/L		3280.36	m	07/28/06 11:10	07/31/06	13261	Sec	n	No
CO-58	2007	-3.36E+00		4.05E+00	pCi/L		3280.36	m	07/28/06 11:10	07/31/06	13261	Sec	Ω	No
FR_59	2007	2.10E-02		8.74E+00	pCi/L		3280.36	m	07/28/06 11:10	07/31/06	13261	Sec	ח	% %
09 <b>-</b> 02	2007	-2.20E+00		5.49E+00	pCi/L		3280.36	m	07/28/06 11:10	07/31/06	13261	Sec	n	%
7N-65	2007	1 22E+01		1.23E+01	pCi/L		3280.36	lm.	07/28/06 11:10 07/31/06	07/31/06	13261	Sec	Ω	No
NR-95	2007	6.24E+00	3.40E+00	5.57E+00	pCi/L		3280.36	lm	07/28/06 11:10 07/31/06	07/31/06	13261	Sec	*n	No
ZR-95	2007	1.96E+00		9.03E+00	pCi/L		3280.36	m	07/28/06 11:10	07/31/06	13261	Sec	ם	No
CS-134	2007	6.16E+00	4.47E+00	5.59E+00	pCi/L		3280.36	m.	07/28/06 11:10	02//31/06	13261	Sec	n	No.
CS-137	2007	-3.50E-01	3.25E+00	5.35E+00	pCi/L		3280.36	m	07/28/06 11:10   07/31/06	07/31/06	13261	Sec	n	و گ
BA-140	2007	2.48E+00	1.19E+01	1.97E+01	pCi/L		3280.36	Ш	07/28/06 11:10	02/31/06	13261	Sec	n n	No
I.A-140	2007	1.09E+00	4.18E+00	7.01E+00	pCi/L		3280.36	ш	07/28/06 11:10	02/31/06	13261	Sec	n	No
	. , , , ,				T		The second secon	***************************************						

Yes = Peak identified in gamma spectrum
\*\*\*\* Results are reported on an as received basis
unless otherwise noted No = Peak not identified in gamma spectrum

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec

MDC - Minimum Detectable Concentration

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Bolded text indicates reportable value.

TELEDYNE BROWN ENGINEERING, INC. A Teledyne Technologies Company

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Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Matrix: Ground Water (WG)	**		- 1	int Count Count te Time Units Flag Values	1/06 49.35 M +	1/06 120 M U	11671 Sec U	11671 Sec U	11671 Sec U	11671 Sec U	11671 Sec U*	11671 Sec U	11671 Sec U	11671 Sec U*	11571	110/1 360 0	11671 Sec U
	Volume:	% Moisture:	i de la communicación de l	t Reference Count Date Date	08/01/09	07/28/06 11:15 07/31/06	07/28/06 11:15   07/31/06	07/28/06 11:15   07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	07/28/06 11:15 07/31/06	-	
6 11:15		9		ot Aliquot ne Units	lm	m <sub>I</sub>	lm 6	lm 68	lm 68	lm 68	lm 68	lm 68	lm 68	lm 68	36 m		_
Collect Start: 07/28/2006 11:15	.dc	Receive Date: 07/28/2006		ın Aliquot # Volume	10	450	3379.89	3379.89	3379.89	3379.89	3379.89	3379.89	3379.89	3379.89	3379.89		3379.89
Collect Sta	Collect Stop:	Receive Da		Run Units #	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L		pCi/L
				MDC	2.01E+02	1.26E+00	4.98E+00	5.25E+00	9.91E+00	4.76E+00	1.52E+01	5.77E+00	9.20E+00	8.30E+00	5.28E+00		2.02E+01
-NZ-013				Uncertainty 2 Sigma	1.82E+02	6.54E-01	3.07E+00	3.09E+00	5.64E+00	2.96E+00	8.80E+00	3.30E+00	5.45E+00	8.40E+00	3.15E+00		1.22E+01
-1091-072806				Activity Conc	1 14F+03	4 12E-01	-1.62E-01	2.07E+00	6.10E+00	-7.57E-01	2.83E+01	4.29E+00	2.82E+00	2.31E+01	7.17E-01		3.11E+00
-0C-MW-0C	,		403-6	SOP#	2010	2018	2007	2007	2007	2007	2007	2007	2007	2007	2007	.;;1	2007
Sample ID: WG-OC-MW-QC-109I-072806-NZ-013	Station:	Description:	LIMS Number: L29403-6	Radionuclide	H 3 (DIST)	TOTAL SR	MN-54	CO-58	FE-59	09-02	20 02 ZN-65	NB-95	ZR-95	CS-134	CS-137		BA-140

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis unless otherwise noted No = Peak not identified in gamma spectrum

MDC - Minimum Detectable Concentration

Page

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Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Flag Values

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

High Spec

Bolded text indicates reportable value. High recovery

Low recovery

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EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: RB-OC-MW-OC-102D-072806-NZ-014	C-MW-OC	-102D-07280	6-NZ-014		Collec	x Start: 07	Collect Start: 07/28/2006 11:20	20	A CONTRACTOR OF THE CONTRACTOR	Matrix: Ground Water	ound Wate	10	(MG)	
Station:					Collec	Collect Stop:				Volume:				
Description:					Receiv	Receive Date: 07/28/2006	7/28/2006		W %	% Moisture:				
LIMS Number: L29403-7	13-7													$\neg$
Radionuclide	SOP#	Activity	Activity Uncertainty Conc 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Count Time Units	Count Units	Flag Values	
		)	0											T
H-3 (DIST)	2010	3.65E+02	1.32E+02	1.83E+02	pCi/L		10	ш,		08/01/06	09	Σ	+	
TOTAL SR	2018	-6 88E-01	5.58E-01	1.28E+00	pCi/L		450	Im.	07/28/06 11:20	07/31/06	120	Σ	D	······································
MN-54	2002	-3 13E+00		3.84E+00	pCi/L		3268.73	Jm	07/28/06 11:20	07/31/06	9481	Sec	U No	
+C-NIM	2007	-4 24E-01		4.85E+00	pCi/L		3268.73	lm	07/28/06 11:20	07/31/06	9481	Sec	n No	uadroi sieny
FF_50	2007	-3.31E-01		8.87E+00	pCi/L		3268.73	E	07/28/06 11:20	07/31/06	9481	Sec	U No	
00 00	2007	-1 96F+00		4.17E+00	pCi/L		3268.73	m	07/28/06 11:20 07/31/06	07/31/06	9481	Sec	n No	
00-00	7007	20.00		22.71		-			000000000	20, 10, 10	1010	c	- L	*****

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pCi/L

4.81E+00

pCi/L pCi/L

> 4.52E+00 5.11E+00

2.84E+00

1.42E+00

2.90E+00

1.94E-01 1.08E+01

7.84E+00

4.50E+00

-3.31E-01

pCi/L

9.60E+00

5.70E+00 2.65E+00

3.02E+00 1.16E+00

2007 2007 2007 2007 2007

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02//31/06 07/31/06

07/28/06 11:20

3268.73

pCi/L

pCi/L

2.19E+01 6.27E+00

1.18E+01

3.65E+00

-1.89E+00

2007

BA-140 LA-140

CS-137

CS-134

NB-95 ZR-95

**SN-65** 

pCi/L

3268.73 3268.73

07/28/06 11:20

07/28/06 11:20

07/28/06 11:20

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07/31/06 07/31/06 9481

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07/31/06

07/28/06 11:20

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Yes = Peak identified in gamma spectrum
\*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum unless otherwise noted

MDC - Minimum Detectable Concentration

Activity concentration exceeds MDC and 3 sigma, peak identified(gamma only)

Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma Activity concentration exceeds customer reporting value MDC exceeds customer technical specification High recovery Low recovery II High Spec

Compound/Analyte not detected or less than 3 sigma

Flag Values

Jo Page

Bolded text indicates reportable value.

TELEDYNE
BROWN ENGINEERING, INC.

A Teledyne Technologies Company

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Collect Start: 07/28/2006 12:25

Collect Stop:

Volume: % Moisture:

(MG)

Ground Water

Matrix:

Sample ID: WG-QC-MW-QC-102D-072806-NZ-015 Station:

Kathy Shaw

Receive Date: 07/28/2006

Description:					Receive	Date: 0	Receive Date: 07/28/2006		www.	% Moisture:				
LIMS Number: L29403-8	3-8													
		Activity	Activity Uncertainty			Run	Aliquot	Aliquot	Reference	Count	Count	Count	i	
Radionuclide	#dos	Conc	2 Sigma	MDC	Units	#	Volume	Units	Date	Date	Time	Units	Flag	Flag Values
II 3 (DIST)	2010	3 93E±03	4.50E+02	3.25E+02	pCi/L		10	ml		08/01/06	18.85	Σ	+ High	ų
TOTAL SR	2018	-3.47E-02		1.87E+00	pCi/L		450	TEI	07/28/06 12:25	02/31/06	120	Σ	Ω	1.70 A
MN-54	2007	1.05E+00		6.26E+00	pCi/L		3358.53	lm	07/28/06 12:25	01/31/06	7756	Sec	n	No
CO-58	2007	1.10E-01		6.47E+00	pCi/L		3358.53	m	07/28/06 12:25	02/31/06	7756	Sec	Ω	oN.
FF_59	2007	3.34E-01	7.71E+00	1.27E+01	pCi/L		3358.53	m	07/28/06 12:25	02/31/06	7756	Sec	'n	No
09-00	2007	8.21E-01	4.61E+00	8.18E+00	pCi/L		3358.53	m	07/28/06 12:25	07/31/06	7756	Sec	ם	oN :
20-NZ	2007	1.43E+01	1.12E+01	1.81E+01	pCi/L		3358.53	ш	07/28/06 12:25	02/31/06	7756	Sec	n	No
NB-95	2007	7.22E+00	4.34E+00	7.98E+00	pCi/L		3358.53	m	07/28/06 12:25		7756	Sec	ם D	oN :
ZR-95	2007	-1.69E+00	6.03E+00	9.62E+00	pCi/L		3358.53	lm	07/28/06 12:25	- 1	7756	Sec	D :	oN ;
CS-134	2007	9.94E+00	4.61E+00	7.84E+00	pCi/L		3358.53	m	07/28/06 12:25	07/31/06	7756	Sec	*	oN No
CS-137	2007	7.66E+00	4.17E+00	7.84E+00	pCi/L		3358.53	m	07/28/06 12:25	07/31/06	7756	Sec	ם	No
BA-140	2007	-1.53E+01	1.66E+01	2.52E+01	pCi/L		3358.53	lm	07/28/06 12:25	07/31/06	7756	Sec	ח	oN ;
LA-140	2007	4.33E+00	4.93E+00	9.03E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	n	No
		THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED I	Philippinson and the second se	THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NA										

Yes = Peak identified in gamma spectrum \*\*\*\* Results are reported on an as received basis No = Peak not identified in gamma spectrum

unless otherwise noted

Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma

Compound/Analyte not detected or less than 3 sigma

Activity concentration exceeds customer reporting value MDC exceeds customer technical specification

MDC - Minimum Detectable Concentration

<sub>∞</sub> of

Page 8

Bolded text indicates reportable value.

Low recovery

U\* High Spec

### QC Results Summary

# QC Summary Report

L29403

for

8/1/2006

9:58:25AM

H-3 (DIST)

BROWN ENGINEERING
A Teledyne Technologies Company

	Qualifier P/F U P		Range Qualifier P/F 70-130 + P			Range Qualifier P/F <30 ** NE	
			Spike Recovery 94.3			RPD	
	Units pCi/Total		Units pCi/Total			Units pCi/L	
 ıary	Blank Result < 1.810E+00	ary	LCS Result 4.760E+02		ry	<b>DUP Result</b> < 1.820E+02	
Method Blank Summary		LCS Sample Summary	Spike Value 5.05E+002		Duplicate Summary	Original Result < 1.780E+02	
	Count Date/Time 07/31/2006 17:40		Count Date/Time 07/31/2006 18:44			Count Date/Time 07/31/2006 19:03	
	<u>Matrix</u> WO		Matrix WO			Matrix WG	
	<u>Radionuclide</u> H-3 (DIST)		Radionuclide H-3 (DIST)	1706-1 +002 +000		Radionuclide H-3 (DIST)	
	TBE Sample ID WG4273-1		TBE Sample ID WG4273-2	Spike ID: 3H-041706-1 Spike conc: 5.05E+002 Spike Vol: 1.00E+000		TBE Sample ID WG4273-3 L29402-1	

Page:

Positive Result Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated Nuclide not detected

Spiking level < 5 times activity Pass Fail Not evaluated

+D\* \* \* a LZ

# QC Summary Report

L29403

for

9:58:25AM

8/1/2006

BROWN ENGINEERING
A Teledyne Technologies Company

		<u>P/F</u> P		P/F P			NE NE	L29403	29	of
		Oualifier P/F U P		ualifier +			nalifier **	;e: 5		
		a		Range         Qualifier         P/F           70-130         +         P			Range Qualifier <30 ***	Page:		
				H C			<u> </u>			
				overy 6						
				Spike Recovery 109.6			RPD			
	ł	otal					SZ //			
		Units pCi/Total		Units pCi/Total			Units pCi/L			
		Blank Result < 8.500E-01		LCS Result 6.400E+01			<b>DUP Result</b> < 1.620E+00			
	ıary	<b>Blank</b> < 8.5(	ary	LCS 6.40		ry.	DUP < 1.62			
	Method Blank Summary		LCS Sample Summary			Duplicate Summary	Result 3+00			
	Blank		mple			cate S	Original Result < 1.890E+00	MDC		
TOTAL SR	ethod		CS S	alue 101		Dupli	01 V	d above		
TOT	Σ			Spike Value 5.84E+001				t detecte		
		<u>Fime</u> 17:05					<u>Time</u> 17:05	ıd/or no		
		Count Date/Time 07/31/2006 17:05		Count Date/Time 07/31/2006 17:05			Count Date/Time 07/31/2006 17:05	ıtified aı		
								not ider		
		<u>Matrix</u> WO		<u>Matrix</u> WO			<u>Matrix</u> WG	ed, peak luated		
				<b>6</b> )			<b>431</b>	s analyza not eva	activity	
		Radionuclide FOTAL SR		Radionuclide FOTAL SR			Radionuclide FOTAL SR	llyte was ADC are tected	: 5 times	
		Radionucl TOTAL SR		Radionucl TOTAL SR	)11905 +002 001		Radionucli TOTAL SR	Positive Result Compound/analyte was analyzed, peak not identified and/or not detected above MDC < 5 times the MDC are not evaluated Nuclide not detected	Spiking level < 5 times activity Pass	Fail Not evaluated
		ple ID		ple ID 2	Spike ID: 90SR-011905 Spike conc: 2.34E+002 Spike Vol: 2.50E-001		ple ID 3	Positive Compc < 5 tim Nuclide	Spiking Pass	Fail Not ev
		TBE Sample ID WG4278-1		TBE Sample ID WG4278-2	Spike ID: Spike conc Spike Vol:		TBE Sample ID WG4278-3 L29389-6	. AL	* ** <b>Q</b>	F NE
	ı	El ≯		∄≯	\$ \$ \$	1	H \$1	+ > * *	* 🕰	щZ

### Raw Data

Raw Data Sheet (rawdata) Aug 01 2006, 10:14 am

Work Order: <u>L29403</u>	Customer: <u>Exelon</u>		7,110,1111					Page:	н			
Nuclide: <u>H-3 (DIST)</u>	Project : EX001-3ESPQUAD-06	BESPOUAD-06									Decay &	
æ	ce Volume/	Scavenge Mil	Milking Date/time	Mount	Count Recovery Date/time	Counter	Total	Sample Bkg dt(min) counts		Bkg 1 dt (min)	Eff. Ingrowth / Factor	Analyst
# #		1			01-aug-06	ا ر	170	09	2.03	09	.211	国口
LZ9403-1	10 ml			,	02:27							
WG-QC-MW-QC-116S-072806-NZ-008												
Activity: 1.71E+02 Error: 1.22E+02	MDC: 1.83E+02	*				Ì						
l				0	01-aug-06	16 LS7	118	09	2.03	09	. 209	ŽĮ.
	10 ml				03:31							
WG-QC-MW-QC-115S-072806-NZ-009												
-1.51E+01	MDC: 1.85E+02	×			30 - price - 10	1.27	166	60	2.03	9	.213	田口
L29403-3 H-3 DIST	- E			<b>5</b>	04:34			•				
OTO MIN GOODED DOO'T DO MIN TO MIN	7111 07											
MG-QC-MW-QC-1098-0/8800-NA-010	MDC: 1.81E+02 *	*						A Company				
1				0	01-aug-06	)6 LS7	141	60	2.03	09	.225	因
	10 ml				05:38							
WG-QC-MW-QC-109S-072806-NZ-011												
Activity: 6.428+01 Error: 1.08E+02	MDC: 1.72E+02 *	*			- Address -							1
L29403-5 H-3 DIST				0	01-aug-06	)6 LS7	332	0 9	2.03	9	507.	9
	10 ml				06:42							
WG-QC-MW-QC-109I-072806-NZ-012												
Activity: 7.68E+02 * Error: 1.56E+02	MDC: 1.88E+02				1 1		1	100	60 0	0	212	T:3
L29403-6 H-3 DIST	•			0	01-aug-06	)6 LS7	365	44.33	2.03	0	7 7 7 7 .	O.
	TM OT				7							
WG-QC-MW-QC-LUSI-U/Z808-NZ-UIS	MDG. 2 01#1.02											***************************************
*20402 7 1.145+02 * BILDE: 1.025+02				c	01-aug-06	)6 LS7	224	9	2.03	09	.211	良い
1277 C-U	ן ש טר			,	08:38							
RB-OC-MW-OC-102D-072806-NZ-014	<del>1</del>											
Activity: 3.65E+02 * Error: 1.32E+02	MDC: 1.83E+02											
1 [-4				0	01-aug-06	)6 LS7	387	18.85	2.03	09	.212	国
	10 ml				09:42							
WG-QC-MW-QC-102D-072806-NZ-015	10 C											
ACTIVITY: 3.93E+U3 * ELIGI: 4.3E+UZ	MUC: 3.438+04		The second secon									

Raw Data Sheet (rawdata) Aug 01 2006, 10:14 am

LCB LCB LCB LCB LCB 9 LCB LCB Analyst Eff. Ingrowth Decay & Factor .335 .345 .343 .344 .344 .343 400 400 400 400 400 400 400 400 dt (min) Bkg 363 342 289 277 307 312 289 counts Вкд Page: 2 120 120 120 20 120 120 120 dt (min) Sample counts 108 126 105 Counter Total 68 23 62 97 87 X3A XIC XID X2C X2D X1B х2в 31-jul-06 20:13 Mount
Weight Recovery Date/time
0 31-jul-06 31-jul-06 20:13 31-jul-06 20:13 31-jul-06 20:13 31-jul-06 20:13 31-jul-06 31-jul-06 23:35 20:13 118.68 119.23 85.16 95.33 81.87 64.56 59.34 0 0 0 0 0 0 Date/time Date/time Milking 31-jul-06 12:30 31-jul-06 12:30 31-jul-06 31-ju1-06 31-jul-06 31-jul-06 31-jul-06 31-jul-06 12:30 12:30 12:30 12:30 12:30 Scavenge Project : EX001-3ESPQUAD-06 Customer: Exelon MDC: 1.26E+00 MDC: 1.28E+00 MDC: 1.87E+00 MDC: 1.88E+00 MDC: 1.72E+00 MDC: 1.49E+00 MDC: 9.21E-01 MDC: 1.1E+00 Volume/ Aliquot 450 ml 450 ml 450 ml 450 ml 450 ml 450 ml 450 ml 450 ml TOTAL SR 28-jul-06 10:00 Activity: 2.33E-01 Error: 4.71E-01 P L29403-4 TOTAL SR 28-jul-06 TOTAL SR 28-jul-06 11:10 Error: 6.26E-01 1 TOTAL SR 28-jul-06 11:15 TOTAL SR 28-jul-06 TOTAL SR 28-jul-06 28-juI-06 28-jul-06 Reference Date/time WG-QC-MW-QC-116S-072806-NZ-008
Activity: -6.21E-01 Error: 8.65E-01
L29403-2 TOTAL SR 28-ju Activity: 4.03E-01 Error: 7.34E-01 11:20 Activity: -3.47E-02 Error: 9.15E-01 07:50 10:05 Activity: -6.88E-01 Error: 5.58E-01 12:25 06:50 Activity: -9.81E-01 Error: 7.45E-01 L29403-3 TOTAL SR 28-11 Activity: 4.12E-01 Error: 6.54E-01 WG-QC-MW-QC-102D-072806-NZ-015 WG-QC-MW-QC-115S-072806-NZ-009 WG-QC-MW-QC-109I-072806-NZ-012 Activity: 9.97E-01 Error: 6.261 RB-QC-MW-QC-102D-072806-NZ-014 WG-QC-MW-QC-109S-072806-NZ-010 WG-QC-MW-QC-109S-072806-NZ-011 WG-QC-MW-QC-109I-072806-NZ-013 TOTAL SR Analysis Nuclide: SR-90 (FAST) Work Order: L29403 Run L29403-8 L29403-5 L29403-6 L29403-7 L29403-1 Sample ID Client ID

Sec. Review: Analyst LIMS:

\_\_\_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:25.68 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 23:53:16.81

LIMS No., Customer Name, Client ID: WG L29403-1 EX QUAD

Sample ID : 04L29403-1 Smple Date: 28-JUL-2006 06:50:00.

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	4	63.17*	71	379	1.35	127.23	5.49E-01	4.92E-03	51.7	1.69E+00
2	4	66.39*	100	418	1.36	133.68	6.66E-01	6.95E-03	38.6	
3	1	77.05*	65	389	0.80	155.01	1.06E+00	4.51E-03	52.5	1.27E+00
4	1	87.16*	36	300	1.07	175.24	1.39E+00	2.50E-03	82.6	3.80E+00
5	1	139.69*	59	447	1.10	280.37	2.04E+00	4.09E-03	67.9	2.93E+00
6	1	185.62*	10	361	1.25	372.27	1.92E+00	6.66E-043	363.9	1.48E+00
7	1	198.16*	74	362	1.15	397.37	1.87E+00	5.15E-03	49.1	1.77E+00
8	1	241.11	182	553	5.10	483.30	1.67E+00	1.27E-02	32.6	7.91E+00
9	1	294.86*	212	247	1.23	590.86	1.46E+00	1.47E-02	16.6	4.18E+00
10	1	351.84*	386	199	1.24	704.85	1.28E+00	2.68E-02	9.1	1.42E+00
11	1	595.98	43	92	1.41	1193.25	8.63E-01	2.96E-03	44.0	2.40E+00
12	1	609.05*	357	101	1.45	1219.39	8.49E-01	2.48E-02	8.6	1.76E+00
13	1	1120.27*	105	25	2.64	2241.72	5.27E-01	7.32E-03	16.2	3.41E+00
14	1	1237.91*	29	58	2.04	2476.91	4.87E-01	2.03E-03	65.7	1.89E+00
15	1	1377.74	37	27	1.90	2756.43	4.49E-01	2.57E-03	33.0	1.34E+00
16	1	1460.41*	11	21	2.66	2921.67	4.30E-01	7.69E-043	134.2	9.71E-01
17	1	1764.56*	76	26	2.69	3529.48	3.77E-01	5.29E-03	19.8	8.15E-01

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	11	10.67*	4.297E-01	1.444E+01	1.444E+01	268.42
RA-226	186.21	10	3.28*	1.923E+00	9.090E+00	9.090E+00	727.89
U-235	143.76		10.50*	2.041E+00	Li	ne Not Found	
	163.35		4.70	2.007E+00	Li	ne Not Found	
	185.71	10	54.00	1.923E+00	5.521E-01	5.521E-01	727.89
	205.31		4.70	1.833E+00	Li	ne Not Found	

Page: 2

Summary of Nuclide Activity

Sample ID: 04L29403-1 Acquisition date: 30-JUL-2006 23:53:16

Total number of lines in spectrum 17

Number of unidentified lines 14

Number of lines tentatively identified by NID 3 17.65%

Nuclide Type : natural

			Uncorrected	Decay Corr	Decay Corr	2-Sigma
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error Flags
K-40	1.28E+09Y	1.00	1.444E+01	1.444E+01	3.876E+01	268.42
RA-226	1600.00Y	1.00	9.090E+00	9.090E+00	66.16E+00	727.89

RA-226 1600.00Y 1.00 9.090E+00 9.090E+00 66.16E+00 727.89 U-235 7.04E+08Y 1.00 5.521E-01 5.521E-01 40.19E-01 727.89 K

Total Activity : 2.408E+01 2.408E+01

Grand Total Activity: 2.408E+01 2.408E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID: 04L29403-1

Page: 3
Acquisition date: 30-JUL-2006 23:53:16

17.65%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	63.17	71	379	1.35	127.23	123	18	4.92E-03	****	5.49E-01	
4	66.39	100	418	1.36	133.68	123	18	6.95E-03	77.1	6.66E-01	
1	77.05	65	389	0.80	155.01	153	6	4.51E-03	***	1.06E+00	
1	87.16	36	300	1.07	175.24	173	6	2.50E-03	***	1.39E+00	
1	139.69	59	447	1.10	280.37	276	9	4.09E-03	* * * *	2.04E+00	
1	198.16	74	362	1.15	397.37	393	9	5.15E-03	98.2	1.87E+00	
1	241.11	182	553	5.10	483.30	474	19	1.27E-02	65.2	1.67E+00	${ m T}$
1	294.86	212	247	1.23	590.86	585	11	1.47E-02	33.2	1.46E+00	
1	351.84	386	199	1.24	704.85	700	11	2.68E-02	18.2	1.28E+00	
1	595.98	43	92	1.41	1193.25	1191	9	2.96E-03	87.9	8.63E-01	
1	609.05	357	101	1.45	1219.39	1212	14	2.48E-02	17.1	8.49E-01	
1	1120.27	105	25	2.64	2241.72	2235	18	7.32E-03	32.4	5.27E-01	
1	1237.91	29	58	2.04	2476.91	2470	18	2.03E-03	***	4.87E-01	
1	1377.74	37	27	1.90	2756.43	2751	12	2.57E-03	66.0	4.49E-01	
1	1764.56	76	26	2.69	3529.48	3521	15	5.29E-03	39.6	3.77E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 17
Number of unidentified lines 14
Number of lines tentatively identified by NID 3

Nuclide Type : natural

Wtd Mean Wtd Mean Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide Hlife pCi/L Decay pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 3.876E+01 268.42 1.00 1.444E+01 1.444E+01 66.16E+00 727.89 RA-226 1600.00Y 1.00 9.090E+00 9.090E+00 Total Activity : 2.353E+01 2.353E+01

Grand Total Activity: 2.353E+01 2.353E+01

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.444E+01	3.876E+01	4.140E+01	0.000E+00	0.349
RA-226	9.090E+00	6.616E+01	9.919E+01	0.000E+00	

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/L) Ideo		MDA (pCi/L)	MDA error	Act/MDA
BE-7	-4.158E+00	2.211E+01	3.591E+01	0.000E+00	-0.116
NA-24	-8.604E+00	6.751E+01	9.528E+01	0.000E+00	-0.090
CR-51	4.727E+00	2.310E+01	3.775E+01	0.000E+00	0.125
MN-54	-9.267E-01	2.394E+00	3.782E+00	0.000E+00	-0.245
CO-57	-1.526E+00	2.352E+00	3.757E+00	0.000E+00	-0.406
CO-58	1.459E+00	2.654E+00	4.499E+00	0.000E+00	0.324
FE-59	1.045E+00	5.018E+00	8.384E+00	0.000E+00	0.125
CO-60	8.132E-01	2.730E+00	4.885E+00	0.000E+00	0.166
ZN-65	1.262E+01	5.827E+00	1.023E+01	0.000E+00	1.233
SE-75	1.724E+00	3.440E+00	5.743E+00	0.000E+00	0.300
SR-85	6.811E+00	3.128E+00	5.557E+00	0.000E+00	1.226
Y-88	-1.671E+00	2.840E+00	4.372E+00	0.000E+00	-0.382
NB-94	-3.263E+00	2.557E+00	3.882E+00	0.000E+00	-0.840
NB-95	2.035E+00	2.655E+00	4.570E+00	0.000E+00	0.445
ZR-95	1.972E+00	4.434E+00	7.503E+00	0.000E+00	0.263
MO-99	-3.094E+01	3.703E+01	5.724E+01	0.000E+00	-0.541
RU-103	5.436E-01	2.664E+00	4.407E+00	0.000E+00	0.123
RU-106	-1.034E+01	2.289E+01	3.706E+01	0.000E+00	-0.279
AG-110m	-1.547E+00	2.477E+00	3.946E+00	0.000E+00	-0.392
SN-113	1.335E+00	3.242E+00	5.491E+00	0.000E+00	0.243
SB-124	2.083E+00	4.642E+00	4.073E+00	0.000E+00	0.511
SB-125	1.419E+00	7.558E+00	1.260E+01	0.000E+00	0.113
TE-129M	1.225E+01	2.974E+01	4.997E+01	0.000E+00	0.245
I-131	2.111E+00	3.101E+00	5.335E+00	0.000E+00	0.396
BA-133	2.422E+00	3.841E+00	5.730E+00	0.000E+00	0.423 1.849
CS-134	9.003E+00	3.338E+00	4.869E+00	0.000E+00	
CS-136	-2.468E+00	2.935E+00	4.490E+00	0.000E+00	-0.550
CS-137	1.225E+00	2.743E+00	4.672E+00	0.000E+00	0.262 -0.361
CE-139	-1.447E+00	2.541E+00	4.002E+00	0.000E+00	-0.083
BA-140	-1.380E+00	1.031E+01	1.665E+01	0.000E+00	0.455
LA-140	2.695E+00	3.336E+00	5.922E+00	0.000E+00	-0.190
CE-141	-1.335E+00	4.859E+00	7.028E+00	0.000E+00 0.000E+00	0.414
CE-144	1.283E+01	2.058E+01	3.100E+01		-0.634
EU-152	-8.228E+00	9.178E+00	1.298E+01	0.000E+00	-0.286
EU-154	-2.263E+00	4.922E+00	7.904E+00	0.000E+00 0.000E+00	0.103
AC-228	1.808E+00	1.046E+01	1.760E+01	0.000E+00	-0.158
TH-228	-1.384E+00	6.017E+00	8.783E+00		0.103
TH-232	1.806E+00	1.045E+01	1.759E+01	0.000E+00 0.000E+00	0.189
U-235	5.776E+00	2.169E+01	3.063E+01	0.000E+00	0.368
U-238	1.888E+02	2.960E+02	5.125E+02		-0.270
AM-241	-1.045E+01	2.697E+01	3.874E+01	0.000E+00	-0.270

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,07/31/2006 03:53,07/28/2006 06:50,
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C, K-40
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                    9.090E+00,
C, RA-226
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C, BE-7
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C, RU-106
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                                                                   -0.083
C, BA-140
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C, CE-144
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                                    9.178E+00,
C, EU-152
            , NO
                                                   7.904E+00,,
                                                                    -0.286
                    -2.263E+00,
            , NO
                                    4.922E+00,
C, EU-154
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                                                                    -0.158
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                                    6.017E+00,
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 C, TH-228
                                                   1.759E+01,,
                                                                     0.103
                                    1.045E+01,
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                                    2.169E+01,
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            ,NO
                                                    5.125E+02,,
                                                                     0.368
 C, U-238
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                                                                    -0.270
                    -1.045E+01,
                                    2.697E+01,
                                                    3.874E+01,,
 C, AM-241
            , NO
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Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:48.37 TBE23 03017322 HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 23:53:29.39

LIMS No., Customer Name, Client ID: WG L29403-2 EX QUAD

Sample ID : 23L29403-2 Smple Date: 28-JUL-2006 07:50:00.

Sample Type : WG Geometry : 2335L090704
Quantity : 3.42710E+00 L BKGFILE : 23BG072806MT
Start Channel : 50 Energy Tol : 1.00000 Real Time : 0 04:00:09.98
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:00:00.00

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	7	33.69*	56	9	1.08	67.71	9.24E-02	3.87E-03	29.0	2.77E+00
2	7	35.16*	59	110	1.80	70.63		4.10E-03		
3	7	37.45*	117	235	1.81	75.21		8.15E-03		
4	7	39.51		213	1.14	79.34		5.04E-03		
5	7	40.72		312	1.50	81.75		3.51E-03	62.1	
6	7	42.99*	23	352	1.75	86.28		1.61E-033		
7	0	77.16*	87	584	1.25	154.55		6.08E-03	48.1	
8	0	92.57*	18	504	1.35	185.34	1.69E+00	1.28E-03	227.1	
9	0	139.91*		638	1.34	279.91	2.05E+00	1.32E-02	26.2	
10	0	198.16	98	399	1.04	396.30	1.90E+00	6.79E-03	36.7	
11	0	238.57*		263	0.94	477.06	1.72E+00	5.00E-03	42.1	
12	0	241.81	119	321	1.21	483.53	1.71E+00	8.30E-03	27.5	
13	0	294.77*	306	328	1.07	589.37	1.50E+00	2.13E-02	13.1	
14	0	351.91*	408	255	1.19	703.57	1.32E+00	2.84E-02	9.6	
15	0	596.61	48	127	0.83	1192.81	8.73E-01	3.34E-03	50.9	
16	0	609.20*	426	119	1.69	1218.00	8.59E-01	2.96E-02	7.6	
17	0	934.56	36	48	1.45	1868.88	6.27E-01	2.50E-03	39.6	
18	0	1120.35*	93	44	1.38	2240.75	5.52E-01	6.47E-03	19.0	
19	0	1238.91	43	39	1.48	2478.14	5.15E-01	2.99E-03	33.6	
20	0	1378.69	32	35	1.44	2758.06	4.78E-01	2.24E-03	40.9	
21	0	1461.45*		40	2.39	2923.85	4.59E-01	9.62E-04	157.3	
22	0	1730.65	17	23	2.31	3463.30	4.06E-01	1.19E-03	65.5	
23	0	1764.18*	63	15	2.00	3530.50	4.01E-01	4.36E-03	19.8	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pĈi/L	%Error
K-40	1460.81	14	10.67*	4.593E-01	1.549E+01	1.549E+01	314.53
TH-228	238.63	72	44.60*	1.725E+00	5.125E+00	5.139E+00	84.17
	240.98	119	3.95	1.711E+00	9.683E+01	9.709E+01	54.91

Summary of Nuclide Activity Page: 2

Sample ID : 23L29403-2 Acquisition date : 30-JUL-2006 23:53:29

Total number of lines in spectrum 23 Number of unidentified lines 20

Number of lines tentatively identified by NID 3 13.04%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma Nuclide pCi/L pCi/L 2-Sigma Error %Error Flags Hlife Decay

1.549E+01 4.871E+01 314.53 5.139E+00 4.325E+00 84.17 K-40 1.28E+09Y 1.00 1.549E+01 TH-228 1.91Y 1.00 5.125E+00

> Total Activity : 2.061E+01 2.063E+01

Grand Total Activity: 2.061E+01 2.063E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"E" = Manually edited "A" = Nuclide specific abn. limit

```
Unidentified Energy Lines
                                                                       Page :
Sample ID : 23L29403-2
                                         Acquisition date : 30-JUL-2006 23:53:29
Ιt
     Energy
               Area
                      Bkgnd
                             FWHM
                                    Channel Left Pw Cts/Sec %Err
                                                                    %Eff
                                                                            Flags
 7
      33.69
                 56
                          9
                             1.08
                                      67.71
                                              65 25 3.87E-03 58.1
                                                                    9.24E-02
 7
      35.16
                 59
                        110
                             1.80
                                      70.63
                                              65 25 4.10E-03 ****
                                                                   1.16E-01
 7
      37.45
                117
                        235
                                      75.21
                             1.81
                                              65 25 8.15E-03 64.8
                                                                   1.58E-01
 7
      39.51
                        213
                 73
                             1.14
                                      79.34
                                              65 25 5.04E-03 73.1
                                                                   2.02E-01
 7
      40.72
                 51
                        312
                             1.50
                                      81.75 65 25 3.51E-03 ****
                                                                   2.31E-01
 7
      42.99
                 23
                        352
                             1.75
                                      86.28 65 25 1.61E-03 ****
                                                                    2.88E-01
 0
      77.16
                 87
                        584
                             1.25
                                     154.55
                                                  7 6.08E-03 96.2
                                             152
                                                                   1.36E+00
 0
      92.57
                18
                        504
                             1.35
                                     185.34 182
                                                 7 1.28E-03 ****
                                                                   1.69E+00
 0
     139.91
                190
                        638
                             1.34
                                     279.91 276 10 1.32E-02 52.4
                                                                   2.05E+00
 0
     198.16
                98
                        399
                             1.04
                                     396.30
                                             393
                                                 8 6.79E-03 73.4
                                                                   1.90E+00
 0
     294.77
                306
                        328
                             1.07
                                     589.37
                                            584 11 2.13E-02 26.1
                                                                   1.50E+00
 0
     351.91
                408
                        255
                            1.19
                                    703.57
                                            697 12 2.84E-02 19.2
                                                                   1.32E+00
 0
     596.61
                48
                        127 0.83
                                    1192.81 1187 13 3.34E-03 ****
                                                                   8.73E-01
 0
     609.20
                426
                        119 1.69
                                    1218.00 1211 14 2.96E-02 15.3
                                                                   8.59E-01
 0
     934.56
                         48 1.45
                 36
                                    1868.88 1864 10 2.50E-03 79.2
                                                                   6.27E-01
 0
    1120.35
                 93
                         44 1.38
                                    2240.75 2236 13 6.47E-03 38.0
                                                                   5.52E-01
 0
   1238.91
                 43
                         39 1.48
                                    2478.14 2473 13 2.99E-03 67.2
                                                                   5.15E-01
    1378.69
                         35 1.44
                 32
                                    2758.06 2751 12 2.24E-03 81.9
                                                                   4.78E-01
 0
    1730.65
                 17
                         23
                             2.31
                                   3463.30 3453 14 1.19E-03 ****
                                                                   4.06E-01
 0
    1764.18
                 63
                         15
                             2.00
                                   3530.50 3524 12 4.36E-03 39.5
                                                                   4.01E-01
Flags: "T" = Tentatively associated
Summary of Nuclide Activity
 Total number of lines in spectrum
                                                 23
 Number of unidentified lines
                                                 20
 Number of lines tentatively identified by NID
                                                3
                                                          13.04%
Nuclide Type : natural
                           Wtd Mean
                                        Wtd Mean
                          Uncorrected Decay Corr
                                                     Decay Corr
                                                                  2-Sigma
Nuclide
            Hlife
                    Decay
                             pCi/L
                                          pCi/L
                                                    2-Sigma Error %Error Flags
K-40
        1.28E+09Y
                     1.00
                           1.549E+01
                                        1.549E+01
                                                     4.871E+01
                                                                  314.53
TH-228
            1.91Y
                     1.00
                           5.125E+00
                                        5.139E+00
                                                     4.325E+00
                                                                   84.17
                           _____
                                        _____
         Total Activity:
                           2.061E+01
                                         2.063E+01
   Grand Total Activity:
                           2.061E+01
                                        2.063E+01
Flags: "K" = Keyline not found
                                       "M" = Manually accepted
       "E" = Manually edited
                                        "A" = Nuclide specific abn. limit
Interference Report
No interference correction performed
```

Combined Activity-MDA Report

---- Identified Nuclides ----

Activity Act error MDA MDA error Act/MDA

Nuclide	(pCi/L)		(pCi/L)		
K-40 TH-228	1.549E+01 5.139E+00	4.871E+01 4.325E+00	3.478E+01 6.953E+00	0.000E+00 0.000E+00	0.445 0.739
Non-Id	dentified Nuclio	les			
	Key-Line				
	Activity K	L. Act error	MDA	MDA error	Act/MDA
Nuclide	(pCi/L) Id	led	(pCi/L)		
BE-7	-1.491E+01	1.806E+01	3.017E+01	0.000E+00	-0.494
NA-24	3.563E+01	5.057E+01	9.122E+01	0.000E+00	0.391
CR-51	-4.559E+00	2.006E+01	3.353E+01	0.000E+00	-0.136
MN-54	-1.131E+00	2.164E+00	3.707E+00	0.000E+00	-0.305
CO-57	1.944E-01	2.458E+00	4.058E+00	0.000E+00	0.048
CO-58	-1.321E-02	2.192E+00	3.757E+00	0.000E+00	-0.004
FE-59	2.066E-01	4.486E+00	7.883E+00	0.000E+00	0.026
CO-60	1.016E-01	1.999E+00	3.558E+00	0.000E+00	0.029
ZN-65	3.633E+00	4.732E+00	7.854E+00	0.000E+00	0.463
SE-75	5.244E-01	3.042E+00	5.200E+00	0.000E+00	0.101
SR-85	-4.455E+00	2.645E+00	4.231E+00	0.000E+00	-1.053
Y-88	-1.264E-02	2.203E+00	3.985E+00	0.000E+00	-0.003
NB-94	7.572E-01	2.163E+00	3.801E+00	0.000E+00	0.199
NB-95	2.794E+00	2.447E+00	4.471E+00	0.000E+00	0.625
ZR-95	-1.336E+00	3.629E+00	6.083E+00	0.000E+00	-0.220
MO-99	-4.014E+00	3.126E+01	5.337E+01	0.000E+00	-0.075
RU-103	1.382E-01	2.305E+00	4.024E+00	0.000E+00	0.034
RU-106	-8.741E+00	2.006E+01	3.379E+01	0.000E+00	-0.259
AG-110m	4.104E-02	2.077E+00	3.599E+00	0.000E+00	0.011
SN-113	2.999E+00	2.962E+00	5.212E+00	0.000E+00	0.576
SB-124	2.264E+00	3.423E+00	3.627E+00	0.000E+00	0.624
SB-125	-3.020E+00	6.626E+00	1.081E+01	0.000E+00	-0.279
TE-129M	3.570E+00	2.503E+01	4.408E+01	0.000E+00	0.081
I-131	-2.587E+00	2.789E+00	4.479E+00	0.000E+00	-0.578
BA-133	-1.321E+00	3.580E+00	5.071E+00	0.000E+00	-0.260
CS-134	1.776E+00	2.746E+00	3.653E+00	0.000E+00	0.486
CS-136 CS-137	5.160E-01	2.413E+00	4.208E+00	0.000E+00	0.123
CE-137	-9.725E-02 -5.302E-01	2.383E+00	4.104E+00	0.000E+00	-0.024
BA-140	-8.130E-02	2.356E+00	4.035E+00	0.000E+00	-0.131
LA-140	1.766E+00	8.446E+00	1.472E+01	0.000E+00	-0.006
CE-141	-1.278E+00	2.652E+00 4.967E+00	5.118E+00 7.013E+00	0.000E+00	0.345
CE-141 CE-144	1.357E+01	1.912E+01		0.000E+00	-0.182
EU-152	2.672E+00	7.768E+00	3.098E+01	0.000E+00	0.438
EU-152	1.569E+00	7.768E+00 5.088E+00	1.208E+01 8.455E+00	0.000E+00 0.000E+00	0.221 0.186
RA-226	-2.096E+01	6.306E+00	1.080E+02	0.000E+00	-0.194
AC-228	1.337E-01	8.504E+00	1.527E+01	0.000E+00	0.009
TH-232	1.337E-01 1.336E-01	8.496E+00	1.527E+01 1.525E+01	0.000E+00	0.009
U-235	6.054E+00	2.174E+01	3.122E+01	0.000E+00	0.009
U-238	1.341E+02	2.434E+02	4.500E+02	0.000E+00	0.194
AM-241	-1.478E+01	1.264E+01	2.069E+01	0.000E+00	-0.715
ful shada	1 V 1 V - L	- · 2 O 1 D 1 O 1	2.0074701	U.UUUITUU	0./13

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C, K-40
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                                    4.871E+01,
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Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 12:34:55.78
TBE07 P-10768B HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 10:11:49.13

LIMS No., Customer Name, Client ID: L29403-3 WG EX/QUAD

Sample ID : 07L29403-3 Smple Date: 28-JUL-2006 10:00:00.

 Sample Type
 : WG
 Geometry
 : 073L082504

 Quantity
 : 3.19170E+00 L
 BKGFILE
 : 07BG072806MT

 Start Channel
 : 40
 Energy Tol
 : 1.00000
 Real Time
 : 0 02:23:02.49

 End Channel
 : 4090
 Pk Srch Sens: 5.00000
 Live time
 : 0 02:23:00.67

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.09*	61	330	1.25	133.06	7.96E-01	7.16E-03	54.0	2.18E+00
2	4	76.94*	75	189	1.03	154.78	1.22E+00	8.71E-03	35.1	2.28E+00
3	1	198.03*	151	234	2.43	397.26	2.25E+00	1.75E-02	23.1	1.29E+00
4	1	242.04*	80	152	1.45	485.40	2.04E+00	9.34E-03	29.6	1.45E+00
5	1	295.27*	134	198	1.50	591.97	1.81E+00	1.56E-02	24.7	1.47E+00
6	1	351.78*	226	98	1.36	705.11		2.63E-02		
7	1	584.21	133	81	1.48	1170.39	1.12E+00	1.55E-02	16.7	2.48E+01
8	1	595.94	48	84	1.95	1193.86	1.10E+00	5.55E-03		1.37E+00
9	1	609.15*	228	50	1.54	1220.32	1.09E+00	2.66E-02		
10	1	768.15	43	26	2.45	1538.52	9.20E-01	5.03E-03	26.4	2.62E+00
11	1	1083.33	17	22	1.22	2169.14	7.20E-01	2.02E-03	57.3	1.35E+00
12	1	1120.46*	64	36	2.13	2243.42	7.03E-01	7.45E-03	26.5	6.14E-01
13	1	1238.51*	28	32	2.13	2479.55	6.55E-01	3.23E-03	50.5	1.00E+00
14	1	1765.08*	44	17	2.36	3532.48	5.12E-01	5.16E-03	25.8	1.15E+00
15	1	1849.29	44	11	1.72	3700.81	4.96E-01	5.10E-03	18.0	7.84E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Summary of Nuclide Activity Page: 2 Acquisition date : 31-JUL-2006 10:11:49 Sample ID : 07L29403-3

Total number of lines in spectrum 15 Number of unidentified lines 15 Number of lines tentatively identified by NID 0
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

0.00%

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 07L29403-3

Page: 3 Acquisition date : 31-JUL-2006 10:11:49

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.09	61	330	1.25	133.06	130	8	7.16E-03	***	7.96E-01	L
4	76.94	75	189	1.03	154.78	148	10	8.71E-03	70.2	1.22E+0	)
1	198.03	151	234	2.43	397.26	392	13	1.75E-02	46.2	2.25E+0	)
1	242.04	80	152	1.45	485.40	482	8	9.34E-03	59.2	2.04E+0	)
1	295.27	134	198	1.50	591.97	585	14	1.56E-02	49.5	1.81E+0	)
1	351.78	226	98	1.36	705.11	701	9	2.63E-02	21.8	1.61E+0	)
1	584.21	133	81	1.48	1170.39	1163	17	1.55E-02	33.4	1.12E+0	)
1	595.94	48	84	1.95	1193.86	1186	14	5.55E-03	86.3	1.10E+0	)
1	609.15	228	50	1.54	1220.32	1215	11	2.66E-02	19.2	1.09E+0	C
1	768.15	43	26	2.45	1538.52	1534	9	5.03E-03	52.8	9.20E-0	1
1	1083.33	17	22	1.22	2169.14	2161	11	2.02E-03	****	7.20E-0	1
1	1120.46	64	36	2.13	2243.42	2234	18	7.45E-03	52.9	7.03E-0	1
1	1238.51	28	32	2.13	2479.55	2472	16	3.23E-03	****	6.55E-0	1
1	1765.08	44	17	2.36	3532.48	3525	13	5.16E-03	51.6	5.12E-0	1
1	1849.29	44	11	1.72	3700.81	3695	14	5.10E-03	35.9	4.96E-0	1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 15 Number of unidentified lines 15 Number of lines tentatively identified by NID 0 0.00% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found
"E" = Manually edited "M" = Manually accepted

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide		K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	5.546E+00		2.533E+01	4.241E+01	0.000E+00	0.131
NA-24	-3.359E+01		1.034E+02	1.640E+02	0.000E+00	-0.205
K-40	2.913E+01		4.148E+01	8.186E+01	0.000E+00	0.356
CR-51	-1.935E+01		2.831E+01	4.522E+01	0.000E+00	-0.428
MN-54	2.789E+00		3.242E+00	5.603E+00	0.000E+00	0.498
CO-57	4.821E-01		3.019E+00	4.911E+00	0.000E+00	0.098
CO-58	-4.175E-01		3.259E+00	5.270E+00	0.000E+00	-0.079
FE-59	7.020E+00		6.525E+00	1.154E+01	0.000E+00	0.608
CO-60	8.322E-01		3.083E+00	5.200E+00	0.000E+00	0.160
ZN-65	1.703E+01		8.366E+00	1.406E+01	0.000E+00	1.211
SE-75	1.265E+00		4.008E+00	6.767E+00	0.000E+00	0.187
SR-85	1.760E+01		3.765E+00	7.367E+00	0.000E+00	2.389
Y-88	-9.461E-01		3.504E+00	4.998E+00	0.000E+00	-0.189

NB-94	6.870E-01	3.024E+00	5.065E+00	0.000E+00	0.136
NB-95	1.682E+00	3.307E+00	5.606E+00	0.000E+00	0.300
ZR - 95	-3.382E+00	5.688E+00	8.497E+00	0.000E+00	-0.398
MO-99	-2.401E+01	4.940E+01	7.835E+01	0.000E+00	-0.306
RU-103	-1.490E-01	3.307E+00	5.437E+00	0.000E+00	-0.027
RU-106	-1.112E+01	2.931E+01	4.630E+01	0.000E+00	-0.240
AG-110m	-3.979E-01	3.127E+00	5.144E+00	0.000E+00	-0.077
SN-113	4.756E-01	4.095E+00	6.702E+00	0.000E+00	0.071
SB-124	-1.078E+00	7.289E+00	5.058E+00	0.000E+00	-0.213
SB-125	-6.900E-01	8.659E+00	1.436E+01	0.000E+00	-0.048
TE-129M	-7.749E-01	3.659E+01	6.057E+01	0.000E+00	-0.013
I-131	-1.078E+00	3.905E+00	6.289E+00	0.000E+00	-0.171
BA-133	1.034E+01	5.280E+00	8.278E+00	0.000E+00	1.249
CS-134	1.324E+01	6.418E+00	7.317E+00	0.000E+00	1.810
CS-136	-3.899E-01	3.543E+00	5.730E+00	0.000E+00	-0.068
CS-137	-1.607E+00	3.446E+00	5.540E+00	0.000E+00	-0.290
CE-139	1.120E+00	2.913E+00	4.888E+00	0.000E+00	0.229
BA-140	-6.286E+00	1.290E+01	2.051E+01	0.000E+00	-0.306
LA-140	3.129E+00	4.193E+00	7.435E+00	0.000E+00	0.421
CE-141	-5.123E+00	5.500E+00	8.892E+00	0.000E+00	-0.576
CE-144	-7.639E+00	2.376E+01	3.936E+01	0.000E+00	-0.194
EU-152	-8.637E+00	1.118E+01	1.524E+01	0.000E+00	-0.567
EU-154	-4.244E-01	6.374E+00	1.028E+01	0.000E+00	-0.041
RA-226	-6.390E+01	7.576E+01	1.243E+02	0.000E+00	-0.514
AC-228	-4.238E+00	1.168E+01	1.984E+01	0.000E+00	-0.214
TH-228	4.413E+00	7.193E+00	1.064E+01	0.000E+00	0.415
TH-232	-4.234E+00	1.166E+01	1.982E+01	0.000E+00	-0.214
U-235	-3.904E+01	2.376E+01	3.742E+01	0.000E+00	-1.043
U-238	1.576E+01	3.524E+02	5.782E+02	0.000E+00	0.027
AM-241	-5.275E+01	3.070E+01	4.401E+01	0.000E+00	-1.199

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C, U-235
            , NO
                    -3.904E+01,
                                    2.376E+01,
                                                   3.742E+01,,
                                                                   -1.043
C, U-238
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                     1.576E+01,
                                    3.524E+02,
                                                   5.782E+02,,
                                                                    0.027
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3.070E+01,

4.401E+01,,

-1.199

C, AM-241

,NO ,

-5.275E+01,

Sec. Review: Analyst: LIMS: \_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 13:13:15.17 TBE23 03017322 HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 10:11:54.83

LIMS No., Customer Name, Client ID: L29403-4 WG EX/QUAD

Sample ID : 23L29403-4 Smple Date: 28-JUL-2006 10:05:00.

 Sample Type
 : WG
 Geometry
 : 2335L090704

 Quantity
 : 3.33380E+00 L
 BKGFILE
 : 23BG072806MT

 Start Channel
 : 50
 Energy Tol
 : 1.00000
 Real Time
 : 0 03:01:08.92

 End Channel
 : 4090
 Pk Srch Sens: 5.00000
 Live time
 : 0 03:01:01.32

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	6	33.67*	49	14	1.11	67.75	9.20E-02	4.48E-03	33.9	3.20E+00
2	6	35.24*	54	101	1.68	70.89	1.17E-01	4.98E-03	56.0	
3	6	36.85*	37	131	1.40	74.11		3.45E-03	69.3	
4	6		96	230	1.42	78.08	1.87E-01	8.81E-03	28.5	
5	0	63.56*		373	1.02	127.46	9.50E-01	3.21E-03	94.7	
6	2	74.62	178	448	1.17	149.57	1.29E+00	1.64E-02	21.4	1.04E+00
7	2	77.02*		411	0.95	154.36	1.35E+00	2.42E-02	13.7	
8	0	87.00	148	427	0.98	174.29	1.59E+00	1.36E-02	24.6	
9	0	139.92*	84	505	1.54	280.03	2.05E+00	7.69E-03	48.6	
10	0	185.27*	51	530	1.24	370.65	1.95E+00			
11	0	240.73	290	469	1.29	481.47		2.67E-02		
12	0	295.02*	415	270	1.34	589.97		3.82E-02		
13	0	351.78*	666	230		703.43		6.13E-02		
14	0	609.18*	758	109			8.59E-01			
15	0	768.28	73	81			7.22E-01			
16	0	934.31	42	52			6.27E-01			
17	0	1120.32*	155	36	1.84	2240.74	5.52E-01	1.43E-02	11.8	
18	0	1238.29	80	26	2.18	2476.90		7.39E-03		
19	0	1377.45	56	28	1.17	2755.56		5.16E-03		
20	0	1460.91*	21	18	1.78	2922.72		1.90E-03		
21	0	1729.28	45	14	1.95	3460.40	4.07E-01	4.18E-03	23.5	
22	0	1764.18*	150	11	2.31	3530.33	4.01E-01			
23	0	1847.94	22	28	1.66	3698.22	3.87E-01	2.04E-03	57.6	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

2-Sigma Uncorrected Decay Corr pCi/L pCi/L %Error Area %Abn %Eff Nuclide Energy 3.141E+01 151.62 10.67\* 4.594E-01 3.141E+01 K-40 1460.81 21 185.76 1.949E+00 5.933E+01 5.933E+01 3.28\* 51 RA-226 186.21

Page: 2

Summary of Nuclide Activity

Acquisition date : 31-JUL-2006 10:11:54 Sample ID : 23L29403-4

23 Total number of lines in spectrum

Number of unidentified lines 20

Number of lines tentatively identified by NID 3 13.04%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags K-40 1.28E+09Y 1.00 3.141E+01 3.141E+01 4.762E+01 151.62 RA-226 1600.00Y 1.00 5.933E+01 5.933E+01 11.02E+01 185.76

\_\_\_\_\_ Total Activity: 9.074E+01 9.074E+01

Grand Total Activity: 9.074E+01 9.074E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"E" = Manually edited "A" = Nuclide specific abn. limit Unidentified Energy Lines Page: 3 Sample ID : 23L29403-4 Acquisition date : 31-JUL-2006 10:11:54

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6 6 6 0 2	33.67 35.24 36.85 38.84 63.56 74.62 77.02	49 54 37 96 35 178 263	14 101 131 230 373 448 411	1.11 1.68 1.40 1.42 1.02 1.17 0.95	67.75 70.89 74.11 78.08 127.46 149.57 154.36	65 65 65 125 144 144	19 19 19 19 6 14	2.42E-02	27.3	9.20E-02 1.17E-01 1.46E-01 1.87E-01 9.50E-01 1.29E+00 1.35E+00	
0 0 0	87.00 139.92 240.73	148 84 290	427 505 469	0.98 1.54 1.29	174.29 280.03 481.47	171 277 474	7 8 14	1.36E-02 7.69E-03 2.67E-02	49.3 97.3 33.8	1.59E+00 2.05E+00 1.72E+00	
0 0 0	295.02 351.78 609.18	415 666 758	270 230 109	1.34 1.45 1.51	589.97 703.43 1218.06	584 698 1212	12		18.0 12.2 9.7	1.50E+00 1.32E+00 8.59E-01	
0 0 0	768.28 934.31 1120.32	73 42 155	81 52 36	1.48 1.60 1.84	1536.27 1868.45 2240.74	1529 1860 2234	14 13 13	6.75E-03 3.87E-03 1.43E-02	56.9 77.2 23.6	7.22E-01 6.27E-01 5.52E-01	
0 0 0 0	1238.29 1377.45 1729.28 1764.18 1847.94	80 56 45 150 22	26 28 14 11 28	2.18 1.17 1.95 2.31 1.66	2476.90 2755.56 3460.40 3530.33 3698.22	2471 2749 3450 3522			32.3 48.1 46.9 20.0 ****	5.16E-01 4.79E-01 4.07E-01 4.01E-01 3.87E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 23 Number of unidentified lines 20 Number of lines tentatively identified by NID 3 13.04%

Nuclide Type : natural

			Wtd Mean	Wtd Mean		
			Uncorrected	Decay Corr	Decay Corr	2-Sigma
Nuclide	Hlife	Decay	pCi/L	pĊi/L	2-Sigma Error	%Error Flags
K-40	1.28E+09Y	1.00	3.141E+01	3.141E+01	4.762E+01	151.62
RA-226	1600.00Y	1.00	5.933E+01	5.933E+01	11.02E+01	185.76
	Total Acti	vity:	9.074E+01	9.074E+01		

Grand Total Activity: 9.074E+01 9.074E+01

"M" = Manually accepted Flags: "K" = Keyline not found

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.141E+01	4.762E+01	4.448E+01	0.000E+00	0.706
R-40 RA-226	5.933E+01	1.102E+01	1.275E+02	0.000E+00	0.465
RA-226	5.9336+01	1.1026702	1.2/50102	0.0001100	0.100
Non-I	dentified Nuclides	5			
	Key-Line				
	Activity K.L		MDA	MDA error	Act/MDA
Nuclide	(pCi/L) Ideo	d	(pCi/L)		
D	2 4255.00	2 4255.01	4.217E+01	0.000E+00	-0.081
BE-7	-3.435E+00	2.435E+01	1.362E+02	0.000E+00	-0.377
NA-24	-5.135E+01	8.939E+01		0.000E+00	0.042
CR-51	1.868E+00	2.643E+01	4.468E+01		-0.158
MN-54	-8.007E-01	2.913E+00	5.073E+00	0.000E+00	-0.136
CO-57	-2.539E+00	3.078E+00	4.924E+00	0.000E+00	
CO-58	-1.326E+00	2.793E+00	4.614E+00	0.000E+00	-0.287
FE-59	-3.723E+00	5.289E+00	8.755E+00	0.000E+00	-0.425
CO-60	1.375E+00	2.789E+00	5.178E+00	0.000E+00	0.266
ZN-65	-5.719E-01	7.452E+00	1.104E+01	0.000E+00	-0.052
SE-75	-8.699E-01	3.916E+00	6.583E+00	0.000E+00	-0.132
SR-85	-2.789E+00	3.443E+00	5.714E+00	0.000E+00	-0.488
Y-88	6.858E-01	3.601E+00	6.245E+00	0.000E+00	0.110
NB-94	-1.973E+00	2.759E+00	4.509E+00	0.000E+00	-0.438
NB-95	6.906E+00	3.485E+00	6.080E+00	0.000E+00	1.136
ZR-95	2.950E+00	4.966E+00	8.939E+00	0.000E+00	0.330
MO-99	3.901E+01	4.610E+01	8.414E+01	0.000E+00	0.464
RU-103	1.369E-01	2.819E+00	4.936E+00	0.000E+00	0.028
RU-106	-8.385E+00	2.627E+01	4.455E+01	0.000E+00	-0.188
AG-110m	5.348E-01	2.708E+00	4.755E+00	0.000E+00	0.112
SN-113	9.001E-02	3.882E+00	6.512E+00	0.000E+00	0.014
SB-124	1.278E+00	3.205E+00	4.939E+00	0.000E+00	0.259
SB-125	-5.652E+00	8.226E+00	1.390E+01	0.000E+00	-0.407
TE-129M	-2.186E+01	3.357E+01	5.661E+01	0.000E+00	-0.386
I-131	-2.750E+00	3.896E+00	6.311E+00	0.000E+00	-0.436
BA-133	1.556E+00	4.591E+00	6.818E+00	0.000E+00	0.228
CS-134	2.313E+00	3.111E+00	4.934E+00	0.000E+00	0.469
CS-136	1.835E+00	3.095E+00	5.757E+00	0.000E+00	0.319
CS-137	-2.596E+00	3.144E+00	5.119E+00	0.000E+00	-0.507
CE-139	4.679E-01	3.007E+00	5.188E+00	0.000E+00	0.090
BA-140	-1.164E+00	1.158E+01	2.004E+01	0.000E+00	-0.058
LA-140	6.066E-01	3.606E+00	6.649E+00	0.000E+00	0.091
CE-141	3.493E+00	5.839E+00	9.369E+00	0.000E+00	0.373
CE-144	-1.513E+01	2.433E+01	3.903E+01	0.000E+00	-0.388
EU-152	-3.151E-01	9.472E+00	1.498E+01	0.000E+00	-0.021
EU-152 EU-154	-1.882E+00	6.317E+00	1.028E+01	0.000E+00	-0.183
AC-228	-1.002E+00 -5.199E+00	1.048E+01	1.835E+01	0.000E+00	-0.283
AC-228 TH-228	-5.199E+00 -2.331E+00	6.575E+00	9.667E+00	0.000E+00	-0.241
		1.047E+01	1.833E+01	0.000E+00	-0.283
TH-232	-5.194E+00	2.695E+01	4.055E+01	0.000E+00	0.058
U-235	2.366E+00		4.055E+01 5.391E+02	0.000E+00	-0.231
U-238	-1.247E+02	3.100E+02	2.743E+02	0.000E+00	0.108
AM-241	2.955E+00	1.843E+01	Z./43E+UI	O.UUETUU	0.100

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B, 23L29403-4
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                                    4.762E+01,
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C, K-40
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           , YES,
                                                   1.275E+02,,
                                                                    0.465
C, RA-226
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                                    1.102E+02,
                                                   4.217E+01,,
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1.843E+01,

2.743E+01,,

0.108

C, AM-241

,NO,

2.955E+00,

\_\_\_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 13:53:07.64 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 10:11:51.17

LIMS No., Customer Name, Client ID: L29403-5 WG EX/QUAD

Sample ID : 04L29403-5 Smple Date: 28-JUL-2006 11:10:00.

Sample Type : WG Geometry : 0435L090804
Quantity : 3.28040E+00 L BKGFILE : 04BG072806MT
Start Channel : 90 Energy Tol : 1.00000 Real Time : 0 03:41:03.67
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:41:01.06

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	65.71*	102	540	2.03	132.30	6.27E-01	7.72E-03	43.0	2.36E+00
2	1	77.05*	114	368	0.77	155.01	9.89E-01	8.59E-03	29.7	1.30E+00
3	1	139.90*	42	530	1.92	280.77	1.82E+00	3.20E-03	105.7	4.37E+00
4	1	185.54*	84	377	2.41	372.12	1.73E+00	6.31E-03	46.4	2.16E+00
5	1	198.67*	80	275	1.14	398.38	1.68E+00	6.03E-03	38.9	3.14E+00
6	1	238.58*	52	187	1.30	478.24	1.52E+00	3.89E-03	48.1	4.14E+00
7	1	241.84	199	243	1.31	484.76		1.50E-02		
8	1	295.07*	226	241	1.13	591.28	1.32E+00	1.70E-02	15.1	1.36E+00
9	1	351.92*	501	185	1.14	705.01	1.17E+00	3.78E-02	7.0	3.41E+00
10	1	595.65	66	100	1.66	1192.59	7.86E-01	5.01E-03	31.4	1.34E+00
11	1	609.16*	469	97	1.41	1219.62	7.73E-01	3.54E-02	6.7	8.24E-01
12	1	768.59	56	56	2.88	1538.50	6.46E-01	4.21E-03	30.2	1.06E+00
13	1	785.00	40	38	2.50	1571.32		3.03E-03		
14	1	911.14*	7	32	2.52	1823.56	5.66E-01	5.64E-04	177.3	1.06E+00
15	1	1120.08*	98	39	2.02	2241.35	4.81E-01	7.40E-03	17.2	2.13E+00
16	1	1237.69*	61	45	3.81	2476.46	4.45E-01	4.58E-03	29.3	1.12E+00
17	1	1377.62	37	37	2.63	2756.18	4.10E-01	2.77E-03	36.0	1.66E+00
18	1	1460.96*	15	36	3.00	2922.77	3.92E-01	1.14E-03	109.4	5.87E-01
19	1	1729.42	30	17	3.99	3459.25	3.48E-01			
20	1	1764.50*	69	17	2.58	3529.35	3.43E-01	5.23E-03	21.3	1.38E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

					Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	15	10.67*	3.920E-01	2.236E+01	2.236E+01	218.85
RA-226	186.21	84	3.28*	1.727E+00	9.170E+01	9.170E+01	92.79
AC-228	835.50		1.75	6.054E-01	Li:	ne Not Found	
	911.07	7	27.70*	5.657E-01	2.968E+00	2.971E+00	354.63
TH-228	238.63	52	44.60*	1.520E+00	4.723E+00	4.737E+00	96.25
	240.98	199	3.95	1.508E+00	2.078E+02	2.085E+02	30.38
U-235	143.76		10.50*	1.822E+00	Li:	ne Not Found	
	163.35		4.70	1.796E+00	Li:	ne Not Found	
	185.71	84	54.00	1.727E+00	5.570E+00	5.570E+00	92.79
	205 31		4.70	1.652E+00	Li:	ne Not Found	

Page: 2

Summary of Nuclide Activity

Sample ID: 04L29403-5 Acquisition date: 31-JUL-2006 10:11:51

20

Total number of lines in spectrum

Number of unidentified lines 15

Number of lines tentatively identified by NID 5 25.00%

Nuclide Type : natural

			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pĊi/L	2-Sigma Error	%Error	Flags
K-40	1.28E+09Y	1.00	2.236E+01	2.236E+01	4.892E+01	218.85	
RA-226	1600.00Y	1.00	9.170E+01	9.170E+01	8.509E+01	92.79	
AC-228	5.75Y	1.00	2.968E+00	2.971E+00	10.54E+00	354.63	
TH-228	1.91Y	1.00	4.723E+00	4.737E+00	4.559E+00	96.25	
U-235	7.04E+08Y	1.00	5.570E+00	5.570E+00	5.168E+00	92.79	K

Total Activity: 1.273E+02 1.273E+02

Grand Total Activity: 1.273E+02 1.273E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID: 04L29403-5 Page: 3
Acquisition date: 31-JUL-2006 10:11:51

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.71	102	540	2.03	132.30	129	9	7.72E-03	85.9	6.27E-0	
1	77.05	114	368	0.77	155.01	153	6	8.59E-03	59.4	9.89E-0	1
1	139.90	42	530	1.92	280.77	276	10	3.20E-03	***	1.82E+0	0
1	198.67	80	275	1.14	398.38	394	8	6.03E-03	77.9	1.68E+0	0
1	295.07	226	241	1.13	591.28	587	10	1.70E-02	30.1	1.32E+0	0
1	351.92	501	185	1.14	705.01	700	10	3.78E-02	14.0	1.17E+0	0
1	595.65	66	100	1.66	1192.59	1189	11	5.01E-03	62.9	7.86E-0	1
1	609.16	469	97	1.41	1219.62	1213	14	3.54E-02	13.4	7.73E-0	1
1	768.59	56	56	2.88	1538.50	1533	12	4.21E-03	60.5	6.46E-0	1
1	785.00	40	38	2.50	1571.32	1567	10	3.03E-03	65.1	6.36E-0	1
1	1120.08	98	39	2.02	2241.35	2236	13	7.40E-03	34.3	4.81E-0	1
1	1237.69	61	45	3.81	2476.46	2470	18	4.58E-03	58.7	4.45E-0	1
1	1377.62	37	37	2.63	2756.18	2752	12	2.77E-03	71.9	4.10E-0	1
1	1729.42	30	1.7	3.99	3459.25	3454	16	2.24E-03	75.7	3.48E-0	1
1	1764.50	69	17	2.58	3529.35	3519	22	5.23E-03	42.5	3.43E-0	1

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 20
Number of unidentified lines 15
Number of lines tentatively identified by NID 5 25.00%

Nuclide Type : natural

Nuclide	Type: nacc	ırar	Wtd Mean	Wtd Mean			
			Uncorrected	Decay Corr	Decay Corr	2-Sigma	
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error		Flags
K-40	1.28E+09Y	1.00	2.236E+01	2.236E+01	4.892E+01	218.85	
RA-226	1600.00Y	1.00	9.170E+01	9.170E+01	8.509E+01	92.79	
AC-228	5.75Y	1.00	2.968E+00	2.971E+00	10.54E+00	354.63	
TH-228	1.91Y	1.00	4.723E+00	4.737E+00	4.559E+00	96.25	
	Total Act:	ivity :	1.217E+02	1.218E+02			

Grand Total Activity: 1.217E+02 1.218E+02

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.236E+01	4.892E+01	4.403E+01	0.000E+00	0.508

0.150

-0.430

0.333

-0.011

0.000E+00

0.000E+00

0.000E+00

0.000E+00

1.980E+01

3.565E+01

5.490E+02

4.200E+01

RA-226 AC-228 TH-228	9.170E+01 2.971E+00 4.737E+00	8.509E+01 1.054E+01 4.559E+00	1.089E+02 1.731E+01 8.514E+00	0.000E+00 0.000E+00 0.000E+00	0.842 0.172 0.556
Non-Id	dentified Nuclides	3			
Nuclide	Key-Line Activity K.L (pCi/L) Ideo		MDA (pCi/L)	MDA error	Act/MDA
Nuclide  BE-7 NA-24 CR-51 MN-54 CO-57 CO-58 FE-59 CO-60 ZN-65 SE-75 SR-85 Y-88 NB-94 NB-95 ZR-95 MO-99 RU-103 RU-106 AG-110m SN-113 SB-124 SB-125 TE-129M I-131 BA-133 CS-134 CS-136	9.259E+00 3.906E+01 -1.817E+01 6.820E-01 1.601E-01 -3.363E+00 2.099E-02 -2.201E+00 1.224E+01 -1.977E+00 7.060E+00 -1.993E+00 -3.563E-01 6.238E+00 1.957E+00 4.593E+00 5.476E-01 9.192E+00 5.123E-02 2.268E+00 9.224E-01 1.295E+00 1.165E+01 1.375E+00 4.439E+00 6.164E+00 -4.986E-01	2.421E+01 8.986E+01 2.693E+01 3.016E+00 2.705E+00 2.754E+00 5.317E+00 3.338E+00 7.440E+00 3.881E+00 3.475E+00 3.475E+00 3.475E+01 3.284E+00 2.878E+00 2.878E+00 3.401E+00 5.370E+01 3.028E+01 3.028E+01 3.785E+01 2.834E+00 3.785E+00 5.761E+00 8.171E+00 3.432E+01 3.432E+01 3.430E+00 4.176E+00 4.176E+00 4.176E+00 3.278E+00	(pCi/L)  4.056E+01 1.404E+02 4.233E+01 4.993E+00 4.418E+00 4.050E+00 8.738E+00 5.486E+00 1.225E+01 6.232E+00 6.154E+00 5.047E+00 4.715E+00 5.565E+00 9.028E+00 6.943E+01 5.003E+00 4.287E+01 4.706E+00 6.461E+00 4.746E+00 1.361E+01 5.744E+01 5.836E+00 6.413E+00 5.591E+00 5.288E+00	0.000E+00 0.000E+00	0.228 0.278 -0.429 0.137 0.036 -0.831 0.002 -0.401 0.999 -0.317 1.147 -0.395 -0.076 1.121 0.217 0.066 0.109 0.214 0.011 0.351 0.194 0.095 0.203 0.236 0.692 1.102 -0.094
CS-137 CE-139 BA-140	-3.497E-01 -6.079E-01 2.484E+00	3.249E+00 2.832E+00 1.194E+01	5.352E+00 4.514E+00 1.967E+01	0.000E+00 0.000E+00 0.000E+00	-0.065 -0.135 0.126
LA-140 CE-141 CE-144 EU-152	1.088E+00 4.572E-01 -6.424E-01 -1.054E+01	4.179E+00 5.943E+00 2.351E+01 9.912E+00	7.012E+00 8.314E+00 3.452E+01 1.382E+01	0.000E+00 0.000E+00 0.000E+00 0.000E+00	0.155 0.055 -0.019 -0.763
EU-154	-1.156E+00	5.610E+00	9.082E+00	0.000E+00	-0.127 0.150

1.053E+01

2.624E+01

3.176E+02

2.648E+01

TH-232

U-235

U-238

AM-241

2.968E+00 +

-1.531E+01

1.829E+02

-4.584E-01

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B,04L29403-5
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                                                   4.403E+01,,
                    2.236E+01,
                                    4.892E+01,
           , YES,
C, K-40
                                                                    0.842
                                                   1.089E+02,,
           , YES,
                     9.170E+01,
                                    8.509E+01,
C, RA-226
                                                                    0.172
                                                   1.731E+01,,
                                   1.054E+01,
           , YES,
                     2.971E+00,
C, AC-228
                                                                    0.556
                                                   8.514E+00,,
                                    4.559E+00,
                     4.737E+00,
C, TH-228
           ,YES,
                                                   4.056E+01,,
                                                                    0.228
                     9.259E+00,
                                    2.421E+01,
C, BE-7
           , NO
                                                   1.404E+02,,
                                                                    0.278
                                    8.986E+01,
C, NA-24
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C, CR-51
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                                    3.016E+00,
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C, MN-54
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                                    2.705E+00,
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                     1.601E-01,
C, CO-57
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                                                   4.050E+00,,
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                                    2.754E+00,
C, CO-58
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                    -3.363E+00,
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                                    5.317E+00,
                     2.099E-02,
C, FE-59
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C, CO-60
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                                    7.440E+00,
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                                    3.881E+00,
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                     7.060E+00,
C, SR-85
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C, NB-94
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                     6.238E+00,
                                    3.401E+00,
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C, NB-95
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                                    5.370E+00,
                     1.957E+00,
C, ZR-95
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                                    4.187E+01,
                                                   6.943E+01,,
                     4.593E+00,
C, MO-99
            , NO
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                                                   5.003E+00,,
                                    3.028E+00,
C, RU-103
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                                    2.517E+01,
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C, RU-106
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C, AG-110m , NO
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C, SN-113
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C, TE-129M
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                     1.375E+00,
                                    3.430E+00,
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                                     2.832E+00,
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                                     1.194E+01,
                                                    1.967E+01,,
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C, BA-140
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C, LA-140
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C, CE-141
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 C, EU-152
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                                     5.610E+00,
                                                    9.082E+00,,
                                                                    -0.127
                     -1.156E+00,
 C, EU-154
            , NO
                                                    1.980E+01,,
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                      2.968E+00,
                                     1.053E+01,
 C, TH-232
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                                                    3.565E+01,,
                                                                    -0.430
                                     2.624E+01,
            , NO
                     -1.531E+01,
 C, U-235
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                                                    5.490E+02,,
                                     3.176E+02,
                      1.829E+02,
 C, U-238
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                                                                    -0.011
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2.648E+01,

C,AM-241

, NO

-4.584E-01,

Sec. Review: Analyst:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 15:53:45.83 TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 12:39:04.39

TBE07 P-10768B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 12:39:04.39

LIMS No., Customer Name, Client ID: L29403-6 WG EX/QUAD

LIMS:

Sample ID : 07L29403-6 Smple Date: 28-JUL-2006 11:15:00.

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	77.13*	98	470	0.88	155.16	1.11E+00	8.42E-03	41.3	1.09E+00
2	1	198.37*	71	362	1.47	397.95	1.98E+00	6.10E-03	51.5	2.54E+00
3	5	241.95*	253	311	1.61	485.22	1.80E+00	2.16E-02	14.7	1.97E+00
4	1	295.15*	338	235	1.35	591.74	1.61E+00	2.90E-02	10.7	1.57E+00
5	1	351.79*	626	213	1.25	705.14	1.43E+00	5.37E-02	6.3	1.26E+00
6	1	595.96	51	147	1.77	1193.91	9.96E-01	4.39E-03	52.6	1.27E+00
7	1	609.20*	616	154	1.38	1220.40	9.81E-01	5.28E-02	6.2	9.23E-01
8	1	934.08	32	61	2.38	1870.54	7.17E-01	2.73E-03	50.6	9.96E-01
9	1	1120.22*	109	49	1.73	2242.95	6.26E-01	9.37E-03	16.5	1.36E+00
10	1	1237.95*	77	37	2.54	2478.43	5.81E-01	6.56E-03	19.2	2.29E+00
11	1	1378.18*	52	26	2.32	2758.90	5.37E-01	4.46E-03	26.7	1.58E+00
12	1	1764.75*	142	24	2.72	3531.82	4.54E-01	1.21E-02	11.8	5.20E-01

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Page: 2

Summary of Nuclide Activity Sample ID: 07L29403-6

Acquisition date: 31-JUL-2006 12:39:04

Total number of lines in spectrum 12 Number of unidentified lines 11
Number of lines tentatively identified by NID 1
\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

8.33%

"M" = Manually accepted Flags: "K" = Keyline not found
"E" = Manually edited

"A" = Nuclide specific abn. limit

Unidentified Energy Lines Sample ID: 07L29403-6

Page: 3 Acquisition date : 31-JUL-2006 12:39:04

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1 5 1 1 1 1 1	77.13 198.37 241.95 295.15 351.79 595.96 609.20 934.08 1120.22 1237.95 1378.18	98 71 253 338 626 51 616 32 109 77	470 362 311 235 213 147 154 61 49 37 26	0.88 1.47 1.61 1.35 1.25 1.77 1.38 2.38 1.73 2.54 2.32	155.16 397.95 485.22 591.74 705.14 1193.91 1220.40 1870.54 2242.95 2478.43 2758.90	587 699 1188 1214 1865 2237 2472	9 22 11 12 14 15 11 11	5.37E-02 4.39E-03 5.28E-02 2.73E-03	**** 29.5 21.4 12.6 **** 12.3 **** 33.1 38.4	1.11E+00 1.98E+00 1.80E+00 1.61E+00 1.43E+00 9.96E-01 9.81E-01 7.17E-01 6.26E-01 5.81E-01 5.37E-01	Т
1	1764.75	142	24	2.72	3531.82	3526	14	1.21E-02	23.5	4.54E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 12 Number of unidentified lines 11 Number of lines tentatively identified by NID 1 8.33% \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide		.L. Act error ded	MDA (pCi/L)	MDA error	Act/MDA
BE-7 NA-24 K-40 CR-51 MN-54 CO-57 CO-58 FE-59 CO-60	-6.685E+00 9.916E+00 4.799E+01 8.283E+00 -1.618E-01 2.536E+00 2.070E+00 6.102E+00 -7.566E-01	2.427E+01 1.214E+02 4.066E+01 2.696E+01 3.069E+00 3.003E+00 3.094E+00 5.639E+00 2.963E+00	3.960E+01 1.682E+02 7.965E+01 4.492E+01 4.984E+00 4.973E+00 5.247E+00 9.905E+00 4.758E+00	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	-0.169 0.059 0.602 0.184 -0.032 0.510 0.394 0.616 -0.159
ZN-65 SE-75 SR-85 Y-88 NB-94 NB-95 ZR-95	2.834E+01 -3.871E-01 2.059E+01 -4.533E+00 -5.232E-01 4.291E+00 2.823E+00	8.797E+00 3.967E+00 3.482E+00 3.376E+00 2.868E+00 3.303E+00 5.450E+00	1.521E+01 6.592E+00 6.866E+00 4.723E+00 4.688E+00 5.772E+00 9.202E+00	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00	1.863 -0.059 2.999 -0.960 -0.112 0.744 0.307

		4 0515.01	0 5005.01	0.000E+00	0.510
MO-99	4.354E+01	4.951E+01	8.529E+01	* * *	0.070
RU-103	3.795E-01	3.260E+00	5.401E+00	0.000E+00	
RU-106	-1.929E+00	2.744E+01	4.296E+01	0.000E+00	-0.045
AG-110m	-3.807E+00	2.921E+00	4.505E+00	0.000E+00	-0.845
SN-113	2.579E+00	3.889E+00	6.504E+00	0.000E+00	0.397
SB-124	3.078E+00	6.239E+00	4.963E+00	0.000E+00	0.620
SB-125	3.357E+00	8.341E+00	1.412E+01	0.000E+00	0.238
TE-129M	2.050E+01	3.460E+01	5.884E+01	0.000E+00	0.348
I-131	-1.388E+00	3.889E+00	6.261E+00	0.000E+00	-0.222
BA-133	2.136E+01	5.225E+00	8.742E+00	0.000E+00	2.443
CS-134	2.309E+01	8.404E+00	8.299E+00	0.000E+00	2.782
CS-136	-3.262E+00	3.430E+00	5.257E+00	0.000E+00	-0.620
CS-137	7.171E-01	3.145E+00	5.277E+00	0.000E+00	0.136
CE-139	-2.666E+00	2.959E+00	4.776E+00	0.000E+00	-0.558
BA-140	3.105E+00	1.219E+01	2.023E+01	0.000E+00	0.153
LA-140	2.690E+00	4.079E+00	7.093E+00	0.000E+00	0.379
CE-141	-5.496E+00	5.481E+00	8.903E+00	0.000E+00	-0.617
CE-144	-3.794E+01	2.282E+01	3.656E+01	0.000E+00	-1.038
EU-152	-5.820E+00	1.110E+01	1.497E+01	0.000E+00	-0.389
EU-154	4.909E+00	6.292E+00	1.040E+01	0.000E+00	0.472
RA-226	-1.743E+01	7.603E+01	1.264E+02	0.000E+00	-0.138
AC-228	4.935E+00	1.181E+01	2.067E+01	0.000E+00	0.239
TH-228	1.508E+01	7.300E+00	1.121E+01	0.000E+00	1.345
TH-232	4.930E+00	1.180E+01	2.065E+01	0.000E+00	0.239
U-235	-1.822E+01	2.391E+01	3.891E+01	0.000E+00	-0.468
U-238	1.458E+01	3.333E+02	5.428E+02	0.000E+00	0.027
AM-241	-3.778E+01	2.692E+01	4.314E+01	0.000E+00	-0.876
Σπ.1 _ C .# T	J. / / OLITOI	2.0/21101	1.011101	J. J J J J J J J J J J J J J J J J J J	5 . 5 . 5

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,NO ,

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Sec. Review: Analyst: LIMS:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 15:55:02.76
TBE23 03017322 HpGe \*\*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 13:16:47.13

LIMS No., Customer Name, Client ID: L29403-7 WG EX/QUAD

Sample ID : 23L29403-7 Smple Date: 28-JUL-2006 11:20:00.

Sample Type : WG Geometry : 2335L090704
Quantity : 3.26870E+00 L BKGFILE : 23BG072806MT
Start Channel : 50 Energy Tol : 1.00000 Real Time : 0 02:38:07.54
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:38:00.99

MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec %Err	Fit
1	0	39.22	17	183	2.34	78.85	1.96E-01	1.81E-03132.8	0.00E+00
2	0	63.08*	30	326	0.94	126.50	9.34E-01	3.18E-03110.1	
3	0	92.60*	28	379	1.10	185.48	1.69E+00	2.93E-03138.7	
4	0	351.55*	20	107	1.30	702.96	1.32E+00	2.06E-03 98.2	
5	0	583.65*	21	53	0.91	1166.99	8.88E-01	2.20E-03 76.6	
6	0	595.64	64	42	0.94	1190.99	8.74E-01	6.77E-03 23.1	
7	0	609.21*	60	90	1.56	1218.13	8.59E-01	6.35E-03 38.6	
8	0	1121.30	48	24	0.99	2242.70	5.52E-01	5.05E-03 29.1	
9	0	1460.80*	4	25	1.28	2922.49	4.59E-01	4.55E-04345.6	
10	0	1764.33*	32	13	2.78	3530.64	4.00E-01	3.41E-03 32.6	

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Uncorrected Decay Corr 2-Sigma %Abn %Eff pCi/L pCi/L %Error Energy Area Nuclide 7.676E+00 7.676E+00 691.10 1460.81 10.67\* 4.595E-01 K-40

Summary of Nuclide Activity Sample ID: 23L29403-7

rivity Page: 2
Acquisition date: 31-JUL-2006 13:16:47

Total number of lines in spectrum

10 8

Number of unidentified lines

8

Number of lines tentatively identified by NID 2

2 20.00%

Nuclide Type : natural

Uncorrected Decay Corr Decay Corr 2-Sigma

Nuclide Hlife Decay pCi/L pCi/L 2-Sigma Error %Error Flags

K-40 1.28E+09Y 1.00 7.676E+00 7.676E+00 53.05E+00 691.10

Total Activity: 7.676E+00 7.676E+00

Grand Total Activity: 7.676E+00 7.676E+00

Flags: "K" = Keyline not found "M" = Manually accepted

"E" = Manually edited "A" = Nuclide specific abn. limit

-0.390

-0.147

0.000E+00

0.000E+00

Page: 3

Unidentified Energy Lines Sample ID: 23L29403-7

Acquisition date: 31-JUL-2006 13:16:47

20.00%

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0 0 0 0 0 0	39.22 63.08 92.60 351.55 583.65 595.64 609.21 1121.30 1764.33	17 30 28 20 21 64 60 48 32	183 326 379 107 53 42 90 24	2.34 0.94 1.10 1.30 0.91 0.94 1.56 0.99 2.78	1190.99 1218.13 2242.70	1186 1209 2234	8 9 7 11 15 18	1.81E-03 3.18E-03 2.93E-03 2.06E-03 2.20E-03 6.77E-03 6.35E-03 5.05E-03 3.41E-03	46.1 77.2 58.2	1.96E-01 9.34E-01 1.69E+00 1.32E+00 8.88E-01 8.74E-01 8.59E-01 5.52E-01 4.00E-01	Т

Flags: "T" = Tentatively associated

Total Activity:

Summary of Nuclide Activity

Total number of lines in spectrum 10
Number of unidentified lines 8
Number of lines tentatively identified by NID 2

Nuclide Type : natural

Wtd Mean Wtd Mean 2-Sigma Uncorrected Decay Corr Decay Corr 2-Sigma Error %Error Flags pCi/L pCi/L Hlife Decay Nuclide 53.05E+00 691.10 7.676E+00 7.676E+00 1.00 1.28E+09Y K-40 \_\_\_\_\_\_

7.676E+00

Grand Total Activity: 7.676E+00 7.676E+00

Flags: "K" = Keyline not found "M" = Manually accepted

7.676E+00

"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

BE-7

NA-24

No interference correction performed

-1.518E+01

-2.137E+01

Combined Activity-MDA Report

## ---- Identified Nuclides ----

Identified Natifices									
Nuclide	Activity (pCi/L) 7.676E+00		Act error	MDA (pCi/L)	MDA error	Act/MDA			
K-40			5.305E+01	4.911E+01	0.000E+00	0.156			
Non-Identified Nuclides									
Nuclide		K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA			

2.310E+01

8.068E+01

3.894E+01

1.457E+02

CR-51	9.639E+00	2.489E+01	4.318E+01	0.000E+00	0.223
MN-54	-3.133E+00	2.421E+00	3.837E+00	0.000E+00	-0.816
CO-57	1.879E+00	2.999E+00	5.060E+00	0.000E+00	0.371
CO-58	-4.237E-01	2.835E+00	4.853E+00	0.000E+00	-0.087
FE-59	-3.306E-01	4.966E+00	8.870E+00	0.000E+00	-0.037
CO-60	-1.956E+00	2.585E+00	4.174E+00	0.000E+00	-0.469
ZN-65	3.024E+00	5.704E+00	9.599E+00	0.000E+00	0.315
SE-75	1.534E-01	3.709E+00	6.348E+00	0.000E+00	0.024
SR-85	3.963E-03	3.446E+00	5.965E+00	0.000E+00	0.001
Y-88	8.579E-02	2.753E+00	5.145E+00	0.000E+00	0.017
NB-94	-8.700E-01	2.627E+00	4.451E+00	0.000E+00	-0.195
NB-95	1.160E+00	2.652E+00	4.814E+00	0.000E+00	0.241
ZR-95	-3.306E-01	4.503E+00	7.838E+00	0.000E+00	-0.042
MO-99	3.839E+01	4.758E+01	8.803E+01	0.000E+00	0.436
RU-103	-7.739E-01	2.819E+00	4.872E+00	0.000E+00	-0.159
RU-106	-1.033E+01	2.582E+01	4.377E+01	0.000E+00	-0.236
AG-110m	1.694E-01	2.761E+00	4.845E+00	0.000E+00	0.035
SN-113	6.471E-01	3.892E+00	6.630E+00	0.000E+00	0.098
SB-124	-6.844E-01	4.135E+00	4.433E+00	0.000E+00	-0.154
SB-125	2.714E+00	7.916E+00	1.425E+01	0.000E+00	0.190
TE-129M	3.546E+00	3.063E+01	5.457E+01	0.000E+00	0.065
I-131	-3.732E-01	3.547E+00	5.984E+00	0.000E+00	-0.062
BA-133	7.672E-01	4.683E+00	6.921E+00	0.000E+00	0.111
CS-134	1.420E+00	2.837E+00	4.523E+00	0.000E+00	0.314
CS-136	5.468E-01	2.891E+00	5.332E+00	0.000E+00	0.103
CS-137	1.942E-01	2.902E+00	5.112E+00	0.000E+00	0.038
CE-139	-2.661E+00	2.876E+00	4.807E+00	0.000E+00	-0.553
BA-140	1.075E+01	1.175E+01	2.186E+01	0.000E+00	0.492
LA-140	-1.886E+00	3.648E+00	6.267E+00	0.000E+00	-0.301
CE-141	4.971E+00	5.268E+00	9.393E+00	0.000E+00	0.529
CE-144	-1.376E+01	2.404E+01	3.867E+01	0.000E+00	-0.356
EU-152	-5.485E+00	8.707E+00	1.379E+01	0.000E+00	-0.398
EU-154	2.521E+00	6.328E+00	1.059E+01	0.000E+00	0.238
RA-226	-4.713E+01	7.654E+01	1.324E+02	0.000E+00	-0.356
AC-228	-4.078E-01	9.770E+00	1.814E+01	0.000E+00	-0.022
TH-228	3.570E+00	5.647E+00	9.946E+00	0.000E+00	0.359
TH-232	-4.074E-01	9.759E+00	1.813E+01	0.000E+00	-0.022
U-235	-1.533E+01	2.405E+01	4.048E+01	0.000E+00	-0.379
U-238	9.144E+01	2.842E+02	5.406E+02	0.000E+00	0.169
AM-241	3.137E+00	1.676E+01	2.521E+01	0.000E+00	0.124

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 C, CE-139
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                                                    2.186E+01,,
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                      4.971E+00,
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                     -4.713E+01,
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                     -4.078E-01,
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                      3.570E+00,
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                                                                     -0.022
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                     -4.074E-01,
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                     -1.533E+01,
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                      9.144E+01,
                                     2.842E+02,
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                                                     2.521E+01,,
                                     1.676E+01,
                      3.137E+00,
             ,NO,
 C, AM-241
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LIMS: Analysta Sec. Review:

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 16:07:35.17 TBE04 P-40312B HpGe \*\*\*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 13:55:42.70 \_\_\_\_\_\_

LIMS No., Customer Name, Client ID: L29403-8 WG EX/QUAD

Smple Date: 28-JUL-2006 12:25:00. : 04L29403-8 Sample ID

Geometry : 0435L090804 : WG Sample Type BKGFILE : 04BG072806MT Quantity : 3.35850E+00 L

Start Channel: 90 Energy Tol: 1.00000 Real Time: 0 02:09:17.96 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:09:17.36
MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 3 3 1 1 1 1 1 1 1 1 1	66.14* 74.75* 77.08* 185.84* 198.45* 238.58* 241.84 295.13* 351.87* 583.08* 609.18* 768.19 1120.49* 1266.70 1372.41 1377.76 1460.27*	66 73 122 73 36 60 163 276 506 15 447 56 100 19 17 36	309 267 180 255 287 166 159 189 174 44 65 34 22 4 2	1.26 1.10 0.91 2.56 1.64 1.30 1.31 0.93 1.08 2.21 1.28 1.62 2.17 1.94 2.32 2.77 2.46	133.18 150.40 155.07 372.71 397.94 478.24 484.76 591.39 704.92 1167.46 1219.66 1537.70 2242.17 2534.47	6.42E-01 9.18E-01 9.90E-01 1.73E+00 1.68E+00 1.51E+00 1.51E+00 1.32E+00 1.17E+00 7.99E-01 7.73E-01 6.46E-01 4.81E-01 4.37E-01 4.11E-01 4.10E-01 3.92E-01	8.51E-03 9.39E-03 1.58E-02 9.37E-03 4.58E-03 7.77E-03 2.11E-02 3.56E-02 6.52E-02 1.92E-03 5.76E-02 7.21E-03 1.29E-02 2.47E-03 2.20E-03 4.62E-03 4.43E-04	41.9 19.8 47.2 95.8 40.1 15.3 11.2 7.1 92.5 6.0 22.9 15.1 26.7 26.3 26.5	8.76E-01 1.48E+00 4.39E-01 1.29E+00 9.19E-01
18	-	1764.30*	71	11	2.61	3528.96	3.43E-01	9.20E-03	16.3	1.31E+00

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nucliue	Type. Hacare	t ute			Uncorrected	Decay Corr	2-Sigma
Nuclide	Energy	Area	%Abn	%Eff	pCi/L	pCi/L	%Error
K-40	1460.81	3	10.67*	3.922E-01	8.525E+00	8.525E+00	487.65
RA-226	186.21	73	3.28*	1.726E+00	1.332E+02	1.332E+02	94.43
	238.63	60	44.60*	1.520E+00	9.220E+00	9.249E+00	80.12
TH-228		163	3.95	1.508E+00	2.845E+02	2.854E+02	30.54
	240.98			1.822E+00		ne Not Found	
U-235	143.76		10.50*			ne Not Found	
	163.35		4.70	1.796E+00			94.43
	185.71	73	54.00	1.726E+00		8.090E+00	24.43
	205.31		4.70	1.652E+00	Li:	ne Not Found	

Flaq: "\*" = Keyline

Page: 2

Summary of Nuclide Activity

Acquisition date: 31-JUL-2006 13:55:42 Sample ID : 04L29403-8

18 Total number of lines in spectrum Number of unidentified lines 13

Number of lines tentatively identified by NID 5 27.78%

Nuclide Type : natural

RA-226	Hlife 1.28E+09Y 1600.00Y	Decay 1.00 1.00	pCi/L 8.525E+00 1.332E+02	Decay Corr pCi/L 8.525E+00 1.332E+02 9.249E+00	Decay Corr 2-Sigma Error 41.57E+00 1.258E+02 7.411E+00	2-Sigma %Error 487.65 94.43 80.12	Flags
TH-228 U-235	1.91Y 7.04E+08Y	1.00 1.00	9.220E+00 8.090E+00	9.249E+00 8.090E+00	7.411E+00 7.640E+00	94.43	K

Total Activity : 1.590E+02 1.591E+02

Grand Total Activity: 1.590E+02 1.591E+02

"M" = Manually accepted Flags: "K" = Keyline not found

"A" = Nuclide specific abn. limit "E" = Manually edited

Unidentified Energy Lines Sample ID : 04L29403-8

Page: 3 Acquisition date : 31-JUL-2006 13:55:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff I	lags
1 3 3 1 1 1 1 1 1 1 1	66.14 74.75 77.08 198.45 295.13 351.87 583.08 609.18 768.19 1120.49 1266.70 1372.41 1377.76 1764.30	66 73 122 36 276 506 15 447 56 100 19 17 36	309 267 180 287 189 174 44 65 34 22 4 2 15	1.26 1.10 0.91 1.64 0.93 1.08 2.21 1.28 1.62 2.17 1.94 2.32 2.77 2.61	133.18 150.40 155.07 397.94 591.39 704.92 1167.46 1219.66 1537.70 2242.17 2534.47 2745.77 2756.47 3528.96	699 1164 1213 1533 2235 2531 2742 2751	20 20 11 10 13 10 11 9 16 7 7	4.58E-03 3.56E-02 6.52E-02 1.92E-03 5.76E-02 7.21E-03 1.29E-02 2.47E-03 2.20E-03 4.62E-03	83.9 39.5 **** 22.4 14.1 **** 12.0 45.8 30.3 53.4 52.6 53.0	6.42E-01 9.18E-01 9.90E-01 1.68E+00 1.32E+00 1.17E+00 7.99E-01 7.73E-01 6.46E-01 4.81E-01 4.37E-01 4.11E-01 4.10E-01 3.43E-01	Т

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

18 Total number of lines in spectrum 13 Number of unidentified lines Number of lines tentatively identified by NID 5

27.78%

Nuclide Type : natural

	11		Wtd Mean Uncorrected	Wtd Mean Decay Corr	Decay Corr	2-Sigma	77
Nuclide	Hlife	Decay	pCi/L	pCi/L	2-Sigma Error	%Error 487.65	Frags
K-40	1.28E+09Y	1.00		8.525E+00	41.57E+00	94.43	
RA-226	1600.00Y	1.00	1.332E+02	1.332E+02	1.258E+02 7.411E+00	80.12	
TH-228	1.91Y	1.00	9.220E+00	9.249E+00	7.4116+00	00.12	
	Total Act	ivity :	1.509E+02	1.510E+02			

Grand Total Activity: 1.509E+02

Flags: "K" = Keyline not found

"M" = Manually accepted

"A" = Nuclide specific abn. limit "E" = Manually edited

1.510E+02

Interference Report

No interference correction performed

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.525E+00	4.157E+01	7.079E+01	0.000E+00	0.120
RA-226	1.332E+02	1.258E+02	1.430E+02	0.000E+00	0.932
TH-228	9.249E+00	7.411E+00	1.070E+01	0.000E+00	0.865

### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K. (pCi/L) Id	L. Act error ed	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.392E+00	3.149E+01	5.183E+01	0.000E+00	0.027
NA-24	6.803E+01	1.561E+02	2.399E+02	0.000E+00	0.284
CR-51	-1.754E+01	3.394E+01	5.332E+01	0.000E+00	-0.329
MN-54	1.054E+00	3.745E+00	6.264E+00	0.000E+00	0.168
CO-57	-1.371E+00	3.700E+00	5.945E+00	0.000E+00	-0.231
CO-58	1.096E-01	3.953E+00	6.472E+00	0.000E+00	0.017
FE-59	3.339E-01	7.710E+00	1.272E+01	0.000E+00	0.026
CO-60	8.210E-01	4.611E+00	8.177E+00	0.000E+00	0.100
ZN-65	1.430E+01	1.119E+01	1.805E+01	0.000E+00	0.792
SE-75	-3.983E+00	5.174E+00	8.154E+00	0.000E+00	-0.488
SR-85	8.673E+00	4.428E+00	7.996E+00	0.000E+00	1.085
Y-88	3.144E-01	4.098E+00	6.859E+00	0.000E+00	0.046
NB-94	4.907E-01	3.711E+00	6.191E+00	0.000E+00	0.079
NB-95	7.220E+00	4.342E+00	7.983E+00	0.000E+00	0.904
ZR-95	-1.687E+00	6.028E+00	9.618E+00	0.000E+00	-0.175
MO-99	-2.917E+01	5.952E+01	9.350E+01	0.000E+00	-0.312
RU-103	3.056E+00	3.892E+00	6.717E+00	0.000E+00	0.455
RU-106	-4.604E+00	3.324E+01	5.474E+01	0.000E+00	-0.084
AG-110m	2.455E-02	3.855E+00	6.398E+00	0.000E+00	0.004
SN-113	5.159E+00	5.029E+00	8.838E+00	0.000E+00	0.584
SB-124	-4.174E+00	4.708E+00	6.072E+00	0.000E+00	-0.687
SB-125	-1.219E+00	1.185E+01	1.947E+01	0.000E+00	-0.063
TE-129M	4.364E+00	4.783E+01	7.913E+01	0.000E+00	0.055
I-131	-3.081E+00	5.034E+00	8.119E+00	0.000E+00	-0.380
BA-133	5.555E+00	5.737E+00	8.872E+00	0.000E+00	0.626
CS-134	9.940E+00	4.613E+00	7.840E+00	0.000E+00	1.268
CS-136	-1.534E+00	4.473E+00	7.067E+00	0.000E+00	-0.217
CS-137	7.662E+00	4.169E+00	7.840E+00	0.000E+00	0.977
CE-139	-2.402E+00	3.919E+00	6.131E+00	0.000E+00	-0.392
BA-140	-1.528E+01	1.662E+01	2.519E+01	0.000E+00	-0.607
LA-140	4.333E+00	4.926E+00	9.025E+00	0.000E+00	0.480
CE-141	-6.606E+00	6.755E+00	1.049E+01	0.000E+00	-0.630
CE-141 CE-144	1.019E+00	2.964E+01	4.818E+01	0.000E+00	0.021
EU-152	-1.016E+01	1.379E+01	1.864E+01	0.000E+00	-0.545
EU-154	-2.099E+00	7.719E+00	1.245E+01	0.000E+00	-0.169
AC-228	1.533E+01	1.491E+01	2.758E+01	0.000E+00	0.556
TH-232	1.533E+01	1.489E+01	2.755E+01	0.000E+00	0.556
U-235	-3.978E+01	2.999E+01	4.596E+01	0.000E+00	-0.865
U-238	2.935E+01	4.322E+02	7.199E+02	0.000E+00	0.041
AM-241	-4.245E+01	3.501E+01	5.451E+01	0.000E+00	-0.779

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                     9.249E+00,
C, TH-228
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                                    3.394E+01,
                    -1.754E+01,
C, CR-51
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                                    1.185E+01,
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C, CS-134
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                                                                    -0.607
                                     1.662E+01,
            , NO
                    -1.528E+01,
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                      4.333E+00,
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                                     6.755E+00,
                     -6.606E+00,
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                                                    4.818E+01,,
                      1.019E+00,
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                                                                    -0.545
                                     1.379E+01,
                     -1.016E+01,
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                                                                    -0.169
                                                    1.245E+01,,
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                     -2.099E+00,
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                                     1.491E+01,
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                                                    2.755E+01,,
                                     1.489E+01,
                      1.531E+01,
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                                                                    -0.865
                                                    4.596E+01,,
                                     2.999E+01,
                     -3.978E+01,
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                                     4.322E+02,
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                                                                    -0.779
                                                    5.451E+01,,
                     -4.245E+01,
                                     3.501E+01,
 C, AM-241
             , NO
```

#### **Revision 1**

#### APPENDIX E

DATA VALIDATION MEMORANDUM



45 Farmington Valley Drive Plainville, Connecticut 06062

Telephone: (860) 747-1800

www.CRAworld.com

Fax: (860) 747-1900

### MEMORANDUM

To:

Steve Quigley

Ref. No.:

45136-28

FROM:

Kathy Shaw/ks/6/CT →

DATE:

June 22, 2006

Revision Date:

August 23, 2006

RE:

Data Quality Assessment and Verification

Fleetwide Assessment - Hydrogeologic Investigation Quad Cities Generating Station - Cordova, Illinois

This memorandum details a data verification of the radiochemical data resulting from the collection of 32 groundwater, two (2) surface water and eight (8) quality control samples from the Quad Cities Generating Station in Cordova, Illinois. The sample summary detailing sample identification, sample location, quality control samples, and analytical parameters is presented in Table 1. Sample analysis was completed at Teledyne Brown Engineering in Knoxville, Tennessee (TBE) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods.<sup>1</sup>

#### Sample Quantitation

The laboratory reported several radionuclides with activity concentrations above the minimum detectable concentration (MDC) and greater than the three (3) sigma critical level (99% confidence interval), but qualified them as not detected due to the presence of interference preventing identification of the major peaks, with a U\* flag. Based on the laboratory qualification definition these concentrations should be qualified as not-detected (U\*) above the laboratory reported MDC.

#### Sample Preservation

Samples collected for gamma scan and total strontium analyses are to be preserved to a pH of less than or equal to two (2) during shipment and laboratory storage with nitric acid at the time of collection. The samples were shipped and maintained in accordance with the sample preservation requirements.

#### Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free of radioactive material contamination produced by the laboratory conditions or procedures.

<sup>&</sup>lt;sup>1</sup> Prescribed Procedure for Measurement of Radioactivity in Drinking Water EPA-600/4-80-032

#### Laboratory Control Sample Analysis

The laboratory control sample (LCS) is a sample containing a known amount of a radionuclide that is equivalent to internal or external control samples prepared by the analytical laboratory or a Federal/State agency. The LCS percent recoveries were within the laboratory or agency control limits, indicating that an acceptable level of overall performance was achieved.

#### **Duplicate Sample Analyses**

The laboratory precision of matrix-specific measurement system was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria. No targeted analytes were reported as detected in the laboratory duplicate sample sets.

### Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of five (5) field duplicate sample sets and three (3) rinsate blank samples.

To assess the efficiency of field decontamination procedures and cleanliness of sample containers, the rinsate samples identified in Table 1 were collected and analyzed. The samples that should be qualified due to rinsate blank contamination are summarized in Table 3. No additional target radionuclides were reported as detected in the rinsate samples.

Overall precision for the sampling event and laboratory procedures were monitored using the results of the field duplicate sample sets. Table 4 summarizes the results of the detected analytes in the field duplicate sample set. The data indicate that an adequate level of precision was achieved for the sampling event.

#### Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1 Page 1 of 2

# SAMPLE KEY FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Sample Identifiation	QC Sample	Sample Date	Matrix	Analysis
MW-QC-1021	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102S	WG-QC-MW-QC-1025-053106-JH-018		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	Surface Water	Tritium/Strontium/Gamma Spectrum
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	Surface Water	Tritium/Strontium/Gamma Spectrum
Rinsate	RB-QC-MW-QC-108S-053106-JH-013	Rinsate	5/31/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Fire Training Well	WG-QC-MW-QC-FTW-053106-JH-001		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
WELL #1	WG-QC-MW-QC-WELL#1-060106-JH-009		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
WELL #5	WG-QC-MW-QC-WELL#5-060106-JH-010		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Big Fish Well	WG-QC-MW-QC-BFW-060106-JH-007		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum

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# SAMPLE KEY FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Sample Location	Sample Identifiation	QC Sample	Sample Date	Matrix	Analysis
MW-QC-115S	RB-QC-MW-QC-115S-072706-NZ-007	Rinsate	7/27/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102D	RB-QC-MW-QC-102D-072806-NZ-014	Rinsate	7/28/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum

Gamma Spectrum - Barium-140, Cesium-134, Cesium-137, Cobalt-58, Cobalt-60, Iron-59, Lanthanum-140, Manganese-54, Niobium-95, Zinc-65, Zirconium-95 Isotopes not listed in Table 1, but typically detected in environmental samples (i.e. Ac-228, K-40, Be-7, Ra-226, Th-228, Th-232, etc.) were reported if detected.

QC - Quality Control

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# SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Parameter	$m{Method}^{1}$	Matrix	Holding Time	Preservation
Tritium	EPA 906.0	Water	- 6 months	None
Strontium - 89/90 (Total)	EPA 905.0	Water	- 6 months	HNO3 to pH<2
Gamma Spectrum	EPA 901.1	Water	- 6 months	HNO3 to pH<2

 $<sup>^{\</sup>rm I}\,{\rm EPA-60/40-80-032}\,\,{\rm August\,1980\,\,^{\rm ``Precribed\,Procedures\,For\,Measurement\,of\,Radioactivity\,In\,Drinking\,Water}$ 

TABLE 3

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO RINSATE BLANK CONTAMINATION FLEETWIDE ASSESSMENT

## QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Rinse Blank Date	Analyte	Blank Result	Sample ID	Sample Result	Uncertainty @ 2 sigma	Qualified Sample Result	Units
7/27/06	Tritium	282	WG-QC-MW-QC-108I-072706-NZ-001 WG-QC-MW-QC-111I-072706-NZ-006	597 390	+/-140 +/-127	597 J 390 J	pCi/L pCi/L
7/28/07	Tritium	365	WG-QC-MW-QC-109I-072806-NZ-012 WG-QC-MW-QC-109I-072806-NZ-013 WG-QC-MW-QC-102D-072806-NZ-015	768 1140 3930	+/- 234 +/- 273 +/- 675	768 J 1140 J 3930 J	pCi/L pCi/L pCi/L

Notes:

J - The associated numerical value is an estimated quanity

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#### SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SET FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS

Analyte	Original Sample ID	Original Result	Uncertainty @ 2 sigma	Duplicate Sample ID	Duplicate Result	Uncertainty @ 2 sigma		Units
Tritium	WG-QC-MW-QC-109I-072806-NZ-012	768 J	+/- 156	WG-QC-MW-QC-109I-072806-NZ-013	1140 [	+/~182	39	pCi/L

Notes:

RPD Relative Percent Difference